2015 Research Results

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Research & Education Advisory Council

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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

RESEARCH SPECIALISTS:

MICHIGAN SUGAR COMPANY

Jim Stewart, Director of Research
Cell 989.225.6720
Email ..... james.stewart@michigansugar.com

David Pratt, Agronomist
Cell 989.225.8715
Email ..... david.pratt@michigansugar.com

Brian Groulx, Research Assistant
Cell 989.225.6709
Email ..... brian.groulx@michigansugar.com

MICHIGAN STATE UNIVERSITY

Steven Poindexter, Senior Extension Educator
Cell 989.798.5848
Email ..... poindex2@msu.edu

Tom Wenzel, Research Technician
Cell 989.737.9447
Email ..... wenzelth@msu.edu

MICHIGAN SUGAR COMPANY
CORPORATE AGRICULTURAL OFFICE:
2600 South Euclid Avenue
Bay City, Michigan 48706
Tel: 989.686.0161

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2015 Research Results

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Evaluate Generic Formulations of Quadris for Rhizoctonia Control in Sugarbeets

Average of 3 locations

Trial Quality: Good
Variety: C-RR047NT
Planted: Crumbaugh - April 27, Laker - April 17, Stoneman - May 1
Harvested: Crumbaugh - Oct 9, Laker - Sept 17 Stoneman - Oct 6
Plot Size: 6 rows X 38 ft, 6 reps
Application: JD 3520 Tractor mounted plot sprayer 7" Band , compressed air, 30 psi, 15.3 gpa

Rhizoc Level: Moderate
Cerc Control: Good
Seeding Rate: 4.1 inches
Row Spacing: 22 inch

No.	Treatment	Rate	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	Stand B/100	Dead B/100	Vigor 1-10
1	Quadris	14.25 fl oz	6-8 lf	**$1,725**	**8467**	**251**	**33.4**	**16.9**	**95.5**	**251**	**4.3**	**8.4**
3	Azoxy 2SC	14.25 fl oz	6-8 lf	**$1,702**	**8233**	**250**	**33.4**	**16.8**	**95.4**	**248**	**3.9**	**8.0**
4	Agristar Azoxystrobin	14.25 fl oz	6-8 lf	**$1,641**	**7888**	**247**	**32.7**	**16.7**	**95.2**	**251**	**4.5**	**8.2**
2	Equation SC	14.25 fl oz	6-8 lf	**$1,594**	**7913**	**247**	**31.6**	**16.7**	**95.3**	**252**	**4.6**	7.8
5	Untreated Check			**$1,435**	6695	**238**	28.5	**16.1**	**94.6**	**245**	**24.7**	**8.0**
Average				$1,619	7839	247	31.9	16.6	95.2	249	8.4	8.1
LSD 5%				n.s.	1427.4	n.s.	4.9	n.s.	n.s.	n.s.	n.s.	0.4
CV %				10.7	9.7	3.3	8.1	2.8	0.7	2.1	160.8	2.8

Comments: Quadris and 3 Generic Azoxystrobin formulations were evaluated for root rot control in sugarbeets. There did not appear to be any differences between Quadris and the generic formulations.

Stoneman, Breckenridge, MI - 2015

Trial Quality: Good
Variety: C-RR074NT
Planted: May 1
Harvested: Oct 6
Plot Size: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Application: JD 3520 Tractor mounted plot sprayer 7" Band , compressed air, 30 psi, 15.3 gpa

Soil Info: Sandy Loam 3.3% OM, 7.2 pH, CEC: 7.5 > Opt: P and Opt: K Medium: Mn, Low: B
Added N: Manure + 80 lbs
Prev Crop: Corn Silage

Rhizoc Level: Low
Cerc Control: Good
Problems: Water
Seeding Rate: 4.1 inches
Rainfall: 18.3 inches

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	2-Jun Stand B/100	1-Jul Dead B/100'	16-Jul Vigor 0-10
1	Quadris	14.25 fl oz	6-8 lf	**$2,469**	**11486**	**239**	**47.5**	**16.1**	**95.4**	**264**	**0.1**	**8.6**
5	Untreated Check			**$2,363**	**10670**	**236**	**45.6**	**16.1**	**94.8**	**256**	**0.2**	**8.0**
3	Azoxy 2SC	14.25 fl oz	6-8 lf	**$2,315**	**10730**	**231**	**46.2**	**15.8**	**94.8**	**256**	**0.3**	7.9
4	Agristar Azoxystrobin	14.25 fl oz	6-8 lf	**$2,297**	10576	226	**46.8**	**15.7**	**94.4**	250	**0.1**	**8.3**
2	Equation SC	14.25 fl oz	6-8 lf	$2,139	10276	227	43.3	**15.6**	**94.7**	**263**	**0.4**	7.5
Average				$2,317	10748	232	45.9	15.9	94.8	258	0.2	8.1
LSD 5%				210.0	872.6	11.4	3.7	0.7	1.0	9.4	0.5	0.5
CV %				7.5	6.7	4.1	6.7	3.5	0.9	3.0	184.0	5.0

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statistically different fron the top ranking variety in each column.

Evaluate Generic Formulations of Quadris for Rhizoctonia Control in Sugarbeets

Laker, Elkton, MI - 2015

Trial Quality: Good
Variety: C-RR074NT
Planted: April 18
Harvested: Sept 17
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.4 pH, CEC: 12.6
> Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low-moderate
Cerc Control: Good
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 21.8 inches
Application: JD 3520 Tractor mounted plot sprayer 7" Band , compressed air, 30 psi, 15.3 gpa

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	Stand B/100	8-Jul Dead B/100'	Vigor 0-10
3	Azoxy 2SC	14.25 fl oz	6-8 lf	**$1,311**	**7045**	**277**	**25.4**	**18.4**	**96.0**	**257**	**0.7**	**8.5**
1	Quadris	14.25 fl oz	6-8 lf	**$1,284**	**6926**	**274**	**25.3**	**18.2**	95.8	**257**	**0.6**	**8.7**
4	Agristar Azoxystrobin	14.25 fl oz	6-8 lf	**$1,239**	**6596**	**273**	**24.4**	**18.1**	**96.0**	**260**	**0.4**	**8.5**
2	Equation SC	14.25 fl oz	6-8 lf	**$1,222**	**6585**	**274**	**24.0**	**18.2**	**96.1**	**255**	**2.4**	**8.1**
5	Untreated Check			$1,150	5821	**266**	22.8	**17.7**	**96.0**	**250**	7.2	**8.6**
Average				$1,241	6594	273	24.4	18.1	95.9	256	2.3	8.5
LSD 5%				112.0	536.5	n.s.	1.5	n.s.	0.3	n.s.	4.0	n.s.
CV %				7.5	6.8	3.7	5.1	3.1	0.3	5.2	146.0	5.6

Crumbaugh, Breckenridge, MI - 2015

Trial Quality: Fair
Variety: C-RR074NT
Planted: April 27
Harvested: Oct 9
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Loamy Sand
2.2% OM, 6.7 pH, CEC: 5.1
> Opt: P and Opt: K
Medium: Mn, Very Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: High
Cerc Control: Good
Problems: a few low spots
Seeding Rate: 4.1 inches
Rainfall: 18.8 inches
Application: JD 3520 Tractor mounted plot sprayer 7" Band , compressed air, 30 psi, 15.3 gpa

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	Stand B/100	3-Aug Dead B/100'	8-Jun Vigor 0-10
3	Azoxy 2SC	14.25 fl oz	6-8 lf	**$1,480**	**6923**	**242**	**28.6**	**16.3**	**95.4**	**229**	**10.8**	**7.6**
1	Quadris	14.25 fl oz	6-8 lf	**$1,421**	**6991**	**241**	**27.5**	**16.3**	**95.2**	**234**	**12.4**	**7.8**
2	Equation SC	14.25 fl oz	6-8 lf	**$1,419**	**6877**	**240**	**27.6**	**16.3**	**95.2**	**237**	**11.0**	**7.7**
4	Agristar Azoxystrobin	14.25 fl oz	6-8 lf	**$1,387**	**6493**	**241**	**26.8**	**16.3**	**95.4**	**242**	**12.9**	**7.8**
5	Untreated Check			$793	3593	212	17.1	14.6	93.1	230	66.8	**7.5**
Average				$1,300	6175	235	25.5	16.0	94.8	234	22.7	7.7
LSD 5%				176.4	692.8	9.3	3.0	0.6	0.6	10.6	13.0	n.s.
CV %				13.3	11.0	3.9	11.6	3.5	0.6	4.4	55.7	5.2

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statistically different fron the top ranking variety in each column.

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Evaluate Registered and Experimental Fungicides for control of Rhizoctonia in Sugarbeets

Crumbaugh, Breckenridge, MI - 2015

Trial Quality: Fair
Variety: B-19RR1N
Planted: April 15
Harvested: Oct 8
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch
Soil Info: Loamy Sand
2.2% OM, 6.7 pH, CEC: 5.1
>Opt: P and Opt: K
Medium: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: High
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 18.8 inches
Application: In-Furrow trts applied 3.5" T-Band on planter in 9 gpa, 8 leaf trts 7" banded with plot sprayer in 15 gpa.

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% Suc	% CJP	22-Sep Vigor 0-10	10-Aug Dead B/100'
4	Quadris	10 fl oz	IF T-Band	**$1,880**	**7754**	**215**	**36.1**	**15.1**	**93.9**	**7.1**	**28**
24	Quadris Moncut 70 DF	10 fl oz 24 oz	IF T-Band 6-8 lf	**$1,817**	**7706**	**223**	**34.3**	**15.3**	**94.8**	**7.4**	**25**
6	Moncut 70 DF	16 oz	IF T-Band	**$1,722**	**7171**	**220**	**32.7**	**15.2**	**94.7**	**7.3**	**25**
5	Quadris	12 fl oz	IF T-Band	**$1,709**	**7069**	**206**	**34.3**	**14.5**	**93.8**	**6.6**	**39**
23	Quadris Moncut 70 DF	10 fl oz 16 oz	IF T-Band 6-8 lf	**$1,669**	**7032**	**219**	**31.8**	**15.1**	**94.6**	**7.3**	**24**
27	Quadris Gem SC	10 fl oz 3.6 fl oz	IF T-Band 6-8 lf	**$1,667**	**6996**	**217**	**31.8**	**15.2**	**93.8**	**7.3**	**26**
17	Moncut 70 DF	24 oz	6-8 lf	**$1,626**	**6849**	**215**	**31.8**	**15.3**	**93.3**	**6.9**	**30**
22	Quadris Quadris	10 fl oz 14.25 fl oz	IF T-Band 6-8 lf	**$1,570**	**6597**	**220**	**30.0**	**15.2**	**94.7**	**7.0**	**25**
10	Serenade Soil	3 qt	IF T-Band	**$1,558**	**6449**	**210**	**30.3**	**14.8**	**93.9**	6.1	59
25	Quadris Moncut 70 DF	10 fl oz 32 oz	IF T-Band 6-8 lf	**$1,557**	**6716**	**221**	**30.3**	**15.2**	**94.8**	**7.0**	**24**
15	Quadris	14.25 fl oz	6-8 lf	**$1,556**	**6462**	**212**	**30.6**	**14.8**	**94.1**	**7.0**	**38**
16	Moncut 70 DF	16 oz	6-8 lf	**$1,535**	**6407**	**199**	**32.6**	**14.3**	**93.1**	**7.0**	**27**
21	Topsin M	20 fl oz	6-8 lf	**$1,491**	**6287**	**217**	**28.4**	**15.1**	**94.3**	**6.8**	**43**
19	Proline + Induce	5.7 fl oz +.25%	6-8 lf	**$1,486**	**6175**	**215**	**28.6**	**15.0**	**94.3**	**6.6**	**40**
28	Quadris Topsin M	10 fl oz 20 fl oz	IF T-Band 6-8 lf	**$1,469**	**6160**	**221**	27.6	**15.4**	**94.3**	**6.3**	**39**
3	Quadris	9 fl oz	IF T-Band	**$1,455**	**6009**	**223**	26.7	**15.3**	**94.7**	**6.9**	**43**
13	Gem SC	3.6 fl oz	IF T-Band	**$1,449**	**6027**	**199**	**30.3**	**14.4**	92.8	**6.8**	**43**
7	Moncut 70 DF	24 oz	IF T-Band	**$1,420**	**6009**	**220**	27.1	**15.1**	**94.9**	**6.6**	**46**
26	Quadris Proline + Induce	10 fl oz 5.7 fl oz +.25%	IF T-Band 6-8 lf	$1,368	5105	**208**	27.7	**14.7**	**93.7**	**7.0**	**29**
2	Quadris	8 fl oz	IF T-Band	$1,339	4376	**214**	25.1	**14.9**	**94.3**	**6.6**	**45**
1	Quadris	7 fl oz	IF T-Band	$1,308	5392	**200**	27.0	**14.2**	**93.5**	**6.4**	**45**
14	Topsin M	20 fl oz	IF T-Band	$1,289	5327	**210**	25.0	**14.8**	**93.5**	5.6	60
11	Serenade Soil	4 qt	IF T-Band	$1,215	5080	**196**	26.1	14.1	**92.9**	6.0	53
18	Moncut 70 DF	32 oz	6-8 lf	$1,162	5026	195	25.8	14.0	**93.0**	**6.4**	**44**
8	Moncut 70 DF	32 oz	IF T-Band	$1,158	5009	**197**	25.1	14.1	**93.1**	5.8	66
20	Gem SC	3.6 fl oz	6-8 lf	$1,063	4454	188	23.0	13.0	92.4	5.9	53
12	Proline + Induce	5.7 fl oz +.25%	IF T-Band	$997	4179	191	21.7	13.7	**93.1**	5.8	69
9	Serenade Soil	2 qt	IF T-Band	$950	3936	186	20.9	13.6	92.6	5.9	64
29	Untreated Check			$918	3747	179	20.5	13.4	91.5	4.4	92
Average				$1,428	5914	208	28.4	14.7	93.7	6.5	43
LSD 5%				501.7	2009.8	27.6	7.9	1.2	1.9	1.1	28.9
CV %				24.9	24.0	9.4	19.7	6.0	1.5	12.2	47.9

Comments: Quadris infurrow at 10 fl oz/a provided good control of Rhizoctonia root rot in this trial. The disease level was high. Quadris at 7 and 8 fl oz/a (in-furrow) was less effective than the 10 fl oz/a rate. Moncut at 16 oz/a applied in-furrow also gave good disease control. Foliar treatments were somewhat less effective. The sugarbeet stand was good (220 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statistically different from top-ranking variety in each column.

Evaluate Xanthion for Control of Rhizoctonia Root Rot in Sugarbeets

Crumbaugh, Breckenridge, MI - 2015

Trial Quality: Fair
Variety: B-19RR1N
Planted: April 15
Harvested: Oct 8
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Loamy Sand
2.2% OM, 6.7 pH, CEC:5.1
>Opt: P and Opt: K
Medium: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Very High
Cerc Control: Good
Problems: none
Seeding Rate: 4.1 inches
Rainfall: 18.8 inches
Application: In-Furrow trts applied in 3.5" t-band on planter in 9 gpa.

No.	Treatment		Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	31-Aug DB 100 ft	Vigor 0-10
2	Xanthion	Bacillus subtilis	1.8 fl oz/A	In-Fur	**$1,491**	**6157**	**218**	**28.7**	**14.9**	**94.5**	**42.9**	**7.7**
		Pyraclostrobin	9 fl oz/A	In-Fur								
3	Xanthion	Bacillus subtilis	2.4 fl oz/A	In-Fur	**$1,349**	**5527**	**214**	**26.6**	**14.9**	**94.5**	**62.6**	**7.3**
		Pyraclostrobin	12 fl oz/A	In-Fur								
1	Xanthion	Bacillus subtilis	1.2 fl oz/A	In-Fur	$1,261	**5384**	**223**	23.6	**15.2**	**94.8**	**50.3**	**7.7**
		Pyraclostrobin	6 fl oz/A	In-Fur								
4	Quadris	Azoxystrobin	10 fl oz/A	In-Fur	$1,244	5175	**216**	24.3	**14.8**	**94.7**	76.1	**7.2**
5	Untreated Check				$659	2733	187	14.7	13.5	92.9	165.4	6.0
Average					$1,201	4995	212	23.6	14.7	94.3	79.5	7.2
LSD 5%					168.7	827.4	12.0	2.8	0.6	0.8	21.2	0.5
CV %					13.7	16.2	5.5	11.6	3.8	0.8	26.1	6.5

Comments: Xanthion, a combination of Bacillus Subtillis and Pyraclostrobin (Headline), was applied in-furrow and compaired to Quadris. Xanthion appeared to provide better root rot control compared to Quadris. The disease level was very high. The Sugarbeet stand was high (250 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statistically different from top-ranking in each column.

Evaluate Moncut Experimental Fungicide for Control of Rhizoctonia Root Rot in Sugarbeets

Yoder Disease, Pigeon, MI - 2015

Trial Quality: Good
Variety: C-RR074NT
Planted: April 28
Harvested: Sept 24
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch

Soil Info: Sandy Loam
3.0% OM, 7.2 pH, CEC: 9.5
>Opt: P and K
High: Mn, Medium: B
Added N: 125 lbs
Prev Crop: Soybeans

Rhizoc Level: Low / Moderate
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 Inches
Rainfall: 17.3 Inches

Application: In-Furrow trts applied 3.5" T-Band on planter in 9 gpa, 8 lf trts 7" banded with plot sprayer in 15 gpa

No.	Treatment	Rate/A	Appl	Dead Beets 100 ft	31-Aug Vigor 1-10	Stand 100 ft	Net $/A	RWSA	RWST	T/A
6	Quadris FL	10 fl oz	In-Fur	**0.3**	**8.7**	**269**	**$2,314**	**10305**	**231.2**	**44.5**
3	Moncut 70 DF	16 oz	In-Fur	**0.3**	**9.0**	**261**	**$2,269**	**10331**	**231.5**	**44.7**
	Moncut 70 DF	16 oz	8 lf							
1	Moncut 70 DF	16 oz	In-Fur	**1.0**	**8.6**	**267**	**$2,221**	**9966**	**225.5**	**44.3**
7	Quadris FL	14.25 fl oz	8 lf	**1.2**	**8.8**	**255**	**$2,182**	**9761**	**224.3**	**43.5**
9	Proline	5.7 fl oz	8 lf	**1.4**	**8.7**	**260**	**$2,185**	**9768**	**222.0**	**44.1**
5	Moncut 70 DF	32 oz	8 lf	**2.2**	**8.6**	**270**	**$2,284**	**10245**	**229.9**	**44.6**
4	Moncut 70 DF	16 oz	8 lf	**2.7**	**8.5**	**254**	**$2,218**	**9951**	**221.2**	**45.0**
2	Moncut 70 DF	32 oz	In-Fur	**3.9**	**8.6**	**263**	**$2,167**	**9883**	**227.8**	**43.4**
8	Proline	5.7 fl oz	In-Fur	5.3	8.1	**263**	**$2,165**	**9678**	**225.1**	**43.1**
10	Untreated Check			12.6	6.7	**243**	**$1,974**	8719	**214.4**	**40.7**
Average				3.1	8.4	261	$2,198	9861	225.3	43.8
LSD 5%				4.8	0.7	n.s.	n.s.	822.6	n.s.	n.s.
CV %				121.8	6.8	5.7	6.6	6.5	3.7	5.5

Comments: Moncut was applied in-furrow in a 3.5 inch T-Band and as a foliar treatment at the 8 leaf stage in a 7 inch band. Moncut provided good Rhizoctonia root rot control, similar to Quadris. Moncut did not cause sugarbeet injury. Moncut and Quadris are from different chemical classes. Moncut is registered in other crops and provides good control of Rhizoctonia root rot. The disease level was low to moderate.

$/A: Calculated assuming a $51 payment and subtract the cost of fungicides.
Bold: Results are not statistically different from top-ranking variety in each column.

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Evaluate Moncut Experimental Fungicide for Control of Rhizoctonia Root Rot in Sugarbeets

Stoneman, Breckenridge, MI - 2015

Trial Quality: Good
Variety: C-RR074NT
Planted: April 30
Harvested: Oct 6
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Sandy Loam
3.3% OM, 7.2 pH, CEC: 7.5
>Opt: P and K
High: Mn, Low: B
Added N: Manure + 80 lbs
Prev Crop: Corn Silage
Rhicoz Level: Low
Cerc Control: Good
Problems: Flooding
Seeding Rate: 4.1 Inches
Rainfall: 18.3 inches
Application: In-Furrow trts applied 3.5" T-Band on planter in 9 gpa, 8 leaf trts 7" banded with plot sprayer in 15 gpa

No.	Treatmer	Rate/A	Appl	9-Jul Vigor 1-10	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
3	Moncut 70 DF Moncut 70 DF	16 oz 16 oz	In-Fur 8 lf	**8.9**	**$2,496**	**12191**	**254**	**48.0**	**17.0**	**95.6**
8	Proline	5.7 fl oz	In-Fur	**8.9**	**$2,299**	**11046**	**240**	**46.1**	**16.4**	**94.8**
9	Proline	5.7 fl oz	8 lf	**8.9**	**$2,445**	**11737**	**244**	**48.2**	**16.5**	**95.2**
5	Moncut 70 DF	32 oz	8 lf	**8.8**	**$2,289**	**11039**	**237**	**46.8**	**16.1**	**95.0**
6	Quadris FL	10 fl oz	In-Fur	**8.6**	**$2,311**	**11072**	**235**	**47.2**	**16.0**	**95.0**
1	Moncut 70 DF	16 oz	In-Fur	**8.5**	**$2,514**	**12109**	**240**	**50.4**	**16.4**	**94.8**
7	Quadris FL	14.25 fl oz	8 lf	**8.5**	**$2,401**	**11535**	**249**	**46.3**	**16.9**	**95.1**
2	Moncut 70 DF	32 oz	In-Fur	**8.4**	**$2,521**	**12312**	**250**	**49.3**	**16.8**	**95.5**
4	Moncut 70 DF	16 oz	8 lf	**8.4**	**$2,415**	**11641**	**248**	**47.0**	**16.7**	**95.3**
10	Untreated Check			**8.3**	**$2,206**	**10482**	**228**	**46.0**	**15.7**	**94.5**
Average				8.6	$2,390	11516	242	47.5	16.5	95.1
LSD 5%				ns	ns	ns	ns	ns	ns	ns
CV %				8.92	7.4	7.29	5.18	4.51	3.97	0.83

Comments: Moncut (flutolanil) is being developed for Rhizoctonia control in sugarbeets. Moncut has a different mode of action than Quadris. There was very little disease in this trial and yield and quality differences were not statistically different from each other. There was a trend for the treatments to be superior to the untreated check. The trial quality was good (low % cv values). Moncut is registered in other crops and provides effictive control of Rhizoctonia solani.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statistically different from top-ranking variety in each column.

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Evaluate Moncut Experimental Fungicide for Control of Rhizoctonia Root Rot in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: C-RR074NT
Planted: April 17
Harvested: Sept 21
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inch

Soil Info: Clay Loam
3.0% OM, 7.4 pH, CEC: 12.6
>Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans

Rhizoc Level: Low / Moderate
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 25 inches

Application: In-Furrow trts applied 3.5" T-Band on planter in 9 gpa, 8 leaf trts 7" banded with plot sprayer in 15 gpa

No.	Treatment	Rate/A	Appl	Late Dead Beets 100 ft	Vigor 0-10	Early Stand 100 ft	Net $/A	RWSA	RWST	T/A
1	Moncut 70 DF	16 oz	In-Fur	**1.0**	**8.0**	**138**	**$1,528**	**8472**	**281**	**30.1**
5	Moncut 70 DF	32 oz	8 lf	**1.3**	**8.2**	**142**	**$1,513**	**8389**	**281**	**29.7**
3	Moncut 70 DF	16 oz	In-Fur	**2.3**	**7.8**	**136**	**$1,417**	**8058**	**274**	**29.3**
	Moncut 70 DF	16 oz	8 lf							
8	Proline	5.7 fl oz	In-Fur	**2.6**	**8.2**	**144**	**$1,548**	**8532**	**276**	**30.9**
6	Quadris FL	10 fl oz	In-Fur	**2.8**	**8.1**	**138**	**$1,473**	**8088**	**279**	**29.0**
7	Quadris FL	14.25 fl oz	8 lf	**3.0**	**8.3**	**146**	**$1,541**	**8497**	**275**	**30.9**
4	Moncut 70 DF	16 oz	8 lf	4.8	**8.4**	**139**	**$1,566**	**8678**	**273**	**31.6**
9	Proline	5.7 fl oz	8 lf	5.0	**8.2**	**141**	**$1,482**	**8174**	**275**	**29.8**
2	Moncut 70 DF	32 oz	In-Fur	5.1	**7.7**	**141**	**$1,412**	**8031**	**277**	**29.0**
10	Untreated Check			7.6	**7.9**	**141**	$1,391	7537	**272**	**27.7**
Average				3.5	8.1	141	$1,487	8246	276	29.8
LSD 5%				3.1	1.0	n.s.	158.9	860.9	n.s.	n.s.
CV %				75.2	10.2	12.8	9.2	9.0	4.3	8.0

Comments: Moncut was applied in-furrow at planting in a 3.5 inch T-Band and in a 7 inch band at the 8 lf stage as a foliar spray. Moncut provided good root rot control, similar to Quadris. There was no advantage to using the higher Moncut rate. Moncut did not cause sugarbeet injury. Moncut is in a different chemical class than Quadris. Moncut is registered in other crops and provides good control of Rhizoctonia root rot. The disease level was low to moderate.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statistically different from top-ranking variety in each column.

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Evaluate Moncut Experimental Fungicide for Control of Rhizoctonia Root Rot in Sugarbeets

Crumbaugh, Breckenridge, MI - 2015

Trial Quality: Good
Variety: C-RR074NT
Planted: April 15
Harvested: Oct 8
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inch

Soil Info: Loamy Sand
2.2% OM, 6.7 pH, CEC: 5.1
>Opt: P and Opt: K
Medium: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans

Rhizoc Level: Moderate
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 19 inches

Application: In-Furrow trts applied 3.5" T-Band on planter in 9 gpa, 8 leaf trts 7" banded with plot sprayer in 15 gpa

No.	Treatment	Rate/A	Appl	Late Dead Beets 100 ft	Avg 2 Vigor 0-10	Early Stand 100 ft	Net $/A	RWSA	RWST	T/A
3	Moncut 70 DF	16 oz	In-Fur	**2.4**	**8.4**	**214**	**$1,677**	**8381**	**250**	**33.6**
	Moncut 70 DF	16 oz	8 Lf							
2	Moncut 70 DF	32 oz	In-Fur	**4.8**	**8.4**	**222**	**$1,702**	**8503**	**249**	**34.1**
7	Quadris FL	14.25 fl oz	8 Lf	**7.7**	**8.2**	**221**	**$1,710**	**8336**	**249**	**33.4**
6	Quadris FL	10 fl oz	In-Fur	**8.6**	**7.9**	**216**	**$1,641**	**7971**	**245**	**32.5**
8	Proline	5.7 fl oz	In-Fur	**9.8**	**7.6**	**212**	**$1,700**	**8279**	**244**	**34.1**
4	Moncut 70 DF	16 oz	8 Lf	**10.3**	**7.8**	**205**	**$1,713**	**8386**	**248**	**33.8**
5	Moncut 70 DF	32 oz	8 Lf	**11.5**	**7.9**	**210**	**$1,674**	**8200**	**241**	**34.0**
9	Proline	5.7 fl oz	8 Lf	**15.3**	**7.9**	**207**	**$1,642**	**8002**	**244**	**32.8**
1	Moncut 70 DF	16 oz	In-Fur	17.3	7.8	**210**	**$1,642**	**8045**	**244**	**33.0**
10	Untreated Check			39.6	6.5	**198**	**$1,390**	**6669**	**235**	**28.4**
Average				12.7	7.8	211.3	$1,649	8077	245	33.0
LSD 5%				13.8	0.5	ns	ns	ns	ns	ns
CV %				74.8	4.8	10.4	10.5	10.3	4.4	8.5

Comments: Moncut was applied in-furrow at planting in a 3.5 inch T-Band and a 7 inch band at the 8 lf stage as a foliar spray. Moncut provided good root rot control (similar to Quadris). The 16 oz rate was as good as the 32 oz rate. Moncut did not cause any stand loss or crop injury. Moncut and Quadris are in different chemical classes. Moncut is registered in other crops and provides good control of Rhizoctonia root rot. The disease level was moderate to high.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statistically different from top-ranking variety in each column.

Evaluate Methods for Improving the BEETCast Model for Controlling Cercospora in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: C-RR059 and B-12RR2N
Planted: April 17
Harvested: Sept 23
Plot Size: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.4 pH, CEC: 12.6
> Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc level: Low
Cerc Control: See trts
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No.	Treatment	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
9	MAWN Improve BEETcast 12 lf	**2.41**	**$1,831**	**10101**	**273**	**37.0**	**17.9**	**96.5**
7	MAWN Duplicate BEETcast 12 lf	**2.46**	**$1,740**	**9623**	264	**36.6**	17.4	96.2
10	MAWN Duplicate Free Weather	**2.49**	**$1,791**	**9734**	**267**	**36.4**	**17.6**	**96.6**
8	MAWN Improve BEETcast	**2.49**	**$1,726**	9391	**267**	**34.8**	**17.6**	**96.4**
1	35 / 50 or 55 DSV Standard Rec	**2.49**	$1,669	9243	**269**	33.3	**17.7**	**96.4**
3	50 or 55 DSV More Stringent Rec	**2.51**	**$1,748**	**9669**	**275**	**35.2**	**18.1**	**96.4**
2	50 or 55 DSV Standard Rec	2.54	**$1,866**	**10211**	**273**	**37.5**	**18.0**	**96.3**
6	MAWN Duplicate BEETcast	2.58	$1,714	9291	**267**	**34.8**	**17.6**	96.2
5	50 or 55 DSV Follow Label	2.59	$1,710	9310	**273**	34.1	**17.9**	**96.4**
4	50 or 55 DSV Less Stringent Rec	2.66	**$1,742**	**9436**	262	**35.9**	17.3	**96.4**
11	Untreated Check	4.55	$1,604	8442	263	32.0	17.4	96.2
Average		2.84	$1,740	9496	268	34.7	17.7	96.3
LSD 5%		0.1	148.3	780.5	10.1	2.8	0.6	0.3
CV %		5.9	7.4	7.1	2.9	5.8	2.6	0.4

No.	Treatment	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
1	Crystal 059	**2.60**	**$1,803**	**9805**	**278**	**35.1**	**18.3**	96.3
2	Beta 2N	2.81	$1,677	9186	259	**35.4**	17.1	**96.5**
Average		2.71	$1,740	9496	268	35.2	17.7	96.4
LSD %		0.06	49.3	259.7	2.9	n.s.	0.2	0.1
CV %		5.9	7.4	7.1	2.9	5.8	2.6	0.4

CLS Rate: Cercospora visual rating, lower number is better. Rated on: Sept 22.

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: We evaluated several changes to the BEETCast Model including when to start counting DSV's (12 leaf stage), what 24 hour period to record disease infection values (3 pm to 3 pm), reducing disease infection values with very hot temperatures (>95 F), included relative humidity as a factor and several other minor changes. We also compared MAWN weather stations to BEETCast sites. The moderately tolerant variety had less disease than the moderately susceptible variety. The disease level in this trial was not high enough to separate treatments well, however, it did appear that the improved model provided better overall results. Detailed treatments are contained on pages 2-5.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statiscally different from top ranking variety in each column.

Evaluate Methods for Improving BEETCast for Cercospora Control in Sugarbeets (M. Tolerant Var.)

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: C-RR059
Planted: April 17
Harvested: Spet 23
Plot Size: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.4 pH, CEC: 12.6
> Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc level: Low
Cerc Control: See trts
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No.	Treatment	DSV/Days/ CSU	Actual DSV	Actual Date	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
9	MAWN Improve BEETcast 12 lf				**2.30**	**$1,875**	**10334**	**282**	**36.7**	**18.4**	**96.5**
	Inspire + Manzate	12 lf	33	20-Jun							
	Super Tin + Cuprofix	116 csu	68	16-Jul							
	Dithane	211 csu	123	12-Aug							
	Inspire + Manzate	258 csu	151	22-Aug							
7	MAWN Duplicate BEETcast 12 lf				**2.35**	**$1,803**	**9957**	**276**	**36.0**	**18.2**	**96.4**
	Inspire + Manzate	12 lf	33	20-Jun							
	Super Tin + Cuprofix	148 csu	80	22-Jul							
	Dithane	269 csu	130	14-Aug							
	Inspire + Manzate	330 csu	154	24-Aug							
10	MAWN Duplicate Free Weather				**2.38**	**$1,843**	**10010**	**275**	**36.5**	**18.1**	**96.3**
	Inspire + Manzate	204 csu	54	8-Jul							
	Super Tin + Cuprofix	348 csu	101	31-Jul							
	Dithane	476 csu	154	24-Aug							
8	MAWN Improve BEETcast				**2.43**	**$1,775**	**9650**	**280**	33.5	**18.4**	**96.3**
	Inspire + Manzate	154 csu	46	1-Jul							
	Super Tin + Cuprofix	264 csu	92	28-Jul							
	Dithane	362 csu	151	22-Aug							
1	35 / 50 or 55 DSV Standard Rec				**2.45**	**$1,777**	**9730**	**280**	33.6	**18.5**	**96.2**
	Manzate	35 dsv	33	20-Jun							
	Inspire + Manzate	55 dsv	57	9-Jul							
	Super Tin + Cuprofix	100 dsv	101	31-Jul							
	Dithane	140 dsv	141	18-Aug							
3	50 or 55 DSV More Stringent Rec				2.53	**$1,746**	**9658**	**282**	**34.2**	**18.5**	**96.3**
	Inspire + Manzate	55 dsv	57	9-Jul							
	Super Tin + Cuprofix	95 dsv	99	30-Jul							
	Dithane	130 dsv	138	17-Aug							
	Inspire + Manzate	147 dsv	151	22-Aug							
5	50 or 55 DSV Follow Label				2.53	**$1,742**	**9475**	**277**	**34.2**	**18.2**	**96.3**
	Inspire + Manzate	55 dsv	57	9-Jul							
	Super Tin + Cuprofix	20 days	80	30-Jul							
	Dithane	32 days	130	14-Aug							

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Evaluate Methods for Improving BEETCast for Cercospora Control in Sugarbeets (M. Tolerant Var.)

Laker School Agronomy Field, Elkton, MI - 2015

No.	Treatment	DSV/Days/ CSU	Actual DSV	Actual Date	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
6	MAWN Duplicate BEETcast				2.53	**$1,831**	**9864**	**276**	**35.7**	**18.2**	**96.1**
	Inspire + Manzate	204 csu	51	6-Jul							
	Super Tin + Cuprofix	348 csu	108	4-Aug							
2	50 or 55 DSV Standard Rec				2.55	**$1,883**	**10221**	**282**	**36.3**	**18.6**	**96.1**
	Inspire + Manzate	55 dsv	57	9-Jul							
	Super Tin + Cuprofix	100 dsv	101	31-Jul							
	Dithane	140 dsv	141	18-Aug							
4	50 or 55 DSV Less Stringent Rec				2.60	**$1,850**	**9963**	**274**	**36.4**	**18.1**	**96.2**
	Inspire + Manzate	55 dsv	57	9-Jul							
	Super Tin + Cuprofix	105 dsv	108	4-Aug							
11	Untreated Check				4.00	$1,708	8988	271	33.2	**18.0**	**96.0**
Average					2.60	$1,803	9805	278	35.1	18.3	96.3
LSD 5%					0.2	163.6	861.2	9.8	2.6	n.s.	n.s.
CV %					5.9	7.4	7.1	2.9	5.8	2.6	0.4

CLS Rate: Cercospora visual rating, lower number is better. Rated on: Sept 22.

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

CSU's: Cersospora severity units, based on a possible 10 points / day, rather than the possible 4 points / day in the BEETCast model.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

Bold: Results are not statiscally different from top ranking variety in each column.

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Evaluate Methods for Improving BEETCast for Cercospora Control in Sugarbeets (M. Susc. Variety)

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: B-12RR2N
Planted: April 17
Harvested: Sept 23
Plot Size: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch
Soil Info: Clay loam
3.0% OM, 7.4 pH, CEC: 12.6
> Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc level: Low
Cerc Control: See Trts
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No.	Treatment	DSV/Days/ CSU	Actual DSV	Actual Date	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
3	50 or 55 DSV More Stringent Rec				**2.50**	**$1,751**	**9680**	**268**	**36.2**	**17.6**	**96.4**
	Inspire + Manzate	50 dsv	51	6-Jul							
	Super Tin + Cuprofix	85 dsv	91	27-Jul							
	Dithane	115 dsv	120	10-Aug							
	Inspire + Manzate	127 dsv	138	17-Aug							
1	35 / 50 or 55 DSV Standard Rec				**2.53**	$1,561	8755	258	33.0	**17.0**	**96.5**
	Manzate	35 dsv	33	20-Jun							
	Inspire + Manzate	50 dsv	51	6-Jul							
	Super Tin + Cuprofix	90 dsv	93	28-Jul							
	Dithane	125 dsv	128	13-Aug							
	Manzate	142 dsv	144	20-Aug							
2	50 or 55 DSV Standard Rec				**2.53**	**$1,849**	**10200**	**264**	**38.7**	**17.4**	**96.4**
	Inspire + Manzate	50 dsv	33	6-Jul							
	Super Tin + Cuprofix	90 dsv	93	28-Jul							
	Dithane	125 dsv	128	13-Aug							
	Inspire + Manzate	142 dsv	144	20-Aug							
9	MAWN Improve BEETcast 12 lf				**2.53**	**$1,786**	**9867**	**265**	**37.2**	**17.4**	**96.5**
	Inspire + Manzate	12 lf	33	20-Jun							
	Super Tin + Cuprofix	104 csu	68	15-Jul							
	Dithane	187 csu	108	4-Aug							
	Inspire + Manzate	227 csu	138	17-Aug							
8	MAWN Improve BEETcast				**2.55**	$1,676	9132	253	36.0	16.7	**96.6**
	Inspire + Manzate	154 csu	46	1-Jul							
	Super Tin + Cuprofix	264 csu	92	21-Jul							
	Dithane	362 csu	151	22-Aug							
7	MAWN Duplicate BEETcast 12 lf				**2.58**	$1,676	9290	251	**37.1**	16.7	96.1
	Inspire + Manzate	12 lf	33	20-Jun							
	Super Tin + Cuprofix	133 csu	79	21-Jul							
	Dithane	239 csu	113	7-Aug							
	Inspire + Manzate	291 csu	141	18-Aug							
10	MAWN Duplicate Free Weather				**2.60**	**$1,738**	**9458**	**260**	**36.4**	**17.0**	**96.9**
	Inspire + Manzate	188 csu	46	1-Jul							
	Super Tin + Cuprofix	316 csu	90	27-Jul							
	Dithane	428 csu	138	17-Aug							

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Evaluate Methods for Improving BEETCast for Cercospora Control in Sugarbeets (M. Susc. Variety)

Laker School Agronomy Field, Elkton, MI - 2015

No.	Treatment	DSV/Days/ CSU	Actual DSV	Actual Date	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
6	MAWN Duplicate BEETcast				**2.63**	$1,598	8718	257	33.9	**17.0**	96.2
	Inspire + Manzate	188 csu	46	1-Jul							
	Super Tin + Cuprofix	316 csu	90	27-Jul							
	Dithane	428 csu	141	18-Aug							
5	50 or 55 DSV Follow Label				**2.65**	$1,679	9146	**268**	34.1	**17.6**	**96.4**
	Inspire + Manzate	50 dsv	51	6-Jul							
	Super Tin + Cuprofix	18 days	80	22-Jul							
	Dithane	28 days	130	14-Aug							
4	50 or 55 DSV Less Stringent Rec				2.73	$1,634	8909	251	35.4	16.6	**96.6**
	Inspire + Manzate	55 dsv	57	9-Jul							
	Super Tin + Cuprofix	105 dsv	108	4-Aug							
11	Untreated Check				5.10	$1,500	7896	255	30.9	16.8	**96.5**
Average					2.81	$1,677	9186	259	35.4	17.1	96.5
LSD 5%					0.2	163.6	861.2	9.8	2.6	0.6	0.5
CV					5.9	7.4	7.1	2.9	5.8	2.6	0.4

CLS Rate: Cercospora visual rating, lower number is better. Rated on: Sept 22.

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

CSU's: Cersospora severity units, based on a possible 10 points / day, rather than the possible 4 points / day in the BEETCast model.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

Bold: Results are not statiscally different from top ranking variety in each column.

Evaluate Methods for Improving the BEETCast Model for Controllong Cercospora Leafspot in Sugarbeets

English, Breckenridge, MI - 2015

Trial Quality: Good
Variety: C-RR059 and B-12RR2N
Planted: April 28
Harvested: Oct 13
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch

Soil Info: Sandy Clay Loam
3.1% OM, 6.5 pH, CEC: 11.7
> Opt: P and K
High: Mn, Low: B
Added N: Clover + 140 lbs
Prev Crop: Wheat

Rhizoc Level: Low
Cerc Control: See trts
Problems: Water
Seedling Rate: 4.1 inches
Rainfall: 19.2 inches

Applications: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No	Treatment	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
1	35 / 50 or 55 DSV Standard Rec	**2.28**	**$1,503**	**8979**	**287**	**31.3**	**19.0**	**95.7**
8	MAWN Improve BEETcast	**2.30**	**$1,610**	**9466**	**290**	**32.6**	**19.2**	**95.7**
11	MAWN Improve BEETcast 50 or 55	**2.30**	**$1,535**	**9083**	**291**	**31.3**	**19.3**	**95.7**
3	50 or 55 DSV More Stringent Rec	**2.30**	**$1,518**	**9028**	**287**	**31.4**	**19.0**	**95.8**
6	MAWN Duplicate BEETcast	**2.30**	**$1,517**	**8946**	280	**31.9**	18.6	**95.6**
2	50 or 55 DSV Standard Rec	**2.38**	**$1,550**	**9166**	**283**	**32.4**	**18.8**	**95.7**
9	MAWN Improve BEETcast 12 lf	**2.35**	**$1,490**	**8785**	**282**	**31.1**	**18.8**	**95.6**
7	MAWN Duplicate BEETcast 12 lf	**2.35**	**$1,486**	**8762**	**283**	**31.0**	**18.8**	**95.7**
10	MAWN Duplicate Free Weather	**2.43**	**$1,545**	**9137**	**288**	**31.7**	**19.1**	**95.7**
4	50 or 55 DSV Less Stringent Rec	2.65	**$1,527**	**8998**	**287**	**31.3**	**19.1**	**95.7**
5	50 or 55 DSV Follow Label	2.70	**$1,566**	**9048**	**290**	**31.2**	**19.4**	**95.3**
12	Untreated Check	4.20	$1,448	8089	272	29.7	18.4	95.1
Average		2.5	$1,524	8957	285	31.4	19.0	95.6
LSD 5%		0.2	134.4	751.1	10.8	2.0	0.6	0.5
CV		6.1	8.7	8.3	3.5	7.3	3.1	0.5

No	Treatment	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
1	Crystal 059	**2.5**	**$1,523**	**8921**	**289**	30.8	**19.2**	**95.6**
2	Beta 2N	**2.6**	**$1,526**	**8993**	281	**32.0**	18.7	**95.6**
Average		2.5	$1,524	8957	285	31.4	19.0	95.6
LSD 5%		n.s.	n.s.	n.s.	3.6	0.8	0.2	n.s.
CV		6.1	8.7	8.3	3.5	7.3	3.1	0.5

CLS 0-9: Cercospora visual rating, lower is better. Rated on: October 12

Cercospora Rating Scale 0-9: 2 = <1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: We evaluated several changes to the BEETCast Model including when to start counting DSV's (12 leaf stage), what 24 hour period to record disease infestion values (3 pm to 3 pm), reducing disease infection values with very hot temperatures (>95 F), included relative humidity as a factor and several other minor changes. We also compared MAWN weather stations to BEETCast sites. The moderately tolerant variety had slightly less disease than the moderately susceptible variety. The disease level in this trial was not high enough to separate treatments well, however, the improved model provided equal to or better overall results. Detailed treatment information is contained on pages 2-5.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.
Bold: Results are not statistically different from top-ranking variety in each column.

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Evaluate Methods for Improving BEETCast for Cercospora Control in Sugarbeets (M. Tolerant Var.)

English, Breckenridge, MI - 2015

Trial Quality: Good
Variety: C-RR059
Planted: April 28
Harvested: Oct 13
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Sandy Clay Loam
3.1% OM, 6.5 pH, CEC: 11.7
> Opt: P and K
High: Mn, Low: B
Added N: Clover + 140 lbs
Prev Crop: Wheat
Rhizoc Level: Low
Cerc Control: See trts
Problems: Water
Seedling Rate: 4.1 inches
Rainfall: 19.2 inches
Applications: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No	Treatment	DSV/Day/ CSU	Actual DSV	Actual Date	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
6	MAWN Duplicate BEETcast				**2.10**	**$1,546**	**9107**	**285**	**31.9**	**19.0**	**95.4**
	Inspire + Manzate	204 csu	59	6-Jul							
	Super Tin + Cuprofix	348 csu	106	4-Aug							
	Dithane	476 csu	147	24-Aug							
	Inspire + Manzate	540 csu	183	10-Sep							
8	MAWN Improve BEETcast				**2.15**	**$1,498**	**8841**	**289**	**30.6**	**19.2**	**95.7**
	Inspire + Manzate	154 csu	54	30-Jun							
	Super Tin + Cuprofix	264 csu	104	3-Aug							
	Dithane	362 csu	147	24-Aug							
	Inspire + Manzate	411 csu	162	3-Sep							
1	35 / 50 or 55 DSV Standard Rec				**2.20**	**$1,577**	**9358**	**290**	**32.3**	**19.3**	**95.7**
	Manzate	35 dsv	47	19-Jun							
	Inspire + Manzate	55 dsv	54	30-Jun							
	Super Tin + Cuprofix	100 dsv	98	29-Jul							
	Dithane	140 dsv	143	21-Aug							
	Inspire + Manzate	160 dsv	159	2-Sep							
11	MAWN Improve BEETcast 50 or 55				**2.20**	**$1,546**	**9109**	**293**	**31.1**	**19.4**	**95.7**
	Inspire + Manzate	55 dsv	54	30-Jun							
	Super Tin + Cuprofix	116 csu	106	5-Aug							
	Dithane	211 csu	147	24-Aug							
	Inspire + Manzate	258 csu	162	3-Sep							
3	50 or 55 DSV More Stringent Rec				**2.25**	**$1,472**	**8771**	**292**	**30.0**	**19.4**	**95.5**
	Inspire + Manzate	55 dsv	54	30-Jun							
	Super Tin + Cuprofix	95 dsv	96	27-Jul							
	Dithane	130 dsv	131	17-Aug							
	Inspire + Manzate	147 dsv	147	24-Aug							
	Manzate	187 dsv	183	10-Sep							
2	50 or 55 DSV Standard Rec				**2.30**	**$1,580**	**9294**	**287**	**32.4**	**19.1**	**95.7**
	Inspire + Manzate	55 dsv	54	30-Jun							
	Super Tin + Cuprofix	100 dsv	98	29-Jul							
	Dithane	140 dsv	143	21-Aug							
	Inspire + Manzate	160 dsv	159	2-Sep							
	Manzate										

Evaluate Methods for Improving BEETCast for Cercospora Control in Sugarbeets (M. Tolerant Var.)

English, Breckenridge, MI - 2015

No	Treatment	DSV/Day/ CSU	Actual DSV	Actual Date	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
7	MAWN Duplicate BEETcast 12 lf				**2.30**	**$1,500**	**8756**	**292**	**30.1**	**19.4**	**95.7**
	Manzate	12 lf	45	22-Jun							
	Inspire + Manzate	118 csu	84	20-Jul							
	Super Tin + Cuprofix	254 csu	122	13-Aug							
	Dithane	376 csu	162	3-Sep							
9	MAWN Improve BEETcast 12 lf				2.35	**$1,521**	**8875**	**292**	**30.3**	**19.3**	**95.8**
	Manzate	12 lf	45	22-Jun							
	Inspire + Manzate	93 csu	84	20-Jul							
	Super Tin + Cuprofix	199 csu	131	17-Aug							
	Dithane	293 csu	183	10-Sep							
10	MAWN Duplicate Free Weather				2.40	**$1,479**	**8729**	**289**	**30.2**	**19.2**	**95.6**
	Inspire + Manzate	204 csu	51	26-Jun							
	Super Tin + Cuprofix	348 csu	88	23-Jul							
	Dithane	476 csu	122	13-Aug							
	Inspire + Manzate	540 csu	147	24-Aug							
5	50 or 55 DSV Follow Label				2.50	**$1,517**	**8774**	**291**	**30.1**	**19.4**	**95.5**
	Inspire + Manzate	55 dsv	54	30-Jun							
	Super Tin + Cuprofix	20 days	87	22-Jul							
	Dithane	32 days	147	24-Aug							
4	50 or 55 DSV Less Stringent Rec				2.70	**$1,549**	**9125**	**291**	**31.4**	**19.3**	**95.5**
	Inspire + Manzate	55 dsv	54	30-Jun							
	Super Tin + Cuprofix	105 dsv	104	3-Aug							
	Dithane	150 dsv	147	24-Aug							
	Inspire + Manzate	175 dsv	183	10-Sep							
12	Untreated Check				3.95	**$1,488**	**8314**	**281**	**29.6**	**18.8**	**95.3**
Average					2.45	$1,523	8921	289	30.8	19.2	95.6
LSD 5%					0.20	n.s.	n.s	n.s.	n.s.	n.s.	n.s.
CV					6.1	8.7	8.3	3.5	7.3	3.1	0.5

CLS Rate: Cercospora visual rating, lower is better. Rated on: October 12.

Cercospora Rating Scale 0-9: 2 = <1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

CSU's: Cersospora severity units, based on a possible 10 points / day, rather than the possible 4 points / day used in the BEETCast madel.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

Bold: Results are not statistically different from top ranking variety in each column/

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Evaluate Methods for Improving BEETCast for Cercospora Control in Sugarbeets (M. Susc. Variety)

English, Breckenridge, MI - 2015

Trial Quality: Good
Variety: B-12RR2N
Planted: April 28
Harvested: Oct 13
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch

Soil Info: Sandy Clay Loam
3.1% OM, 6.5 pH, CEC: 11.7
> Opt: P and K
High: Mn, Low: B
Added N: Clover + 140 lbs
Prev Crop: Wheat

Rhizoc Level: Low
Cerc Control: See trts
Problems: Water
Seedling Rate: 4.1 inches
Rainfall: 19.2 inches

Applications: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No	Treatment	DSV/Day/ CSU	Actual DSV	Actual Date	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
1	35 / 50 or 55 DSV Standard Rec				**2.35**	$1,428	8600	**283**	30.4	**18.8**	**95.7**
	Manzate	35 dsv	47	19-Jun							
	Inspire +Manzate	50 dsv	50	25-Jun							
	Super Tin + Cuprofix	90 dsv	88	23-Jul							
	Dithane	125 dsv	124	14-Aug							
	Inspire +Manzate	142 dsv	147	24-Aug							
	Manzate	182 dsv	183	10-Sep							
3	50 or 55 DSV More Stringent Rec				**2.35**	**$1,564**	**9284**	**282**	**32.8**	**18.7**	**96.0**
	Inspire +Manzate	50 dsv	50	24-Jun							
	Super Tin + Cuprofix	85 dsv	84	20-Jul							
	Dithane	115 dsv	120	11-Aug							
	Inspire +Manzate	127 dsv	134	18-Aug							
	Manzate	162 dsv	159	2-Sep							
9	MAWN Improve BEETcast 12 lf				**2.35**	$1,459	8694	273	**31.9**	18.3	95.3
	Manzate	12 lf	45	22-Jun							
	Inspire +Manzate	81 csu	84	20-Jul							
	Super Tin + Cuprofix	175 csu	120	11-Aug							
	Dithane	258 csu	156	31-Aug							
	Inspire +Manzate	298 csu	183	10-Sep							
7	MAWN Duplicate BEETcast 12 lf				**2.40**	$1,472	8768	274	**32.0**	18.3	**95.7**
	Manzate	12 lf	45	22-Jun							
	Inspire +Manzate	103 csu	74	15-Jul							
	Super Tin + Cuprofix	224 csu	108	7-Aug							
	Dithane	330 csu	149	27-Aug							
	Inspire +Manzate	382 csu	183	10-Sep							
11	MAWN Improve BEETcast 50 or 55				**2.40**	$1,523	9056	**288**	31.4	**19.1**	**95.8**
	Inspire +Manzate	50 dsv	50	24-Jun							
	Super Tin + Cuprofix	104 csu	96	27-Jul							
	Dithane	187 csu	131	17-Aug							
	Inspire +Manzate	227 csu	147	24-Aug							
2	50 or 55 DSV Standard Rec				**2.45**	$1,520	9038	**280**	**32.3**	**18.6**	**95.8**
	Inspire +Manzate	50 dsv	50	24-Jun							
	Super Tin + Cuprofix	90 dsv	88	23-Jul							
	Dithane	125 dsv	124	14-Aug							
	Inspire +Manzate	142 dsv	147	24-Aug							
	Manzate	182 dsv	183	10-Sep							

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Evaluate Methods for Improving BEETCast for Cercospora Control in Sugarbeets (M. Susc. Variety)

English, Breckenridge, MI - 2015

No	Treatment	DSV/Day/ CSU	Actual DSV	Actual Date	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
8	MAWN Improve BEETcast				**2.45**	**$1,722**	**10091**	**291**	**34.7**	**19.3**	**95.8**
	Inspire +Manzate	142 csu	51	26-Jun							
	Super Tin + Cuprofix	240 csu	90	24-Jul							
	Dithane	325 csu	131	17-Aug							
	Inspire +Manzate	367 csu	147	24-Aug							
10	MAWN Duplicate Free Weather				**2.45**	**$1,611**	**9546**	**287**	**33.3**	**19.0**	**95.7**
	Inspire +Manzate	188 csu	50	24-Jun							
	Super Tin + Cuprofix	316 csu	84	20-Jul							
	Dithane	428 csu	106	5-Aug							
	Inspire +Manzate	483 csu	131	17-Aug							
6	MAWN Duplicate BEETcast				**2.50**	$1,489	8786	275	**31.9**	18.2	**95.9**
	Inspire +Manzate	188 csu	54	30-Jun							
	Super Tin + Cuprofix	316 csu	96	27-Jul							
	Dithane	428 csu	131	17-Aug							
	Inspire +Manzate	483 csu	149	27-Aug							
4	50 or 55 DSV Less Stringent Rec				2.60	$1,504	8870	**283**	31.2	**18.8**	**95.8**
	Inspire +Manzate	50 dsv	50	24-Jun							
	Super Tin + Cuprofix	95 dsv	96	27-Jul							
	Dithane	135 dsv	137	20-Aug							
	Inspire +Manzate	155 dsv	156	31-Aug							
5	50 or 55 DSV Follow Label				2.90	**$1,615**	**9322**	**288**	**32.3**	**19.3**	95.1
	Inspire +Manzate	50 dsv	50	24-Jun							
	Super Tin + Cuprofix	18 days	74	15-Jul							
	Dithane	28 days	122	13-Aug							
12	Untreated Check				4.45	$1,407	7863	264	29.8	18.0	94.8

Average	2.64	$1,526	8993	281	32.0	18.7	95.6
LSD 5%	0.20	169.6	947.7	12.6	2.9	0.7	0.6
CV	6.1	8.7	8.3	3.5	7.3	3.1	0.5

CLS Rate: Cercospora visual rating, lower is better. Rated on: October 12.

Cercospora Rating Scale 0-9: 2 = <1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

CSU's: Cersospora severity units, based on a possible 10 points / day, rather than the possible 4 points / day used in the BEETCast madel.

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

Bold: Results are not statistically different from top ranking variety in each column/

Evaluate Agri-Life Copper Fungicide for Cercospora Control in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015 (Page 1 fo 2)

Trial Quality: Good
Variety: C-RR074NT
Planted: April 17
Harvested: Sept 23
Plot Size: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.4 pH, CEC: 12.6
> Opt: p and K
High: Mn, Low B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: See trt
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No.	Treatment	Rate/A	DSV	CLS 0-9	% SB Injury	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
6	Badge SC	2.1 pt	35	**2.25**	**0.0**	**$2,108**	**10813**	256	**42.3**	**17.1**	**95.8**
	Badge SC	2.1 pt	55								
	Badge SC	2.1 pt	75								
	Badge SC	2.1 pt	95								
	Badge SC	2.1 pt	115								
	Badge SC	2.1 pt	135								
7	Cuprofix See Trt 6, 6 applic every 20 DSV	2 lb	35	**2.42**	**0.0**	**$2,181**	**11107**	257	**43.1**	**17.2**	**95.7**
11	Minerva Duo	13 fl oz	55	2.46	**0.0**	**$2,060**	**10729**	257	**41.7**	**17.2**	**95.7**
	Minerva Duo	16 fl oz	95								
	Minerva Duo	13 fl oz	135								
12	Baccarat	13 fl oz	55	2.50	**0.0**	**$2,047**	**10627**	254	**41.8**	17.0	**95.7**
	Minerva Duo + Baccarat	16 fl oz + 1 qt	95								
	Minerva Duo	13 fl oz	95								
9	Inspire XT + Manzate	7 fl oz + 1.6 qt	55	2.50	**0.0**	**$2,050**	**10926**	**258**	**42.3**	**17.2**	**95.8**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95								
	Manzate	1.6 qt	135								
8	Kocide 3000 See Trt 6, 6 applic every 20 DSV	2 lb	35	2.50	**0.0**	**$2,202**	**11405**	**265**	**43.1**	**17.5**	**96.1**
5	Manzate See Trt 6, 6 applic every 20 DSV	1.6 qt	35	2.50	**0.0**	**$2,167**	**11239**	**261**	**43.1**	**17.4**	**95.9**
4	Agri-Life See Trt 6, 6 applic every 20 DSV	144 fl oz	35	2.54	27.5	$1,656	9291	248	37.5	16.8	95.1
3	Agri-Life See Trt 6, 6 applic every 20 DSV	72 fl oz	35	2.54	10.8	$1,927	10166	253	40.2	17.0	95.5
2	Agri-Life See Trt 6, 6 applic every 20 DSV	38 fl oz	35	2.75	**0.0**	**$2,114**	**10732**	256	**41.9**	**17.1**	**95.7**

Evaluate Agri-Life Copper Fungicide for Cercospora Control in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015 (Page 2 fo 2)

No.	Treatment	Rate/A	DSV	CLS 0-9	% SB Injury	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
1	Agri-Life See Trt 6, 6 applic every 20 DSV	24 fl oz	35	2.88	**0.0**	$1,963	10058	253	39.8	**17.1**	95.2
10	Untreated Check			4.75	**0.0**	$1,891	9449	245	38.5	16.6	95.2
Average				2.72	3.2	$2,031	10545	255	41.3	17.1	95.6
LSD 5%				0.17	1.9	165.2	800.1	7.0	2.6	0.4	0.4
CV %				5.6	51.9	7.1	6.6	2.4	5.4	1.9	0.4

CLS 0-9: Cercospora visual rating, lower is better. Rated on September 15

Cercospra Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: Agri-Life is a new copper fungicide for Cercospora control in sugarbeets. It is formulated as a solution which makes it very useful as a tank mix partner. The use rates of 24 to 38 fl oz/a appears to be a little low. We tested higher rates (72 and 144 fl oz/a) which provided better Cercospora control, however, the 144 fl oz/a rate caused significant leaf injury and the 72 fl oz/a rate caused noticable leaf injury. We plan to test rates in the 50 to 60 fl oz/a range next year to see if Agri-Life can provide a little better leafspot control without causing sugarbeet injury. Baccarat did not improve the performance of Minerva Duo. The sugarbeet stand was good (190 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

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

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Evaluate Tank Mixed Fungicide Treatments (including Ballad Plus) for Control of Cercospora in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: B-18RR1N
Planted: Apr 16
Harvested: Sep 21
Plots: 6 rows X 38 ft, 3 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.4 pH, CEC: 12.6
> Opt: P, > Opt: K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: See Trts.
Problems: Low Disease
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
4	Inspire XT + Cuprofix	7 fl oz + 2 lb	55	**0.81**	**$2,090**	**11100**	**265**	**42.0**	**17.4**	**96.6**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Inspire XT + Cuprofix	7 fl oz + 2 lb	150							
3	Inspire XT + Manzate	7 fl oz + 1.6 qt	55	**1.06**	**$2,147**	**11462**	**267**	**43.0**	**17.4**	**96.8**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Inspire XT + Manzate	7 fl oz + 1.6 qt	150							
2	Inspire XT + Ballad Plus	7 fl oz + 1 qt	55	1.19	**$2,091**	**11103**	**269**	**41.2**	**17.6**	**96.7**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Inspire XT + Ballad Plus	7 fl oz + 1 qt	150							
1	Inspire XT	7 fl oz	55	1.44	$1,887	9992	247	**40.4**	16.3	**96.6**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Inspire XT	7 fl oz	150							
7	Headline + Manzate	9.2 fl oz + 1.6 qt	55	1.56	**$2,086**	**11149**	**271**	**41.1**	**17.8**	**96.7**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Headline + Manzate	9.2 fl oz + 1.6 qt	150							
8	Headline + Cuprofix	9.2 fl oz + 2 lb	55	1.56	**$2,069**	**11131**	**265**	**42.0**	**17.4**	**96.6**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Headline + Cuprofix	9.2 fl oz + 2 lb	150							
6	Headline + Ballad Plus	9.2 fl oz + 1 qt	55	1.75	**$1,961**	**10576**	**265**	**39.9**	**17.5**	96.4
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Headline + Ballad Plus	9.2 fl oz + 1 qt	150							

Evaluate Tank Mixed Fungicide Treatments (including Ballad Plus) for Control of Cercospora in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

No	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
5	Headline	9.2 fl oz	55	2.06	$1,899	10192	249	40.8	16.5	**96.5**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Headline	9.2 fl oz	150							
9	Untreated Check			3.67	$1,929	9866	250	39.4	16.6	96.2
Average				1.7	$2,018	10730	250	41.1	17.2	96.6
LSD 5%				0.3	229.8	1108.9	11.7	ns	0.7	0.3
CV %				12.5	7.8	7.1	3.1	6.1	2.7	0.2

CLS 0-9: Cercospora visual rating, lower is better. Rated on: October 5.

Cercospora Rating Scale 0-9: 2 = <1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: Ballad Plus, Manzate and Cuprofix were tank mixed with Inspire and Headline for control of Cercospora leafspot in sugarbeets. The disease level was low but differences in Cercospora control were apparent. Without tank mix treatments the average Cercospora rating for Inspire and Headline was a 1.8 . When Ballad Plus, Manzate and Cuprofix were tank mixed, the Cercospora ratings were 1.5, 1.3 and 1.2, respectively. A lower Cercospora rating means better Cercospora control. Inspire provided better leafspot control than did Headline. The sugarbeet stand was good (190 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

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

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Evaluate Tank Mixed Fungicide Treatments (including Ballad Plus) for Control of Cercospora in Sugarbeets

Shaffner, Freeland, MI - 2015

Trial Quality: Good
Variety: B-18RR4N
Planted: May 1
Harvested: Oct 5
Plots: 6 rows X 38 ft, 3 reps
Row Spacing: 22 inch
Soil Info: Silt Loam
3.2% OM, 7.8 pH, CEC: 12.4
> Opt: P, > Opt: K
Medium: Mn, Medium: B
Added N: 150 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: See Trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 22.9 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
3	Inspire XT + Manzate	7 fl oz + 1.6 qt	55	**2.92**	**$2,925**	**12712**	**237**	**54.8**	**16.0**	**95.5**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Inspire XT + Manzate	7 fl oz + 1.6 qt	150							
4	Inspire XT + Cuprofix	7 fl oz + 2 lb	55	**3.17**	$2,661	**11823**	220	**53.8**	**15.2**	**94.7**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Inspire XT + Cuprofix	7 fl oz + 2 lb	150							
2	Inspire XT + Ballad Plus	7 fl oz + 1 qt	55	**3.17**	**$2,782**	**12347**	**230**	**53.9**	**15.5**	**95.5**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Inspire XT + Ballad Plus	7 fl oz + 1 qt	150							
1	Inspire XT	7 fl oz	55	**3.17**	**$2,852**	**12625**	**225**	**56.0**	**15.3**	**95.4**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Inspire XT	7 fl oz	150							
8	Headline + Cuprofix	9.2 fl oz + 2 lb	55	**3.50**	$2,633	**11758**	**221**	**53.1**	**15.2**	**95.1**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Headline + Cuprofix	9.2 fl oz + 2 lb	150							
7	Headline + Manzate	9.2 fl oz + 1.6 qt	55	**3.83**	$2,676	**11976**	**227**	**52.9**	**15.4**	**95.3**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Headline + Manzate	9.2 fl oz + 1.6 qt	150							
5	Headline	9.2 fl oz	55	4.25	**$2,702**	**12029**	220	**54.6**	**15.1**	**95.1**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Headline	9.2 fl oz	150							

Evaluate Tank Mixed Fungicide Treatments (including Ballad Plus) for Control of Cercospora in Sugarbeets

Shaffner, Freeland, MI - 2015

No	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
6	Headline + Ballad Plus	9.2 fl oz + 1 qt	55	4.58	$2,509	11218	218	51.5	15.0	**94.8**
	Super Tin + Manzate	8 fl oz + 1.6 qt	95							
	Manzate	1.6 qt	130							
	Headline + Ballad Plus	9.2 fl oz + 1 qt	150							
9	Untreated Check			7.50	$2,203	9584	199	48.2	13.9	94.5
Average				4.0	$2,660	11786	222	53.2	15.2	95.1
LSD 5%				1.1	230.4	959.3	16.4	3.9	0.9	0.8
CV %				15.7	5.0	4.7	4.3	4.2	3.5	0.5

CLS 0-9: Cercospora visual rating, lower is better. Rated on: October 5.

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: Ballad Plus, Manzate and Cuprofix were tank mixed with Inspire and Headline for control of Cercospra leafspot in sugarbeets. The disease level in this trial was medium to high. The Ballad Plus tank mix treatments had an average leafspot rating of around 3.9 compared to ratings of 3.4 for Manzate and 3.3 for Cuprofix. Lower ratings mean better leafspot control. Inspire treatments provided significantly better control than Headline treatments. The sugarbeet stand was good (175 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtratcing the cost of fungicides.

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

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Evaluate Registered and Experimental Fungicides for Cercospora Leafspot Control in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: 19RR1N
Planted: April 17
Harvested: Sept 21
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.4 pH, CEC: 12.6
> Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: See Trts
Problems: Low Spots
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No.	Treatment	Rate/A	DSV	CLS 0-9	% Injury	Net $/A	RWSA	RWST	T/A
1	Manzate Inspire XT + Manzate Super Tin + Agri-Life Manzate	1.6 qt 7 fl oz + 1.6 qt 8 fl oz + 38 fl oz 1.6 qt	35 55 100 140	**2.40**	**0.0**	$1,835	9768	**260**	37.5
2	Inspire XT + Manzate Super Tin + Agri-life Manzate	7 fl oz + 1.6 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	**2.44**	**0.0**	**$1,859**	9821	**264**	37.2
18	Agri Tin + Manzate Echo 720 + Manzate Manzate Agri Tin + Manzate	8 fl oz + 1.6 qt 2.5 pt + 1.6 qt 1.6 qt 8 fl oz + 1.6 qt	55 85 120 140	**2.46**	**0.0**	**$1,937**	**10364**	**260**	**39.8**
15	Super Tin + Agri-Life Echo 720 + Agri-Life Manzate Super Tin + Agri-Life	8 fl oz + 38 fl oz 2.5 pt + 38 fl oz 1.6 qt 8 fl oz + 38 fl oz	55 85 120 140	**2.46**	**0.0**	**$1,906**	**10135**	**262**	**38.7**
3	Topguard + Manzate Super Tin + Agri-Life Manzate	14 fl oz + 1.6 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	**2.46**	**0.0**	**$1,894**	**10027**	**262**	**38.3**
14	Echo 720 + Agri-Life Super Tin + Agri-Life Manzate Echo 720 + Agri-Life	2.5 pt + 38 fl oz 8 fl oz + 38 fl oz 1.6 qt 2.5 pt + 38 fl oz	55 85 120 140	**2.48**	**0.0**	**$1,882**	**10081**	**269**	37.4
12	Minerva Duo Super Tin + Agri-Life Manzate	16 fl oz 8 fl oz + 38 fl oz 1.6 qt	55 100 140	**2.48**	**0.0**	**$1,869**	9839	**264**	37.2
17	Super Tin + Manzate Echo 720 + Manzate Manzate Super Tin + Manzate	8 fl oz + 1.6 qt 2.5 pt + 1.6 qt 1.6 qt 8 fl oz + 1.6 qt	55 85 120 140	**2.50**	**0.0**	**$1,882**	**10083**	**260**	**38.8**
16	Echo 720 + Manzate Super Tin + Manzate Manzate Echo 720 + Manzate	2.5 pt + 1.6 qt 8 fl oz + 1.6 qt 1.6 qt 2.5 pt + 1.6 qt	55 85 120 140	**2.50**	**0.0**	**$1,967**	**10592**	**267**	**39.7**
8	Eminent + Manzate Super Tin + Agri-Life Manzate	13 fl oz + 1.6 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	**2.50**	**0.0**	**$1,889**	**9990**	259	**38.5**
20	Badge SC (6 Applications)	2 pt	35,55,70, 85,105,125	2.52	**0.0**	**$1,852**	9756	**263**	37.1
10	Minerva Duo + Manzate Super Tin + Agri-Life Manzate	16 fl oz + 1.6 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	2.52	**0.0**	$1,827	9694	**264**	36.7

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Evaluate Registered and Experimental Fungicides for Cercospora Leafspot Control in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

No.	Treatment	Rate/A	DSV	CLS 0-9	% Injury	Net $/A	RWSA	RWST	T/A
19	Manzate (6 Applications)	1.6 qt	35,55,70, 85,105,125	2.54	**0.0**	**$1,903**	**10159**	259	**39.3**
9	Minerva Duo + Manzate Super Tin + Agri-Life Manzate	13 fl oz + 1.6 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	2.54	**0.0**	$1,821	9627	**264**	36.5
4	Proline + Induce+ 'Manzate Super Tin + Agri-Life Manzate	5.7 fl oz + .25% v/v + 1.6 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	2.56	**0.0**	$1,835	9754	**265**	36.8
11	Minerva Duo + Agri-Life Super Tin + Agri-Life Manzate	16 fl oz + 38 fl oz 8 fl oz + 38 fl oz 1.6 qt	55 100 140	2.57	**0.0**	$1,791	9488	**260**	36.5
23	Agri-Life (6 applications)	144 fl oz	35,55,70, 85,105,125	2.58	19.2	$1,491	8675	254	34.1
7	Enable + Crop Oil + 'Dithane Super Tin + Agri-Life Manzate	8 fl oz + 1 qt + 1.6 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	2.58	**0.0**	**$1,869**	9857	**263**	37.5
6	Proline + Induce + 'Ballad Plus Super Tin + Agri-Life Manzate	5.7 fl oz + .25% v/v + 2 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	2.58	**0.0**	$1,783	9482	**260**	36.4
5	Proline + Induce + Ballad Plus Super Tin + Agri-Life Manzate	5.7 fl oz + .25% v/v + 1 qt 8 fl oz + 38 fl oz 1.6 qt	55 100 140	2.60	**0.0**	**$1,853**	9809	**260**	37.7
22	Agri-Life (6 applications)	72 fl oz	35,55,70, 85,105,125	2.67	6.7	$1,674	9093	255	35.7
21	Agri-Life (6 applications)	38 fl oz 38 fl oz	35,55,70, 85,105,125	2.79	**0.0**	$1,730	9135	258	35.4
13	Headline + Manzate Super Tin + Manzate Manzate	9.2 fl oz + 1.6 qt 8 fl oz + 1.6 qt 1.6 qt	55 100 140	3.00	**0.0**	$1,810	9662	**261**	37.0
24	Untreated Check			4.33	**0.0**	$1,688	8643	256	33.8
Average				2.63	1.1	$1,827	9730	261	37.2
LSD 5%				0.1	1.3	127.3	651.7	9.2	1.9
CV %				3.7	105.1	6.1	5.9	3.1	4.5

CLS Rate: Cercospora visual rating, lower number is better. Rated on September 15.

Cercospra Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: The disease level was moderate. There appeared to be a slight advantage when starting treatments at 35 DSV instead of 55 DSV. All of the Triazole tank mix treatments provided good leafspot control. Minerva Duo also gave good leafspot control. It appeared that Super Tin / Echo treatments worked well. Tank mixing with Ballad Plus was somewhat less effictive than with EBDC's or Copper. Six applications of EBDC's or Copper's provided adequate leafspot control. High (off label) rates of Agri-Life caused leaf injury. Headline treatments were less effective than triazole treatments. The sugarbeet stand was good (200 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

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

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Evaluate EBDC and Copper Fungicides for Control of Cercospora Leafspot in Sugarbeets

Stoneman, Breckenridge, MI - 2015

Trial Quality: Good
Variety: SX-1228RR
Planted: April 30
Harvested: Oct 6
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Sandy Loam
3.3% OM, 7.2 pH, CEC: 7.5
> Opt: P and Opt: K
High: Mn, Low: B
Added N: Manure + 80 lbs
Prev Crop: Corn silage
Rhizoc Level: Low
Cerc Control: See trts
Problems: Flooding
Seeding Rate: 4.1 inches
Rainfall: 18.3 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No	Treatment	Rate/A	DSV	CLS 0-9	% Phyto	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
6	Cuprofix	2 lb	55	**2.29**	**0.0**	**$2,303**	**10421**	**234**	**44.5**	**16.1**	**94.7**
	Cuprofix	2 lb	75								
	Cuprofix	2 lb	95								
	Cuprofix	2 lb	115								
	Cuprofix	2 lb	135								
	Cuprofix	2 lb	155								
	Cuprofix	2 lb	175								
8	ChampION See Trt 6, 7 applic every 20 DSV	2 lb	55	**2.33**	**0.0**	$2,075	9542	**231**	41.4	**15.7**	**95.0**
9	Badge SC See Trt 6, 7 applic every 20 DSV	2.1 pt	55	**2.38**	**0.0**	**$2,114**	**9656**	**224**	**43.1**	15.4	**94.7**
4	Cuprofix See Trt 6, 7 applic every 20 DSV	1.5 lb	55	**2.42**	**0.0**	**$2,174**	**9797**	**225**	**43.5**	**15.6**	**94.3**
5	Cuprofix See Trt 6, 7 applic every 20 DSV	1.75 lb	55	**2.46**	**0.0**	$2,099	9492	222	**42.9**	15.4	**94.2**
19	Super Tin + Manzate	8 fl oz + 1.6 qt	55	**2.50**	**0.0**	**$2,191**	**10062**	**226**	**44.6**	**15.6**	**94.6**
	Manzate	1.6 qt	90								
	Super Tin + Manzate	8 fl oz + 1.6 qt	110								
	Manzate	1.6 qt	150								
	Tilt + Manzate	4 fl oz + 1.6 qt	170								
7	Kocide 3000 See Trt 6, 7 applic every 20 DSV	2 lb	55	**2.58**	**0.0**	**$2,164**	9966	**237**	**42.1**	**16.3**	**94.6**
3	Koverall See Trt 6, 7 applic every 20 DSV	2 lb	55	**2.58**	**0.0**	**$2,227**	**10066**	**229**	**44.0**	**15.8**	**94.5**
12	AgriLife See Trt 6, 7 applic every 20 DSV	144 fl oz	55	**2.67**	**25.8**	$1,509	7719	219	35.1	15.4	**93.9**
2	Dithane See Trt 6, 7 applic every 20 DSV	1.6 qt	55	**2.67**	**0.0**	**$2,181**	**10154**	**225**	**45.3**	15.5	**94.6**
1	Manzate See Trt 6, 7 applic every 20 DSV	1.6 qt	55	2.71	**0.0**	**$2,164**	**10015**	**226**	**44.4**	**15.6**	**94.6**

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Evaluate EBDC and Copper Fungicides for Control of Cercospora Leafspot in Sugarbeets

Stoneman, Breckenridge, MI - 2015

No	Treatment	Rate/A	DSV	CLS 0-9	% Phyto	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
20	Echo 720 + Manzate Manzate Echo 720 + Manzate Manzate Tilt + Manzate	2.5 pt + 1.6 qt 1.6 qt 2.5 pt + 1.6 qt 1.6 qt 4 fl oz + 1.6 qt	55 90 110 150 170	2.75	**0.0**	$2,036	9494	**225**	**42.1**	**15.6**	**94.5**
16	Inspire + Manzate Super Tin + Manzate Cuprofix Inspire + Manzate	7 fl oz + 1.6 qt 8 fl oz + 1.6 qt 2 lb 7 fl oz + 1.6 qt	55 105 145 165	2.75	**0.0**	$2,094	**9667**	219	**44.1**	15.2	**94.3**
15	Inspire + Manzate Super Tin + Manzate Manzate Inspire + Manzate	7 fl oz + 1.6 qt 8 fl oz + 1.6 qt 1.6 qt 7 fl oz + 1.6 qt	55 105 145 165	2.79	**0.0**	**$2,136**	**9884**	**230**	**43.0**	**15.9**	**94.4**
14	Inspire + Manzate Super Tin + Manzate Tilt + AgriLife Inspire + Manzate	7 fl oz + 1.6 qt 8 fl oz + 1.6 qt 4 fl oz + 38 fl oz 7 fl oz + 1.6 qt	55 105 145 165	2.79	**0.0**	**$2,188**	**10105**	**235**	**43.0**	**16.0**	**94.9**
13	Tilt + AgriLife See Trt 6, 7 applic every 20 DSV	4 fl oz + 38 fl oz	55	2.83	**0.0**	**$2,185**	**10043**	**235**	**42.8**	**16.1**	**94.7**
11	AgriLife See Trt 6, 7 applic every 20 DSV	72 fl oz	55	2.88	10.8	$1,797	8480	**229**	37.1	**15.8**	**94.5**
10	AgriLife See Trt 6, 7 applic every 20 DSV	38 fl oz	55	2.88	**0.0**	$2,035	9298	218	**42.6**	15.2	**94.3**
17	Super Tin + AgriLife AgriLife Super Tin + AgriLife AgriLife Tilt + AgriLife	8 fl oz + 38 fl oz 38 fl oz 8 fl oz + 38 fl oz 38 fl oz 4 fl oz + 38 fl oz	55 90 110 150 170	2.92	**0.0**	**$2,178**	**9918**	**231**	**43.0**	**15.9**	**94.1**
18	Echo 720 + AgriLife AgriLife Echo 720 + AgriLife AgriLife Tilt + AgriLife	2.5 pt + 38 fl oz 38 fl oz 2.5 pt + 38 fl oz 38 fl oz 4 fl oz + 38 fl oz	55 90 110 150 170	3.25	**0.0**	$2,009	9292	220	**42.1**	15.3	**94.3**
21	Untreated Check			6.25	**0.0**	$1,761	7808	208	37.5	14.7	93.7
Average				2.99	1.8	$2,077	9566	226	42.3	15.6	94.4
LSD 5%				0.4	1.6	195.3	865.9	12.9	3.4	0.7	0.8
CV %				11.0	78.0	8.2	7.9	5.0	7.0	3.7	0.7

CLS 0-9: Cercospora visual rating, lower is better. Rated on: October 6

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: Cuprofix, ChampION and Badge SC gave better leafspot control in this trial than Dithane, Manzate and Agri-life (all applied 7 times). We evaluated very high rates of Agri-life (72 and 144 fl oz/a) which are off label and they caused sugarbeet leaf injury. The best Copper treatments were better than a 4 application Inspire based tank mix treatment. The disease level was moderate to high and the variety, SX-1228RR, is moderately susceptible to Cercospora. The sugarbeet stand was good (215 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

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

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Control of Cercospora Leafspot in Sugarbeets with Fungicide Tank Mix Treatments

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: SX-1235RR
Planted: April 17
Harvested: Sept 23
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.5 pH, CEC: 12.6
> Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: See trts
Problems: Low disease
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% Sugar	% CJP
3	Inspire XT + Dithane	7 fl oz + 1.6 qt	55	**1.83**	$1,723	**9322**	**263**	35.5	**17.3**	96.3
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + Dithane	7 fl oz + 1.6 qt	150							
9	Inspire XT + Cuprofix	7 fl oz + 2 lb	55	**2.00**	**$1,761**	**9422**	**268**	35.2	**17.6**	**96.6**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + Cuprofix	7 fl oz + 2 lb	150							
5	Inspire XT + Koverall	7 fl oz + 2 lb	55	**2.08**	**$1,759**	**9412**	**267**	35.3	**17.5**	**96.6**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + Koverall	7 fl oz + 2 lb	150							
1	Inspire XT + Manzate	7 fl oz + 1.6 qt	55	**2.08**	**$1,779**	**9516**	**265**	**35.9**	**17.5**	96.4
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + Manzate	7 fl oz + 1.6 qt	152							
15	Inspire XT + ChampION	7 fl oz + 2 lb	55	2.17	**$1,843**	**9899**	**264**	**37.5**	**17.4**	96.3
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + ChampION	7 fl oz + 2 lb	150							
13	Inspire XT + Badge SC	7 fl oz + 2.5 pt	55	2.17	**$1,769**	**9516**	**267**	**35.6**	**17.5**	**96.8**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + Badge SC	7 fl oz + 2.5 pt	150							
17	Inspire XT + Kocide	7 fl oz + 2 lb	55	2.21	**$1,782**	**9592**	260	**36.9**	**17.2**	96.4
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + Kocide	7 fl oz + 2 lb	150							
16	Headline + ChampION	9.2 fl oz + 2 lb	55	2.38	$1,654	9062	**262**	34.6	**17.2**	**96.7**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + ChampION	9.2 fl oz + 2 lb	150							
10	Headline + Cuprofix	9.2 fl oz + 2 lb	55	2.38	**$1,781**	**9671**	**269**	**35.9**	**17.7**	**96.6**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + Cuprofix	9.2 fl oz + 2 lb	150							
11	Inspire XT + Agri-Life	7 fl oz + 38 fl oz	55	2.42	$1,699	9130	**262**	34.8	**17.2**	**96.6**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + Agri-Life	7 fl oz + 38 fl oz	150							

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Control of Cercospora Leafspot in Sugarbeets with Fungicide Tank Mix Treatments

Laker School Agronomy Field, Elkton, MI - 2015

No	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% Sugar	% CJP
7	Inspire XT + Ballad Plus	7 fl oz + 2 qt	55	2.42	**$1,744**	**9340**	**264**	35.5	**17.3**	**96.5**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Inspire XT + Ballad Plus	7 fl oz + 2 qt	150							
18	Headline + Kocide	9.2 fl oz + 2 lb	55	2.46	$1,685	9230	**262**	35.1	**17.3**	96.4
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + Kocide	9.2 fl oz + 2 lb	150							
14	Headline + Badge SC	9.2 fl oz + 2.5 pt	55	2.46	$1,712	**9359**	**263**	35.5	**17.3**	**96.6**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + Badge SC	9.2 fl oz + 2.5 pt	150							
6	Headline + Koverall	9.2 fl oz + 2 lb	55	2.46	**$1,733**	**9418**	**263**	**35.8**	**17.3**	**96.6**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + Koverall	9.2 fl oz + 2 lb	150							
4	Headline + Dithane	9.2 fl oz + 1.6 qt	55	2.50	$1,707	**9379**	**262**	**35.8**	**17.3**	96.4
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + Dithane	9.2 fl oz + 1.6 qt	150							
2	Headline + Manzate	9.2 fl oz + 1.6 qt	55	2.54	**$1,743**	**9547**	**264**	**36.2**	**17.3**	**96.7**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + Manzate	9.2 fl oz + 1.6 qt	150							
12	Headline + Agri-Life	9.2 fl oz + 38 fl oz	55	2.58	$1,596	8732	**261**	33.4	**17.2**	**96.5**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + Agri-Life	9.2 fl oz + 38 fl oz	150							
8	Headline + Ballad Plus	9.2 fl oz + 2 qt	55	2.83	**$1,745**	**9480**	**261**	**36.3**	**17.2**	**96.5**
	Manzate	1.6 qt	95							
	Super Tin	8 fl oz	115							
	Headline + Ballad Plus	9.2 fl oz + 2 qt	150							
19	Untreated Check			3.67	$1,620	8361	258	32.4	17.1	19.2
Average				2.40	$1,728	9336	263	35.4	17.3	96.5
LSD 5%				0.3	115.2	594.4	7.7	1.9	0.5	0.3
CV %				9.4	5.8	5.5	2.5	4.7	2.4	0.3

CLS 0-9: Cercospora Visual Rating, Lower is better. Rated on: September 15

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 - 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: Inspire and Headline were tank mixed with EBDC's, Coppers and Ballad Plus in this trial. The disease level was low but differences in Cercospora control were apparent. Dithane, Cuprofix, Koverall, Manzate, ChampION, Badge SC, and Kocide provided similar levels of leafspot control. Agri-Life was slighly less effictive and Ballad Plus was less effective than Agri-Life. Inspire treatments were superior to Headline treatments. The sugarbeet stand was adequate (140 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

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

Evaluate Super Tin and Manzate for Control of Cercospora Leafspot in Sugarbeets

Yoders Disease, Pigeon, MI - 2015

Trial Quality: Fair
Variety: B-18RR4N
Planted: April 29
Harvested: Sept 24
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch
Soil Info: Sandy Loam
3.0% OM, 7.2 pH, CEC: 9.5
> Opt: P and K
High: Mn, Medium: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: See trts
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 17.3 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No.	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
2	Inspire XT + Manzate Max	7 fl oz + 1.6 qt	50	**2.50**	**$2,107**	**9421**	**216**	**43.6**	**15.3**	**93.7**
	Super Tin + Manzate Max	8 fl oz + 1.6 qt	95							
	Inspire XT + Manzate Max	7 fl oz + 1.6 qt	130							
4	Manzate Max	1.6 qt	35	**2.58**	**$2,054**	**9251**	**223**	**41.6**	**15.5**	**94.1**
	Inspire XT + Manzate Max	7 fl oz + 1.6 qt	50							
	Super Tin + Manzate Max	8 fl oz + 1.6 qt	95							
	Inspire XT + Manzate Max	7 fl oz + 1.6 qt	130							
5	Manzate Max	1.6 qt	35	**2.67**	**$1,964**	**8820**	**220**	**40.3**	**15.3**	**94.2**
	Super Tin + Manzate Max	8 fl oz + 1.6 qt	50							
	Inspire XT + Manzate Max	7 fl oz + 1.6 qt	85							
	Super Tin + Manzate Max	8 fl oz + 1.6 qt	130							
3	Super Tin + Manzate Max	8 fl oz + 1.6 qt	50	3.29	**$2,046**	**9115**	**223**	**41.0**	**15.5**	**94.3**
	Inspire XT + Manzate Max	7 fl oz + 1.6 qt	85							
	Super Tin + Manzate Max	8 fl oz + 1.6 qt	130							
1	Untreated Check			3.83	**$1,963**	**8456**	**217**	**39.1**	**15.3**	**93.6**
Average				2.98	$2,027	9013	220	41.1	15.4	94.0
LSD 5%				0.3	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
CV %				7.5	11.5	11.2	6.8	11.5	4.7	1.0

CLS 0-9: Cercospora Visual Rating, Lower is better. Rated on September 11.

Cercospora Rating Scale 0-9: 2 = < 1$ leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: The disease pressure was low. An early application (35 DSV's) did not appear to help, probably because Cercospora infections came late in the season. The Inspire / Super Tin / Inspire treatment gave better control than the Super Tin / Inspire / Super Tin treatment. The sugarbeet stand was good (180 beets / 100ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

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

Evaluate the Safety of Roundup Plus Copper Fungicides in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: C-G333
Planted: April 17
Harvested: Sept 1
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.5 pH, CEC: 12.6
> Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: See trts
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No	Treatment*	Rate/A	DSV	CLS 0-9	Injury 0-10	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
1	Roundup	32 fl oz	2 lf	**0.94**	**0.0**	**$2,101**	**10904**	247	**44.1**	16.4	**96.3**
	Roundup	32 fl oz	6-8 lf								
	Cuprofix	2 lb	35								
	Roundup	22 fl oz	45								
	Cuprofix	2 lb	55								
	Roundup	22 fl oz	65								
	Inspire XT + Manzate	2 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
7	Roundup	32 fl oz	2 lf	**1.07**	0.8	$2,050	10694	246	**43.6**	16.2	**96.6**
	Roundup	32 fl oz	6-8 lf								
	ChampION	2 lb	35								
	Roundup	22 fl oz	45								
	ChampION	2 lb	55								
	Roundup	22 fl oz	65								
	Inspire XT + Manzate	2 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
5	Roundup	32 fl oz	2 lf	**1.09**	0.9	$2,056	10710	248	**43.1**	16.3	**96.7**
	Roundup	32 fl oz	6-8 lf								
	Badge SC	2.1 pt	35								
	Roundup	22 fl oz	45								
	Badge SC	2.1 pt	55								
	Roundup	22 fl oz	65								
	Inspire XT + Manzate	2 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
12	Roundup	32 fl oz	2 lf	**1.09**	**0.0**	**$2,243**	**11734**	**261**	**45.0**	**17.2**	**96.6**
	Roundup	32 fl oz	6-8 lf								
	Roundup + Manzate	22 fl oz + 1.6 qt	35								
	Roundup + Manzate	22 fl oz + 1.6 qt	55								
	Inspire XT + Manzate	7 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								

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Evaluate the Safety of Roundup Plus Copper Fungicides in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

No	Treatment*	Rate/A	DSV	CLS 0-9	Injury 0-10	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
4	Roundup	32 fl oz	2 lf	**1.12**	2.2	**$2,147**	**10965**	**256**	**43.8**	**16.9**	**96.5**
	Roundup	32 fl oz	6-8 lf								
	Roundup + Kocide	22 fl oz + 2 lb	35								
	Roundup + Kocide	22 fl oz + 2 lb	55								
	Inspire XT + Manzate	7 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
11	Roundup	32 fl oz	2 lf	**1.14**	**0.2**	**$2,138**	**11317**	**257**	**43.2**	**16.9**	**96.8**
	Roundup	32 fl oz	6-8 lf								
	Manzate	1.6 qt	35								
	Roundup	22 fl oz	45								
	Manzate	1.6 qt	55								
	Roundup	22 fl oz	65								
	Inspire XT + Manzate	2 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
8	Roundup	32 fl oz	2 lf	**1.17**	2.1	$1,922	10066	241	41.9	16.0	**96.3**
	Roundup	32 fl oz	6-8 lf								
	Roundup + ChampION	22 fl oz + 2 lb	35								
	Roundup + ChampION	22 fl oz + 2 lb	55								
	Inspire XT + Manzate	7 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
3	Roundup	32 fl oz	2 lf	**1.32**	**0.6**	**$2,144**	**11168**	**254**	**44.0**	**16.7**	**96.6**
	Roundup	32 fl oz	6-8 lf								
	Kocide 3000	2 lb	35								
	Roundup	22 fl oz	45								
	Kocide 3000	2 lb	55								
	Roundup	22 fl oz	65								
	Inspire XT + Manzate	2 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
6	Roundup	32 fl oz	2 lf	1.37	2.3	$2,053	10750	**255**	**42.3**	**16.8**	**96.4**
	Roundup	32 fl oz	6-8 lf								
	Roundup + Badge SC	22 fl oz + 2.1 pt	35								
	Roundup + Badge SC	22 fl oz + 2.1 pt	55								
	Inspire XT + Manzate	7 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								

Evaluate the Safety of Roundup Plus Copper Fungicides in Sugarbeets

Laker School Agronomy Field, Elkton, MI - 2015

No	Treatment*	Rate/A	DSV	CLS 0-9	Injury 0-10	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
2	Roundup	32 fl oz	2 lf	1.39	1.5	$1,972	10288	246	41.8	16.3	**96.3**
	Roundup	32 fl oz	6-8 lf								
	Roundup + Cuprofix	22 fl oz + 2 lb	35								
	Roundup + Cuprofix	22 fl oz + 2 lb	55								
	Inspire XT + Manzate	7 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
9	Roundup	32 fl oz	2 lf	1.49	**0.0**	**$2,080**	10824	**251**	**43.0**	**16.7**	**96.3**
	Roundup	32 fl oz	6-8 lf								
	AGRILIFE	38 fl oz	35								
	Roundup	22 fl oz	45								
	AGRILIFE	38 fl oz	55								
	Roundup	22 fl oz	65								
	Inspire XT + Manzate	2 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
10	Roundup	32 fl oz	2 lf	1.49	1.6	$1,958	10278	**256**	40.2	**16.9**	**96.3**
	Roundup	32 fl oz	6-8 lf								
	Roundup + Agri-Life	22 fl oz + 38 fl oz	35								
	Roundup + Agri-Life	22 fl oz + 38 fl oz	55								
	Inspire XT + Manzate	7 fl oz + 1.6 qt	75								
	Super Tin + Manzate	8 fl oz + 1.6 qt	115								
	Tilt + Badge SC	4 fl oz + 2.1 pt	150								
Average				1.22	1.0	$2,071	10812	251	43.0	16.6	96.5
LSD 5%				0.4	0.6	169.5	836.4	9.1	3.0	0.5	n.s
CV %				24.7	46.0	6.4	6.1	2.8	5.4	2.4	0.4

CLS 0-9: Cercospora visual rating, lower is better. Rated on: September 14.

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

***AMS** at 17 lb/100 gal included in all Round Up PowerMax applications.

Comments: Copper fungicides were tank mixed with Roundup to evaluate for sugarbeet leaf injury. All of the Copper fungicides caused leaf injury when tank mixed with Roundup. Cuprofix and Agri-Life caused less injury than Kocide, Badge SC and ChampION. Roundup plus Manzate did not cause leaf injury. The addition of Roundup had no effect on Cercospora leafspot control. The sugarbeet stand was good (190 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

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

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Control of Cercospora with Triazole and Strobilurin Fungicides Applied With and Without a Tank Mix Partner

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: SX-1235RR
Planted: April 17
Harvested: Sept 22
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Clay Loam
3.0% OM, 7.5 pH, CEC: 12.6
> Opt: P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: See trts
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No.	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
12	Minerva Duo + Manzate	16 fl oz + 1.6 qt	55	**0.79**	**$1,813**	**9734**	**259**	**37.6**	**17.1**	**96.6**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Minerva Duo + Manzate	16 fl oz + 1.6 qt	150							
2	Inspire XT + Manzate	7 fl oz + 1.6 qt	55	**0.79**	**$1,798**	**9583**	**257**	**37.3**	**16.9**	**96.6**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Inspire XT + Manzate	7 fl oz + 1.6 qt	150							
10	Eminent + Manzate	13 fl oz + 1.6 qt	55	**0.83**	**$1,859**	**9921**	**263**	**37.6**	**17.3**	**96.5**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Eminent + Manzate	13 fl oz + 1.6 qt	150							
6	Proline + Induce + Manzate	5.7 fl oz + .25% + 1.6 qt	55	**0.83**	**$1,758**	**9482**	**261**	**36.3**	**17.2**	**96.5**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Proline + Induce + Manzate	5.7 fl oz + .25% + 1.6 qt	150							
5	Proline + Induce	5.7 fl oz + .25%	55	**0.88**	**$1,744**	**9273**	**264**	**35.1**	**17.3**	**96.8**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Proline + Induce	5.7 fl oz + .25 %	150							
4	Topguard + Manzate	14 fl oz + 1.6 qt	55	**0.88**	**$1,800**	**9647**	**257**	**37.5**	**16.9**	**96.6**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Topguard + Manzate	14 fl oz + 1.6 qt	150							
8	Enable + Crop Oil + Manzate	8 fl oz + 1 qt + 1.6 qt	55	**0.92**	**$1,748**	**9341**	**256**	**36.5**	**16.9**	96.4
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Enable + Crop Oil + Manzate	8 fl oz + 1 qt + 1.6 qt	150							
11	Minerva Duo	16 fl oz	55	**1.00**	**$1,846**	**9760**	**261**	**37.3**	**17.2**	**96.5**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Minerva Duo	16 fl oz	150							

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Control of Cercospora with Triazole and Strobilurin Fungicides Applied With and Without a Tank Mix Partner

Laker School Agronomy Field, Elkton, MI - 2015

No.	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
7	Enable + Crop Oil	8 fl oz + 1 qt	55	1.04	**$1,750**	**9211**	**262**	**35.1**	**17.2**	**96.6**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Enable + Crop Oil	8 fl oz + 1 qt	150							
3	Topguard	14 fl oz	55	1.08	**$1,790**	**9422**	**261**	**36.0**	**17.2**	**96.5**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Topguard	14 fl oz	150							
1	Inspire XT	7 fl oz	55	1.08	$1,647	8671	**258**	33.6	**16.9**	**96.6**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Inspire XT	7 fl oz	150							
9	Eminent	13 fl oz	55	1.13	**$1,778**	**9368**	**260**	**35.9**	**17.1**	**96.6**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Eminent	13 fl oz	150							
14	Headline + Manzate	9.2 fl oz + 1.6 qt	55	1.17	**$1,761**	**9529**	**261**	**36.7**	**17.2**	96.4
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Headline + Manzate	9.2 fl oz + 1.6 qt	150							
13	Headline	9.2 fl oz	55	1.38	**$1,748**	**9325**	**261**	**35.5**	**17.2**	**96.6**
	Super Tin	8 fl oz	95							
	Manzate	1.6 qt	130							
	Headline	9.2 fl oz	150							
16	Untreated Check			3.38	**$1,776**	**9063**	**260**	**34.8**	**17.2**	96.3
Average				1.29	$1,775	9399	260	36.1	17.1	96.5
LSD 5%				0.24	173.0	884.3	n.s.	2.9	n.s.	0.3
CV %				16.1	8.4	8.2	3.6	7.0	3.3	0.3

CLS 0-9: Cercospora visual rating, lower is better. Rated on: September 16.

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage an 9 = 100% leaf damage.

Comments: The disease level in this trial was low, however, Cercospora control differences were detectable. When the fungicides were tank mixed the average Cercospora rating was a .89. Without tank mixing the Cercospora ratings were 1.09. The triazole based treatments had an average rating of .94 while the strobilurin based treatments had an average of 1.3. A lower rating means better leafspot control. The sugarbeet stand was good (170 beets / 100ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fungicides.

Bold: Results are not statistically different for top ranking variety in each column.

Evaluation of plant protection products for management of Cercospora leaf spot in sugarbeet, 2015

Ridgetown, Ontario, Canada - 2015

Rishi Burlakoti, Weather INnovations Consulting LP, Chatham, ON
Cheryl Trueman, University of Guelph, Ridgetown Campus, Ridgetown, ON

Trial Quality: Very Good
Planted: April 29
Harvested: October 4
Plot Size: 2 rows x 23 feet
Row Spacing: 2.5 feet
Seeding Rate: 3.5 seeds/foot

Variety: RR074NT
Location: Ridgetown, Ontario, Canada
Application Method: hand-held boom, CO2 pressure
Application Water Volume: 24.7 gal/A
Reps: 4

Treatment (program) [z,y]	AUDPC [x]	Yield (t acre^{-1})	Sugar (%)	RWSA (lbs acre^{-1})
Nontreated control	645 a	28.2 a	16.3 d	6774 abc
Headline @ 0.35 qt (14-day)	616 ab	29.9 a	16.4 cd	7294 abc
Senator 500 SC @ 0.31 qt (14-day)	517 abc	25.6 a	16.4 cd	6323 bc
Inspire @ 0.70 qt (14-day)	**9 h**	32.4 a	**19.5 a**	9545 a
Inspire @ 0.70 qt (BEETcast™ 50/35)	**14 gh**	32.0 a	**18.9 ab**	9021 ab
Tilt @ 0.22 qt (14-day)	**175 e**	28.8 a	**18.3 abc**	7858 abc
Tilt @ 0.22 qt (BEETcast™ 50/35)	**181 e**	29.5 a	17.6 bcd	7667 abc
Parasol WG @ 3.78 lb (14-day)	**207 cde**	29.7 a	**18.5 ab**	8123 abc
Parasol WG @ 3.78 lb (BEETcast™ 50/35)	311 a-e	27.8 a	18.0 a-d	7517 abc
Manzate Pro-Stick @ 2.00 lb (14-day)	**251 b-e**	28.7 a	17.5 bcd	7521 abc
Manzate Pro-Stick @ 2.00 lb (BEETcast™ 50/35)	329 a-e	29.3 a	17.4 bcd	7600 abc
Bravo ZN @ 1.41 qt (14-day)	**200 de**	28.1 a	18.3 abc	7658 abc
Bravo ZN @ 1.41 qt (BEETcast™ 50/35)	280 a-e	30.4 a	18.1 a-d	8228 abc
Proline @ 0.16 qt (14-day)	**33 fg**	33.3 a	**18.4 ab**	9125 ab
Proline @ 0.16 qt (BEETcast™ 50/35)	**50 f**	31.1 a	**18.7 ab**	8719 abc
Agrosolan @ 1.57 qt (14-day)	345 a-e	30.8 a	17.7 bcd	8110 abc
Agrosolan @ 1.57 qt (BEETcast™ 50/35)	306 a-e	26.2 a	17.0 bcd	6652 abc
Product X @ 0.17 qt (14-day)	457 a-d	24.0 a	16.3 d	5823 c
Product Y @ 0.45 qt (14-day)	**36 fg**	30.1 a	18.1 a-d	7856 abc

[z] BEETcast™ 50/35 program applications were made on 23 Jun (55 DSV), 15 Jul (36 DSV), 31 Jul (31 DSV), 20 Aug (41 DSV), and 8 Sep (38 DSV). Calendar applications (14-day) were made on 27 Jun, 8 Jul, 21 Jul, 4 Aug, 18 Aug, 1 Sep, and 17 Sep. Product rates are per acre.

[y] Inspire EC (difenoconazole), Headline EC (pyraclostrobin), Senator WP (thiophanate-methyl), Parasol WG (copper hydroxide), Manzate Pro-Stick DF (mancozeb), Bravo ZN (chlorothalonil), Tilt (propiconazole), Proline (prothioconazole), Agrosolan (mancozeb), Product X (unknown), Product Y (unknown).

[x] AUDPC = area under the disease progress curve. A lower number is better. Symptoms were first observed in mid-July.

[w] Numbers in a column followed by the same letter are not significantly different at P ≤ 0.05, Tukey's HSD. Numbers in bold are different from the control in the same column.

Summary

Inspire, Proline, and Product Y provided the most consistent control. Tilt was not as effective as Proline and Inspire and was equivalent to Parasol, Manzate Pro-Stick, and Bravo ZN applied on a 14-day interval. Headline and Senator provide no disease control.

Acknowledgements: This research was supported by the Ontario Sugarbeet Growers' Association, the Michigan Sugar Company, and the Ontario Ministry of Agriculture and Food.

This project is funded in part through the Ontario Farm Innovation Program (OFIP). OFIP is funded through Growing Forward 2 (GF2), a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of GF2 in Ontario.

Evaluation of programs for management of Cercospora leaf spot of sugarbeet in commercial sugarbeet field in Pain Court, Ontario, Canada

Ridgetown, Ontario, Canada - 2015

Sherri Tedford, University of Guelph, Ridgetown Campus; Rishi Burlakoti, Weather Innovations Inc; Cheryl Trueman, University of Guelph, Ridgetown Campus.

Trial Quality: Very good
Planted: April 15
Harvested: September 21
Plot Size: 2 rows x 23 feet
Row Spacing: 2.5 feet
Seeding Rate: 7.6 seeds/foot

Variety: RR059
Location: Pain Court, Ontario, Canada
Application Method: hand-held boom, CO2 pressure
Application Water Volume: 12.1 or 24.7 gal/A
Reps: 4

- The fungicide program consisted of the following fungicides: first application was Proline + Manzate Pro-Stick, second application was Manzate Pro-Stick alone, third application was Proline + Manzate Pro-Stick, and any subsequent applications were Manzate Pro-Stick alone. Proline EC (prothioconazole) was applied at 0.16 qt/A and Manzate Pro-Stick DF (mancozeb) was applied at 2.00 lb/A.

Treatment (# fungicide applications) [z]	Application water volume (gal/A)	AUDPC [x]	CJP	Sugar (%)	RWST	Beets (T/ac)	RWSA
Untreated control (0)	None	962 aw	94.9 a	17.5 a	258 a	50.2 a	12963 a
Calendar (7)	12.1	**52 c**	95.6 ab	18.6 ab	**278 b**	48.1 a	13334 a
Calendar (7)	24.7	**49 c**	95.5 ab	**18.7 b**	**279 b**	47.2 a	13190 a
BEETcast™ 50/35 (5)	12.1	**151 b**	**95.9 b**	**19.0 b**	**287 b**	46.8 a	13267 a
BEETcast™ 50/35 (5)	24.7	**191 b**	**95.8 b**	**18.8 b**	**284 b**	44.5 a	12580 a
BEETcast™ 55/50 (3)	12.1	331 ab	95.5 ab	**18.6 b**	**279 b**	47.1 a	13082 a
BEETcast™ 55/50 (3)	24.7	313 ab	95.4 ab	**18.8 b**	**281 b**	46.5 a	13027 a
Contrast	12.1	178 a	96 a	19 a	281 a	47 a	13128 a
	24.7	184 a	96 a	19 a	281 a	46 a	12932 a

[z] Fungicide applications were made on 17 Jun, 8 Jul, 28 Jul, 14 Aug, 1 Sept for program 50/35 and actual DSVs were 48/33/39/32/38; on 19 Jun, 20 July, and 19 Aug for program 55/50 and actual DSVs were 53/56/60; and 19 Jun, 3 Jul, 13 Jul, 27 Jul, 5 Aug, 17 Aug, and 27 Aug for the calendar program with the first application at 53 DSVs.

[x] Area under the disease progress curve (AUDPC) represents total disease accumulation over the season. A lower number is better.

[w] Numbers in a column followed by the same letter are not significantly different at P ≤ 0.05, Tukey's adjustment. Numbers in bold are different from the control in the same column.

Summary

Disease incidence in the trial was low to moderate and CLS symptoms were detected on July 23. Both the Calendar and BEETcast™ 50/35 programs reduced disease levels compared to the nontreated control. Sugar purity was higher for the BEETcast™ 50/35 programs than the nontreated control. RWST and sugar content were also higher for all programs than the nontreated control, except for the Calendar program using 12.1 gal/A. The number of fungicide applications was lower in treatments with the BEETcast™ 50/35 program (5 sprays) and BEETcast™ 55/50 program (3 sprays) compared to Calendar spray programs (7 sprays). Application water volume did not affect disease severity.

Acknowledgements: This research was supported by the Ontario Sugarbeet Growers' Association, the Michigan Sugar Company, and the Ontario Ministry of Agriculture and Food.

This project is funded in part through the Ontario Farm Innovation Program (OFIP). OFIP is funded through Growing Forward 2 (GF2), a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of GF2 in Ontario.

Evaluation of programs for management of Cercospora leaf spot of sugarbeet in Ridgetown, Ontario, Canada

Ridgetown, Ontario, Canada - 2015

Sherri Tedford, University of Guelph, Ridgetown Campus; Rishi Burlakoti, Weather Innovations Inc; Cheryl Trueman, University of Guelph, Ridgetown Campus.

Trial Quality: Very good
Planted: April 29
Harvested: October 5
Plot Size: 2 rows x 23 feet
Row Spacing: 2.5 feet
Seeding Rate: 7.6 seeds/foot

Variety: RR074NT
Location: Ridgetown, Ontario, Canada
Application Method: hand-held boom, CO2 pressure
Application Water Volume: 12.1 or 24.7 gal/A
Reps: 4

- The fungicide program consisted of the following fungicides: first application was Proline + Manzate Pro-Stick, second application was Manzate Pro-Stick alone, third application was Proline + Manzate Pro-Stick, and any subsequent applications were Manzate Pro-Stick alone. Proline EC (prothioconazole) was applied at 0.16 qt/A and Manzate Pro-Stick DF (mancozeb) was applied at 2.00 lb/A.

Treatment (# fungicide applications) [z]	Application water volume (gal/A)	AUDPC [x]	CJP	Sugar (%)	RWST	Beets (T/ac)	RWSA
Untreated control (0)	None	3361 aw	95.2 a	16.2 a	238 a	24.5 a	5852 a
Calendar (7)	12.1	**393 de**	95.5 a	**19.0 b**	**285 b**	31.9 a	**9045 b**
Calendar (7)	24.7	**211 e**	95.3 a	**19.3 b**	**289 b**	29.7 a	**8546 b**
BEETcast™ 50/35 (5)	**12.1**	**1701 bc**	**95.2 a**	**18.5 b**	**276 b**	29.5 a	8126 ab
BEETcast™ 50/35 (5)	**24.7**	**1193 cd**	**95.0 a**	**18.7 b**	**278 b**	29.3 a	8103 ab
BEETcast™ 55/50 (4)	**12.1**	**2208 b**	**94.6 a**	**18.1 b**	265 ab	31.6 a	**8357 b**
BEETcast™ 55/50 (4)	**24.7**	**2202 b**	94.8 a	**18.1 b**	266 ab	28.4 a	7606 ab
Contrast	12.1	1434 a	95	19 a	275 a	31 a	8509 a
	24.7	1202 a	95	19 a	275 a	29 a	8085 a

[z] Fungicide applications were made on 23 Jun, 15 Jul, 31 Jul, 20 Aug, and 8 Sept for program 50/35 and actual DSVs were 52/37/33/44/35; on 25 June, 22 July, 20 Aug, and 18 Sept for program 55/50 and actual DSVs were 56/48/62/48; and 25 June, 10 Jul, 20 Jul, 4 Aug, 14 Aug, 24 Aug, and 1 Sept for the calendar program with the first application at 56 DSVs.

[x] Area under the disease progress curve (AUDPC) represents total disease accumulation over the season. A lower number is better.

[w] Numbers in a column followed by the same letter are not significantly different at P ≤ 0.05, Tukey's adjustment. Numbers in bold are different from the control in the same column.

Summary

Disease incidence in the trial was high and CLS symptoms were detected on July 23. All fungicide programs reduced disease levels and increased sugar content compared to the nontreated control. However, both Calendar programs and the BEETcast™ 50/35 programs with 24.7 gal/A had lower disease severity than both BEETcast™ 55/50 programs. RWST was higher in the Calendar and BEETcast™ 50/35 programs than the nontreated control, and RWSA was higher in the Calendar programs and BEETcast™ 55/50 program with 12.1 gal/A than the nontreated control. The number of fungicide applications was lower in treatments with the BEETcast™ 50/35 program (5 sprays) and BEETcast™ 55/50 program (4 sprays) compared to Calendar spray programs (7 sprays). Application water volume did not affect overall disease severity, however a water volume of 24.7 gal/A reduced weekly disease levels (data not shown).

Acknowledgements: This research was supported by the Ontario Sugarbeet Growers' Association, the Michigan Sugar Company, and the Ontario Ministry of Agriculture and Food.

This project is funded in part through the Ontario Farm Innovation Program (OFIP). OFIP is funded through Growing Forward 2 (GF2), a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of GF2 in Ontario.

Spore activity of Cercospora beticola, causal agent of Cercospora leaf spot of sugarbeet, in a commercial sugar beet field in Pain Court, Ontario, Canada

Ridgetown, Ontario, Canada - 2015

Sherri Tedford, University of Guelph, Ridgetown Campus; Rishi Burlakoti, Weather INnovations Inc.; Cheryl Trueman, University of Guelph, Ridgetown Campus

Trial Quality: Very Good
Planted: April 15
Variety: C-RR059
Location: Pain Court, Ontario, Canada

Method: A Burkard 7-day volumetric spore trap was set up on April 3. A weather station operated by Weather INnovations (WIN) at the site monitored relative humidity, air temperature, leaf wetness, and rainfall. The spore trap suctions pathogen spores from the air and deposits them on a piece of sticky tape where they can be counted. Due to spore trap malfunctions spore counts are not available June 26-July 2. The commercial field and adjacent fungicide trial were scouted weekly for symptoms of Cercospora leaf spot and symptoms were first confirmed on July 23.

Results Summary:

- In the early part of the season spore counts were very low. Spores were first detected on May 9.
- Disease symptoms were first observed on July 23, four days after the first spore peak on July 19 (115 spores). Before July 19, the spore counts were lower than 20 spores per day.
- Multi-year (2014-2015) comparisons among weather variables, disease progress, and spore count data will be performed in early 2016 to better understand the relationship of spore activity in disease epidemics.

Figure 1. Spore counts and Cercospora leaf spot disease severity, Pain Court, ON.

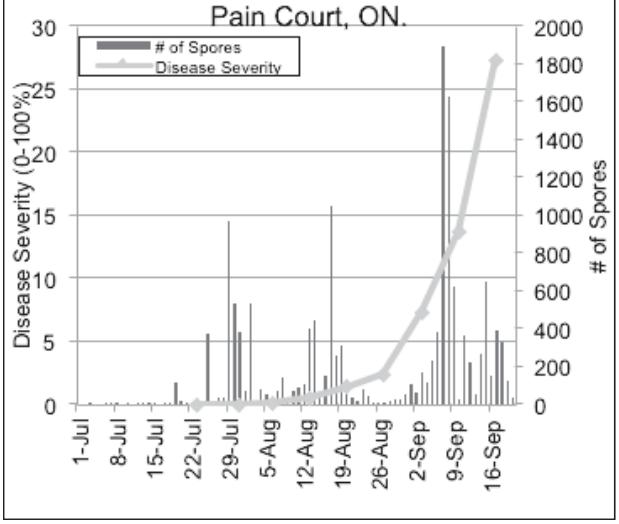
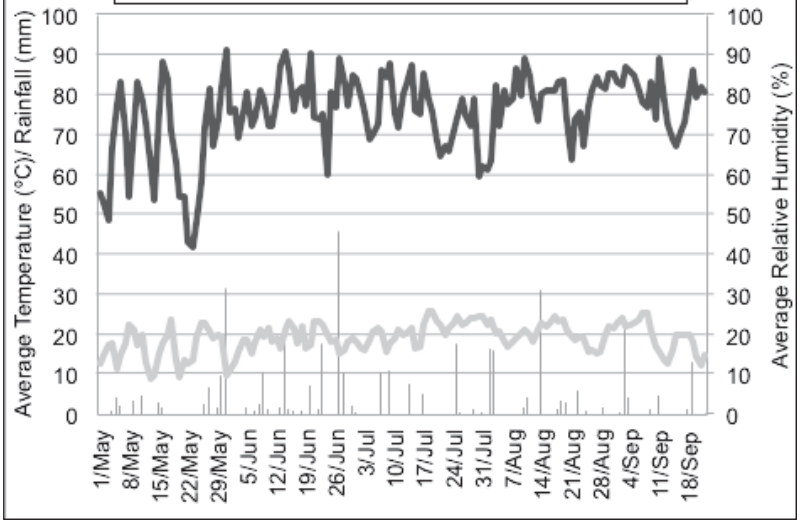


Figure 2. Weather conditions, Pain Court, ON.



Acknowledgements: This research was supported by the Ontario Sugarbeet Growers' Association, the Michigan Sugar Company, and the Ontario Ministry of Agriculture and Food.

Growing Forward 2 AAC agricultural adaptation council Ontario Canada

This project is funded in part through the Ontario Farm Innovation Program (OFIP). OFIP is funded through Growing Forward 2 (GF2), a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of GF2 in Ontario.

Spore activity of Cercospora beticola, causal agent of Cercospora leaf spot of sugarbeet, in Ridgetown, Ontario, Canada

Ridgetown, Ontario, Canada - 2015

Sherri Tedford, University of Guelph, Ridgetown Campus; Rishi Burlakoti, Weather INnovations Inc.; Cheryl Trueman, University of Guelph, Ridgetown Campus

Trial Quality: Very Good
Planted: April 29
Variety: C-RR074NT
Location: Ridgetown, Ontario, Canada

Method: A Burkard 7-day volumetric spore trap was set up on April 30. A weather station operated by Weather INnovations (WIN) at the site monitored relative humidity, air temperature, and rainfall. The spore trap suctions pathogen spores from the air and deposits them on a piece of sticky tape where they can be counted. Due to spore trap malfunctions spore counts are not available Sept 11-23. The field and adjacent fungicide trial were scouted weekly for symptoms of Cercospora leaf spot and symptoms were first confirmed on July 23.

Results Summary:

- In the early part of the season spore counts were very low. Spores were first found on May 9.
- Disease symptoms were first observed on July 23, two days before the first spore peak on July 25 (180 spores). Before July 25, the spore counts were lower than 17 spores per day.
- Multi-year (2014-2015) comparisons among weather variables, disease progress, and spore count data will be performed in early 2016 to better understand the relationship of spore activity in disease epidemics.

Figure 1. Spore Counts and Cercospora leaf spot disease severity, Ridgtown, ON.

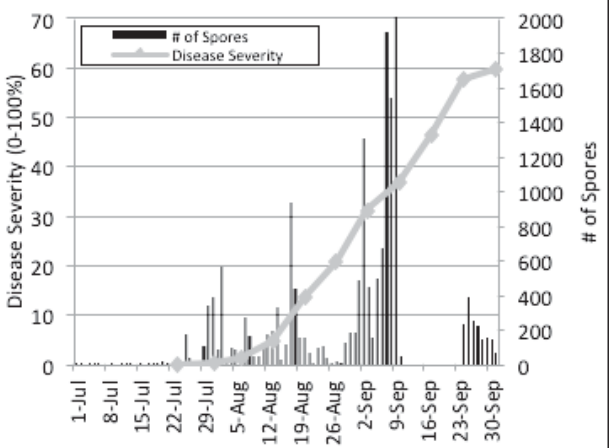
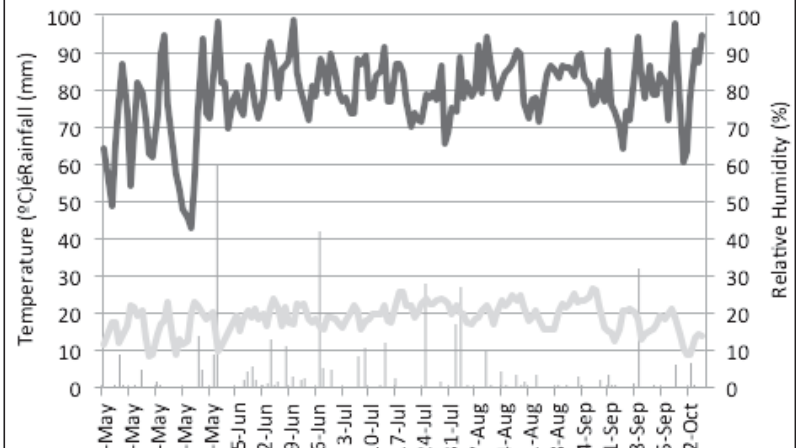


Figure 2. Weather Conditions, Ridgetown, ON.



Acknowledgements: This research was supported by the Ontario Sugarbeet Growers' Association, the Michigan Sugar Company, and the Ontario Ministry of Agriculture and Food.

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Fungicide sensitivity in Alternaria spp. from sugar beet in Michigan

Jiang, Q.W., Q. Chen, H.H. Wu, W.W. Kirk, and L.E. Hanson

Alternaria leaf spot (ALS) in sugar beet has been a minor foliar disease issue in the United States. Management of this disease is usually not required because it only causes minor foliar damage which does not affect the crop yield significantly (Franc 2009). It has been of greater concern in other parts of the world (Abbas et al. 2014, Ozgonen and Kilic 2009). Recently, increased incidence and severity of ALS has been observed in Michigan and levels have been high enough to have the potential to cause yield loss. One hypothesis for increased ALS is that the pathogen has resistance to fungicides used for management of other foliar diseases, such as Cercospora leaf spot.

Fungicide sensitivity tests were done by the USDA-ARS in collaboration with Michigan State University for the response of *Alternaria* species from sugar beet to commonly used foliar fungicides in the Michigan sugar beet growing region. Five *Alternaria* isolates were selected from sugar beet samples submitted as part of the Michigan Sugar Cercospora leaf spot surveys in 2014 or 2015. In addition, 35 *Alternaria* isolates from the USDA-SBRU culture collection from sugar beet from different areas of the United States, collected between 2002 and 2011, also were included in this test. A spiral gradient dilution method (Fig. 1) was used to estimate the fungicide concentration which caused a 50% inhibition of fungal growth (EC50) in vitro for all isolates (Fig. 2).

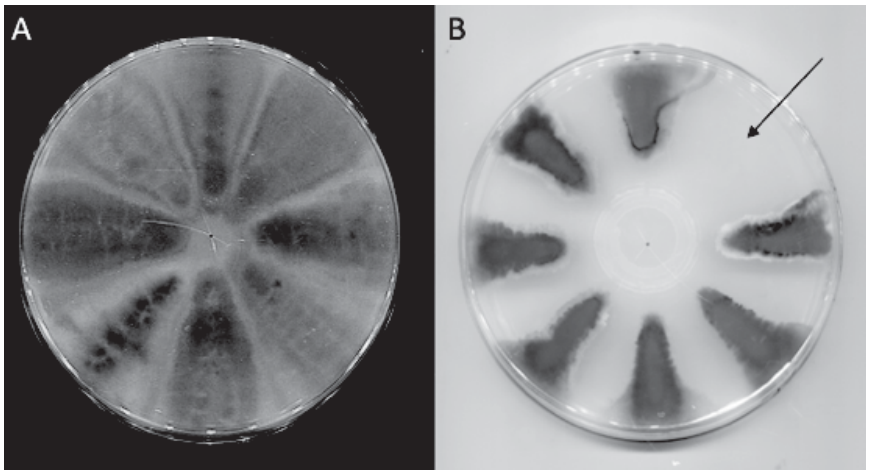


Figure 1. Comparison of a control plate (A) with a fungicide sensitivity assay plate [B, a organo-tin fungicide (Super Tin)] showing growth of eight *Alternaria* isolates from sugar beet. Black arrow indicates a sensitive strain showing total inhibition by the fungicide. Plates are spiral dilution gradient plates with the highest fungicide concentration (100 ppm) at the center and decreasing concentrations moving away from the center. Eight fungal isolates are spread as lines across the gradient. Plates are shown seven days after fungi were applied.

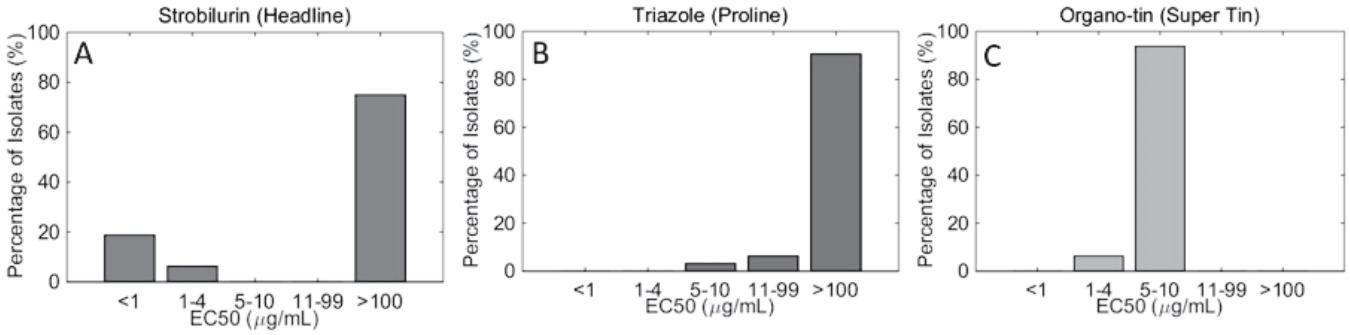


Figure 2. The percentage of *Alternaria* isolates out of 40 tested classified in one of five effective concentration for reduction in growth (EC50) categories: <1 ppm (sensitive), 1-4.99 ppm, 5-9.99 ppm, 10-99.99 ppm and >100 ppm. Results are based on a spiral gradient plate test with A) a strobilurin fungicide (Headline), B) a triazole fungicide (Proline), or C) an organo-tin fungicide (Super Tin). All isolates were collected from sugar beet and results are shown after four days of exposure to the relevant fungicides, except for strobilurins, which are for spore germination at 24-48 hrs of exposure.

Results showed high levels of fungicide resistance to a strobilurin fungicide and moderate tolerance to an organo-tin fungicide. There also was resistance to some triazole fungicides, but in preliminary tests isolates varied in sensitivity to different triazole fungicides (Fig. 3). This is being examined further.

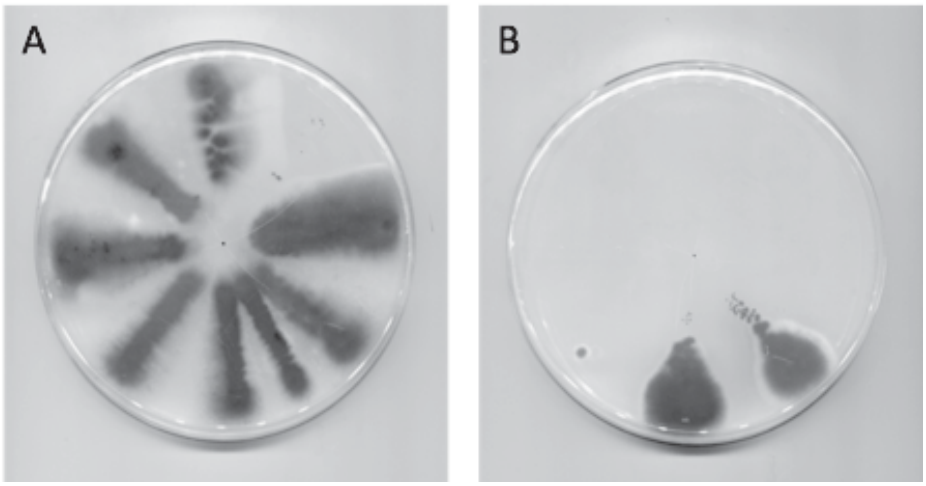


Figure 3. Example of fungicide sensitivity assay plates showing growth of *Alternaria* isolates from sugar beet on two triazole fungicides, A) prothioconazole (Proline) or B) tetraconazole (Eminent). Plates are spiral dilution gradient plates with the highest fungicide concentration (100 ppm) at the center and decreasing concentrations moving away from the center. Eight fungal isolates are spread as lines across the gradient. Plates are shown seven days after fungi were applied.

This high frequency of resistance indicates that fungicide resistance to several fungicide classes is present in the *Alternaria* associated with sugar beet and has been present for several years. The high levels of resistance (EC50 >100 ppm which is close to field application rate) to proline and headline may be a factor in the increased foliar disease incidence in Michigan.

Additional experiments are ongoing to characterize the fungicide sensitivity in *Alternaria*, determine species of *Alternaria* causing symptoms on beet in the region, and examine target genes associated with reduced fungicide sensitivity. Based on preliminary testing, most isolates have been in the *Alternaria alternata* species complex. Data collected will be used to help develop effective management recommendations.

Abbas, H.M.K., Muhammad, A.F., Atta, S., and Subhani, M.N. (2014). Evaluation of different sugar beet varieties against *Fusarium oxysporum* f. sp. *betae* and *Alternaria alternate*. Pak. J. Phytopathol. 26:115-117.

Franc, G.D. (2009). Alternaria leaf spot. In: Compendium of Beet Diseases and Pests, (2nd Ed). Harveson, R. M., Hanson, L. E. and Hein, G. L. (Eds.), APS Press, St. Paul, Minnesota, USA, pp. 12-13.

Oxgonene, H. and Kilic, H.C. (2009). Determination of fungal diseases and diseases prevalence in sugar beet growing areas in Isparta Provinces. Suleyman Demirel Universuitesi Ziraat Fakultesi Dergisi 4:16-22. (in Turkish with English abstract)

Clariva™ pn Nematode Seed Treatment

Gene Meylan, Linwood - 2015

Trial Quality: Excellent
Variety: See treatments
Planted: April 28
Harv/Samp: Oct 26 / Oct 8
Plot Size: 4 reps
Row Spacing: 30"
Seeding Rate: 52,300

Soil Info: Loam
Fertilizer: 2x2: 20 gal of 18-6-14-2.6S; Sidedress: 123# N; Fall: 120 # K_2O
Prev Crop: Soybeans
Weather: Good

Rhizoc Control: Good Control: Quadris I.F. & foliar
Cerc Control: Good Control: 1. Inspire + EBDC, 2. Priaxor + EBDC, 3. Eminent, 4. EBDC
Other Pests: Sugarbeet cyst nematode

Treatment	RWSA	RWST	T/A	% Sugar	% CJP	Stand 100 Ft. 22 Day	Nematodes - 100 cc of Soil		
							Cysts	Eggs	Eggs + Juv's
C-G333NT	**9827**	**263**	**37.3**	**17.4**	**96.2**	**242**	**4.3**	**170**	**213**
C-G333NT Clariva	**9822**	**267**	**36.7**	**17.6**	**96.4**	**241**	**3.7**	**170**	**197**
LSD 5%	ns (756)	ns (5)	ns (2.6)	ns (0.3)	ns (0.4)	ns (19)	ns (5)	ns (263)	ns (311)
CV %	3	1	3.1	0.7	0.2	3	37	44	43
C-RR059	**8288**	**269**	**30.8**	**17.6**	**96.7**	**241**	**6**	**287**	**328**
C-RR059 Clariva	**8243**	**270**	**30.5**	**17.7**	**96.7**	**247**	**5**	**193**	**223**
LSD 5%	ns (366)	ns (13)	ns (2.4)	ns (0.8)	ns (0.6)	ns (24)	ns (19)	ns (1014)	ns (1016)
CV %	2	2	3.4	2.0	0.3	4	95	120	105

Comments: Trial was conducted to evaluate the effect of Clariva pn nematode seed treatment on the population of sugarbeet cyst nematodes (SBCN) and beet yield/quality. This biological product is marketed by Syngenta as a seed treatment that may reduce nematode populations and/or improve yield. It is not recommended as a stand-alone product against SBCN and should be coupled with a tolerant variety. Two sugarbeet varieties were tested: a SBCN tolerant (C-G333NT) and a susceptible (C-RR059). Seed was treated with and without Clariva from the same seed lot. SBCN samples were taken in the fall in 100 foot of row in each of the replications. No visual differences between treatments was noted in summer observations. Clariva did not significantly improve yield or reduce nematode populations in any of the 2015 trials.

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

Clariva™ pn Nematode Seed Treatment

VanDenBoom Farms, Munger - 2015

Trial Quality: Excellent
Variety: See treatments
Planted: April 17
Harv/Samp: Oct 27 / Oct 8
Plot Size: 3 reps
Row Spacing: 28 inch
Seeding Rate: 54,000

Soil Info: Loam
Fertilizer: 2x2: 37#-37#-0#-4.5#S plus 1 gal Black Label, 1 gal Lokomotive & micros; Sidedress: 47 gal of 28%
Prev Crop: Soybeans
Weather: Good

Rhizoc Control: Fair Control: Quadris foliar 6-8 leaf
Cerc Control: Good Control: Proline + EBDC, Tin + EBDC, Enable + EBDC, Copper + EBDC, Inspire + EBDC
Other Pests: Sugarbeet cyst nematode

Treatment	RWSA	RWST	T/A	% Sugar	% CJP	Stand 100 Ft. 33 Day	Nematodes - 100 cc of Soil		
							Cysts	Eggs	Eggs + Juv's
C-G333NT Clariva	**10545**	**270**	**38.9**	**17.6**	**97.0**	**235**	**1.0**	**43**	**56**
C-G333NT	**9933**	**271**	**37.0**	**17.7**	**97.0**	**230**	**2.75**	**85**	**121**
LSD 5%	ns (1049)	ns (13)	ns (3.8)	ns (0.8)	ns (0.3)	ns (14)	ns (3)	ns (225)	ns (297)
CV %	3	2	2.9	2.1	0.1	3	78	157	149
C-RR059	**9993**	**278**	**36.0**	**18.1**	**96.9**	**245**	**3.0**	**245**	**284**
C-RR059 Clariva	**9535**	**280**	**34.3**	**18.2**	**97.0**	**240**	**2.75**	**188**	**219**
LSD 5%	ns (1616)	ns (9)	ns (4.0)	ns (0.6)	ns (0.2)	ns (12)	ns (3)	ns (166)	ns (216)
CV %	5	2	3.2	1.4	0.1	2	47	34	38

Comments: Trial was conducted to evaluate the effect of Clariva pn nematode seed treatment on the population of sugarbeet cyst nematodes (SBCN) and beet yield/quality. This biological product is marketed by Syngenta as a seed treatment that may reduce nematode populations and/or improve yield. It is not recommended as a stand-alone product against SBCN and should be coupled with a tolerant variety. Two sugarbeet varieties were tested: a SBCN tolerant (C-G333NT) and a susceptible (C-RR059). Seed was treated with and without Clariva from the same seed lot. SBCN samples were taken in the fall in 100 foot of row in each of the replications. No visual differences between treatments was noted in summer observations. Clariva did not significantly improve yield or reduce nematode populations in any of the 2015 trials.

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

Clariva™ pn Nematode Seed Treatment

Yoder Farms Inc., Bayport - 2015

Trial Quality: Excellent
Variety: See treatments
Planted: April 18
Harv/Samp: Oct 19 / Oct 7
Plot Size: 4 reps
Row Spacing: 20 inch
Seeding Rate: 58,200

Soil Info: Loam
Fertilizer: PPI: 23 gal of 28%, 1 qt of Mn, 4.5# of Solubor; Sidedress: 25 gal of 28%
Prev Crop: Wheat & clover
Weather: Good

Rhizoc Control: Excellent Control: Quadris I.F. & foliar
Cerc Control: Poor Control: 1. Eminent, 2. Headline + EBDC, 3. Proline, 4. GEM + EBDC
Other Pests: Sugarbeet cyst nematode

Treatment	RWSA	RWST	T/A	% Sugar	% CJP	Stand 100 Ft. 39 Day	Nematodes - 100 cc of Soil		
							Cysts	Eggs	Eggs + Juv's
HM-NT425RR Clariva	**9151**	**258**	**35.5**	**17.3**	**95.3**	**170**	**3.3**	**168**	**195**
HM-NT425RR	**8980**	**257**	**35.0**	**17.3**	**95.3**	**171**	**1.5**	**50**	**65**
LSD 5%	ns (500)	ns (3)	ns (1.9)	ns (0.3)	ns (0.4)	ns (9)	ns (4)	ns (155)	ns (167)
CV %	2	1	2.4	0.7	0.2	2	74	63	57

HM-173RR Clariva	**9704**	**251**	**38.7**	**16.7**	**95.9**	**187**	**3.0**	**129**	**174**
HM-173RR	**9514**	**249**	**38.3**	**16.6**	**95.8**	**193**	2.0	**93**	**113**
LSD 5%	ns (483)	ns (11)	ns (1.3)	ns (0.6)	ns (0.3)	ns (13)	0	ns (73)	ns (75)
CV %	2	2	1.5	1.6	0.1	3	0	29	23

Comments: Trial was conducted to evaluate the effect of Clariva pn nematode seed treatment on the population of sugarbeet cyst nematodes (SBCN) and beet yield/quality. This biological product is marketed by Syngenta as a seed treatment that may reduce nematode populations and/or improve yield. It is not recommended as a stand-alone product against SBCN and should be coupled with a tolerant variety. Two sugarbeet varieties were tested: a SBCN tolerant (HM-NT425RR) and a susceptible (HM-173RR). Seed was treated with and without Clariva from the same seed lot. SBCN samples were taken in the fall in 100 foot of row in each of the replications. No visual differences between treatments was noted in summer observations. Clariva did not significantly improve yield or reduce nematode populations in any of the 2015 trials.

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

Clariva™ pn Nematode Seed Treatment

Spartan Acres, Freeland - 2015

Trial Quality: Good
Variety: See treatments
Planted: April 18
Harv/Samp: Sept 28 / Sept 25
Plot Size: 4 reps
Row Spacing: 20 inch
Seeding Rate: 59,500

Soil Info: Loam
Fertilizer: PPI: 20 gal of 28%; 2x2: 42#-40#-0#, 1 gal Thiosul, micros; S.D. 20 gal 28%
Prev Crop: Wheat & clover
Weather: Good

Rhizoc Control: Good Control: Quadris I.F. only
Cerc Control: Good Control: 1. Inspire, 2. Tin + EBDC, 3. EBDC, 4. Copper
Other Pests: Sugarbeet cyst nematode

Treatment	RWSA	RWST	T/A	% Sugar	% CJP	Stand 100 Ft. 32 Day	Nematodes - 100 cc of Soil		
							Cysts	Eggs	Eggs + Juv's
HM-NT425RR	**7586**	**235**	**32.3**	**15.8**	**95.7**	**166**	**0**	**0**	**0**
HM-NT425RR Clariva	**7213**	**230**	**31.3**	**15.6**	**95.4**	**175**	**0**	**0**	**0**
LSD 5%	ns (1005)	ns (5)	ns (4.9)	ns (0.2)	ns (0.9)	ns (31)	ns	ns	ns
CV %	6	1	6.9	0.5	0.4	8	—	—	—
HM-173RR Clariva	**7900**	**234**	**33.8**	**15.6**	**96.0**	**189**	**0**	**0**	**0**
HM-173RR	**7898**	**232**	**34.0**	**15.6**	**95.7**	**187**	**0.5**	**25**	**28**
LSD 5%	ns (495)	ns (12)	ns (3.6)	ns (0.5)	ns (1.0)	ns (19)	ns (2)	ns (80)	ns (88)
CV %	3	2	4.8	1.6	0.5	5	283	283	283

Comments: Trial was conducted to evaluate the effect of Clariva pn nematode seed treatment on the population of sugarbeet cyst nematodes (SBCN) and beet yield/quality. This biological product is marketed by Syngenta as a seed treatment that may reduce nematode populations and/or improve yield. It is not recommended as a stand-alone product against SBCN and should be coupled with a tolerant variety. Two sugarbeet varieties were tested: a SBCN tolerant (HM-NT425RR) and a susceptible (HM-173RR). Seed was treated with and without Clariva from the same seed lot. SBCN samples were taken in the fall in 100 foot of row in each of the replications. No visual differences between treatments was noted in summer observations. Clariva did not significantly improve yield or reduce nematode populations in any of the 2015 trials. In this trial, the fall samples showed low levels of SBCN. However, cyst were seen on beet roots during the growing season.

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

Clariva™ pn Nematode Seed Treatment

Shaffner Brothers LLC., Freeland - 2015

Trial Quality: Fair
Variety: C-RR059
Planted: April 30
Harv/Samp: Nov 11 / Oct 15
Plot Size: 4 reps
Row Spacing: 22 inch
Seeding Rate: 65,000

Soil Info: Clay loam
Fertilizer: PPI: 90 lb/ac N from ESN/urea, 2x2: 25 gal 15-17-1 + micros
Prev Crop: Soybeans
Weather: Excessively wet in June

Rhizoc Control: Good Control: Quadris in furrow
Cerc Control: Good Control: 1. Topsin, 2. Tin + EBDC, 3. Inspire + EBDC, 4. Tin + Eminent
Other Pests: Sugarbeet cyst nematode, Aphanomyces

Treatment	RWSA	RWST	T/A	% Sugar	% CJP	Stand 100 Ft. 20 Day	Nematodes - 100 cc of Soil		
							Cysts	Eggs	Eggs + Juv's
C-RR059	**11338**	**314**	**35.7**	**20.4**	**96.4**	**217**	**0**	**0**	**0**
C-RR059 Clariva	**10946**	**315**	**34.7**	**20.5**	**96.6**	**225**	**1**	**100**	**115**
LSD 5%	ns (3837)	ns (20)	ns (8.7)	ns (1.1)	ns (0.5)	ns (32)	ns (3)	ns (318)	ns (366)
CV %	10	3	7.1	2.3	0.3	6	283	283	283

Comments: Trial was conducted to evaluate the effect of Clariva pn nematode seed treatment on the population of sugarbeet cyst nematodes (SBCN) and beet yield/quality. This biological product is marketed by Syngenta as a seed treatment that may reduce nematode populations and/or improve yield. It is not recommended as a stand-alone product against SBCN and should be coupled with a tolerant variety. In this trial, one susceptible variety was tested (C-RR059). This variety has performed well under low pressure nematode situations. Seed was treated with and without Clariva. SBCN samples were taken in the fall in 100 foot of row in each of the replications. No visual differences between treatments was noted in summer observations. Clariva did not significantly improve yield or reduce nematode populations in any of the 2015 trials. In this trial, the fall samples showed low levels of SBCN. However, cyst were seen on beet roots during the growing season.

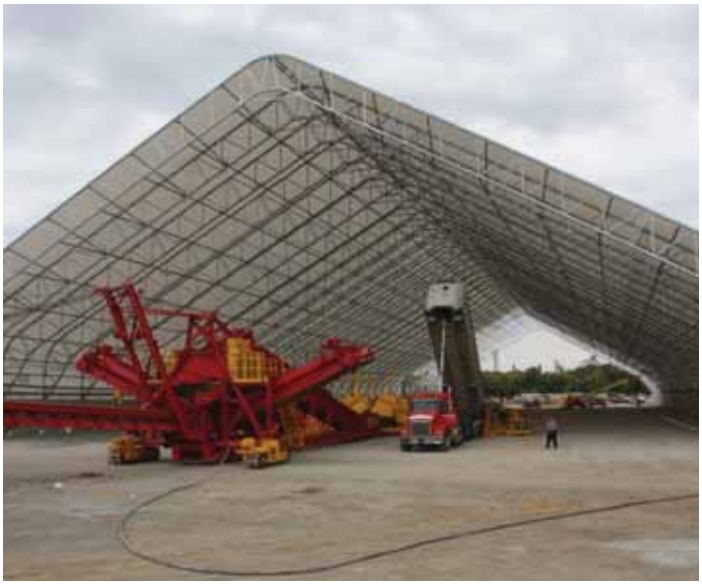
Bold: Results are not statistically different from top ranking variety in each column.

Trusses being installed

All trusses installed

Building cover being installed

Hoop building – Finished product



First load of beets dumped

Truck dumping inside of hoop building

Leaf Speckling from Stream Jet Fertilizer Application

Cercospora Leafspot differences between varieties

Cercospora Leafspot on Lambsquarter weed

Strobilurin based spray program

Super Tin based spray program

Triazole based spray program

Beet Cart Field Day crowd

Big Bear cart

H&S beet cart

Kringstad crop shuttle

Spudnik crop cart

Valley beet cart

Gratiot County variety trials

Huron County variety trials

Midland county variety trials

Saginaw County variety trials

Sanilac County variety trials

Tuscola County variety trials

QuickRoots® Seed Inoculant

Stoneman Farms, Breckenridge - 2015

Trial Quality:	Excellent	**Soil Info:**	Loam	**Rhizoc Control:**	Good Control: Quadris I.F.
Variety:	C-RR059	**Fertilizer:**	PPI: 385# of 27-0-0-10S-5.5Ca; 2x2: 29 gal of 18-13-0+.1Mn & .1 B	**Cerc Control:**	Good Control: 1. Inspire + EBDC, 2. Headline + Tin, 3. Eminent
Planted:	April 26				
Harv/Samp:	Nov 7 / Oct 15				
Plot Size:	6 reps	**Prev Crop:**	Pickles		
Row Spacing:	20 inch	**Weather:**	Good	**Other Pests:**	None
Seeding Rate:	72,000				

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. 22 Day
QuickRoots	$2,304	**11882**	**298**	**39.9**	**19.9**	**95.4**	**235**
Check	$2,217	**11428**	**297**	38.5	**19.8**	**95.4**	**242**
Average	$2,260	11655	297	39.2	19.8	95.4	239
LSD 5%	—	ns (500)	ns (12)	1.1	ns (0.5)	ns (0.8)	ns (10)
CV %	—	3	3	1.9	1.7	0.5	3

Comments: Trial was conducted to evaluate QuickRoots, a Monsanto BioAg product. The product is used as a microbial seed inoculant applied at planting time. Recommended application rate is 10 grams per 100,000 seed unit. Product claims to increase plant vigor and improve yields. No visual differences were seen between treatments. However, QuickRoots did show a significant improvement in tonnage. Testing in 2014 showed a significant improvement in RWSA. In a second trial in 2015 (Sturm), there was a trend for improved yield (1/2 ton) but not statistically significant.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

QuickRoots® Seed Inoculant

Randy Sturm Farms, Pigeon - 2015

Trial Quality:	Excellent	**Soil Info:**	Loam	**Rhizoc Control:**	Good Control: Quadris at 6-8 leaf
Variety:	HM-173RR	**Fertilizer:**	Broadcast: P & K; PPI: 55# N + micros; Sidedress: 55# N; Fall: 1 ton lime	**Cerc Control:**	Fair / Good Control: 1. Proline, 2. Gem + Sonata, 3. Eminent
Planted:	April 28				
Harv/Samp:	Oct 23 / Oct 16				
Plot Size:	5 reps	**Prev Crop:**	Wheat		
Row Spacing:	28 inch	**Weather:**	Good	**Other Pests:**	None
Seeding Rate:	56,000				

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. 30 Day
QuickRoots	$1,855	**9567**	**286**	**33.5**	**18.8**	**96.3**	**227**
Check	$1,834	**9458**	**288**	**32.9**	**18.9**	**96.1**	**231**
Average	$1,845	9513	287	33.2	18.8	96.2	229
LSD 5%	—	ns (488)	ns (8)	ns (1.4)	ns (0.4)	ns (0.4)	ns (28)
CV %	—	3	2	2.4	1.3	0.2	7

Comments: Trial was conducted to evaluate QuickRoots, a Monsanto BioAg product. The product is used as a microbial seed treatment applied at planting time. Recommended application rate is 10 grams per 100,000 seed unit. Product claims to increase plant vigor and improve yields. No visual difference was seen between treatments. However, QuickRoots did show a trend for improvement in tonnage. Testing in 2014 showed a significant improvement in RWSA. In a second trial in 2015 (Stoneman), there was a significant improvement in yield (1.4 ton).

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

MICHIGAN STATE UNIVERSITY

2015 Beet Cyst Nematode Report

George Bird and Fred Warner, Nematologists
Michigan State University, East Lansing, Michigan 48824

The 2015 MSU Beet Cyst Nematode (BCN) Annual Report is divided into four sections: 1) BCN and the 2015 growing season, 2) BCN resistant/tolerant varieties and seed treatments, 3) Cover Crops and 4) Soil health.

2015 Growing Season.- The growing season at the 2015 MSU trial plots was excellent for sugar beets. It was the best that the senior author of this article had witnessed in his forty-two years of BCN research in Michigan. Beet yields ranged from 37.4 to 47.6 tons per acre; compared to 23 to 29 tons per acre in 2014. Mid-day wilting associated with BCN damage was absent in 2015 in many BCN infested locations and there was very little beet tap root deformation. White females of BCN, however, were evident on roots at harvest. Beet yield differences between BCN susceptible and resistant/tolerant varieties was less than in a typical growing season. The same was true for the candidate nematicides evaluated.

BCN Resistant-Tolerant Varieties and Seed Treatments.- Of the twenty sugar beet varieties approved for planting in Michigan in 2015, nine had BCN resistance or tolerance with an average projected gross dollars per acre, assuming a $50 payment, of $1,735; whereas, the eleven BCN susceptible varieties have an average projected gross of $1,674 per acre. It is important for Michigan sugar beet growers to let their seed companies known that they need resistant varieties (high yielding and BCN population reduction) and not just tolerant varieties (high yielding, but also leaving high BCN populations at the end of the growing season). Resistant varieties provide a **double payday** (high yields the year they are planted and a greater potential for high yields the next time beets are planted at the same site). Seed treatment is common in sugar beet production. The availability of seed treatments designed to control BCN; however, is a relatively recent development. VOTiVO, Clariva and N'Hibit are marketed in Michigan as seed treatments for use on nematode resistant crop varieties and not as stand-alone nematicides. It is currently not known if these products provide beet yield increases and BCN population reduction on BCN tolerant sugar beet varieties.

Cover Crops.- Cover crops can be used in sugar beet production systems as a BCN trap crop or to enhance overall soil health. Only specific cover crop varieties like Defender oilseed radish work as BCN trap crops; whereas, other types may increase risk to BCN. In some situations, cover crop blends can be used to enhance both soil biological diversity and overall soil health. BCN has a relatively large host range compared to other species of cyst nematodes. Growers should be particularly leery of brassicas and mustards for controlling BCN because most of these plants should be considered good hosts unless they have been screened by nematologists specifically against BCN. When selecting oilseed radish cultivars, there is no way to predict their performances solely by inspecting the seeds or by reading seeding rates and planting instructions.

The following information should be useful for decision making in regards to management of BCN in infested fields in Michigan.

Five greenhouse/growth chamber trials were conducted from 2012-2015 to compare the development of beet cyst nematodes (BCN} on various species/cultivars of plants with potential use in sugar beet cropping systems in Michigan for management of this nematode. The results are summarized in three Tables. Each Table give use (traffic light) designations of **Green Light**, Table 1. (poor to non-hosts of BCN), **Yellow Light**, Table 2. (moderate hosts for BCN) and **Red Light** Table 3. (good hosts for BCN). The poor to non-host plants were given Green Lights because growers should feel confident in using them to reduce population densities of BCN. A Yellow Light designation applies to plants that should be used with caution as they were identified as moderate hosts. BCN will develop on these cover crops, but near or below replacement level. The Red Light Table lists the plants/cultivars regarded as good to excellent hosts for BCN. If managing BCN is an objective, Red Light plants should be avoided. BCN population densities and risk of future low beet yield will increase when these plant species/cultivars are grown in BCN infested sites. BCN populations can increase more than 1,000% on many of the plants tested. Because of the complexity of cover crops in regards to BCN management, two additional items have been included: A list of the names and uses of radish, mustard and arugula species (Table 4) and a glossary of cover crop terms for nematode management (Table 5).

2015 Beet Cyst Nematode Report

George Bird and Fred Warner, Nematologists
Michigan State University, East Lansing, Michigan 48824

Soil Health.- Physical, chemical and biological disturbances are known to degrade agricultural soils. It is now recognized that healthy soils are necessary for long-term crop productivity. Recent research has shown that optimal levels of soil health indicators such as water stable soil aggregates, nitrogen mineralization potential and active carbon are associated with highly productive fields; whereas, these are often not adequate in under producing fields.

Table 1. **GREEN LIGHT PLANT BCN MANAGEMENT PLANTS.-** These plant species/cultivars were poor or non-hosts for the beet cyst nematode in Michigan State University 2012-2015 greenhouse/growth chamber trials (number of trials Included in parentheses).

Plant	Cultivar	BCN females (average)
oilseed radish	Mercator (1)	0.75
oilseed radish	Tajuna (3)	0.58
oilseed radish	Image (2)	0.37
oilseed radish	Cannavaro (1)	0.25
oilseed radish	Defender: home grown (2)	0.25
oilseed radish	Maximus (1)	0.25
oilseed radish	Respect (2)	0.25
oilseed radish	Defender: certified (3)	0.13
Alfalfa	Foregrazer (1)	0.00
crimson clover (1)		0.00
red clover	Dynamite (1)	0.00
white clover	Domino (1)	0.00

Table 2. **YELLOW LIGHT BCN PLANTS. -** These plant species/cultivars were moderate hosts for the beet cyst nematode in Michigan State University 2012-2015 greenhouse/growth chamber trials (the number of trials included in parentheses).

Plant	Cultivar	BCN females (average)
oilseed radish	Cardinal (2)	7.00
dry bean	Puebla 152 (2)	5.88
oilseed radish	Taro (2)	5.75
white mustard	Accent (3)	3.83
oilseed radish	Intermezzo (3)	2.40
white mustard	Ludique (1)	1.75
oilseed radish	FumaRad (3)	1.33

Table 3. **RED LIGHT BCN PLANTS.-** These plant species/cultivars were good hosts for the beet cyst nematode in Michigan State University 2012-2015 greenhouse/growth chamber trials (the number of trials included in parentheses).

Plant	Cultivar	BCN females (average)
yellow mustard	Idagold (1)	267.25
oilseed radish	tillage (1)	262.00
oilseed radish	Soilbuster (1)	220.25
oilseed radish	Driller (1)	211.25
oilseed radish	Daikon (1)	197.25
Rapeseed	Dwarf Essex (3)	190.00
turnip, forage	Appin (3)	185.00
sugar beet	Prompt (1)	176.50
oilseed radish	Groundhog (3)	174.00
oilseed radish	Pile Driver (3)	173.58
brown mustard	Kodiak (3)	165.33
sugar beet	C-RR059 (1)	147.25
turnip, forage	Vivant (1)	137.75
oilseed radish	Graza (1)	135.25
yellow mustard	Pacific Gold (2)	121.00
oilseed radish	GO-DRK (1)	87.00
Cabbage	Early Jersey Wakefield (1)	70.25
sugar beet	SX-1211NRR (1)	65.75
sugar beet	HM-50RR (1)	56.00
dry bean	Zarro (2)	26.58
oilseed radish	Carwoodi (3)	20.67

Table 4. Names and uses of radish, mustard and arugula species.

Common Name	Latin Name	Use
Garden Radish	*Raphanus sativus sativus*	Vegetable
Oilseed Radish	*Raphanus sativus oleiferus*	Oil, Cover Crop, and Nematode Trap Crop
Daikon Radish	*Raphanus sativus longipinnatus*	Cover Crop, Vegetable
Wild Radish	*Raphanus Raphanistrum*	Weed
Horse Radish	*Raphanus sativus niger*	Vegetable
Wild Mustard	*Sinapis arvensis*	Weed
White/Yellow mustard	*Sinapis alba/ Brassica hirta*	Cover, Nematode Reducing Crop
Ethiopian Mustard	*Brassica carinata*	Cover crop
Brown, Oriental, Indian Mustard	*Brassica juncea*	Cover crop
Black Mustard	*Brassica nigra*	Weed
Arugula	*Eruca sativa*	Cover crop, Vegetable

Table 5. Glossary of Cover Crop Terms for Nematode Management.

Nematode Population Density Terms.

- P_i : Population density of a specific nematode species at the beginning of a growing season or after a period of seasonal inactivity.
- P_m: Population density of a specific nematode species at mid-season.
- P_f: Population density of a specific nematode at-harvest or at the end of a period of seasonal activity.
- R-value: Pf/Pi (Reproductive factor)

Plant Host Status.

- Good Host: a specific plant variety where the population density of a specific nematode species increases at least two-fold during the growing season (Pf > 2.0-fold Pi).
- Moderate Host: a specific plant cultivar where the population density of a specific nematode increases up to twice the at-planting population density (Pf >0.10-fold Pi, but ,<2X PI).
- Poor Host = a specific variety of a plant that maintains the population density of a specific nematode species, but keeps the population density at 10% or less than the initial population density keeps the initial population standing (in fact hardly no reproduction or reduction)
- Non Host: Specific nematode species will not feed or reproduce on non-hosts. The associated nematode population dynamics will vary depending on the nematode species. In some cases, such as cyst, foliar seeding and seed gall nematodes, the population density will remain relatively constant for a significant number of years. With others, the population density will decline.

Crop Response Status.

- Trap Crops: Nematode trap crops are plants varieties that attract sedentary endoparasitic nematode species. After the nematode penetrates the trap crop and signals for the plant to produce nurse cells, the plant fail to respond to the signal and the nematode dies without producing a next generation. The R-value (reproductive factor) range from about 0.01 to 0.10.
- Resistant Crops: Nematode resistant crops are varieties that yield well under initial population densities greater than the action threshold for nematode management and result in final population densities significantly lower than the associated initial population densities.
- Tolerant Crops: Nematode tolerant crops are varieties that yield well under initial population densities greater than the action threshold for nematode management. The resulting final population density, however, is significantly greater than the initial population density.
- Susceptible Crops: Nematode susceptible crops are varieties that suffer significant yield losses under initial population densities greater than the action threshold, with the final population density being significantly higher than the initial population density.
- Cyst Nematode Trap Crops: A crop that stimulates egg hatch, emergence from the cyst, attraction to its root system and then fails to form the nurse cells essential for female development, resulting in a decline in nematode population density.

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MICHIGAN SUGAR

Evaluate Fertilizer Applied 2 X 2 and In-Furrow in Sugarbeets

Maurer, Forestville, MI - 2015

Trial Quality: Fair-Good
Variety: C-G351NT
Planted: May 6
Harvested: Oct 20
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inch
Soil Info: Loam
2.9% OM, 7.7 pH, CEC: 10.8
Opt: P and > Opt: K
High: Mn, Medium: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: Good
Problems: Uneven ground
Seeding Rate: 4.1 inches
Rainfall: 15.7 inches
Application: 2X2 and IF (3.5" T-Band and Dribble) 9 gpa on planter; Sidedress, fluted coulter at 4-6 lf

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	10-Jul Vigor 1-10
1	Quadris	9 fl oz	IF T-band	**$2,071**	**13295**	**310**	**42.8**	**20.3**	**96.3**	**7.8**
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul	4 gal	2 X 2							
	UAN 28%	35 gal	Sidedress							
14	Quadris	9 fl oz	IF T-band	**$1,946**	**12675**	**312**	**40.5**	**20.4**	**96.3**	**8.1**
	10-34-0	2 gal	IF Dribble							
	ULTRA-CHE Mn 6% EDTA	1 qt	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
6	Quadris	9 fl oz	IF T-band	**$1,899**	**12417**	**325**	**38.3**	**21.0**	**96.7**	**7.6**
	Redline	2 gal	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
2	Quadris	9 fl oz	IF T-band	**$1,870**	**12134**	**307**	**39.4**	**20.1**	**96.2**	**7.8**
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
4	Quadris	9 fl oz	IF T-band	**$1,800**	**11748**	**305**	**38.5**	**20.1**	96.0	**8.0**
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
15	Quadris	9 fl oz	IF T-band	**$1,799**	**11337**	**300**	**38.0**	**19.7**	**96.1**	**8.3**
	UAN 28%	47 gal	Sidedress							
13	Quadris	9 fl oz	IF T-band	**$1,777**	**11678**	**308**	**38.0**	**20.2**	**96.2**	**8.1**
	Redline	2 gal	IF Dribble							
	ULTRA-CHE Mn 6% EDTA	1 qt	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							

Evaluate Fertilizer Applied 2 X 2 and In-Furrow in Sugarbeets

Maurer, Forestville, MI - 2015

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	10-Jul Vigor 1-10
5	Quadris	9 fl oz	IF T-band	**$1,748**	**11420**	**312**	36.7	**20.3**	**96.5**	**7.8**
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	Sourceman 5	1 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
10	Quadris	9 fl oz	IF T-band	**$1,737**	**11544**	**324**	35.0	**21.3**	95.8	**6.6**
	Redline + Levesol	2 gal + 1 gal	IF Dribble							
	Sourceman 5	1 qt	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
3	Quadris	9 fl oz	IF T-band	**$1,721**	**11214**	**307**	36.5	**20.1**	**96.2**	**8.1**
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul	4 gal	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
9	Quadris	9 fl oz	IF T-band	$1,697	**11299**	**310**	36.1	**20.3**	**96.2**	**7.4**
	Redline + Levesol	2 gal + 1 gal	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	Sourceman 5	1 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
11	Quadris	9 fl oz	IF T-band	$1,612	10797	**300**	35.8	**19.7**	96.0	**7.5**
	Redline + Levesol	2 gal + 1 gal	IF Dribble							
	ULTRA-CHE Mn 6% EDTA	1 qt	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
12	Quadris	9 fl oz	IF T-band	$1,595	10567	**301**	34.9	**19.7**	**96.2**	**8.5**
	Redline + Sourceman 5	2 gal + 1 qt	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
7	Quadris	9 fl oz	IF T-band	$1,507	10127	**306**	33.0	**20.2**	95.7	**7.0**
	Redline	2 gal	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	Sourceman 5	1 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							

Evaluate Fertilizer Applied 2 X 2 and In-Furrow in Sugarbeets

Maurer, Forestville, MI - 2015

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	10-Jul Vigor 1-10
8	Quadris	9 fl oz	IF T-band	$1,426	9607	**302**	31.8	**19.8**	**96.1**	**7.1**
	Redline + Levesol	2 gal + 2 qt	IF Dribble							
	UAN 28% + 10-34-0	8 gal + 6 gal	2 X 2							
	Thio-Sul + Borosol 10	4 gal + 2 qt	2 X 2							
	Sourceman 5	1 qt	2 X 2							
	UAN 28%	35 gal	Sidedress							
Average				$1,747	11457	309	37.0	20.2	96.2	7.7
LSD 5%				354.3	2143.5	n.s.	6.0	n.s.	0.6	n.s.
CV %				14.2	13.1	6.5	11.3	5.9	0.4	17.0

Vigor: a higher number is better

Comments: Different combinations of 28% N, 10-34-0, Thio-Sul and Micro nutrients were applied 2 X 2 and In-Furrow at planting. 28% N was also applied at the 4-6 leaf to all of the plots. There was a lot of yield variation within the plots and it was difficult to determine treatment effects. The sugarbeet stand was adequate (140 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting the cost of fertilizer.

Bold: Results are not statictically different from top ranking variety in each column.

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Evaluate Fertilizer Applied 2 X 2 and In-Furrow in Sugarbeets

Wadsworth, Sandusky, MI - 2015

Trial Quality: Fair
Variety: SX-1212RR
Planted: May 7
Harvested: Oct 15
Plot Size: 6 rows X 38 ft, 5 reps
Row spacing: 22 inch
Soil Info: Loam
4.9% OM, 7.8 pH, CEC: 18.6
> Opt: P and K
High: Mn, Medium: B
Added N: 140 lbs
Prev Crop: Dry Beans
Rhizoc Level: Low
Cerc Control: Good
Problems: Cyst Nematode
Seeding Rate: 4.1 inches
Rainfall: 18.0 inches
Application: 40 gal 28% N PPI, IF (3.5" T-Band and Dribble) 9 gpa on planter.

No.	Treatment	Rate/A	Appl Method	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	16-Jun Stand B/100'
26	UAN 28%	40 gal	PPI	**$1,708**	**9926**	**287**	**34.6**	**18.8**	**96.6**	162
	Quadris	9 fl oz	T-Band							
19	UAN 28%	40 gal	PPI	**$1,706**	**10302**	**289**	**35.6**	**18.8**	**96.8**	154
	Quadris	9 fl oz	T-Band							
	Levesol	1 gal	Dribble							
	UAN 28% + 10-34-0	3.91 gl + 4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
5	UAN 28%	40 gal	PPI	**$1,702**	**10267**	278	**36.3**	**18.2**	**96.5**	162
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	5.33 gal + 4 gal	2 X 2							
	KTS	3 gal	2 X 2							
2	UAN 28%	40 gal	PPI	**$1,657**	**9830**	**283**	**34.8**	**18.5**	**96.6**	155
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	4 gal + 4 gal	2 X 2							
	Thio-Sul	3 gal	2 X 2							
25	UAN 28%	40 gal	PPI	**$1,632**	**9380**	**281**	**34.9**	**18.3**	**96.7**	158
	Quadris	9 fl oz	T-Band							
	10-34-0	2 gal	Dribble							
	UAN 28% + 10-34-0	3.91 gal + 2 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
1	UAN 28%	40 gal	PPI	**$1,610**	**9536**	**280**	**34.1**	**18.4**	96.3	**173**
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	5.33 gal + 4 gal	2 X 2							
18	UAN 28%	40 gal	PPI	**$1,607**	**9712**	**289**	**33.6**	**18.8**	**96.8**	161
	Quadris	9 fl oz	T-Band							
	Levesol	0.5 gal	Dribble							
	UAN 28% + 10-34-0	3.91 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							

Evaluate Fertilizer Applied 2 X 2 and In-Furrow in Sugarbeets

Wadsworth, Sandusky, MI - 2015

No.	Treatment	Rate/A	Appl Method	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	16-Jun Stand B/100'
13	UAN 28%	40 gal	PPI	**$1,603**	**9683**	**290**	**33.4**	**18.8**	**96.9**	160
	Quadris	9 fl oz	T-Band							
	Redline	1 gal	Dribble							
	UAN 28% + 10-34-0	3.83 gal + 3.7gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
15	UAN 28%	40 gal	PPI	**$1,603**	**9722**	**281**	**34.6**	**18.4**	**96.6**	161
	Quadris	9 fl oz	T-Band							
	Redline	2 gal	Dribble							
	UAN 28% + 10-34-0	3.74 gal + 3.4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
24	UAN 28%	40 gal	PPI	**$1,594**	**9624**	**286**	**33.7**	**18.6**	**96.7**	160
	Quadris	9 fl oz	T-Band							
	ULTRA-CHE Mn 6% EDTA	2 qt	Dribble							
	UAN 28% + 10-34-0	3.88 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
20	UAN 28%	40 gal	PPI	**$1,581**	**9633**	**285**	**33.7**	**18.7**	**96.5**	159
	Quadris	9 fl oz	T-Band							
	Levesol + Sourceman 5	0.5 gal + 1 qt	Dribble							
	UAN 28% + 10-34-0	3.91 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol	3 gal + 2 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
14	UAN 28%	40 gal	PPI	**$1,575**	**9566**	**286**	**33.4**	**18.7**	**96.7**	154
	Quadris + Redline	9 fl oz + 2 gal	T-Band							
	UAN 28% + 10-34-0	3.74 gal + 3.4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
17	UAN 28%	40 gal	PPI	**$1,574**	**9600**	**283**	**34.0**	**18.5**	**96.6**	156
	Quadris	9 fl oz	T-Band							
	Redline	3 gal	Dribble							
	UAN 28% + 10-30-0	3.66 gal + 3.09 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							

Evaluate Fertilizer Applied 2 X 2 and In-Furrow in Sugarbeets

Wadsworth, Sandusky, MI - 2015

No.	Treatment	Rate/A	Appl Method	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	16-Jun Stand B/100'
23	UAN 28%	40 gal	PPI	**$1,566**	**9409**	**281**	**33.5**	**18.3**	**96.8**	158
	Quadris	9 fl oz	T-Band							
	ULTRA-CHE Mn 6% EDTA	1 qt	Dribble							
	UAN 28% + 10-34-0	3.91 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
6	UAN 28%	40 gal	PPI	**$1,561**	**9345**	**286**	**32.7**	**18.6**	**96.9**	154
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	4 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
22	UAN 28%	40 gal	PPI	**$1,560**	**9472**	276	**34.4**	**18.2**	96.3	151
	Quadris	9 fl oz	T-Band							
	Sourceman 5	1 qt	Dribble							
	UAN 28% + 10-34-0	3.91 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
10	UAN 28%	40 gal	PPI	**$1,558**	**9311**	**284**	**32.8**	**18.4**	**97.0**	**165**
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	3.94 gal + 4 gal	2 X 2							
	Thio-Sul	3 gal	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
4	UAN 28%	40 gal	PPI	**$1,554**	**9721**	**284**	**34.2**	**18.6**	**96.6**	152
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	3 gal + 4 gal	2 X 2							
	Thio-Sul	5 gal	2 X 2							
11	UAN 28%	40 gal	PPI	**$1,542**	**9275**	**282**	**32.9**	**18.5**	**96.5**	157
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	3.91 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
9	UAN 28%	40 gal	PPI	**$1,536**	**9172**	**281**	32.6	**18.4**	**96.5**	**170**
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	4 gal + 4 gal	2 X 2							
	Thio-Sul	3 gal	2 X 2							
	Manganese Sulfate 32%	3 lb	2 X 2							
7	UAN 28%	40 gal	PPI	**$1,512**	8475	274	**33.0**	17.9	**96.9**	152
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	3.97 gal + 4 gal	2 X 2							
	Thio-Sul	3 gal	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							

Evaluate Fertilizer Applied 2 X 2 and In-Furrow in Sugarbeets

Wadsworth, Sandusky, MI - 2015

No.	Treatment	Rate/A	Appl Method	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	16-Jun Stand B/100'
3	UAN 28%	40 gal	PPI	$1,500	8998	279	32.2	**18.3**	**96.5**	157
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	3.25 gal + 6 gal	2 X 2							
	Thio-Sul	3 gal	2 X 2							
16	UAN 28%	40 gal	PPI	$1,494	**9550**	**282**	32.4	**18.4**	**96.8**	145
	Quadris	9 fl oz	T-Band							
	Redline	3 gal	T-Band							
	UAN 28% + 10-34-0	3.66 gal + 3.09 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
8	UAN 28%	40 gal	PPI	$1,484	8931	**283**	31.5	**18.5**	**96.7**	160
	Quadris	9 fl oz	T-Band							
	UAN 28% + 10-34-0	3.95 gal + 4 gal	2 X 2							
	Thio-Sul	3 gal	2 X 2							
	ULTRA-CHE Mn 6% EDTA	2 qt	2 X 2							
21	UAN 28%	40 gal	PPI	$1,467	9044	**281**	32.2	**18.3**	**96.7**	161
	Quadris	9 fl oz	T-Band							
	Levesol + Sourceman 5	1 gal + 1 qt	Dribble							
	UAN 28% + 10-34-0	3.91 gal + 4 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
12	UAN 28%	40 gal	PPI	$1,435	8968	279	31.4	**18.3**	**96.5**	154
	Quadris + Redline	9 fl oz + 1 gal	T-Band							
	UAN 28% + 10-34-0	3.83 gal + 3.7 gal	2 X 2							
	Thio-Sul + Borosol 10	3 gal + 2 qt	2 X 2							
	ULTRA-CHE Mn 6% EDTA	1 qt	2 X 2							
	Ultra-Che Zn 9% EDTA	1 qt	2 X 2							
Average				$1,574	9479	282.7	33.6	18.5	96.7	158
LSD 5%				206.0	1192.8	10.8	3.6	0.6	0.5	9.5
CV %				10.5	10.05	3.05	8.7	2.6	0.4	4.8

Vigor: a higher number is better

Comments: One hundred twenty pounds of nitrogen applied pre-plant incorporated did not produce the highest sugarbeet yields but did have the highest net income in this trial. Several treatments with 120 lbs N, PPI plus 20 lbs of N, 16 lbs of P and 9 lbs of S 2X2 with boron and manganses had higher yields but lower net income. Some in-furrow 10-34-0 treatments appeared to cause stand loss.

$/A: Calculated assuming a $51 payment and subtracting the cost of fertilizer.

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

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Evaluate Factory Lime Applications to Sugarbeets

Hrabal, Breckenridge, MI - 2012 and 2015

Trial Quality: Good
Variety: HM-28RR
Planted: April 4, 2012
Harvested: Nov 2, 2012
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch

Soil Info: Sandy Clay Loam
7.9 pH, 2.8% OM, CEC: 13.0
> Opt: P and K
High: Mn and Medium: B
Prev Crop: Corn

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 23.3 nches

No.	Treatment	Applied	2012					
			$/A	RWSA	RWST	T/A	% SUC	% CJP
6	12 Tons/Acre	11/15/2011	**$2,961**	**12662**	**305**	**41.6**	**19.9**	**96.5**
5	8 Tons/Acre	11/15/2011	**$2,852**	**12161**	**303**	**40.1**	**19.8**	**96.5**
4	6 Tons/Acre	11/15/2011	**$2,791**	**11887**	**304**	**39.2**	**19.8**	**96.6**
3	4 Tons/Acre	11/15/2011	$2,777	11806	**302**	**39.0**	**19.7**	**96.6**
2	2 Tons/Acre	11/15/2011	$2,727	11577	**304**	38.1	**19.7**	**96.7**
1	No Lime	11/15/2011	$2,660	11255	**303**	37.1	**19.8**	**96.4**
Average			$2,795	11891	303	39.2	19.8	96.5
LSD 5%			194.0	820.9	n.s.	2.7	n.s.	n.s.
CV %			5.8	5.8	1.8	5.8	1.6	0.3

Trial Quality: Good
Variety: SX-1212
Planted: April 27, 2015
Harvested: Oct 12, 2015
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch

Soil Info: Sandy Clay Loam
8.0 pH, 3.2% OM, CEC: 12.5
> Opt: P and K
High: Mn and Medium: B
Prev Crop: Soybean

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.4 inches

No.	Treatment	Applied	2015					
			$/A	RWSA	RWST	T/A	% SUC	% CJP
6	12 Tons/Acre	11/15/2011	**$1,880**	**10495**	**281**	**37.3**	**18.5**	**96.2**
1	No Lime	11/15/2011	**$1,867**	**10250**	**282**	**36.3**	**18.5**	**96.4**
3	4 Tons/Acre	11/15/2011	**$1,852**	**10245**	**285**	**36.0**	**18.7**	**96.3**
5	8 Tons/Acre	11/15/2011	**$1,832**	**10181**	**278**	**36.6**	**18.3**	**96.2**
4	6 Tons/Acre	11/15/2011	**$1,826**	**10127**	**276**	**36.6**	**18.2**	**96.2**
2	2 Tons/Acre	11/15/2011	**$1,802**	**9944**	**278**	**35.7**	**18.4**	**96.2**
Average			$1,843	10207	280	36.4	18.4	96.2
LSD 5%			n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
CV %			7.4	7.3	2.5	6.5	2.2	0.4

Comments: Spent factory lime was applied in the fall of 2011 and incorporated into the soil. Sugarbeets were planted the following spring (2012) and again in 2015 following rotational crops. In 2012 there was a strong yield response to the lime treatments. Three years later there was not a consistant yield response. Manganese levels were reduced in sugarbeet petioles with lime applications in 2012, with higher lime rates having lower manganese levels. In 2015, there was not a relationship between manganese levels and lime rates.

$/A: Calculated assuming a $51 payment and a trial average RWST.
Bold: Results are not statistically different from top-ranking variety in each column.

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Evaluate Baccarat in Combination With Minerva Duo for Yield Enhancement in Sugarbeets

Stoneman, Breckenridge, MI - 2015

Trial Quality: Good
Variety: SX-1228RR
Planted: April 30
Harvested: Oct 6
Plots: 6 rows X 38 ft, 6 reps
Row spacing: 22 inch
Soil Info: Sandy Loam
3.3% OM, 7.2 pH, CEC: 7.5
>Opt: P and Opt: K
High: Mn, Low: B
Added N: Manure + 80 lbs
Prev Crop: Corn silage
Rhizoc Level: Low
Cerc Control: See Trts
Problems: Flooding
Seeding Rate: 4.1 inches
Rainfall: 18.3 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 100 psi, 22.5 gpa

No.	Treatment	Rate/A	DSV	CLS 0-9	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
1	Minerva Duo	16 fl oz	55	**3.33**	**$2,129**	**9801**	**228**	**42.9**	**15.7**	**94.8**
	Minerva Duo	16 fl oz	95							
2	Minerva Duo	16 fl oz	55	**3.42**	**$2,111**	**9810**	**231**	**42.5**	**15.8**	**94.8**
	Baccarat	28 fl oz								
	Minerva Duo	16 fl oz	95							
	Baccarat	28 fl oz								
3	Untreated Check			6.54	$1,856	8213	**218**	37.7	**15.1**	**94.4**
Average				4.43	$2,032	9275	226	41.0	15.5	94.6
LSD 5%				0.9	135.8	601.0	n.s	1.9	n.s	n.s
CV %				15.3	5.2	5.0	5.3	3.5	3.7	0.8

CLS 0-9: Cercospora visual rating, lower number is better. Rated on Sept. 20

Cercospora Rating Scale 0-9: 2 = < 1% leaf damage, 2.5 = 1% leaf damage, 3 = 3% leaf damage, 4 = 10% leaf damage, 5 = 25% leaf damage, 6 = 50% leaf damage, 7 = 75% leaf damage, 8 = 90% leaf damage and 9 = 100% leaf damage.

Comments: Baccarat (Concentrated Humic Acid) was applied two times to sugarbeets in combination with Minerva Duo as a Cercospora leafspot treatment. There was no improvement in Cercospora control or sugarbeet yield or quality from the Baccarat applications. The sugarbeet stand was good (175 beets / 100 ft).

$/A: Calculated assuming a $51 payment and subtracting out fungicide costs.
Bold: Results are not statistically different from top-ranking variety in each column.

Effect of Harvest Date and Nitrogen Rate on Sugarbeet Yield, Quality and Grower Income

Blumfield East, MI - 2015

Trial Quality: Fair / Good
Variety: C-G351NT
Planted: April 17
Harvested: Sep 1, Oct 1 and Nov 1
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Application: Fertilizers applied at planting (2x2) and at 4 leaf with fluted coulter

Soil Info: Sandy Loam
2.4% OM, 7.7 pH, CEC: 10.2
>Opt: P and K
High: Mn and Low: K
Added N:
Prev Crop: Oil Seed Radish

Rhizoc Level: Low
Cerc Control: Fair/Poor
Problems: Cercospora
Seeding Rate: 4.1 inches
Rainfall:

Average of All Fertilizer Rates by Harvest Date

No	Harv Date	Net $/A	Yield RWSA	Quality RWST	Tons / Acre	% Suc	% CJP
1	1-Sep	**$1,746**	5521	246.9	22.4	16.5	**95.8**
2	1-Oct	$1,453	6792	267.3	25.4	17.6	**95.8**
3	1-Nov	$1,316	**7911**	**298.5**	**26.6**	**19.6**	95.6
Average		$1,505	6741	271	24.8	17.9	95.8
LSD 5%		57.1	245.1	3.0	0.9	0.2	0.1
CV %		8.7	8.3	2.6	8.4	2.3	0.2

Comments: Nitrogen fertilizer was applied at planting (40 lbs ai/A as a 2X2 application) and at the 4 leaf stage with a fluted coulter applicator at rates of 0, 40, 80, 120, 160 and 200 lbs ai/A. Plots were harvested on Sept 1, Oct 1 and Nov 1. Sugarbeet yields and quality increased significantly from the first to the last harvest date, however, grower income was highest at the first harvest date. The 160 lb nitrogen rate provided the highest sugar yield (RWSA) and grower income at all three harvest dates. The nitrogen rate response was fairly clear at the 2nd and 3rd harvest dates with higher nitrogen rates (except for 240 lbs which appeared to be somewhat too high) giving better overall results compared to lower nitrogen rates. Differences from the 1st harvest date were more difficult to interpret. The $/A rankings for the 1st harvest date were: 160 lb > 80 lb > 240 lb > 200 lb > 40 lb > 120 lb > 0 lb. However, the differences between each step-down was small and there were no significant differences from one treatment to the next until the untreated check. More trials need to be conducted over a period of years and conditions to determine nitrogen needs for early harvest fields. The sugarbeet stand was good (~ 175 beets/100 ft) but Cercospora leafspot was not adequately controlled late in the season.

$/A: Calculated assuming a $51 payment, but adjusting the $/Ton payment by the harvest date (Michigan Sugar Early Harvest Payment Schedule), subtracted $4/Ton freight and adjusted for fewer Cercospora applic, then adjusted for the cost of nitrogen fertilizer.

Bold: Results are not statictically different from top ranking variety in each column.

Effect of Harvest Date and Nitrogen Rate on Sugarbeet Yield, Quality and Grower Income

Blumfield East, MI - 2015

Average of All Harvest Dates

No	lbs N ai/A Total	lbs N ai/A 2 X 2	lbs N ai/A 4 lf	$ / Acre	Yield RWSA	Quality RWST	Tons / Acre	% Suc	% CJP
5	160	40	120	**$1,797**	**8092**	265.5	**30.3**	17.6	95.6
7	240	40	200	**$1,674**	**7783**	265.8	**29.1**	17.6	95.8
3	80	40	40	$1,576	6875	267.9	25.7	17.7	95.8
6	200	40	160	$1,568	7252	267.4	26.9	17.8	95.7
4	120	40	80	$1,506	6730	**277.1**	24.2	**18.3**	**96.0**
2	40	40	0	$1,327	5691	**278.0**	20.4	**18.4**	95.8
1	0	0	0	$1,088	4765	**274.6**	17.1	**18.1**	**96.1**
Average				$1,505	6741	271	24.8	17.9	95.8
LSD 5%				104.3	391.6	4.8	1.5	0.3	0.2
CV %				8.7	8.3	2.6	8.4	2.3	0.2

First Harvest Date (Sep 1)

No	lbs N ai/A Total	lbs N ai/A 2 X 2	lbs N ai/A 4 lf	$ / Acre	Yield RWSA	Quality RWST	Tons / Acre	% Suc	% CJP
5	160	40	120	**$2,078**	**6625**	240.4	**27.6**	16.2	95.6
3	80	40	40	**$1,958**	**6112**	252.2	24.2	**16.9**	95.7
7	240	40	200	$1,849	**6042**	237.0	**25.5**	15.9	95.8
6	200	40	160	$1,750	5665	241.1	23.5	16.2	95.7
4	120	40	80	$1,726	5453	252.3	21.6	**16.8**	**96.0**
2	40	40	0	$1,716	5293	**257.3**	20.6	**17.2**	**95.8**
1	0	0	0	$1,147	3454	248.2	13.9	16.5	**96.1**
Average				$1,746	5385	250	21.7	16.7	95.9
LSD 5%				151.2	648.4	3.0	2.4	0.5	0.3
CV %				8.7	8.3	2.6	8.4	2.3	0.2

$/A: Calculated assuming a $51 payment, but adjusting the $/Ton payment by the harvest date (Michigan Sugar Early Harvest Payment Schedule), subtracted $4/Ton freight and adjusted for fewer Cercospora applic, then adjusted for the cost of nitrogen fertilizer.

Bold: Results are not statictically different from top ranking variety in each column.

Effect of Harvest Date and Nitrogen Rate on Sugarbeet Yield, Quality and Grower Income

Blumfield East, MI - 2015

Second Harvest Date (Oct 1)

No	lbs N ai/A Total	lbs N ai/A 2 X 2	lbs N ai/A 4 lf	$ / Acre	Yield RWSA	Quality RWST	Tons / Acre	% Suc	% CJP
5	160	40	120	**$1,788**	**8392**	267.8	**31.3**	**17.6**	95.6
7	240	40	200	**$1,740**	**8358**	267.1	**31.3**	**17.6**	**95.8**
6	200	40	160	$1,534	7344	265.3	27.7	**17.5**	95.7
4	120	40	80	$1,513	7055	**271.3**	26.0	**17.8**	**96.0**
3	80	40	40	$1,486	6857	265.2	25.9	**17.5**	95.8
2	40	40	0	$1,117	5098	266.6	19.2	**17.6**	**95.8**
1	0	0	0	$997	4440	268.0	16.6	**17.6**	**96.1**
Average				$1,453	6792	267	25.4	17.6	95.8
LSD 5%				151.2	648.4	3.0	2.4	n.s.	0.3
CV %				8.7	8.3	2.6	8.4	2.3	0.2

Third Harvest Date (Nov 1)

No	lbs N ai/A Total	lbs N ai/A 2 X 2	lbs N ai/A 4 lf	$ / Acre	Yield RWSA	Quality RWST	Tons / Acre	% Suc	% CJP
5	160	40	120	**$1,525**	**9258**	288.4	**32.1**	19.0	**96.2**
7	240	40	200	**$1,434**	**8948**	293.3	**30.5**	19.3	**96.0**
6	200	40	160	**$1,421**	**8746**	295.9	29.5	19.5	**96.0**
3	80	40	40	$1,285	7657	286.3	26.9	18.8	**96.2**
4	120	40	80	$1,281	7680	**307.7**	23.9	**20.2**	**96.2**
2	40	40	0	$1,147	6683	**310.1**	21.6	**20.4**	**96.1**
1	0	0	0	$1,122	6402	**307.7**	20.8	**20.2**	**96.0**
Average				$1,316	7911	298	26.5	19.6	96.1
LSD 5%				151.2	648.4	3.0	2.4	0.5	n.s.
CV %				8.7	8.3	2.6	8.4	2.3	0.2

$/A: Calculated assuming a $51 payment, but adjusting the $/Ton payment by the harvest date (Michigan Sugar Early Harvest Payment Schedule), subtracted $4/Ton freight and adjusted for fewer Cercospora applic, then adjusted for the cost of nitrogen fertilizer.

Bold: Results are not statictically different from top ranking variety in each column.

Nitrogen Application Method

Richmond Brothers Farms, Pigeon - 2015

Trial Quality:	Good	**Soil Type:**	Clay loam	**Rhizoc Control:**	Good Control: Quadris I.F. & foliar
Variety:	C-RR059	**Fertilizer:**	2x2: 33#-31#-0#-12# S & 0.7#Mn, 0.5# B; Additional N: 75#, See Treatments	**Cerc Control:**	Good Control: 1. Proline + EBDC, 2. GEM + EBDC, 3. Proline + EBDC, 4. Inspire + EBDC
Planted:	April 27	**Prev Crop:**	Wheat & radish		
Harv/Samp:	Sept 30 / Sept 30	**Weather:**	Good	**Other Pests:**	None
Plot Size:	4 reps				
Row Spacing:	22 inch				
Seeding Rate:	70,000				

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP
Sidedress	$2,559	**10660**	**278**	**38.3**	**18.7**	**95.3**
Sidedress with Agrotain Plus	$2,555	**10640**	**280**	**38.0**	**18.7**	**95.4**
Sprayer with Agrotain Plus	$2,543	**10584**	**271**	**39.1**	**18.2**	**95.3**
Sprayer	$2,517	**10488**	**281**	**37.4**	**18.7**	**95.5**
Average	$2,543	10593	278	38.2	18.6	95.4
LSD 5%	—	ns (786)	ns (12)	ns (2.1)	ns (0.6)	ns (0.5)
CV %	—	5	3	3.5	2.0	0.3

Comments: Trial was conducted to compare nitrogen application methods (side-dress vs. sprayer with stream jet fertilizer nozzles) and the effect of Agrotain Plus with both methods of application. Both the sidedress and sprayer applications were made on June 4. Field had 12,000 gallons of dairy manure applied the year before on wheat stubble with an oilseed radish cover crop. A total of 75 pounds of N by 28% UAN was side-dressed or sprayed. Agrotain Plus was added at a rate of 8 pounds per 100 gallons of nitrogen. A small amount of leaf speckling occurred from the sprayer applied nitrogen (see center fold pictures). Sprayer nitrogen rate was applied with 1/3rd water and 2/3rd nitrogen. Effect of higher rates on leaf burn is not known. One gallon of N-Demand was applied to entire field with the first and second fungicide spray. No significant effect on yield/quality was measured between side-dress and sprayer (with stream jet nozzles) N applications. No significant effect with or without Agrotain Plus was found. The trial received 0.4" of rain 4 days after nitrogen application and daily high temperatures ranged from 62-76 degrees F during that time. With the amount of manure applied to this field, nitrogen may not have been a limiting factor to yield and may have impacted results.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

Black Label® Zn

Reif Farms Inc., Reese - 2015

Trial Quality: Excellent
Variety: B-19RR1N
Planted: April 16
Harv/Samp: Sept 15 / Sept 14
Plot Size: 4 reps
Row Spacing: 22 inch
Seeding Rate: 63,000

Soil Type: Loam
Fertilizer: 2x2: 10 gal of 28% + micros; PPI: 50 gal of 28%
Prev Crop: Corn
Weather: Good

Rhizoc Control: Good Control: Quadris I.F.
Cerc Control: Good Control: 1. EBDC, 2. Inspire, 3. Tin, 4. Inspire, 5. Tin
Other Pests: None

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP
Check	$2,474	**8810**	**245**	**35.9**	**16.3**	**96.4**
Black Label Zn	$2,460	**8759**	**246**	**35.7**	**16.3**	**96.3**
Average	$2,467	8785	246	35.8	16.3	96.3
LSD 5%	—	ns (206)	ns (10)	ns (0.8)	ns (0.6)	ns (0.3)
CV %	—	1	3	1.0	2.4	0.2

Comments: Black Label Zn is marketed by Loveland Products. Complexed with organic acid, Black Label Zn (6-20-0-0.77% zinc) is a patented nitrogen and phosphate formulation with zinc designed to protect phosphate tie-up in the soil and help reduce nitrogen loss. Black Label was applied at a rate of 3 gallons per acre with 1 pint of Accomplish which is supposed to enhance nutrient uptake. Both products were applied in a T-band in-furrow with Quadris at planting time. The trial field has a high phosphorus level and a pH of 8.0. For the second year of testing, no yield, quality or visual growth differences were seen between treatments.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

Ascend® Plant Growth Regulator

Clay Crumbaugh, Breckenridge - 2015

Trial Quality:	Good	**Soil Info:**	Loam	**Rhizoc Control:**	Good Control: Quadris I.F. & 6-8 leaf
Variety:	C-RR059	**Fertilizer:**	2x2: 56#-34#-34#-40#S-0.75#B; Pre emerge: 105# N	**Cerc Control:**	Good Control: 1. Eminent, 2. Tin, 3. Inspire
Planted:	April 25				
Harv/Samp:	Nov 11 / Oct 12				
Plot Size:	4 reps	**Prev Crop:**	Wheat & radish		
Row Spacing:	30 inch	**Weather:**	Good	**Other Pests:**	None
Seeding Rate:	54,000				

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. 30 Day
In Furrow & Foliar	$2,016	**10395**	**290**	**35.8**	**19.1**	**96.2**	**252**
Foliar	$2,007	**10351**	**290**	**35.7**	**19.2**	**96.0**	**253**
Check	$1,976	**10192**	**285**	**35.7**	**18.9**	**96.0**	**253**
In Furrow	$1,976	**10189**	**290**	**35.2**	**19.1**	**96.0**	**252**
Average	$1,994	10282	289	35.6	19.1	96.0	253
LSD 5%	—	ns (610)	ns (6)	ns (1.9)	ns (0.4)	ns (0.4)	ns (10)
CV %	—	4	1	3.3	1.3	0.3	3

Comments: Ascend®, by Winfield Solutions, is a product that contains three plant growth regulators-Cytokinin, Giberellic acid and Indolebutyric acid. The product was tested to determine the effect on plant growth, yield and quality. Product was applied in a T-band in-furrow with Quadris at a rate of 6 ounces per acre at planting time. Foliar sprays were applied at the 6-10 leaf stage at a rate of 3.5 ounces per acre in a 7 inch band. No visual growth differences were observed. No significant difference in tonnage. There may have been a trend for improved sugar on treatments with Ascend, but not significant at the 95% confidence level.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

Sugar Sprayed on to Loam Soil

Laracha Farms, Reese - 2015

Trial Quality: Excellent
Variety: B-19RR1N
Planted: April 16
Harv/Samp: Oct 2 / Oct 2
Plot Size: 5 reps
Row Spacing: 20 inch
Seeding Rate: 70,000

Soil Type: Loam
Fertilizer: 2x2: 15 gal of 12-14-5 plus micros; Pre Plant: 52 gal of 28%
Prev Crop: Drybeans
Weather: Good

Rhizoc Control: Good Control: Quadris I.F. and foliar
Cerc Control: Good Control: 1. Inspire + EBDC, 2. Tin + EBDC, 3. Proline
Other Pests: None

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP
Sprayed Sugar	$2,240	**9539**	**261**	**36.6**	**17.3**	**96.2**
Check	$2,223	**9473**	**257**	**36.8**	**17.1**	**96.1**
Average	$2,231	9506	259	36.7	17.2	96.1
LSD 5%	—	ns (282)	ns (8)	ns (2.0)	ns (0.4)	ns (0.4)
CV %	—	2	2	3.1	1.3	0.3

Comments: Reports from other sugarbeet growing areas have suggested that an application of sucrose to the soil may improve growth and yield of crops through stimulation of microbes. In this trial, 100 pounds/acre of granular sugar was dissolved and applied with 52 gallons/acre of 28% UAN prior to planting. The field was then stale seedbed planted. No visual impact was seen on growth and no measurable improvement on yield and quality occurred.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

Sugar Sprayed on Loamy Sand Soil

Laracha Farms, Munger - 2015

Trial Quality: Excellent
Variety: B-18RR4N
Planted: April 16
Harv/Samp: Oct 23 / Oct 13
Plot Size: 3 reps
Row Spacing: 20 inch
Seeding Rate: 70,000

Soil Type: Loamy sand
Fertilizer: 2x2: 15 gal of 12-14-5 plus micros; Pre Plant: 52 gal of 28%
Prev Crop: Pickles
Weather: Good

Rhizoc Control: Good Control: Quadris I.F. and foliar
Cerc Control: Fair / Good Control: 1. Inspire + EBDC, 2. Tin + EBDC, 3. Proline, 4. Tin + EBDC
Other Pests: None

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP
Check	$1,359	**6885**	**226**	**31.0**	**15.4**	**95.3**
Sprayed Sugar	$1,335	**6758**	**226**	**30.5**	**15.5**	**95.0**
Average	$1,347	6822	226	30.7	15.4	95.1
LSD 5%	—	ns (1037)	ns (13)	ns (3.7)	ns (0.8)	ns (0.4)
CV %	—	4	3	3.4	2.2	0.2

Comments: Reports from other sugarbeet growing areas have suggested that an application of sucrose to the soil may improve growth and yield of crops through stimulation of microbes. In this trial, 100 pounds/acre of granular sugar was dissolved and applied with 52 gallons/acre of 28% UAN prior to planting. The field was then stale seedbed planted. No visual impact was seen on growth and no measurable improvement on yield and quality occurred.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

Soil Carbon Mix & LX7

Laracha Farms, Munger - 2015

Trial Quality:	Excellent	**Soil Type:**	Loamy sand	**Rhizoc Control:**	Good Control: Quadris I.F. and foliar
Variety:	B-18RR4N	**Fertilizer:**	2x2: 15 gal of 12-14-5 plus micros; Pre plant: 52 gal of 28%	**Cerc Control:**	Fair / Good Control: 1. Inspire + EBDC, 2. Tin + EBDC, 3. Proline, 4. Tin + EBDC
Planted:	April 16	**Prev Crop:**	Pickles		
Harv/Samp:	Oct 23 / Oct 13	**Weather:**	Good	**Other Pests:**	None
Plot Size:	3 reps				
Row Spacing:	20 inch				
Seeding Rate:	70,000				

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP
Soil Carbon Mix & LX7 Foliar	$1,438	**7412**	**247**	**30.0**	**16.5**	**95.9**
Check	$1,396	**7201**	**240**	**30.0**	**16.1**	**95.6**
Average	$1,417	7307	243	30.0	16.3	95.8
LSD 5%	—	ns (672)	ns (26)	ns (4.1)	ns (1.5)	ns (0.5)
CV %	—	3	3	3.9	2.5	0.2

Comments: SOIL CARBON MIX & LX7 FOLIAR BLEND: These products are from MTS Environment Holdings (website www.mtsenvironmental.ca). Soil Carbon Mix is a liquid concentrate form of natural humic carbon. This product's claim is to increase plant nutrition, reduce hard pans, stimulate microbes, promote soil drainage and increase water retention. LX7 Foliar blend is a fulvic acid solution with added trace minerals. It is utilized as a foliar feed product. These 2 products form the Crop Pro Gold Soil & Foliar Program. Soil Carbon Mix was applied at 1 gallon per acre with the 28%. Soil Carbon Mix was also applied at planting at 1 quart per acre in the 2 by 2 fertilizer band. LX7 was applied foliar at 1 quart per acre on 07/01/15. No visual difference was seen in growth and no significant difference was measured in yield and quality.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

Baccarat Biostimulant

W&K Hecht Farms, Vassar - 2015

Trial Quality:	Excellent	**Soil Type:**	Loam	**Rhizoc Control:**	Good Control: Quadris I.F. + foliar
Variety:	B-19RR1N	**Fertilizer:**	2x2: 13 gal. of 10-34-0; Pre-emerge: 44 gal. of 28%	**Cerc Control:**	Good Control: 1. Inspire, 2. Tin, 3. Priaxor, 4. Eminent + Dithane
Planted:	April 17				
Harv/Samp:	Oct 17 / Oct 8	**Prev Crop:**	Corn		
Plot Size:	3 reps	**Weather:**	Good	**Other Pests:**	None
Row Spacing:	30 inch				
Seeding Rate:	55,000				

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP
Baccarat	$2,139	**11023**	**283**	**39.0**	**18.3**	**97.1**
Check	$2,121	**10918**	**280**	**39.1**	**18.2**	**96.9**
Average	$2,130	10971	281	39.1	18.3	97.0
LSD 5%	—	ns (433)	ns (12)	ns (1.5)	ns (0.7)	0.1
CV %	—	2	2	1.7	2.2	0.1

Comments: Baccarat biostimulant is promoted as a crop soil booster and plant bioactivator. It contains several different acids including: humic, fulvic, ulmic and humine. Claimed benefits are for increased yield, sugar content and more efficient nutrient uptake. Recommendation for sugarbeets is two foliar application of 28 fluid ounces per acre. Product in this trial was applied with first and second leafspot fungicide sprays. No significant difference in visual observation, yield and quality. This was a high yielding and excellent quality trial.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

Starter Nitrogen and Phosphorous on Sugarbeets: What's the Benefit?

Ridgetown, Ontario, Canada - 2015

Dr. Laura L. Van Eerd, Amanda DeBruyn, and Mike Zink
University of Guelph, Ridgetown Campus

Weather 2015: Timely rains resulted in good germination; **2014+ 2013:** Excess rainfall delayed planting

Previous Crop 2015: F3 - soybeans ; R19 soybeans
2014: R9 - winter wheat ; R20 - soybeans
2013: Range 7 - corn; Range 19 & Lambton - soybeans

Trial quality: 2015 Good, 2014 Excellent, 2013 Fair
Sugarbeet Variety: 131RR 2015, 28 RR 2013-14
Fungicide program: 5-6 sprays

Year	site	Planting	Early harvest	Late	%OM	Texture	P
2013	R7	6-May	18-Sep	5-Nov	3.8	Silt Loam	14
	R19	2-May	17-Sep	30-Oct	3.6	Loam	29
	Lambton	7-May	2-Oct	28-Oct	3.0	Clay Loam	25
2014	R9	27-May	16-Sep	28-Oct	3.7	Silt Loam	25
	R20	12-May	10-Sep	27-Oct	3.6	Loam	26
2015	F3/4	1-May	15-Sep	26-Oct	3.8	Silt Loam	41
	R19	29-Apr	16-Sep	26-Oct	3.6	Loam	38

Summary

* As expected, late harvest sugarbeets had higher root yields, %sugar, and RWSA than early harvest but no need to change fertilizer program based on harvest date.
* Starter N & P2O5 in 2x2 band resulted in increased beet and RWSA yields compared to P starter alone or N starter alone
* But results showed differences between years and very few differences in the top yielding treatments; therefore, there is not a lot of compelling evidence to change your planter but if you are set up to do a 2x2 band include N with P.

Table 1: Effect of nitrogen and phoshorous starter fertilizer on sugarbeets

	Treatment*	Yield (ton/ac)			Sugar (%)			RWSA		
		2013	**2014**	**2015**	**2013**	**2014**	**2015**	**2013**	**2014**	**2015**
1	No fertilizer control	27.7 c**	33.4 d	26.8 c	**17.1 a**	**15.7 a**	18.6 ns	7032 d	7882 ns	7683 b
2	100 lb/ac **N** sidedress	**32.0 ab**	35.9 bcd	**32.6 abc**	16.4 c	**15.0 abc**	19.2	**7874 abc**	7977	**9489 ab**
3	40 lb/ac **N** (2x2)	**33.3 a**	**36.8 abc**	**33.3 ab**	16.7 bc	14.8 bc	18.6	**8217 abc**	8050	**9201 ab**
4	40 lb/ac **P2O5** (2x2)	30.9 b	36.3 bcd	**32.1 abc**	16.7 bc	**15.0 abc**	18.9	7604 cd	8078	**9198 ab**
5	40 lb/ac **N & P2O5** (2x2)	**32.1 ab**	**39.5 a**	**36.4 a**	16.5 c	**15.2 abc**	19.0	**7899 abc**	8836	**10400 a**
6	40 lb/ac **P2O5** (2x2) & 40 lb/ac **N** broadcast at planting	**32.7 ab**	36.0 bcd	**33.1 ab**	**17.0 ab**	**15.5 ab**	19.0	**8251 ab**	8311	**9453 ab**
7	2.5 gal/ac **10-34-0** in furrow	**33.1 ab**	35.3 dc	**31.6 abc**	**17.0 ab**	14.7 bc	19.3	**8372 a**	7624	**9136 ab**
8	2.5 gal/ac **10-34-0** in furrow & 37 **N**, 29 **P2O5** lb/ac (2x2)	**31.3 ab**	37.5 abc	**35.1 ab**	16.5 c	14.5 c	19.0	7713 bc	7995	**10008 a**
9	100 lb/ac **N** broadcast at planting	N/A	**38.6 ab**	30.3 bc	N/A	**15.1 abc**	19.0	N/A	8549	**8756 ab**

*Except for no fertilizer control, to make sure that all treatments had the same amount of N fertilizer, trts #3-6, 8 had 60 lb/ac and trt #7 had 97 lb/ac of calcium ammonium nitrate applied at sidedress

**In each column, different letters represent statistical differences between treatments ($p<0.05$)

This project was funded in part through *Growing Forward 2 (GF2)*, a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the deliery of *GF2* in Ontario. The project was funded in part through Michigan Sugar Company and Ontario Sugarbeet Growers Association.

Final Report: Nitrogen Requirement Based on Row Spacing.

Ridgetown, Ontario, Canada - 2015

Dr. Laura L. Van Eerd, Amanda DeBruyn, and Mike Zink
University of Guelph, Ridgetown Campus

Weather 2015: Timely rains resulted in good germination; **2014+ 2013:** Excess rainfall delayed planting

Previous Crop 2015: F3 - soybeans ; R19 soybeans
2014: R9 - winter wheat ; R20 - soybeans
2013: Range 7 - corn; Range 19 - soybeans

Trial quality: 2015 Good, 2014 Excellent, 2013 Fair
Sugarbeet Variety: 131RR in 2015, 28RR in 2013-14
Fungicide program: 5-6 sprays at Ridgetown Campus

Year	site	Planting	Early harvest	Late	%OM	Texture
2013	R7	6-May	18-Sep	5-Nov	3.8	Silt Loam
	R19	2-May	17-Sep	30-Oct	3.6	Loam
2014	R9	27-May	16-Sep	28-Oct	3.7	Silt Loam
	R20	12-May	10-Sep	27-Oct	3.6	Loam
2015	F3/4	1-May	15-Sep	26-Oct	3.8	Silt Loam
	R19	29-Apr	16-Sep	26-Oct	3.6	Loam
	Lambton	29-Apr	29-Sep	5-Nov	2.3	Silt

Row width: 22.5" vs. 30"
4" in-row spacing
Population target:
22.5" = 47,000 plant/ac
30" = 35,000 plant/ac

Summary
* Application of approximately 140 lb N/ac appears optimal for beet and RWSA yields but economics needs to be done
* In all 3 years, based on beet yield and RWSA, you don't need to change N rate for different row spacing
* As expected, higher root yield and RWSA with late (Oct.) compared to early harvest (Sept.)
* In 2015, wider rows had higher yields and RWSA but opposite trends in 2013 and no difference in 2014.
* Further analysis needed in terms of economic returns and combining results of all three years

Table 1: Impact of harvest date and row width on sugarbeet production in 2015 at Ridgetown Campus*

		2015			2014			2013		
Effect	Trt	Yield (ton/ac)	Sugar (%)	RWSA	Yield (ton/ac)	Sugar (%)	RWSA	Yield (ton/ac)	Sugar (%)	RWSA
N applied	0	25.7 c	19.7 ns	7518 b	**29.7 a**	**16.7 a**	7502 c	29.6 b	**17.5 a**	3924 b
	60	29.7 b	19.6	**8524 ab**	34.1 b	**16.5 a**	8289 b	**33.7 ab**	**17.5 ab**	**4417 ab**
	100	**31.5 ab**	19.9	**9244 a**	36 b	16.4 a	**8810 ab**	**35.1 a**	17.1 c	**4461 ab**
	140	**32.3 ab**	19.6	**9143 a**	**39.4 a**	15.9 b	**9236 a**	**36.8 a**	17.1 bc	**4675 a**
	180	**33.8 a**	19.4	**9460 a**	36.5 b	15.7 b	8486 b	**34.1 a**	16.8 c	**4256 ab**
row	22.5"	29.5 k	19.8 l	8538 k	34.9 ns	16.3 ns	8449 ns	35.4 l	17.6 l	4645 l
width	30"	31.7 l	19.5 k	9018 l	35.3	16.2	8481	32.4 k	16.8 k	4048 k
harvest	early	26.7 y	19.7 ns	7572 y	31.3 y	14.9 y	6709 y	26.4 y	16.7 y	3226 y
date	late	34.4 z	19.6	9984 z	39 z	17.6 z	10220 z	41.3 z	17.7 z	5467 z

*For each column, different letters represent statistical differences ($p<0.05$). ns=not significant

This project was funded in part through *Growing Forward 2 (GF2)*, a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the deliery of *GF2* in Ontario. The project was funded in part through Michigan Sugar Company and Ontario Sugarbeet Growers Association.

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Evaluate Soil Active Herbicides in a RoundUp Ready Sugarbeet System

Gilford, Fairgrove, MI - 2015

Trial Quality: Good
Variety: SX-1211N RR
Planted: May 3
Harvested: Sept 28
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch
Soil Info: Sitly Clay
6.5% OM, 7.9 pH, CEC: 26.2
< Opt: P and > Opt: K
High: Mn, Medium: B
Added N: 125 lbs
Prev Crop: Corn
Rhizoc Level: Low
Cerc Control: Good
Problems: Corn Stubble
Seeding Rate: 4.1 inches
Rainfall: 18.8 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 30 psi, 15.3 gpa

No.	Treatment	Rate/A	Appl	% Lambsq Control	6-24 Vigor 0-10	Stand B/100'	Net $/A	RWSA	RWST	T/A
2	Nortron	3 pt	Pre	**99**	**8.2**	**236**	**$2,422**	**8165**	**180**	**45.3**
	Roundup	32 fl oz	2 lf							
	Roundup	32 fl oz	4-6 lf							
	Roundup	22 fl oz	80% RC							
6	Nortron	3 pt	Pre	**99**	**8.2**	**240**	$2,262	7625	**173**	**44.0**
	Roundup	32 fl oz	2 lf							
	Roundup + Dual Magnum	32 fl oz + 1.33 pt	4-6 lf							
	Roundup + Warrant	22 fl oz + 3 pt	80% RC							
3	Roundup	32 fl oz	2 lf	**98**	**7.9**	**221**	**$2,279**	**7682**	171	**44.8**
	Roundup + Dual Magnum	32 fl oz + 1.33 pt	4-6 lf							
	Roundup	22 fl oz	80% RC							
4	Roundup	32 fl oz	2 lf	**98**	**8.1**	**222**	**$2,330**	**7852**	**176**	**44.8**
	Roundup + Outlook	32 fl oz + 1 pt	4-6 lf							
	Roundup	22 fl oz	80% RC							
5	Roundup	32 fl oz	2 lf	**98**	**7.9**	**232**	$2,216	7471	166	**45.1**
	Roundup + Warrant	32 fl oz + 3 pt	4-6 lf							
	Roundup	22 fl oz	80% RC							
7	Dual Magnum	8 fl oz	Pre	**98**	7.4	206	**$2,325**	**7836**	**175**	**44.9**
	Roundup + Dual Magnum	32 fl oz + 12 fl oz	2 lf							
	Roundup + Dual Magnum	32 fl oz + 1.33 pt	4-6 lf							
	Roundup + Warrant	22 fl oz + 3 pt	80% RC							
8	Outlook	6 fl oz	Pre	**98**	**8.1**	217	**$2,348**	**7914**	**176**	**45.0**
	Roundup + Outlook	32 fl oz + 9 fl oz	2 lf							
	Roundup + Outlook	32 fl oz + 1 pt	4-6 lf							
	Roundup + Warrant	22 fl oz + 3 pt	80% RC							
9	Warrant	8 fl oz	Pre	**98**	7.3	210	$2,239	7548	170	**44.4**
	Roundup + Warrant	32 fl oz + 12 fl oz	2 lf							
	Roundup + Warrant	32 fl oz + 3 pt	4-6 lf							
	Roundup + Dual Magnum	22 fl oz + 1.67 pt	80% RC							
1	Roundup	32 fl oz	2 lf	**97**	**8.0**	**220**	$2,258	7609	**172**	**44.2**
	Roundup	32 fl oz	4-6 lf							
	Roundup	22 fl oz	80% RC							

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Evaluate Soil Active Herbicides in a RoundUp Ready Sugarbeet System

Gilford, Fairgrove, MI - 2015

No.	Treatment	Rate/A	Appl	% Lambsq Control	6-24 Vigor 0-10	Stand B/100'	Net $/A	RWSA	RWST	T/A
10	Untreated Check			0	**7.8**	**233**	$1,952	6578	169	38.9
Average				88.3	7.9	224	$2,263	7628	173	44.2
LSD 5%				3.3	0.5	20.2	143.4	483.3	7.9	2.1
CV %				2.9	5.4	7.1	5.0	5.0	3.6	3.7

***AMS** at 17 lb/100 gal included in all round up PowerMax Applications
Vigor: a higher number is better.

Comments: Nortron at 3 pt/a applied pre followed by Roundup foilar applications and layby Dual, Outlook or Warrant applications provided safe and effictive weed control in this trial. Low rates of Dual, Outlook and Warrant pre and early post caused minor sugarbeet injury. Roundup only treatments were somewhat less effective than the Roundup plus soil active herbicide treatments.

$/A: Calculated assuming a $51 payment and subtracting the cost of herbicides.

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

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Evaluate Roundup + Stinger Applications for Weed Control in Sugarbeets

Crumbaugh, Breckenridge, MI - 2015

Trial Quality: Fair-Good
Variety: B-18RR4N
Planted: April 15
Harvested: Oct 8
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch
Soil Info: Loamy Sand
2.5% OM, 6.1 pH, CEC: 6.2
> Opt: P and < Opt: K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Soybeans
Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.4 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 30 psi, 15.3 gpa

No.	Treatment	Rate/A	Appl	% Lambq Control	% SB Injury	Net $/A	RWSA	RWST	T/A
11	Roundup Roundup + Stinger	22 fl oz 22 fl oz + 8 fl oz	2 lf 6-8 lf	**98.8**	15.0	**$2,048**	**10258**	**256**	**40.0**
13	Roundup + Stinger Roundup + Stinger + Warrant	22 fl oz + 2 fl oz 22 fl oz + 4 fl oz + 3 pt	2 lf 6-8 lf	**98.8**	**8.8**	**$2,022**	**10180**	255	**40.0**
17	Roundup + Stinger Nortron Roundup + Stinger + Nortron	22 fl oz + 2 fl oz + 4 fl oz 22 fl oz + 4 fl oz + 4 fl oz	2 lf 6-8 lf	**98.8**	10.0	**$1,977**	**9919**	**257**	**38.6**
14	Roundup + Stinger Roundup + Stinger + Dual Magnum	22 fl oz + 2 fl oz 22 fl oz + 4 fl oz + 1.33 pt	2 lf 6-8 lf	**98.8**	**8.8**	**$1,902**	**9596**	**256**	**37.4**
15	Roundup + Stinger Roundup + Stinger + Outlook	22 fl oz + 2 fl oz 22 fl oz + 4 fl oz + 16 fl oz	2 lf 6-8 lf	**98.8**	10.0	**$1,836**	**9266**	253	**36.6**
23	Roundup + Stinger Roundup + Stinger Roundup + Stinger	22 fl oz + 2 fl oz 22 fl oz + 4 fl oz 22 fl oz + 6 fl oz	2 lf 6-8 lf 80% RC	**98.8**	10.0	**$1,722**	8683	251	**34.7**
4	Roundup + Stinger Roundup	22 fl oz + 4 fl oz 22 fl oz	2 lf 6-8 lf	**98.8**	12.5	**$1,703**	8019	**266**	32.0
22	Roundup Roundup + Stinger + Nortron Roundup + Stinger + Nortron	22 fl oz 22 fl oz + 2 fl oz + 4 fl oz 22 fl oz + 4 fl oz + 4 fl oz	2 lf 6-8 lf 80% RC 80% RC	**98.8**	10.0	$1,698	8558	245	**34.9**
21	Roundup Roundup + Stinger Roundup + Stinger	22 fl oz 22 fl oz + 4 fl oz 22 fl oz + 4 fl oz	2 lf 6-8 lf 80% RC	**98.8**	**8.8**	$1,651	8310	252	32.7
3	Roundup + Stinger Roundup	22 fl oz + 3 fl oz 22 fl oz	2 lf 6-8 lf	**98.8**	10.0	$1,619	8102	252	32.1
18	Roundup + Stinger Roundup + Stinger Roundup + Stinger	22 fl oz + 2 fl oz 22 fl oz + 2 fl oz 22 fl oz + 2 fl oz	2 lf 6-8 lf 80% RC	**97.5**	**6.3**	**$1,980**	**9934**	252	**39.5**
2	Roundup + Stinger Roundup	22 fl oz + 2 fl oz 22 fl oz	2 lf 6-8 lf	**97.5**	**5.0**	**$1,973**	**9855**	255	**38.6**

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Evaluate Roundup + Stinger Applications for Weed Control in Sugarbeets

Crumbaugh, Breckenridge, MI - 2015

No.	Treatment	Rate/A	Appl	% Lambq Control	% SB Injury	Net $/A	RWSA	RWST	T/A
20	Roundup Roundup + Stinger Roundup + Stinger	22 fl oz 22 fl oz + 3 fl oz 22 fl oz + 3 fl oz	2 lf 6-8 lf 80% RC	**97.5**	**8.8**	**$1,924**	8615	253	**37.8**
7	Roundup + Stinger Roundup + Stinger	22 fl oz + 3 fl oz 22 fl oz + 3 fl oz	2 lf 6-8 lf	**97.5**	10.0	**$1,856**	**8984**	**260**	**35.7**
16	Roundup + Norton Roundup + Norton	22 fl oz + 4 fl oz 22 fl oz + 4 fl oz	2 lf 6-8 lf	**97.5**	**8.8**	$1,698	8502	**257**	33.0
8	Roundup + Stinger Roundup + Stinger	22 fl oz + 2 fl oz 22 fl oz + 4 fl oz	2 lf 6-8 lf	**97.5**	**8.8**	$1,649	7789	253	32.6
10	Roundup Roundup + Stinger	22 fl oz 22 fl oz + 6 fl oz	2 lf 6-8 lf	**97.5**	15.0	$1,498	7516	238	31.5
1	Roundup Roundup Roundup	22 fl oz 22 fl oz 22 fl oz	2 lf 6-8 lf 80% RC	**96.3**	**2.5**	**$1,860**	**9308**	253	**36.8**
12	Roundup + Stinger Roundup + Stinger Roundup + Stinger	22 fl oz + 2 fl oz 22 fl oz + 4 fl oz 22 fl oz + 4 fl oz	2 lf 6-8 lf 80% RC	**96.3**	**7.5**	**$1,783**	**8977**	251	**35.8**
9	Roundup Roundup + Stinger	22 fl oz 22 fl oz + 4 fl oz	2 lf 6-8 lf	**96.3**	**7.5**	**$1,783**	**8911**	248	**35.8**
5	Roundup + Stinger Roundup	22 fl oz + 6 fl oz 22 fl oz	2 lf 6-8 lf	**96.3**	15.0	**$1,738**	8703	251	**34.6**
6	Roundup + Stinger Roundup + Stinger	22 fl oz + 2 fl oz 22 fl oz + 2 fl oz	2 lf 6-8 lf	**96.3**	**7.5**	$1,576	7892	254	31.2
19	Roundup Roundup + Stinger Roundup + Stinger	22 fl oz 22 fl oz + 2 fl oz 22 fl oz + 4 fl oz	2 lf 6-8 lf 80% RC	**95.0**	**5.0**	**$1,999**	**10027**	**260**	**38.6**
24	Untreated Check			0.0	43.8	$1,138	5647	**271**	20.3
Average				93.6	10.6	$1,776	8815	254	35.0
LSD 5%				3.9	6.6	347.1	1541.5	15.2	5.8
CV %				2.9	43.9	13.8	12.4	4.2	11.7

***AMS** at 17 lb/100 gal included in all Roundup PowerMax applications

Comments: This trial was designed as a marestail test, however marestail failed to show up in sufficient numbers to make a test. We did have a heavy lambsquarter infestion. The stand was good (~ 190 beets/100ft) and the treatments had no effect on stand. All Roundup + Stinger treatments provided very good control of lambsquarter. Sugarbeet injury was apparent when the Stinger rate was higher than 4 fl oz/A. Sugarbeet yield was reduced by nearly 50% in the untreated plots.

$/A: Calculated assuming a $51 and subtracting the cost of herbicides.

Bold: Results are not statiscally different from top ranking variety in each column.

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Evaluate Low Rate Pre Herbicide Treatments in Conjunction with Roundup Tank Mixes

Laker School Agronomy Field, Elkton, MI - 2015

Trial Quality: Good
Variety: C-RR059
Planted: April 17
Harvested: Sept 21
Plot Size: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Clay loam
3.0% OM, 7.5 pH, CEC: 12.6
> Opt: P anf K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop Soybeans
Rhizoc Level: Low
Cerc Control: Good
Problems: A few low spots
Seeding Rate: 4.1 inches
Rainfall: 25.7 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 30 psi, 15.3 gpa

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	% Weed Cont	Vigor 0-10	6-May Stand B/100'
11	Nortron	4 pt	Pre	**$2,115**	**11722**	272	**43.2**	17.8	**96.6**	**100.0**	**9.0**	**147**
	Roundup	32 fl oz	2 lf									
	Roundup	32 fl oz	6-8 lf									
	Roundup	22 fl oz	80% RC									
15	Warrant	8 fl oz	Pre	**$2,104**	**11553**	270	**42.7**	17.7	**96.6**	**99.2**	**8.5**	**147**
	Roundup + Warrant	32 fl oz + 12 fl oz	2 lf									
	Roundup + Warrant	32 fl oz + 3 pt	6-8 lf									
	Roundup	22 fl oz	80% RC									
17	Dual Magnum	8 fl oz	Pre	**$2,070**	**11496**	275	**41.8**	**18.0**	**96.6**	**99.2**	**8.6**	135
	Roundup + Dual Mag	32 fl oz + 12 fl oz	2 lf									
	Roundup + Dual Mag	32 fl oz + 1.33 pt	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									
3	Roundup + Nortron	32 fl oz + 4 fl oz	2 lf	**$2,062**	**11325**	278	40.8	**18.2**	**96.7**	**100.0**	**8.7**	**162**
	Roundup + Norton	32 fl oz + 4 fl oz	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									
18	Outlook	6 fl oz	Pre	**$2,036**	**11307**	274	**41.3**	**17.9**	**96.6**	**100.0**	**8.6**	**150**
	Roundup + Outlook	32 fl oz + 9 fl oz	2 lf									
	Roundup + Outlook	32 fl oz + 1 pt	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									
4	Roundup + Nortron	32 fl oz + 4 fl oz	2 lf	**$2,029**	**11121**	278	40.0	**18.1**	**96.8**	**100.0**	**8.5**	**150**
	Destiny HC	1 pt	2 lf									
	Roundup + Nortron	32 fl oz + 4 fl oz	6-8 lf									
	Destiny HC	1 pt	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									
7	Roundup + Warrant	32 fl oz + 12 fl oz	2 lf	**$2,027**	**11205**	275	40.8	**18.0**	**96.6**	**100.0**	**8.5**	139
	Roundup + Warrant	32 fl oz + 2 pt	6-8 lf									
	Roundup + Dual Magn	22 fl oz + 1.67 pt	80% RC									
14	Outlook	6 fl oz	Pre	**$2,006**	**11061**	274	40.3	**17.9**	**96.9**	**100.0**	**8.4**	**147**
	Roundup + Outlook	32 fl oz + 9 fl oz	2 lf									
	Roundup + Outlook	32 fl oz + 1 pt	6-8 lf									
	Roundup	22 fl oz	80% RC									
10	Nortron	3 pt	Pre	**$2,000**	**11060**	276	40.0	**18.1**	**96.6**	**100.0**	**8.7**	**151**
	Roundup	32 fl oz	2 lf									
	Roundup	32 fl oz	6-8 lf									
	Roundup	32 fl oz	80% RC									
16	Nortron	3 pt	Pre	**$1,995**	**11089**	270	41.0	17.8	96.4	**100.0**	**8.8**	**143**
	Roundup	32 fl oz	2 lf									
	Roundup	32 fl oz	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									

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Evaluate Low Rate Pre Herbicide Treatments in Conjunction with Roundup Tank mixes

Laker School Agronomy Field, Elkton, MI - 2015

No.	Treatment	Rate/A	Appl	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	% Weed Cont	Vigor 0-10	6-May Stand B/100'
6	Roundup + Outlook	32 fl oz + 9 fl oz	2 lf	$1,982	10985	275	39.9	**18.0**	**96.7**	**100.0**	**8.5**	**152**
	Roundup + Outlook	32 fl oz + 1 pt	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									
19	Warrant	8 fl oz	Pre	$1,981	10990	276	39.8	**18.0**	**96.6**	**100.0**	**8.5**	139
	Roundup + Warrant	32 fl oz + 12 fl oz	2 lf									
	Roundup + Warrant	32 fl oz + 3 pt	6-8 lf									
	Roundup + Dual Mag	22 fl oz + 1.67 pt	80% RC									
2	Roundup + Destiny	32 fl oz + 1 pt	2 lf	$1,974	10818	278	38.9	**18.1**	**96.8**	**100.0**	**8.7**	**154**
	Roundup + Destiny	32 fl oz + 1 pt	6-8 lf									
	Roundup + Destiny	22 fl oz + 1 pt	80% RC									
13	Dual Magnum	8 fl oz	Pre	$1,970	10892	**279**	39.1	**18.2**	**96.7**	**100.0**	**8.6**	139
	Roundup + Dual Mag	32 fl oz + 12 fl oz	2 lf									
	Roundup + Dual Mag	32 fl oz 1.33 pt	6-8 lf									
	Roundup	22 fl oz	80% RC									
5	Roundup + Dual Mag	32 fl oz + 12 fl oz	2 lf	$1,968	10915	273	39.9	**17.9**	**96.6**	**100.0**	**8.8**	**145**
	Roundup + Dual Mag	32 fl oz + 1.3 pt	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									
9	Roundup + Betamix	32 fl oz + 2 pt	2 lf	$1,967	**11232**	277	40.5	**18.1**	**96.7**	**99.7**	**8.8**	**151**
	Destiny HC	1 pt	2 lf									
	Roundup + Betamix	32 fl oz + 4 pt	6-8 lf									
	Destiny HC	1 pt	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									
1	Roundup	32 fl oz	2 lf	$1,953	10648	276	38.5	**18.1**	**96.7**	**99.2**	**8.8**	**141**
	Roundup	32 fl oz	6-8 lf									
	Roundup	22 fl oz	80% RC									
12	Nortron	6 pt	Pre	$1,949	10926	274	39.9	**17.9**	**96.6**	**100.0**	**8.6**	**143**
	Roundup	32 fl oz	2 lf									
	Roundup	32 fl oz	6-8 lf									
	Roundup	22 fl oz	80% RC									
8	Roundup + Betamix	32 fl oz + 2 pt	2 lf	$1,842	10516	270	38.9	17.7	**96.6**	**99.2**	**8.8**	**149**
	Roundup + Betamix	32 fl oz + 4 pt	6-8 lf									
	Roundup + Warrant	22 fl oz + 3 pt	80% RC									
20	Untreated Check			$1,560	8419	**285**	29.6	**18.5**	**96.9**	0.0	7.5	**158**
Average				$1,979	10964	275	39.8	18.0	96.7	94.8	8.6	147
LSD 5%				129.3	697.7	6.0	2.3	0.3	0.3	1.0	0.4	17.8
CV %				5.7	5.6	1.9	5.0	1.6	0.3	1.0	4.1	10.6

***AMS** at 17 lb/100 gal included in all Round up applications.

Comments: Nortron applied Pre at 3 to 4 pts/a and Dual, Outlook and Warrant at low pre rates (8 oz, 6 oz and 8 oz) provided better results than Roundup without pre treatments. Reduced rates of the soil active herbicides were applied (tank mixed with Roundup) at the 2 lf stage and full rate of the soil active herbicides were applied at the 8 lf stage (tank mixed with Roundup).

$/A: Calculated assuming a $51 payment and subtracting the cost of herbicides.

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

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Weed Control in Sugarbeets with Roundup Tank Mixes and Soil Active Herbicides

Gilford, Fairgrove, MI - 2015

Trial Quality: Good
Variety: B-133N
Planted: May 3
Harvested: Sept 28
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch
Soil Info: Silty Clay
6.5% OM, 7.9 pH, CEC: 26.2
< Opt: P and > Opt: K
High: Mn, Medium: B
Added N: 125 lbs
Prev Crop: Corn
Rhicoz Level: Low
Cerc Control: Good
Problems: Corn stubble
Seeding Rate: 4.1 inches
Rainfall: 18.8 inches
Application: JD 3520 Tractor mounted plot sprayer, compressed air, 30 psi, 15.3 gpa

No.	Treatment	Rate/A	Appl	% Lambsq Control	6-24 Vigor 0-10	10-Jun Stand B/100'	Net $/A	RWSA	RWST	T/A
23	Nortron	2 pt	Pre	**100**	**7.0**	**197**	$1,777	7147	180	**39.7**
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 1.5 pt + 12 fl oz + 2 fl oz	2 lf							
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 3 pt + 1.33 pt + 3 fl oz	6-8 lf							
	Roundup + Nortron + Destiny + Betamix + Warrant + Stinger	22 fl oz + 4 fl oz + 1 pt + 4 pt + 3 pt + 4 fl oz	80% RC							
24	Nortron	3 pt	Pre	**100**	**6.5**	173	$1,669	6794	177	**38.3**
	Roundup + Nortron + Destiny + Betamix + Dual Mag + Stinger	32 fl oz + 4 fl oz + 1 pt + 1.5 pt + 12 fl oz + 2 fl oz	2 lf							
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 3 pt + 1.33 pt + 3 fl oz	6-8 lf							
	Roundup + Nortron + Destiny + Betamix + Warrant + Stinger	22 fl oz + 4 fl oz + 1 pt + 4 pt + 3 pt + 4 fl oz	80% RC							
27	Nortron	6 pt	Pre	**100**	5.6	165	$1,666	6886	179	**38.4**
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 1.5 pt + 12 fl oz + 2 fl oz	2 lf							
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 3 pt + 1.33 pt + 3 fl oz	6-8 lf							
	Roundup + Nortron + Destiny + Betamix + Warrant + Stinger	22 fl oz + 4 fl oz + 1 pt + 4 pt + 3 pt + 4 fl oz	80% RC							
25	Nortron	4 pt	Pre	**100**	6.3	**185**	$1,601	6585	171	**38.4**
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 1.5 pt + 12 fl oz + 2 fl oz	2 lf							
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 3 pt + 1.33 pt + 3 fl oz	6-8 lf							
	Roundup + Nortron + Destiny + Betamix + Warrant + Stinger	22 fl oz + 4 fl oz + 1 pt + 4 pt + 3 pt + 4 fl oz	80% RC							

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Weed Control in Sugarbeets with Roundup Tank Mixes and Soil Active Herbicides

Gilford, Fairgrove, MI - 2015

No.	Treatment	Rate/A	Appl	% Lambsq Control	6-24 Vigor 0-10	10-Jun Stand B/100'	Net $/A	RWSA	RWST	T/A
26	Nortron	5 pt	Pre	**100**	5.8	172	$1,561	6472	178	**36.4**
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 1.5 pt + 12 fl oz + 2 fl oz	2 lf							
	Roundup + Nortron + Destiny + Betamix + Dual Mag. + Stinger	32 fl oz + 4 fl oz + 1 pt + 3 pt + 1.33 pt + 3 fl oz	6-8 lf							
	Roundup + Nortron + Destiny + Betamix + Warrant + Stinger	22 fl oz + 4 fl oz + 1 pt + 4 pt + 3 pt + 4 fl oz	80% RC							
3	Roundup + Nortron + Destiny	32 fl oz + 8 fl oz + 1 pt	2 lf	**98.8**	**7.1**	**194**	**$2,208**	**8121**	**214**	**38.0**
	Roundup + Nortron + Destiny	32 fl oz + 8 fl oz + 1 pt	6-8 lf							
	Roundup + Nortron + Destiny	22 fl oz + 8 fl oz + 1 pt	80% RC							
12	Roundup + Stinger	32 fl oz + 3 fl oz	2 lf	**98.8**	**6.5**	**181**	**$2,187**	**7988**	**206**	**38.7**
	Roundup + Stinger	32 fl oz + 3 fl oz	6-8 lf							
	Roundup + Stinger	22 fl oz + 3 fl oz	80% RC							
13	Roundup + Stinger	32 fl oz + 4 fl oz	2 lf	**98.8**	**6.4**	**189**	**$2,178**	**7966**	**199**	**40.0**
	Roundup + Stinger	32 fl oz + 4 fl oz	6-8 lf							
	Roundup + Stinger	22 fl oz + 4 fl oz	80% RC							
14	Roundup + Stinger	32 fl oz + 2 fl oz	2 lf	**98.8**	6.3	**192**	**$2,112**	**7718**	198	**39.0**
	Roundup + Stinger	32 fl oz + 3 fl oz	6-8 lf							
	Roundup + Stinger	22 fl oz + 4 fl oz	80% RC							
19	Roundup + Betamix + Stinger	32 fl oz + 1.5 pt + 2 fl oz	2 lf	**98.8**	**7.1**	**195**	$1,859	7188	177	**40.6**
	Roundup + Betamix + 'Stinger	32 fl oz + 3 pt + 3 fl oz	6-8 lf							
	Roundup + Betamix + Stinger	22 fl oz + 4 pt + 4 fl oz	80% RC							
5	Roundup + Nortron + Destiny	32 fl oz + 4 fl oz + 1 pt	2 lf	**98.8**	**6.9**	**192**	$1,847	6820	175	**38.8**
	Roundup + Nortron + Destiny	32 fl oz + 8 fl oz + 1 pt	6-8 lf							
	Roundup + Nortron + Destiny	22 fl oz + 12 fl oz + 1 pt	80% RC							
17	Roundup + Betamix + Nortron + Destiny	32 fl oz + 1.5 pt + 4 fl oz + 1 pt	2 lf	**98.8**	**6.5**	**191**	$1,825	7097	192	**37.0**
	Roundup + Betamix + Nortron + Destiny	32 fl oz + 3 pt + 4 fl oz + 1 pt	6-8 lf							
	Roundup + Betamix + Nortron + Destiny	22 fl oz + 4 pt + 4 fl oz + 1 pt	80% RC							
20	Roundup + Betamix + Stinger	32 fl oz + 2 pt + 2 fl oz	2 lf	**98.8**	**6.4**	**174**	$1,817	7105	174	**41.0**
	Roundup + Betamix + Stinger	32 fl oz + 4 pt + 3 fl oz	6-8 lf							
	Roundup + Betamix + Stinger	22 fl oz + 4 pt + 4 fl oz	80% RC							

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Weed Control in Sugarbeets with Roundup Tank Mixes and Soil Active Herbicides

Gilford, Fairgrove, MI - 2015

No.	Treatment	Rate/A	Appl	% Lambsq Control	6-24 Vigor 0-10	10-Jun Stand B/100'	Net $/A	RWSA	RWST	T/A
9	Roundup + UpBeet	32 fl oz + 1 oz	2 lf	**98.8**	6.1	**183**	$1,801	7267	**202**	36.1
	Roundup + UpBeet	32 fl oz + 1 oz	6-8 lf							
	Roundup + UpBeet	22 fl oz + 1 oz	80% RC							
15	Roundup + Betamix	32 fl oz + 1.5 pt	2 lf	**98.8**	**6.8**	**185**	$1,745	6745	175	**38.5**
	Roundup + Betamix	32 fl oz + 3 pt	6-8 lf							
	Roundup + Betamix	22 fl oz + 4 pt	80% RC							
8	Roundup + UpBeet	32 fl oz + .75 oz	2 lf	**98.8**	6.0	**173**	$1,717	6789	183	**37.2**
	Roundup + UpBeet	32 fl oz + .75 oz	6-8 lf							
	Roundup + UpBeet	22 fl oz + .75 oz	80% RC							
22	Roundup + Nortron + Destiny + Betamix + Stinger	32 fl oz + 4 fl oz + 1 pt + 2 pt + 2 fl oz	2 lf	**98.8**	**6.9**	**195**	$1,692	6717	173	**38.9**
	Roundup + Nortron + Destiny + Betamix + Stinger	32 fl oz + 4 fl oz + 1 pt + 4 pt + 3 fl oz	6-8 lf							
	Roundup + Nortron + Destiny + Betamix + Stinger	22 fl oz + 4 fl oz + 1 pt + 4 pt + 4 fl oz	80% RC							
18	Roundup + Betamix + Nortron + Destiny	32 fl oz + 2 pt + 4 fl oz + 1 pt	2 lf	**98.8**	**6.9**	**198**	$1,689	6676	171	**39.0**
	Roundup + Betamix + Nortron + Destiny	32 fl oz + 4 pt + 4 fl oz + 1 pt	6-8 lf							
	Roundup + Betamix + Nortron + Destiny	22 fl oz + 4 pt + 4 fl oz + 1 pt	80% RC							
4	Roundup + Nortron + Destiny	32 fl oz + 12 fl oz + 1 pt	2 lf	**98.8**	**6.4**	**180**	$1,666	6193	173	35.7
	Roundup + Nortron + Destiny	32 fl oz + 12 fl oz + 1 pt	6-8 lf							
	Roundup + Nortron + Destiny HC	22 fl oz + 12 fl oz + 1 pt	80% RC							
6	Roundup + Nortron	32 fl oz + 4 fl oz	2 lf	**98.8**	6.0	**174**	$1,638	6026	172	35.1
	Roundup + Nortron	32 fl oz + 8 fl oz	6-8 lf							
	Roundup + Nortron	22 fl oz + 12 fl oz	80% RC							
21	Roundup + Nortron + Destiny + Betamix + Stinger	32 fl oz + 4 fl oz + 1 pt + 1.5 pt + 2 fl oz	2 lf	**98.8**	**6.5**	**176**	$1,593	6294	171	**36.8**
	Roundup + Nortron + Destiny + Betamix + Stinger	32 fl oz + 4 fl oz + 1 pt + 3 pt + 3 fl oz	6-8 lf							
	Roundup + Nortron + Destiny + Betamix + Stinger	22 fl oz + 4 fl oz + 1 pt + 4 pt + 4 fl oz	80% RC							
16	Roundup + Betamix	32 fl oz + 2 pt	2 lf	**98.8**	**6.4**	**194**	$1,588	6247	174	35.8
	Roundup + Betamix	32 fl oz + 4 pt	6-8 lf							
	Roundup + Betamix	22 fl oz + 4 pt	80% RC							

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Weed Control in Sugarbeets with Roundup Tank Mixes and Soil Active Herbicides

Gilford, Fairgrove, MI - 2015

No.	Treatment	Rate/A	Appl	% Lambsq Control	6-24 Vigor 0-10	10-Jun Stand B/100'	Net $/A	RWSA	RWST	T/A
11	Roundup + Stinger Roundup + Stinger Roundup + Stinger	32 fl oz + 2 fl oz 32 fl oz + 2 fl oz 22 fl oz + 2 fl oz	2 lf 6-8 lf 80% RC	**97.5**	**7.1**	**194**	**$2,221**	**8101**	**210**	**38.7**
2	Roundup + Nortron + Destiny HC Roundup + Nortron + Destiny HC Roundup + Norton + Destiny HC	32 fl oz + 4 fl oz + 1 pt 32 fl oz + 4 fl oz + 1 pt 22 fl oz + 4 fl oz + 1 pt	2 lf 6-8 lf 80% RC	**97.5**	6.1	**173**	$1,983	7284	**202**	36.0
10	Roundup + UpBeet Roundup + UpBeet Roundup + UpBeet	32 fl oz + .5 oz 32 fl oz + .75 oz 22 fl oz + 1 oz	2 lf 6-8 lf 80% RC	**97.5**	**6.8**	**186**	$1,946	**7614**	**204**	37.3
1	Roundup Roundup Roundup	32 fl oz 32 fl oz 22 fl oz	2 lf 6-8 lf 80% RC	**97.5**	**7.3**	**192**	$1,758	6410	174	**36.9**
7	Roundup + UpBeet Roundup + UpBeet Roundup + UpBeet	32 fl oz + .5 oz 32 fl oz + .5 oz 22 fl oz + .5 oz	2 lf 6-8 lf 80% RC	**97.5**	6.1	**176**	$1,734	6673	185	36.2
28	Untreated Check			0.0	**6.3**	**195**	$1,044	3766	161	23.4
Average				95.2	6.5	181	$1,790	6882	184	37.4
LSD 5%				3.2	0.9	24.2	229.6	828.0	14.8	3.4
CV %				2.3	9.4	9.4	9.1	8.5	5.7	6.4

***AMS** at 17 lb/100 gal included in all Round up PowerMax applications

Comments: Roundup tank mix treatments and soil active herbicides were evaluated in this trial. The weed pressure was high. Nortron pre applications at 2 and 3 pt/a followed by Roundup applications provided excellent weed control without causing crop injury. Higher Nortron rates caused temporary stunting. Low rates of Dual Magnum (12 fl oz/a) applied at the 2 leaf stage in combination with Roundup provided very good weed control without causing crop injury. Numerous tank mix treatments with Roundup and Stinger, UpBeet, Nortron and Betamix provided effective weed control.

$/A: Calculated assuming a $51 payment and subtracting the cost of herbicides.

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

Effect of Stinger Tank-Mixtures on Weed Control and Sugarbeet Yield

Christy Sprague and Gary Powell, Michigan State University

Locations: Richville (SVREC)	**Application timings:** 2-, 6-leaf beets & @ canopy
Planting Dates: April 15	**Herbicides:** see treatments
Soil Type: Clay loam	**O.M.:** 3.0
Replicated: 4 times	**Variety:** Crystal 351NT

Table 1. Weed control and sugarbeet yield and recoverable white sugar per acre (RWSA) for combinations of Stinger with Roundup (glyphosate) for potential control of glyphosate-resistant weeds.

Herbicide treatments[a]	Timing	C. lambsquarters[b]	Pigweed	Smartweed	Yield	RWSA
		— % —	— % —	— % —	— ton/A —	— lb/A —
Roundup - applied 2X		96	98	99	21.5	5547
Stinger (2 oz)	2-lf	94	99	99	21.0	5274
Stinger (3 oz)	2-lf	96	99	99	23.7	6296
Stinger (4 oz)	2-lf	96	96	99	26.0	6700
Stinger (6 oz)	2-lf	98	99	99	24.4	6236
Stinger (2 oz) fb. (2 oz)	2-lf fb. 6-lf	99	96	99	24.2	6086
Stinger (3 oz) fb. (3 oz)	2-lf fb. 6-lf	97	99	99	23.2	6384
Stinger (2 oz) fb. (4 oz)	2-lf fb. 6-lf	99	99	99	23.4	6130
Stinger (4 oz)	6-lf	98	99	99	27.6	7080
Stinger (6 oz)	6-lf	97	99	98	22.4	5662
Stinger (8 oz)	6-lf	98	99	99	22.6	5845
Stinger (2 oz) fb. (4 oz) fb. (4 oz)	2-lf fb. 6-lf fb. canopy	99	99	99	21.0	5459
$LSD_{0.05}$[c]		**4.5**	**2.9**	**1.3**	**6.6**	**1614**

[a] Roundup PowerMax at 22 fl oz/A was applied with all POST herbicide treatments when sugarbeet were at the 2- and 6-leaf stages. All POST treatments included ammonium sulfate at 17 lb/100 gal. See recommendations in the MSU Weed Control Guide for Field Crops.

[b] Weed control was evaluated in mid-August.

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

Summary: A field trial was conducted to evaluate the effects of Stinger tank-mixtures with glyphosate (Roundup) on weed control and sugarbeet yield. Stinger will be the main component of a program to control glyphosate-resistant horseweed (marestail) and/or glyphosate-resistant horseweed. All treatments contained Roundup PowerMax at 22 fl oz/A at each application timing. Overall, sugarbeet injury was low with all treatments, 10 d after the 6-leaf sugarbeet application. For the weed species evaluated the inclusion of Stinger had minimal effect on weed control, in that weed control was over 90% for all weed species regardless of treatment. None of the treatments reduced yield compared with the Roundup only treatments. Due to low variable horseweed populations at the additional site where this study was conducted we are not able to report horseweed control results. However, in our past studies at least two-applications of Stinger at a minimum rate of 3 oz/A were needed for season-long control of glyphosate-resistant horseweed. The treatment that provided the best control of glyphosate resistant horseweed in the past was three applications of Stinger at 2 oz, fb. 4 oz fb. 4 oz/A at the 2-, 6-leaf sugarbeet stages and at canopy closure. We will continue to examine additional methods for glyphosate-resistant horseweed control.

Management of Glyphosate (Group 9)-Resistant Palmer Amaranth in Sugarbeet

Christy Sprague and Gary Powell, Michigan State University

Locations: Gratiot Co.; SVREC (Richville)	**Application timings:** PRE, 2-, 6-leaf beets & @ canopy (see comments)
Planting Dates: May 22 (GR); April 15 (SVREC)	**Herbicides:** see treatments
Soil Type: Sandy loam (GR); Clay loam (SVREC)	**O.M.:** 3.1% (GR); 3.0 (SVREC)
Replicated: 4 times	**Variety:** Crystal 059 (GR); 351NT (SVREC)

Table 1. Palmer amaranth control (Gratiot Co.) and sugarbeet yield and recoverable white sugar per acre (RWSA) (SVREC) of selected herbicide programs examined for glyphosate-resistant Palmer amaranth control.

		Gratiot Co.	SVREC (Richville)	
Herbicide treatments[a]	Timing	Palmer amaranth[b]	Yield	RWSA
		— % —	— ton/A —	— lb/A —
Roundup - applied 3X	2-lf fb. 6-lf fb. canopy	0	27.5	6913
Betamix (2 pt) + Warrant (3 pt)	2-lf	80	24.8	6501
Betamix (2 pt) + Dual II Mag. (1.33 pt)	2-lf	84	25.5	6703
Betamix (2 pt) fb. Betamix (3 pt)	2-lf fb. 6-lf	75	27.4	7160
Nortron (3 pt) fb. Betamix (2 pt) fb. Betamix (3 pt) + Warrant (3 pt)[d]	PRE fb. 2-lf fb. 6-lf	99	—	—
Betamix (2 pt) fb. Betamix (3 pt) + Warrant (3 pt)	2-lf fb. 6-lf	79	23.1	6066
Betamix (2 pt) fb. Betamix (3 pt) + Dual II Mag. (1.33 pt)	2-lf fb. 6-lf	60	26.6	7015
Betamix (2 pt) fb. Betamix (3 pt) + Outlook (18 fl oz)	2-lf fb. 6-lf	95	25.8	6662
Betamix (2 pt) fb. Betamix (3 pt) fb. Betamix (3 pt)	2-lf fb. 6-lf fb. canopy	96	24.4	6535
Betamix (2 pt) fb. Betamix (4 pt) fb. Betamix (6 pt)	2-lf fb. 6-lf fb. canopy	88	27.3	6974
Nortron (4 fl oz) + Destiny (1.5 pt)	2-lf fb. 6-lf fb. canopy	30	29.5	7795
Nortron (4 fl oz) + Warrant (3 pt) + Destiny (1.5 pt)	2-lf fb. 6-lf	73	24.6	6279
Nortron (4 fl oz) + Dual II Magnum (1.33 pt) + Destiny (1.5 pt)	2-lf fb. 6-lf	67	24.1	6255
$LSD_{0.05}$[c]		**11**	**4.55**	**1098**

[a] Roundup PowerMax at 32 fl oz/A fb. 22 fl oz/A and 22 fl oz/A was applied in each of the treatments. All POST treatments included ammonium sulfate at 17 lb/100 gal. See recommendations in the MSU Weed Control Guide for Field Crops.

[b] Palmer amaranth control was evaluated in mid-August.

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

[d] This treatment was not included in the trial at SVREC.

Management of Glyphosate (Group 9)-Resistant Palmer Amaranth in Sugarbeet

Christy Sprague and Gary Powell, Michigan State University

Summary: Two field trials were conducted to evaluate possible herbicide treatments to control glyphosate-resistant Palmer amaranth in sugarbeet. The first trial was conducted to evaluate Palmer amaranth control and the second trial was conducted to examine the effects of these treatments on sugarbeet injury and yield. Not all treatments are presented. Results indicate that there are some treatments that show some promise for glyphosate-resistant Palmer amaranth control (Table 1), without reducing yield compared with three applications of glyphosate alone. We will continue to examine additional methods for glyphosate-resistant Palmer amaranth control.

Comparison of Chloroacetamide Herbicides in Sugarbeet

Christy Sprague and Gary Powell, Michigan State University

Locations: Richville (SVREC)	**Application timings:** 2-,4- and 6-leaf beets
Planting Dates: April 15	**Herbicides:** see treatments
Soil Type: Clay loam (SVREC)	**O.M.:** 3.0 (SVREC)
Replicated: 4 times	**Variety:** Crystal 351NT

Table 1. Weed control, sugarbeet yield and recoverable white sugar per acre (RWSA) of selected herbicide programs comparing different chloroacetamide programs when tank-mixed with Roundup (POST).

Herbicide treatments[a]	Timing	C. lambsquarters[b]	Pigweed	C. Ragweed	Yield	RWSA
		— % —			— ton/A —	— lb/A —
Roundup - applied 2X	2-lf fb. 6-lf	97	99	99	20.0	5347
Nortron (4 fl oz) - applied 2X	2-lf fb. 6-lf	97	99	98	24.1	6411
Nortron + Warrant (3 pt)	2-lf	82	94	95	21.5	5659
Nortron + Warrant (3 pt)	4-lf	79	96	92	20.6	5381
Nortron + Dual II Mag. (1.33 pt)	2-lf	87	96	89	18.9	4974
Nortron + Dual II Mag. (1.33 pt)	4-lf	96	99	91	18.6	4876
Nortron + Outlook (16 fl oz)	2-lf	93	99	92	24.7	6601
Nortron + Outlook (16 fl oz)	4-lf	96	98	99	22.6	5765
Nortron + Warrant (3 pt) fb. Nortron + Warrant (3 pt)	2-lf fb. 6-lf	97	96	98	20.5	5459
Nortron + Dual II Mag. (1.33 pt) fb. Nortron + Dual II Mag. (1.33 pt)	2-lf fb. 6-lf	99	99	97	23.1	5990
Nortron + Outlook (16 fl oz) fb. Nortron + Outlook (16 fl oz)	2-lf fb. 6-lf	99	99	99	22.5	5916
Untreated		0	0	0	12.3	3295
$LSD_{0.05}$[c]		**8**	**4**	**8**	**7.5**	**2022**

[a] Roundup PowerMax at 32 fl oz/A was applied in each of the treatments. All POST treatments included ammonium sulfate at 17 lb/100 gal. See recommendations in the MSU Weed Control Guide for Field Crops.

[b] Weed control was evaluated in mid-August.

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

Summary: A field trial was conducted to compare the addition of three chloroacetamide herbicides, Warrant, Dual II Magnum, or Outlook, as layby herbicides applied in combination with Nortron and Roundup POST for weed control and the effects on sugarbeet yield and recoverable white sugar. There was very little sugarbeet injury from any of the treatments. Overall, weed control was excellent when at least two weed control applications were made. When two POST herbicides were made with the weed species examined there was no detriment on weed control by adding any of the herbicides and there were no reductions in sugarbeet yield or RWSA. Common lambsquarters and in some cases common ragweed control was lower when only one herbicide application was made. While there was not many differences observed in this trial for weed control or sugarbeet yield, the inclusion of Warrant, Dual II Magnum, or Outlook may be valuable tools when tank-mixed with glyphosate at the 2- or 6-leaf stages of sugarbeet. These herbicides would add a different herbicide site of action group in sugarbeet to help control later emerging pigweed species (i.e., Palmer amaranth and/or waterhemp) that are showing up as glyphosate-resistant in many areas of Michigan.

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Effect of Harvest Date on Sugarbeet Yield Quality and Grower Income

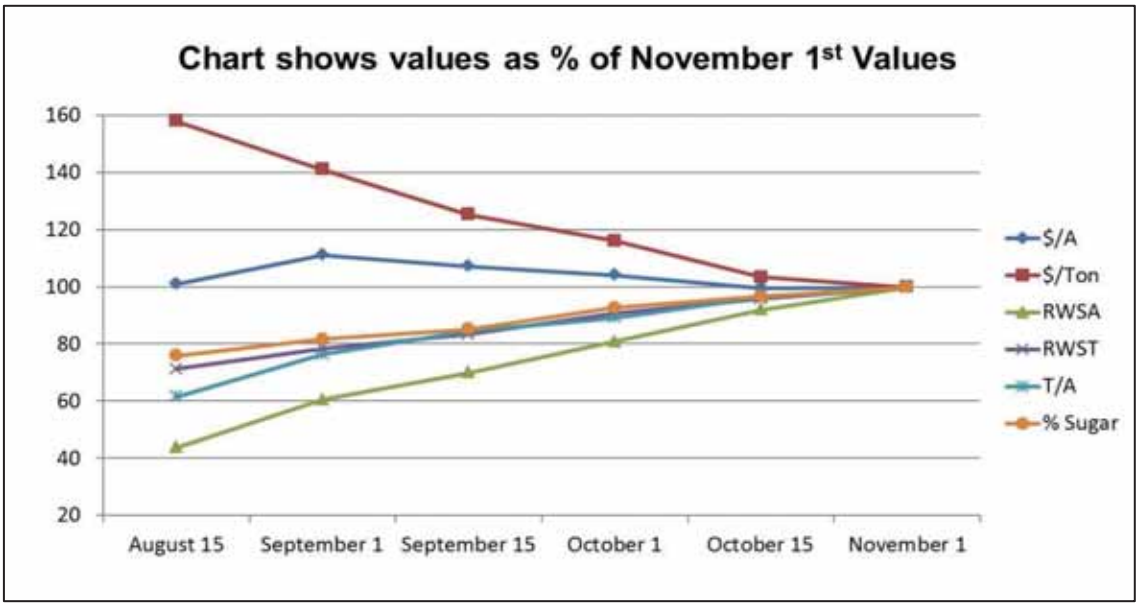
Average of 6 Years, 14 Locations

Harvest: 6 Dates, Aug 15 to Nov 1
Plot Size: 6 rows X 38 ft, various reps
Seeding Rate: 4.1 inches
Beet Population: About 190 B/100'

Harvest Date	$/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100'
Sept 1	**$2,134**	$75	6604	228	28.9	15.7	94.5	**191.8**
Sept 15	**$2,059**	$67	7641	243	32.0	16.4	95.4	184.6
Oct 1	**$2,000**	$62	8822	265	33.7	17.9	95.2	**186.5**
Aug15	$1,941	**$84**	4784	208	23.3	14.6	93.9	**189.3**
Oct 30	$1,919	$53	**10910**	**291**	**37.8**	**19.2**	**95.8**	**186.7**
Oct 15	$1,914	$55	10051	279	**36.5**	**18.6**	**95.5**	**193.4**
Average	$1,995	$66	8135	252	32.0	17.1	95.1	188.7
LSD 5%	169.6	3.8	528.6	11.8	2.1	0.7	0.4	7.9
CV %	11.3	7.6	8.6	6.2	8.6	5.5	0.6	5.4

Comments: Harvest date trials continued in 2015 following the same protocol. Trials show we continue to gain about 1.35 tons per week. We also continue to gain approximately 7.9 lbs RWST per week. The Early Delivery Incentive Program takes this into consideration and evens out the payments. When 2015 data was added, the data favored earlier harvest dates. The 2015 trials had low to moderate levels of Cercospora Leafspot infection which slowed the yield and sugar increases compared to previous years. Also in 2015, the rainfall amounts decreased during late September and early October slowing yield increases.

Graph: By converting $/Acre, $/Ton, RWSA, RWST, Tons/A and % Sugar all to a common value (% of the Nov 1st amount for each) all of the parameters can be graphed on the same scale. It is interesting to note that yield and quality all increase at a rapid rate, $/Ton decreases inversely and $/Acre holds steady (all as the harvest dates become later).



$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and a trial average RWST.
Bold: Results are not statistically different from top-ranking variety in each column.

Effect of Harvest Date on Sugarbeet Yield Quality and Grower Income

Average of 3 Locations - 2015

Trial Quality: Good
Variety: SX-1212RR
Planted: Blum - April 17, Rayl - April 17, Shaffner - May 1
Harvested: See trts
Plot Size: 6 rows X 38 ft

Rhizoc Level: Low
Cerc Control: Good
Seeding Rate: 4.1 inches
Row Spacing: 22 inch

Harvest Date	$/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100'
Sept 1	**$2,797**	$77	8652	228	38.3	15.5	**95.5**	**196.2**
Sept 15	**$2,601**	$63	9642	225	**43.8**	15.2	**95.5**	**183.7**
August 15	$2,462	**$87**	6063	211	29.6	14.7	94.7	**189.7**
Oct 1	$2,324	$59	**10449**	250	**42.1**	16.8	**95.7**	**188.5**
Oct 15	$1,902	$51	**10356**	**257**	**40.7**	**17.2**	**95.6**	**189.4**
Nov 1	$1,886	$50	**10850**	**265**	**41.4**	**17.8**	**95.6**	**185.1**
Average	$2,329	$65	9335	239	39.3	16.2	95.4	188.8
LSD 5%	275.2	5.6	947.3	11.9	3.5	0.7	0.5	n.s.
CV %	6.5	4.8	5.6	2.7	4.9	2.5	0.3	7.2

Comments: The sugarbeet yield increased quickly until late September, then begun leveling off. Sugarbeet quality continued to increase until the latest harvest date. Cercospora disease pressure, as well as dry late season conditions favored the earlier harvest dates.

MSC Research Station, Blumfield, MI - 2015

Trial Quality: Good
Variety: SX-1212RR
Planted: April 17
Harvested: See trts
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch

Soil Info: Sandy Loam
2.4% OM, 7.7 pH, CEC: 10.2
> Opt. P and K
High: Mn, Low: B
Added N: 125 lbs
Prev Crop: Oil Seed Radish

Rhizoc Level: low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches

Harvest Date	$/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100'	GDD*	Rain Inch*
Sept 1	**$2,385**	$81	7335	242	30.3	16.1	**96.0**	**223.5**	40.6	2.0
Sept 15	**$2,285**	$67	8097	237	**36.1**	15.8	**96.1**	**219.5**	35.9	2.2
Oct 1	**$2,099**	$63	**9382**	267	**35.2**	17.6	**96.3**	**221.5**	31.4	1.0
August 15	$1,947	**$96**	4782	232	20.6	15.9	95.3	**227.1**	31.7	3.4
Nov 1	$1,762	$54	**10008**	**289**	**35.1**	**18.9**	**96.2**	**211.4**	16.3	2.1
Oct 15	$1,572	$55	8503	277	30.7	18.2	**96.5**	**217.7**	21.1	0.5
Average	$2,008	$69	8018	257	31.3	17.1	96.1	220.1	29.5	11.3
LSD 5%	325.2	3.2	1069.3	9.7	4.8	0.5	0.5	n.s.		
CV %	12.3	3.5	10.1	2.9	11.7	2.1	0.4	6.9		

***GDD** (Growing Degree Days): an average daily amount for the 2 weeks prior to that harvest date.
***Rain Inch:** actual rainfall amount 2 weeks prior to that harvest date.

Comments: At this location, the highest payment was on September 1. Yield increased until Mid-September, then leveled off. Quality continued to increase until the latest harvest dates.

$/A: Gross payment unless noted as net. Calculated assuming a $50 payment and a trial average RWST.

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

Effect of Harvest Date on Sugarbeet Yield Quality and Grower Income

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Rayl, Akron, MI - 2015

Trial Quality: Good
Variety: SX-1212RR
Planted: April 17
Harvested: See trts
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inch

Soil Info: Sandy Clay Loam
3.1% OM, 7.4 pH, CEC: 14.4
> Opt: P and K
High: Mn, Medium: B
Added N:
Prev Crop: Wheat

Rhizoc Level: low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches

Harvest Date	$/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100'	GDD*	Rain Inch*
Sept 1	**$3,006**	$79	9291	234	39.8	15.8	**95.5**	**190.0**	41.1	1.9
Sept 15	**$2,956**	$65	11124	232	**48.0**	15.6	**95.9**	**189.3**	33.8	4.6
August 15	**$2,895**	**$91**	7034	219	32.9	15.3	95.2	**194.1**	32.0	5.5
Oct 1	$2,445	$59	10997	248	44.3	16.7	**95.5**	**187.9**	34.7	1.8
Nov 1	$2,113	$49	**12276**	**264**	**46.4**	**17.6**	**95.8**	**193.6**	16.8	1.8
Oct 15	$2,082	$50	11350	**251**	**45.3**	**16.9**	**95.5**	**191.9**	21.0	0.7
Average	$2,583	$65	10345	241	42.8	16.3	95.6	191.1	29.9	16.2
LSD 5%	211.6	4.0	866.8	13.9	2.8	0.8	0.5	n.s.		
CV %	6.9	5.2	7.0	4.9	5.4	4.2	0.5	9.2		

Comments: At this location, the highest payment was on September 1. Yield increased until Mid-September, then leveled off. Quality continued to increase until later harvest dates. This trial had a moderate level of Cercospora Leaf Spot which limited the increases in yield and quality.

Shaffner, Freeland, MI - 2015

Trial Quality: Good
Variety: SX-1212RR
Planted: May 1
Harvested: See trts
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inch

Soil Info: Silt Loam
3.2% OM, 7.8 pH, CEC: 12.4
> Opt: P and K
Medium: Mn, Medium: B
Added N:
Prev Crop: Soybeans

Rhizoc Level: low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 inches

Harvest Date	$/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100'	GDD*	Rain Inch*
Sept 1	**$2,999**	**$70**	9329	208	**44.8**	14.4	**94.8**	**196.2**	37.2	2.1
Sept 15	$2,562	$58	**9706**	206	**47.2**	14.3	94.6	**179.9**	35.1	4.2
August 15	$2,545	**$75**	6372	181	35.4	13.0	93.5	**176.7**	33.7	4.0
Oct 1	$2,429	$56	**10966**	**235**	**46.6**	**16.0**	**95.4**	**186.9**	30.4	1.6
Oct 15	$2,051	$48	**11214**	**243**	**46.2**	**16.6**	**94.9**	**181.4**	22.3	0.7
Nov 1	$1,782	$45	**10267**	**244**	**42.7**	**16.8**	94.6	146.1	15.4	1.4
Average	$2,395	$59	9642	219	43.8	15.2	94.6	177.9	29.0	14.1
LSD 5%	284.5	5.0	1583.5	18.7	5.1	1.0	0.6	42.1		
CV %	7.9	5.7	10.9	5.7	7.8	4.3	0.4	15.7		

***GDD** (Growing Degree Days): an average daily amount fo rthe 2 weeks prior to that harvest date.
***Rain Inch:** Actual rainfall amount 2 weeks prior to that harvest date.

Comments: At this location, the highest payment was on September 1. Yield increased between the August and September harvest, but then leveled off. Quality increased at the later harvest dates. This trial had a low level of Cercospora Leaf Spot which limited the increases in yield and quality.

$/A: Calculated assuming a $51 payment and company average RWST. Early delivery premiums and charges are also factored into payment.

Bold: Results are not statistically different from top-ranking variety in easch column.

TrackTill® Planter Attachment - Trial #1

D & B Karg Farms, Harbor Beach - 2015

Trial Quality: Excellent
Variety: C-RR059
Planted: April 30
Harv/Samp: Oct 1 / Oct 1
Plot Size: 4 reps
Row Spacing: 22 inch
Seeding Rate: 62,000

Soil Type: Loam
Fertilizer: Variable K_2O; 2x2: 40#-50#-25# plus micros; Sidedress: 120# N by Anhydrous
Prev Crop: Drybeans
Weather: Dry season

Rhizoc Control: Good Control: Quadris I.F. & foliar
Cerc Control: Excellent Control: 1. EBDC, 2. Inspire + EBDC, 3. Topsin + EBDC, 4. Inspire + EBDC
Other Pests: None

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP
TrackTill	$2,630	**10595**	**309**	**34.3**	**20.3**	**96.1**
Check	$2,553	**10283**	**314**	**32.7**	**20.5**	**96.3**
Average	$2,591	10439	311	33.5	20.4	96.2
LSD 5%	—	ns (552)	ns (7)	ns (2.4)	ns (0.3)	ns (0.5)
CV %	—	2	1	3.1	0.7	0.2

Comments: TrackTill is a planter attachment manufactured by Yetter that provides vertical tillage to reduce compaction caused by the tractor and planter. Learn more about TrackTill on the web at www.tracktill.com. This attachment may reduce planter pinch row effect or wheel compaction in the tire rows of a planter. Three trials were conducted on sugarbeets planted in 22 inch rows with a 24 row planter (John Deere DB44 CCS). All three trials were planted into a stale seedbed (no spring tillage). Only the center 8 rows were harvested for comparison with and without TrackTill for yield and quality. Trial #1 was planted on April 30th and did show a significant yield improvement at the 80% confidence level. In two other trials, yield and quality results were equal. In this trial a track tractor was used for planting. Planter tractor track axle was extended to go in the same row as one planter wheel. No individual rows actually have a true pinch row effect. Different planter and tractor wheel / track configuration would probably effect TrackTill results. All 3 trials were planted in near ideal conditions for stale seedbed and no large (damaging) rainfall events happened during the growing season. The revenue per acre is calculated only for the 8 rows of the planter that were harvested for the trial and not on a whole planter basis.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

TrackTill® Planter Attachment - Trial #2

D & B Karg Farms, Harbor Beach - 2015

Trial Quality:	Excellent	**Soil Info:**	Loam	**Rhizoc Control:**	Good Control: Quadris I.F. & foliar
Variety:	C-G333NT	**Fertilizer:**	Variable K2O, 2x2: 40#-50#-25# plus micros, Sidedress: 80# N by Anhydrous	**Cerc Control:**	Excellent Control: 1. EBDC, 2. Inspire + EBDC, 3. Topsin + EBDC, 4. Inspire +
Planted:	April 19				
Harv/Samp:	Oct 30 / Oct 14				
Plot Size:	4 reps	**Prev Crop:**	Wheat & radish		
Row Spacing:	22 inch	**Weather:**	Dry season	**Other Pests:**	None
Seeding Rate:	62,000				

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. 45 Day
TrackTill	$2,623	**13526**	**308**	**43.9**	**19.9**	**97.0**	**210**
Check	$2,607	**13448**	**307**	**43.8**	**19.8**	**97.0**	**209**
Average	$2,615	13487	308	43.8	19.9	97.0	209
LSD 5%	—	ns (412)	ns (13)	ns (1.1)	ns (0.9)	ns (0.4)	ns (13)
CV %	—	1	2	1.2	2.0	0.2	4

Comments: TrackTill is a planter attachment manufactured by Yetter that provides vertical tillage to reduce compaction caused by the tractor and planter. Learn more about TrackTill on the web at www.tracktill.com. This attachment may reduce planter pinch row effect or wheel compaction in the tire rows of a planter. Three trials were conducted on sugarbeets planted in 22 inch rows with a 24 row planter (John Deere DB44 CCS). All three trials were planted into a stale seedbed (no spring tillage). Only the center 8 rows were harvested for comparison with and without TrackTill for yield and quality. Trial #1 was planted on April 30th and did show a significant yield improvement at the 80% confidence level. In two other trials, yield and quality results were equal. In this trial a track tractor was used for planting. Planter tractor track axle was extended to go in the same row as one planter wheel. No individual rows actually have a true pinch row effect. Different planter and tractor wheel / track configuration would probably effect TrackTill results. All 3 trials were planted in near ideal conditions for stale seedbed and no large (damaging) rainfall events happened during the growing season. The revenue per acre is calculated only for the 8 rows of the planter that were harvested for the trial and not on a whole planter basis.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

TrackTill® Planter Attachment - Trial #3

D & B Karg Farms, Harbor Beach - 2015

Trial Quality: Excellent
Variety: B-19RR1N
Planted: May 2
Harv/Samp: Nov 7 / Oct 14
Plot Size: 4 reps
Row Spacing: 22 inch
Seeding Rate: 62,000

Soil Type: Silty loam
Fertilizer: Variable K_2O, 2x2: 40#-50#-25# plus micros, Sidedress: 80# N by Anhydrous
Prev Crop: Wheat & radish
Weather: Dry season, damaging hail in October

Rhizoc Control: Good Control: Quadris I.F. & foliar
Cerc Control: Excellent Control: 1. EBDC, 2. Inspire + EBDC, 3. Topsin + EBDC, 4. Inspire + EBDC
Other Pests: None

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP
TrackTill	$2,408	**12418**	**304**	**40.8**	**19.7**	**96.9**
Check	$2,403	**12399**	**301**	**41.2**	**19.4**	**97.0**

Average	$2,406	12409	302	41.0	19.6	97.0
LSD 5%	—	ns (879)	ns (13)	ns (1.4)	ns (0.8)	ns (0.2)
CV %	—	3	2	1.5	1.7	0.1

Comments: TrackTill is a planter attachment manufactured by Yetter that provides vertical tillage to reduce compaction caused by the tractor and planter. Learn more about TrackTill on the web at www.tracktill.com. This attachment may reduce planter pinch row effect or wheel compaction in the tire rows of a planter. Three trials were conducted on sugarbeets planted in 22 inch rows with a 24 row planter (John Deere DB44 CCS). All three trials were planted into a stale seedbed (no spring tillage). Only the center 8 rows were harvested for comparison with and without TrackTill for yield and quality. Trial #1 was planted on April 30th and did show a significant yield improvement at the 80% confidence level. In two other trials, yield and quality results were equal. In this trial a track tractor was used for planting. Planter tractor track axle was extended to go in the same row as one planter wheel. No individual rows actually have a true pinch row effect. Different planter and tractor wheel / track configuration would probably effect TrackTill results. All 3 trials were planted in near ideal conditions for stale seedbed and no large (damaging) rainfall events happened during the growing season. The revenue per acre is calculated only for the 8 rows of the planter that were harvested for the trial and not on a whole planter basis.

$/A: Gross payment unless noted as net. Calculated assuming a $51 payment and an average RWST of 263.

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

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