Research Results 2011

GROWING THE BEST SUGARBEETS.

MICHIGAN SUGARBEET REACh

Research Education Advisory Council

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Research Education Advisory Council

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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.

maes research

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MICHIGAN SUGARBEET REACh Research Education Advisory Council

Sugarbeet Advancement

University of Guelph Ontario

USDA

Cercospora Control Trials

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PIONEER · BIG CHIEF
MICHIGAN SUGAR

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Cercospora: Evaluate Fungicides for Leafspot Control
Blumfield, MI

Trial Quality: Fair
Planted: May 5
Harvested: October 17
Rainfall: 14.5 inches
Variety: B-19RR90
Row Spacing: 22 Inches

Applic Details:
JD 990 tractor plot sprayer
90 psi, 25 gpa
Compressed air, 8002 flat fan

Disease Level: Low

Seeding Rate: 4.2 inch spacing

Plot Size: 6 Rows X 35 Ft
Reps: 6
Application Timing: July 15 (78 dsv)
Aug 2 (38 dsv)
Aug 19 (35 dsv)

Treatment	Rate	Appl Code	CLS Rate 0-9	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Inspire Dithane	7 fl oz/A 2 lb/A	AC B	**1.0**	**$1,611**	**7082**	**287**	**24.7**	**19.3**	**95.1**
Eminent Dithane	13 fl oz/A 2 lb/A	AC B	**1.1**	$1,487	6540	**283**	**23.2**	**19.1**	**94.9**
Enable Dithane Crop Oil	8 fl oz/A 2 lb/A 1 qt/A	AC ABC AC	1.4	$1,474	6482	**290**	22.3	**19.5**	**95.2**
Proline Dithane Induce	5.7 fl oz/A 2 lb/A 0.5% v/v	AC B AC	1.6	$1,469	6459	**284**	22.8	**19.2**	**95.0**
Super Tin Dithane	5 oz/A 2 lb/A	AC B	1.7	**$1,525**	**6706**	**285**	**23.6**	**19.2**	**95.0**
Dithane	2 lb/A	ABC	2.1	**$1,505**	**6619**	**287**	**23.1**	**19.3**	**95.1**
Gem Dithane	3.6 fl oz/A 2 lb/A	AC B	2.3	$1,500	6594	**288**	**22.9**	**19.4**	**95.1**
Headline SC Dithane	7 fl oz/A 2 lb/A	AC B	2.4	**$1,509**	**6636**	**286**	**23.3**	**19.2**	**95.2**
Headline Dithane	9.2 fl oz/A 2 lb/A	AC B	2.4	**$1,505**	**6619**	**285**	**23.3**	**19.2**	**94.9**
Untreated			3.1	$1,499	6590	**284**	**23.2**	**19.1**	**95.0**
Average			1.9	$1,508	6633	286	23.2	19.2	95.1
LSD 5%			0.2	110.5	486.1	ns(8.0)	1.8	ns(0.4)	ns(0.4)
CV %			12.5	8.9	8.9	3.0	8.8	2.5	0.4

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: lower number is better
$/Acre: Gross dollars per acre assuming a $60 payment.

SUMMARY
Triazole, strobilurin, tin and EBDC fungicides were evaluated for control of Cercospora leafspot in this small plot replicated trial. The sugarbeet stand was a little spotty which caused variation in sugarbeet yields. Cercospora 0-9 ratings are considered to be more reliable than yield and quality values. Inspire provided the best Cercospora control followed by Eminent, Enable + Dithane, Proline, Super Tin and Dithane. Gem and Headline were less effective. The leafspot level was low.

Cercospora: Evaluate Strobilurin, Triazole & Tin Fungicides

Herford Farm, Elkton, MI

Trial Quality: Good
Planted: April 15
Harvested: October 5
Plot Size: 6 rows X 35 ft, 4 reps
Variety: C-RR827

Applic Timings: A = 7/14 (70 DSV)
B = 8/3 (51 DSV), C = 8/17 (33 DSV)
A and C Timings are fungicide trts
B Timing is Dithane
First Spot: 70 DSV, 7/14

DSV's for season: 201
Seasonal Rainfall: ~ 20″
PSI: 90
GPA: 25

Treatment	Rate/ Acre	App	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Cercospora 0-9 Ratings			
									Sep 24	Sep 9	Aug 30	Aug 23
Inspire	7 fl oz	AC	**$1,962**	**7634**	**244**	**31.3**	**16.8**	**94.2**	**1.7**	**1.3**	**1.2**	**1.2**
Dithane	2 lbs	B										
Induce	0.125%	AC										
28% N	2 qts	AC										
Inspire	7 fl oz	AC	**$1,907**	**7420**	**237**	**31.3**	**16.7**	**93.4**	**1.6**	**1.4**	**1.4**	**1.3**
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Inspire	7 fl oz	AC	**$1,863**	**7248**	**245**	**29.7**	**17.0**	**93.4**	**2.1**	**1.6**	1.8	1.8
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Proline	5.7 fl oz	AC	**$1,856**	**7218**	**243**	**29.8**	**16.8**	**94.1**	**1.9**	1.9	1.7	**1.1**
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Inspire	7 fl oz	AC	**$1,841**	**7162**	**241**	**29.8**	**16.6**	**94.4**	**1.8**	**1.5**	1.5	**1.3**
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Eezyman	2 qts	AC										
Inspire	7 fl oz	AC	**$1,838**	**7149**	**236**	**30.3**	**16.6**	**93.4**	**1.6**	**1.4**	**0.9**	**0.9**
Dithane	2 lbs	B										
No Additive		AC										
Eminent	13 fl oz	AC	**$1,834**	**7135**	**239**	**29.9**	**16.7**	**93.9**	**1.9**	**1.8**	1.7	1.4
Dithane	2 lbs	B										
Induce	0.125%	AC										
28% N	2 qts	AC										
Super Tin	5 oz	AC	**$1,805**	**7023**	**236**	**29.7**	**16.7**	93.2	2.6	2.6	2.4	2.1
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Eminent	13 fl oz	AC	**$1,798**	**6996**	**239**	**29.2**	**16.9**	**93.4**	**1.9**	**1.8**	1.7	1.7
Dithane	2 lbs	B										
Roundup	22 fl oz	B										
Super Tin	5 oz	AC	**$1,796**	**6987**	**243**	**28.8**	**17.0**	**93.7**	2.4	2.3	2.2	1.9
Dithane	2 lbs	B										
No Additive		B										
Super Tin	5 oz	AC	**$1,774**	**6902**	**241**	**28.6**	**16.8**	**93.8**	2.4	2.2	2.3	2.1
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										

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Cercospora: Evaluate Strobilurin, Triazole & Tin Fungicides

Herford Farm, Elkton, MI

Treatment	Rate/ Acre	App	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Cercospora 0-9 Ratings			
									Sep 24	Sep 9	Aug 30	Aug 23
Super Tin	5 oz	AC	**$1,772**	**6894**	**233**	**29.6**	**16.5**	93.0	2.5	2.1	2.2	1.7
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Eezyman	2 qts	AC										
Eminent	13 fl oz	AC	**$1,749**	**6803**	**241**	**28.5**	**16.8**	**93.9**	**1.8**	**1.4**	1.7	**1.3**
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Proline	5.7 fl oz	AC	$1,741	6773	**233**	**29.3**	**16.4**	**93.4**	2.4	2.0	2.1	2.0
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Eezyman	2 qts	AC										
Eminent	13 fl oz	AC	$1,707	6641	**237**	**28.1**	**16.7**	93.0	**1.8**	**1.8**	1.6	1.9
Dithane	2 lbs	B										
No Additive		AC										
Proline	5.7 fl oz	A	$1,686	6558	**240**	27.5	**16.8**	**93.6**	2.4	1.9	1.8	1.4
Dithane	2 lbs	B										
Induce	0.125%	AC										
28% N	2 qts	AC										
Proline	5.7 fl oz	AC	$1,666	6482	**234**	27.6	**16.6**	93.0	**2.1**	1.9	**1.4**	1.9
Dithane	2 lbs	B										
No Additive		AC										
Super Tin	5 oz	AC	$1,660	6458	229	**28.2**	**16.2**	93.2	2.3	2.2	2.3	1.5
Dithane	2 lbs	B										
Induce	0.125%	AC										
28% N	2 qts	AC										
Headline	9.2 fl oz	AC	$1,658	6451	**239**	27.1	**16.8**	**93.6**	4.8	3.3	2.6	2.4
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Eezyman	2 qts	AC										
Eminent	13 fl oz	AC	$1,587	6174	**237**	26.1	**16.7**	**93.4**	2.3	2.2	2.3	2.1
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Eezyman	2 qts	AC										
Proline	5.7 fl oz	AC	$1,573	6119	**237**	25.8	**16.7**	**93.4**	2.3	**1.8**	1.8	1.4
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Gem SC	3.6 fl oz	AC	$1,546	6015	227	26.4	16.0	93.2	4.9	3.3	2.7	2.4
Dithane	2 lbs	B										
Induce	0.125%	AC										
28% N	2 qts	AC										

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Cercospora: Evaluate Strobilurin, Triazole & Tin Fungicides

Herford Farm, Elkton, MI

Treatment	Rate/ Acre	App	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Cercospora 0-9 Ratings			
									Sep 24	Sep 9	Aug 30	Aug 23
Gem SC	3.6 fl oz	AC	$1,508	5865	220	26.7	15.8	92.5	5.7	3.6	2.7	2.9
Dithane	2 lbs	B										
No Additive		AC										
Headline	9.2 fl oz	AC	$1,507	5864	**237**	24.7	**16.6**	**93.6**	4.7	3.1	2.7	2.5
Dithane	2 lbs	B										
Induce	0.125%	AC										
28% N	2 qts	AC										
Headline	9.2 fl oz	AC	$1,481	5762	**237**	24.2	**16.7**	93.3	4.6	3.2	2.4	2.2
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Headline	9.2 fl oz	AC	$1,470	5717	221	25.8	15.9	92.6	6.6	4.3	3.1	3.1
Dithane	2 lbs	B										
No Additive		AC										
Gem SC	3.6 fl oz	AC	$1,370	5331	227	23.5	**16.3**	92.5	4.7	3.2	2.8	2.6
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Eezyman	2 qts	AC										
Gem SC	3.6 fl oz	AC	$1,335	5191	223	23.5	15.9	93.1	5.4	3.4	2.8	3.0
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Mustang M	4.2 fl oz	AC										
Gem SC	3.6 fl oz	AC	$1,251	4868	220	22.2	15.9	92.7	5.8	3.8	2.6	2.9
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Headline	9.2 fl oz	AC	$1,246	4845	216	22.7	15.8	92.1	6.4	4.4	2.8	3.2
Dithane	2 lbs	B										
Roundup	22 fl oz	AC										
Untreated		AC	$1,079	4197	205	20.5	14.8	92.6	7.8	6.4	4.3	3.8
Average			$1,641	6383	233	27.3	16.5	93.3	3.3	2.5	2.2	2.0
LSD 5%			218.7	850.7	13.8	3.4	0.8	1.0	0.5	0.5	0.4	0.4
CV %			9.4	9.4	4.3	8.7	3.3	0.8	9.8	13.7	14.1	12.9

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: lower number is better
$/Acre: Gross dollars per acre assuming a $60 payment.

SUMMARY: Strobilurin Fungicides (Headline and Gem) failed to control Cercospora leafspot in this small plot replicated trial. Spray additives including a non-ionic surfactant, 28% Nitrogen and Mustang Max improved leafspot control marginally. The addition of Roundup to spray treatments had no effect on Cercospora control. Triazole fungicides (Inspire, Eminent and Proline) provided very good Cercospora control and Super Tin also gave good leafspot control. There was a direct relationship between Cercospora infection levels and sugarbeet yield and quality. The Triazole treatments averaged 29 T/A and 16.7% sugar compared to 24.7 T/A and 16.2% sugar for the Strobilurin treatments. The untreated check yielded 20.5 T/A and had a 14.8% sugar. The leafspot pressure was high and the plot was not inoculated. The initial fungicide applications were applied July 14 (70 DSV) and very few spots were present. The application intervals for sprays 2 and 3 were shortened up considerably (51 and 33 DSVs). The variety C-RR827 is susceptible to Cercospora leafspot. The plot area was relatively uniform and the soil texture was somewhat sandy. Sugarbeet yields were high and sugars were a little low, possibly because of the early harvest. Rainfall was adequate: April - 5.9 inches, May - 2.3 inches, June - 3.1 inches, July - 2.1 Inches, August - 3.6 inches, September - 3.2 inches and October harvest date - 0.1 inches, for a total of 20.2 inches.

Cercospora: Evaluate Strobilurin, Triazole & Tin Fungicides

Herford Farm, Elkton, MI

Fungicide Treatment Effects

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Cercospora 0-9 Ratings			
							Sep 24	Sep 9	Aug 30	Aug 23
Inspire Dithane	**$1,882**	**7322**	**240**	**30.5**	**16.7**	**93.8**	**1.8**	**1.4**	**1.4**	**1.3**
Super Tin Dithane	$1,762	6853	**237**	**29.0**	**16.6**	**93.4**	**2.4**	2.3	2.3	1.8
Eminent Dithane	$1,735	6650	**238**	28.4	**16.7**	**93.6**	**2.0**	1.8	1.8	1.7
Proline Dithane	$1,704	6630	**237**	28.0	**16.7**	**93.5**	2.2	1.9	1.8	1.6
Headline Dithane	$1,473	5728	230	24.9	16.4	93.0	5.4	3.7	2.7	2.7
Gem SC Dithane	$1,402	5454	223	24.5	16.0	92.8	5.3	3.4	2.7	2.8
Average	$1,660	6439	234	27.5	16.5	93.4	3.2	2.4	2.1	2.0
LSD 5%	82.9	322.8	6.1	1.7	0.3	0.4	0.4	0.3	0.3	0.2

Tank Mix Additive Effects

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Cercospora 0-9 Ratings			
							Sep 24	Sep 9	Aug 30	Aug 23
Induce 28% N	**$1,699**	**6611**	**236**	**28.0**	**16.5**	**93.6**	**3.0**	**2.2**	**2.1**	**1.7**
No Additive	**$1,664**	**6474**	**232**	**27.9**	**16.4**	93.1	3.4	2.5	**2.0**	2.1
Roundup Mustang Max Eezyman	**$1,662**	**6464**	**235**	**27.6**	**16.5**	**93.4**	**3.1**	**2.4**	2.2	2.0
Roundup	**$1,637**	**6366**	**233**	**27.2**	**16.5**	93.2	3.5	2.7	**2.2**	2.2
Roundup Mustang Max	**$1,637**	**6366**	**236**	**27.0**	**16.6**	**93.5**	**3.0**	**2.2**	**2.1**	**1.9**
Average	$1,660	6456	234	27.5	16.5	93.3	3.2	2.4	2.1	2.0
LSD 5%	ns(89)	ns(347)	ns(5.8)	ns(1.4)	ns(0.3)	0.4	0.2	0.2	0.2	0.2

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: lower number is better
$/Acre: Gross dollars per acre assuming a $60 payment.

Cercospora: Evaluate Strobilurin, Triazole & Tin Fungicides

Herford Farm, Elkton, MI

General Trial Information

PLANTING & APPLICATION	
Variety	C-RR827 (Susceptible)
Planting Date	April 15, 2011
Application Dates	Jul 14 (70 dsv)
	Aug 3 (51 dsv)
	Aug 17 (33 dsv)
First Spot	Jul 14 (70 dsv)

Total DSV's for season: 202

WEATHER INFORMATION			
Date	**Rain**	**GDD**	**DSV**
Apr 15	1.82	159	
Apr 20	4.04	354	
May 15	0.58	675	3
May 31	1.72	1100	14
Jun 15	0.56	1606	23
Jun 30	2.5	2122	45
Jul 15	0.87	2713	72
Jul 31	1.21	3400	112
Aug 15	3.02	3977	150
Aug 31	0.55	4526	181
Sep 15	0.19	5005	202
Sep 30	2.97	5384	
Oct 5	0.09	5485	
Total	20.12	5485	202

APPLICATION EQUIPMENT
JD 990 Plot Sprayer (compressed air)
12, 2 gal stainless steel tanks
12 spray booms
8002 flat fan nozzles
90 psi, 25 gpa

APPLICATION DESCRIPTION			
Date	**Jul 14**	**Aug 3**	**Aug 17**
Timing	70 DSV	51 DSV	33 DSV
Air Temp	74	78	76
% RH	45	50	50
Wind speed	4 mph	6 mph	7 mph
Dew	No	No	No
Crop Stage	Row Close	Row Close	Row Close
Crop Height	22 inches	24 inches	22 inches

DISEASE LEVEL ON APPLIC DATES # SPOTS/LEAF			
Treatment	**Jul 14**	**Aug 3**	**Aug 17**
Untreated	< 1	~ 40	~ 300
Triazole Trt	< 1	~ 2	~ 10
Super Tin	< 1	~ 2	~ 10
Strobi Trt	< 1	~ 10	~ 50

Cercospora: Evaluate Fungicide Sequences for Leafspot Control
Average of 2 Locations

Trial Quality: Good
Locations: Saginaw and Tuscola Counties
Row Spacing: 22 Inches

Applic Details:
JD 990 tractor plot sprayer
90 psi, 25 gpa
Compressed air, 8002 flat fan

Plot Size: 6 Rows X 35 Ft
Reps 5
Seeding Rate: 4.2 inch spacing

Treatment	Cerc 0-9	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Inspire XT 7 oz Headline 9 oz Super Tin 5 oz	**2.0**	**$1,285**	**5433**	**241**	**22.3**	**17.0**	**93.2**
Proline 5.7 oz Headline 9.0 oz Super Tin 5 oz	**2.3**	**$1,236**	**5194**	**242**	**21.3**	**17.0**	**93.4**
Enable/Dithane/COC 8 oz / 2 lbs / 1 qt Headline 9 oz Super Tin 5 oz	**2.4**	**$1,260**	**5342**	**242**	**21.9**	**17.2**	**92.8**
Eminent 13 oz Headline 9 oz Super Tin 5 oz	**2.5**	**$1,245**	**5241**	**242**	**21.5**	**17.1**	**92.9**
Untreated	3.7	**$1,228**	**4994**	**243**	20.3	**17.1**	**93.1**
Average	2.6	$1,251	5241	242	21.5	17.1	93.1
LSD 5%	0.8	ns(152)	ns(637)	ns(15.4)	1.6	ns(0.7)	ns(0.8)
CV %	11.0	4.4	4.4	2.3	2.7	1.5	0.3

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: lower number is better
$/Acre: Figured using a $60 payment

SUMMARY
Inspire, Proline, Enable + Dithane and Eminent were evaluated for control of Cercospora leaf spot in small plot replicated trials in 2011. Sugarbeet stands were good and the plots were relatively uniform. The initial applications were made either just before first spot or at first spot. The Cercospora pressure in these trials was lower than average. Inspire provided the best leafspot control and highest yields in these trials, however, the differences were not large and not always statistically different. All of the fungicide treatments outperformed the untreated check plots.

Cercospora: Evaluate Fungicide Sequences for Leafspot Control
Blumfield, MI

Trial Quality: Good
Location: Saginaw County
Planted: May 5
Harvested: October 17
Previous Crop: Soybeans
Variety: B-17RR32

Seasonal Rainfall: 14.5 inches
Soil Info: Silt Loam; 7.6 pH, 3.0% OM
Nutrient Levels: Adequate
Applic Details
JD 990 plot sprayer
90 psi, 25 gpa, 8002

Plot Size: 6 Rows X 35 ft, 5 Reps
Row Spacing: 22 inches
Seeding Rate: 4.2 inches
Application Dates:
July 15 (70 dsv)
Aug 2 (38 dsv)
Aug 19 (35 dsv)

Treatment	Cerc 0-9	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Inspire XT 7 oz Headline 9 oz Super Tin 5 oz	**1.6**	**$1,369**	**6510**	**275**	**23.6**	**18.6**	**94.9**
Proline 5.7 oz Headline 9 oz Super Tin 5 oz	**2.0**	**$1,244**	**5936**	**273**	**21.8**	**18.4**	**95.0**
Enable/Dith/COC 8 oz / 2 lb / 1 qt Headline 9 oz Super Tin 5 oz	2.1	**$1,357**	**6456**	**282**	**22.9**	**19.0**	**94.9**
Eminent 13 oz Headline 9 oz Super Tin 5 oz	2.1	**$1,269**	**6052**	**272**	**22.2**	**18.5**	**94.6**
Untreated	2.9	**$1,297**	**5950**	**275**	**21.6**	**18.6**	**94.9**
Average	2.1	$1,307	6181	275	22.4	18.6	94.9
LSD 5%	0.4	ns(237)	ns(1089)	ns(13.8)	ns(3.7)	ns(0.7)	ns(0.6)
CV %	14.5	13.6	13.1	3.7	12.2	3.0	0.4

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: lower number is better
$/Acre: Figured using a $60 payment

SUMMARY
The first application was applied at 1st spot. Inspire, Proline, Enable + Dithane and Eminent were evaluated for Cercospora control in this small plot replicated trial. The leafspot pressure was low. Inspire provided better leafspot control than the other fungicides at this location.

Cercospora: Evaluate Fungicide Sequences for Leafspot Control

Gilford, MI

Trial Quality: Good
Location: Tuscola County
Planted: May 18
Harvested: September 23
Previous Crop: Oil Seed Radish
Variety: B-19RR1N

Seasonal Rainfall: 17.9 inches
Soil Info: Silt Loam; 7.8 pH, 8.6% OM
Fertilizer Levels: All adequate
Applic Details
JD 990 tractor plot sprayer
90 psi, 25 gpa, 8002

Plot Size: 6 Rows X 35 ft, 5 Reps
Row Spacing: 22 inches
Seeding Rate: 4.2 inches
Application Dates:
July 13 (67dsv)
Aug 1 (41 dsv)
Aug 19 (34 dsv)

Treatment	Cerc 0-9	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Inspire XT 7 oz Headline 9 oz Super Tin 5 oz	**2.4**	**$1,201**	**4357**	**208**	**20.9**	**15.4**	**91.5**
Proline 5.7 oz Headline 9 oz Super Tin 5 oz	**2.5**	**$1,228**	**4453**	**212**	**20.9**	**15.5**	**91.9**
Enable/Dith/COC 8 oz / 2 lbs / 1 qt Headline 9 oz Super Tin 5 oz	2.7	**$1,164**	**4228**	**203**	**20.8**	**15.3**	90.7
Eminent 13 oz Headline 9 oz Super Tin 5 oz	2.8	**$1,222**	**4431**	**212**	**20.8**	**15.7**	**91.3**
Untreated	4.4	**$1,159**	**4037**	**211**	**19.0**	**15.6**	**91.4**
Average	3.00	$1,195	4301.0	209.0	20.5	15.5	91.4
LSD 5%	0.3	ns(159)	ns(55)	ns(10)	ns(2.4)	ns(0.7)	0.7
CV %	8.8	11.0	10.7	4.0	9.7	3.7	0.7

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: lower number is better
$/Acre: Figured using a $60 payment

SUMMARY

The first application was applied at 67 DSV's. Inspire, Proline, Enable + Dithane and Eminent were evaluated for Cercospora leafspot control in this small plot replicated trial. Inspire and Proline provided better leafspot control than the other treatments. All of the treatments kept Cercospora leafspot below economic damage levels. The Cercospora 0-9 ratings are the best indication of fungicide performance in this trial.

BEETcast: Evaluate Tolerant and Susceptible Varieties in a Red Zone

Sylvester Farms, Reese, MI

Trial Quality: Very Good
Location: Tuscola County
Planted: May 5
Harvested: October 13
Previous Crop: Oil Seed Radish
Soil Type: Silt Loam

Fungicides Used:
1st App: Eminent
2nd: Headline
3rd: Inspire
4th: Gem
GPA: 25, PSI: 100

Plot Size: 6 Rows X 38 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4 inches
Seasonal Rainfall: 14.5 inches
Total DSV's: 179
First Spot: 71 DSV (July 18)

Susceptible Variety (B-19RR1N)

Treatment (DSV)	# Applic	CLS 0-9	Net Income $/Acre	RWSA	RWST	T/A	% Sugar
49 / 43 / 45 / 40 Jun 30/Jul 25/Aug 17/Sep 12	4	**2.6**	**$1,907**	**9218**	**281**	**32.8**	**18.6**
56 / 49 / 53 Jul 7 / Aug 2 / Sep 1	3	3.0	$1,830	8767	**281**	31.3	**18.7**
66 / 39 / 53 Jul 15 / Aug 2 / Sep 1	3	3.5	**$1,962**	9382	**281**	**33.4**	**18.6**
Scout (77) / 38 / 59 Jul 20 / Aug 4 / Sep 12	3	3.8	$1,853	**8873**	**276**	**32.2**	**18.3**
Scout Late (89) / 45 July 25 / Aug 17	2	4.3	**$1,881**	**8911**	**279**	32.0	**18.6**
Untreated	0	6.2	$1,646	7638	261	29.2	17.5

Moderately Tolerant Variety (B-19RR90)

Treatment (DSV)	# Applic	CLS 0-9	Net Income $/Acre	RWSA	RWST	T/A	% Sugar
49 / 43 / 45 / 40 Jun 30/Jul 25/Aug 17/Sep 12	4	**2.3**	**$1,687**	**8199**	**282**	**29.0**	**18.9**
56 / 49 / 53 Jul 7 / Aug 2 / Sep 1	3	2.6	**$1,728**	**8295**	**280**	**29.6**	**18.9**
66 / 39 / 53 Jul 15 / Aug 2 / Sep 1	3	3.0	**$1,724**	**8277**	**277**	**29.8**	**18.7**
Scout (77) / 38 / 59 Jul 20 / Aug 4 / Sep 12	3	3.3	**$1,773**	**8503**	**283**	**30.1**	**18.9**
Scout Late (89) / 45 July 25 / Aug 17	2	4.0	**$1,779**	**8437**	**285**	**29.6**	**19.1**
Untreated	0	5.3	$1,587	7364	268	27.5	18.1

BEETcast: Evaluate Tolerant and Susceptible Varieties in a Red Zone

Sylvester Farms, Reese, MI

Tolerant Variety (HM-131RR)

Treatment (DSV)	# Applic	CLS 0-9	Net Income $/Acre	RWSA	RWST	T/A	% Sugar
49 / 43 / 45 / 40 Jun 30/Jul 25/Aug 17/Sep 12	4	**2.2**	**$1,666**	**8098**	**279**	**29.1**	**18.9**
56 / 49 / 53 Jul 7 / Aug 2 / Sep 1	3	**2.4**	**$1,676**	**8056**	**282**	**28.6**	**19.1**
66 / 39 / 53 Jul 15 / Aug 2 / Sep 1	3	2.7	**$1,625**	**7818**	**276**	**28.4**	**18.7**
Scout (77) / 38 / 59 Jul 20 / Aug 4 / Sep 12	3	2.8	**$1,664**	**7997**	**274**	**29.2**	**18.6**
Scout Late (89) / 45 July 25 / Aug 17	2	3.3	**$1,684**	**7997**	**283**	**28.3**	**19.1**
Untreated	0	4.08	**$1,682**	**7802**	**282**	27.6	**19.1**
LSD 5%		0.21	94.8	439.8	9.0	1.4	0.5
CV %		5.4	4.7	4.6	2.8	4.1	2.3

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: Lower number is better.
$/Acre: Figured using a $60 payment.

SUMMARY
Different BEETcast spray schedules and varieties with varying levels of Cercospora leafspot tolerance were evaluated in this small plot replicated trial. The treatments were applied with a JD 990 test plot sprayer at 100 psi and 25 gpa. The field was very uniform and a good sugarbeet population existed. The varieties tested were: HM-131RR (tolerant), B-19RR90 (moderate tolerance) and B-19RR1N (highly susceptible). The 45/45 spray schedule was needed to protect B-19RR1N from Cercospora damage while the tolerant and moderately tolerant varieties were protected with the 55/55 spray schedule. Starting later (66 DSV or scouting) did not provide adequate protection for any of the varieties. The first spots were discovered at 71 DSV.

BEETcast: Evaluate Tolerant and Susceptible Varieties in a Green Zone

Stoutenburg, Sandusky, MI

Trial Quality: Good
Location: Sanilac County
Planted: May 9
Harvested: October 10
Previous Crop: Dry Beans
Soil Type: Loam

Fungicides Used:
1st App: Eminent
2nd: Headline
3rd: Inspire
4th: Gem
GPA: 25, PSI: 100

Plot Size: 6 Rows X 38 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4 inches
Seasonal Rainfall: 14.9 inches
Total DSV's: 190
First Spot: 105 DSV (July 29)

Susceptible Variety (B-19RR1N)

Treatment (DSV)	# Applic	CLS 0-9 Oct 10	CLS 0-9 Sep 21	Net Income $/Acre	RWSA	RWST	T/A	% Sugar
54 / 58 / 52 DSV Jul 5 / Aug 1 / Sep 1	3	**1.9**	**0.5**	**$1,684**	**7324**	**248**	**29.6**	**16.8**
70 / 53 / 54 DSV Jul 15 / Aug 5 / Sep 6	3	**2.0**	**0.5**	**$1,789**	**7764**	**250**	**31.0**	**16.9**
81 / 59 DSV Jul 19 / Aug 14	2	2.4	**0.5**	**$1,757**	**7548**	**249**	**30.4**	**16.8**
Scout Late (135) / 42 Aug 10 / Sep 6	2	2.5	**0.6**	**$1,815**	**7789**	**257**	**30.4**	**17.2**
Scout (112) / 52 Aug 1 / Sep 1	2	2.6	0.9	**$1,685**	**7243**	**254**	28.3	**17.0**
Untreated	0	3.1	1.3	**$1,773**	**7446**	**251**	**29.7**	**17.0**

Moderately Tolerant Variety (B-19RR90)

Treatment (DSV)	# Applic	CLS 0-9 Oct 10	CLS 0-9 Sep 21	Net Income $/Acre	RWSA	RWST	T/A	% Sugar
54 / 58 / 52 DSV Jul 5 / Aug 1 / Sep 1	3	**1.6**	**0.4**	**$1,655**	**7203**	**251**	**28.7**	**17.3**
70 / 53 / 54 DSV Jul 15 / Aug 5 / Sep 6	3	**1.7**	**0.3**	**$1,753**	**7615**	**254**	**29.9**	**17.3**
Scout (112) / 52 Aug 1 / Sep 1	2	2.0	**0.3**	**$1,659**	**7133**	**257**	27.7	**17.5**
81 / 59 DSV Jul 19 / Aug 14	2	2.1	**0.3**	**$1,736**	**7459**	**255**	**29.2**	**17.3**
Scout Late (135) / 42 Aug 10 / Sep 6	2	2.3	1.0	**$1,661**	**7145**	**254**	**28.1**	**17.3**
Untreated	0	2.8	**0.5**	**$1,785**	**7496**	**261**	**28.8**	**17.7**

BEETcast: Evaluate Tolerant and Susceptible Varieties in a Green Zone

Stoutenburg, Sandusky, MI

Tolerant Variety (HM-131RR)

Treatment (DSV)	# Applic	CLS 0-9 Oct 10	CLS 0-9 Sep 21	Net Income $/Acre	RWSA	RWST	T/A	% Sugar
54 / 58 / 52 DSV Jul 5 / Aug 1 / Sep 1	3	**1.3**	**0.3**	**$1,499**	**6548**	**250**	**26.1**	**17.1**
70 / 53 / 54 DSV Jul 15 / Aug 5 / Sep 6	3	**1.5**	**0.4**	**$1,462**	**6392**	**244**	**26.2**	**16.9**
81 / 59 DSV Jul 19 / Aug 14	2	2.0	**0.3**	**$1,490**	**6427**	**245**	**26.1**	**16.9**
Scout Late (135) / 42 Aug 10 / Sep 6	2	2.0	**0.3**	**$1,557**	**6709**	**252**	**26.6**	**17.3**
Scout (112) / 52 Aug 1 / Sep 1	2	2.1	**0.4**	**$1,514**	**6526**	**254**	**25.5**	**17.4**
Untreated	0	2.5	0.6	**$1,552**	**6517**	**252**	**25.9**	**17.3**
LSD 5%		0.2	0.2	ns(141.4)	ns(593.7)	ns(11.1)	ns(2.0)	ns(0.6)
CV %		8.1	27.9	7.4	7.2	3.8	6.2	2.9

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: lower number is better
$/Acre: Figured using a $60 payment

SUMMARY
Different BEETcast spray schedules and varieties with varying levels of Cercospora leafspot tolerance were compared in this small plot replicated trial. The field was fairly uniform and a good sugarbeet population was present. The sugarbeet varieties evaluated were: HM-131RR (tolerant), B-19RR90 (moderate tolerance) and B-19RR1N (highly susceptible). The 55/55 and 70/55 spray schedules provided equal Cercospora control. It appeared that spraying as early as 55 DSV is not necessary in this area. Scouting or starting applications at 80 DSV's worked well for the tolerant (HM-131RR) and moderately tolerant (B-19RR90) varieties. The 70/55 DSV schedule was needed to protect leaves from Cercospora damage for the highly susceptible variety (B-19RR1N). The Cercospora pressure was somewhat low in this trial. The first spots were discovered at 105 DSV's.

BEETCast: Evaluate a Susceptible Variety in a Red Zone

Clay Crumbaugh, St. Louis, MI

Trial Quality: Good
Location: Gratiot County
Planted: May 7
Harvested: Not harvested
Previous Crop: Soybeans
Soil Type: Loam, 2.8% OM, 6.1 pH

Variety Used: B-19RR1N
Fungicides Used:
1st App: Eminent
2nd: Headline
3rd: Inspire
4th: Gem

Application: 4 Wheeler Plot Sprayer, 3 mph, 80 psi, 21 gpa
Plot Size: 6 Rows X 50 ft
Reps: 6
Seasonal Rainfall: 16.7 inches
Total DSV's: 190
First Spot: 74 DSV (July 18)

Treatment (DSV)	# Applic	Cerc Rating 0-9		
		Sep 13	Aug 23	Aug 11
47 / 46 / 44 / 33 DSV Jun 28 / Jul 26 / Aug 15 / Sep 5	4	**1.4**	**1.1**	**0.9**
53 / 55 / 54 DSV Jul 2 / Aug 2 / Sep 5	3	2.3	2.1	1.8
Scout (74) / 62 / 33 DSV Jul 18 / Aug 15 / Sep 5	3	2.4	2.3	2.1
Scout (74) / 34 / 40 DSV Jul 18 / Aug 2 / Aug 22	3	2.4	2.1	1.9
Untreated Check	0	4.1	3.6	3.0
Average		2.5	2.2	1.9
LSD 5%		0.3	0.2	0.3
CV %		8.1	6.8	10.6

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

SUMMARY

Harvest data was not obtained from this trial because the trial was on 30 inch rows and our harvesters are on 22 inch rows. The variety B-19RR1N is highly susceptible to Cercospora leafspot. The Cercospora infestation level was low to moderate for this area. Four applications starting at 52 DSV followed by 45 DSV's provided the best control. All of the treatments kept Cercospora in a safe range.

BEETCast: Evaluate a Susceptible Variety in a Red Zone
Herford Farm, Elkton, MI

Trial Quality: Good
Location: Huron County
Planted: April 15
Harvested: October 5
Variety Used: C-RR827

Fungicides Used:
1st Applic: Eminent
2nd: Headline
3rd: Proline
4th: Gem
Tractor Plot Sprayer:
25 gpa, 90 psi

Plot Size: 6 Rows X 38 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4 inches
Seasonal Rainfall: 16.6 inches
Cercospora pressure: Very High
First Spot: 70 DSV (July 14)

Treatment (DSV)	# Applic	CLS 0-9 Sep 24	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP
42 / 54 / 38 / 30 DSV Jun 29 / Jul 25 / Aug 13 / Aug 30	4	**2.5**	**$1,561**	**6685**	**251**	**26.9**	**17.1**	**94.7**
52 / 57 / 55 DSV Jul 5 / Aug 1 / Aug 30	3	**2.7**	**$1,571**	**6645**	**252**	**26.3**	**17.2**	**94.7**
Scout 82 / 27 / 55 DSV Jul 20 / Aug 1 / Aug 30	3	**2.8**	**$1,438**	**6102**	**249**	**24.5**	**17.1**	**94.5**
Scout 82 / 52 / 51 Jul 20 / Aug 13 / Sep 14	3	3.4	**$1,547**	**6544**	**245**	**26.8**	**16.8**	**94.6**
Untreated	0	7.7	$1,091	4446	226	19.7	15.9	**93.6**
Average	3.25	3.8	$1,442	6084	244	24.8	16.8	94.4
LSD 5%		0.5	200.5	816.6	17.0	2.4	0.8	ns(1.2)
CV %		7.6	9.0	8.7	4.5	6.3	3.1	0.8

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora: lower number is better.
$/Acre: Figured using a $60 payment.

SUMMARY
Different BEETcast spray schedules were compared in this small plot replicated trial. The field was uniform and a good sugarbeet population was present. The variety C-RR827 is highly susceptible to Cercospora leafspot. The leafspot pressure was high. A total of 200 DSV's were recorded in this trial. An intense spray schedule (42/54/38/30 DSV's) provided the best control of leafspot, however, a 52/57/55 spray schedule also gave good leafspot control. Scouting treatments were somewhat less effective, however, the application was a little late. One problem with making the first application based on scouting is that by the time spots are found and the application is made the treatment often ends up being a week or more late. When that occurs it is better to come back early (35 DSV's) with the second spray. Resistance to Headline and Gem has been documented in this field. It is encouraging to note that Cercospora control was adequate when considering that the Strobilurin fungicides were not at full strength.

QoI (strobilurin) resistance in Cercospora beticola in Michigan sugarbeet.

W. W. Kirk1, L.E. Hanson2, E. Gachango1, G. Clark3 and J. Stewart3.

Cercospora leaf spot caused by the fungus Cercospora beticola Sacc. is the most serious and important foliar disease of sugar beet (Beta vulgaris L.) in Michigan. Cercospora leaf spot is controlled mainly with fungicides, including strobilurins (FRAC group 11, Quinone outside Inhibitors [QoI]). QoI resistance in C. betcola has not been previously reported. In 2011, fields sprayed with QoIs from several areas in Michigan showed high Cercospora leaf spot levels. Isolates were collected from symptomatic plants and grown on sugarbeet leaf agar. A conidium germination bioassay was carried out on sugar beet leaf agar covered with water agar amended with pyraclostrobin, azoxystrobin or trifloxystrobin at 0, 0.001, 0.01, 0.1, 1, 10, or 100 µg/mL (ppm). The medium was supplemented with salicylhydroxamic acid (SHAM) to block the alternate oxidation pathway. After 24 h incubation at 22°C under ambient light, the number of germinated conidia out of 50 observed was counted in each of three replicates per treatment. Germination was recorded as positive when the germ tube was at least half the width of the conidium. All four isolates with the G143A mutation were able to germinate at the highest pyraclostrobin concentration tested (50% germination at 100 µg/mL relative to the SHAM control). Isolates that contained the G143A mutation included representatives from Huron and Saginaw counties. Conversely, a representative wild type isolate was unable to germinate over the 0.01 µg/mL concentration. The estimated EC50 for the sensitive isolate was 0.03 µg/mL, while the value for the resistant isolate could not be calculated because it was greater than the highest concentration tested. Additionally, in the controls with no SHAM or fungicide, the representative resistant isolate showed a consistent reduced germination rate compared to the sensitive isolate (30% and 93.5% germination, respectively). Isolates also grew on spiral dilution plates amended with the three different QoI fungicides. These findings indicate that the observed reduction in Cercospora leaf spot control in some commercial Michigan sugarbeet fields may be due to the development of resistance to QoIs. A more detailed study is needed to determine the extent to which C. beticola populations in Michigan have shifted to less sensitive phenotypes in order to devise better recommendations for disease and fungicide resistance management. Additional isolates are being collected from fields in Bay, Genesee, Gratiot, Ingham, Sandusky and Tuscola Counties.

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Cercospora Leafspot Resistance & Management Guidelines, Page 1 of 2

Recent insights on Cercospora Leafspot Resistance

by Gregory M. Clark[1] and James F. Stewart[2]*

Cercospora leafspot, caused by the fungus Cercospora beticola, is one of the most serious diseases of sugarbeets in Michigan. This disease can cause reduced tonnage and sucrose and increased impurities. Losses of 30 percent in recoverable sucrose are fairly common under moderate disease conditions.

Cercospora leafspot has been more difficult for some growers to control the past two seasons. Typically growers use Quadris (a strobilurin) for Rhizoctonia control then apply Proline, Eminent, Enable, or Inspire (triazoles) as the first leafspot spray. Headline or Gem (strobilurins) are generally the second leafspot spray and it is evident that we are losing control of Cercospora at that time.

A sentinel plot was conducted near Elkton, MI in 2011 to evaluate the efficacy of fungicides for leafspot control. Results from this trial show that Headline and Gem (strobilurins) did not provide adequate leafspot control in 2011 (Graph 1). This graph shows leafspot control for fungicides over time. Values are based on the Cercospora rating scale of 0-9 and are expressed as a percent of the untreated. At the sentinel plot in 2011, Eminent; Inspire; Proline and Super Tin provide good Cercospora control, while Headline and Gem failed to control leafspot.

Leaves from the sentinel plot were gathered and sent to Michigan State and to North Dakota State Universities to analyze for Cercospora resistance. Preliminary results from both universities indicate that Cercospora spores from the sentinel plot are resistant to Headline and Gem.

Michigan Sugar Company agriculturists also sampled leaves from around the sugarbeet growing area and a high percentage of those leaves tested positive for resistance to Headline and Gem (Fig. 1& 2). Data from both universities showed that over 85% of the samples had an effective concentration (EC50) greater than 1 ppm, which indicates resistance. Samples considered not to be resistant should have sensitive isolates (isolates killed by fungicide) levels in the range of 0.02-0.06 ppm.

Graph 1: Cercospora Fungicide Efficacy

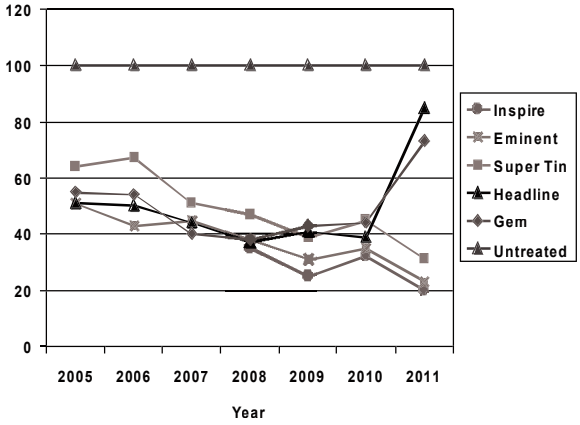
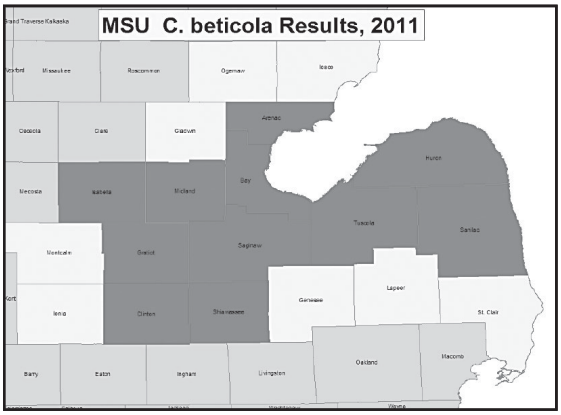


Figure 1: Darkest Gray Counties Indicate Strobiluins Resistance • MSU, 2011



The same question has been asked multiple times, "why did resistance happen?" This is a difficult question to answer, since many variables could lead to this resistance issue. Here are some possible answers to this question.

- First Leafspot application late.
- Poor spray techniques.
- Not tank mixing with other modes of action.
- Earlier planting dates.
- Not controlling leafspot to the end of the season.
- Increased use of susceptible varieties.
- Failing to rotate modes of action.
- Stretching spray intervals.
- Spraying corn, wheat, soybeans, etc., with Headline or Gem and not rotating modes of action.

continued on next page

Cercospora Leafspot Resistance & Management Guidelines, Page 2 of 2

The situation with fungicide resistance in Michigan sugarbeets will be manageable if actions are taken now in a consistent manner by all growers. Management practices need to be implemented and adhered to by all sugarbeet growers in Michigan so that we can continue to produce a successful crop and preserve the fungicides that are still effective in controlling Cercospora leafspot. Practices that all growers should follow include:

- Plant susceptible varieties only if you are willing to follow an aggressive spray recommendation.
- Use of more tolerant varieties is especially important when planting next to a field that had Cercospora problems the previous year.
- Tank mix triazole, strobilurin and Topsin fungicides with an EBDC or Super Tin.
- Never spray with the same mode of action back-to-back.
- Use Headline and Gem (strobilurins) and Topsin only once per season.
- Use the highest labeled rates of all fungicides even in tank mixes.
- Apply fungicides in an approach to insure maximum coverage. Enhanced coverage results in improved Cercospora leafspot control.
- Use 20-25 gallons of water with 90 PSI or greater. Higher pressure and gallonage will produce the best control.
  - Minimum of 80 PSI and 20 gallons of water.
- Use surfactants and additives as required by product labels.
- Do not delay your first leafspot application by following BEETcast or if scouting no later than the first leafspot in your area.
- If following BEETcast refer to Table 1, if you are not following BEETcast then follow the spray intervals as recommended by the product label.

Figure 2:
Strobiluins REsistance • NDSU, 2011

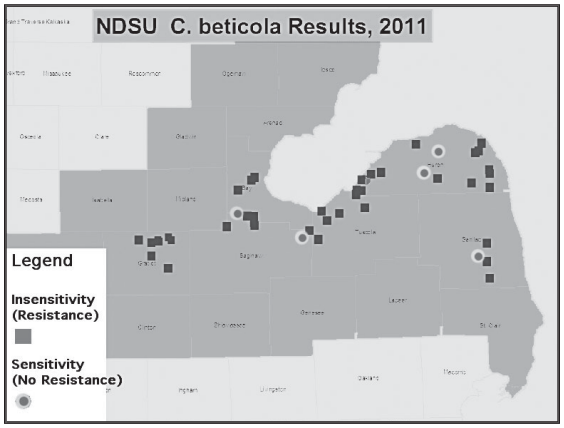


Table 1:
Initial Spray/Subsequent Sprays

	High	Medium	Low
Tolerant	55/55/55/55	60/55/55/55	75/55/55
Moderately Tolerant	55/50/50/50	55/55/55/55	70/55/55
Highly Susceptible	50/40/40/40	55/50/50/50	65/55/55

- When using Headline and Gem (strobilurin) fungicides in other crops (e.g. corn, soybeans, wheat, dry beans, etc.), always tank-mix with a fungicide with a different mode of action or use available combination products.
- Crop rotation plays a key component in reducing Cercospora leafspot levels. Inoculum over-winters in plant debris and soils. A four-year rotation is recommended.

Summary

Growers are doing very well with high sugar prices, high yielding and high quality varieties, disease tolerant varieties and Roundup for weed control. However, resistance to Cercospora is developing with Headline and Gem and we can also lose Eminent, Proline, Enable and Inspire if we do not employ proper resistance management strategies. We need to protect our crop from Cercospora leafspot and need to preserve the fungicides that we have left from developing resistance to Cercospora. There are no new fungicides coming out on the market. This is why tank-mixing and following the Management for Cercospora leafspot program is an important strategy in prolonging our fungicides for Cercospora leafspot control.

[1] Michigan Sugar Company, Bay City, MI 48706
[2] Michigan Sugar Company, Agricultural Research Center, 1459 S. Valley Center Drive, Bay City, MI

Rhizoctonia: Quadris Rate, T-Band Width & Foliar Application Timings

Average of 2 Locations

Breckenridge & St. Louis/Hoard and Crumbaugh

Trial Quality: Fair
Planted: Mid-May
Harvested: Not harvested
Variety Used: C-RR824
Plot Size: 6 rows x 35 ft

Breckenridge:
Soil Info: Sandy Loam
3.1% OM, 7.0 pH
T-band trts: 10 gpa, 6502E
Reps: 6

St. Louis:
Soil Info: Loam
2.8% OM, 6.1 pH
Foliar: 15 gpa, 7 inch band
Rainfall: 15 inches

Treatment	Rate	Application Description	Dead Beets per 100′ Sept 13	Stand	
				B/100′ June 2	B/100′ Sept 1
Quadris	16.6 fl oz/A	6-8 lf 7" band	**15**	**148**	**118**
Quadris	7.125 fl oz/A	T-band 3.5" band	**23**	**142**	**113**
Quadris	9.5 fl oz/A	6-8 lf 7" band			
Quadris	14.25 fl oz/A	T-band 2" band	**24**	**139**	**114**
Quadris	7.125 fl oz/A	T-band 3.5" band	**25**	**137**	**109**
Quadris	14.25 fl oz/A	6-8 lf 7" band			
Quadris	14.25 fl oz/A	T-band 3.5" band	**25**	**136**	**105**
Quadris	9.5 fl oz/A	6-8 lf 7" band	30	**142**	**106**
Quadris	14.25 fl oz/A	T-band 7" band	33	**139**	**112**
Quadris	14.25 fl oz/A	6-8 lf 7" band	34	**132**	92
Quadris	14.25 fl oz/A	2-4 lf 7" band	37	**140**	102
Quadris	4.1 fl oz/A	T-band 2" band	41	**153**	**114**
Quadris	7.125 fl oz/A	T-band 3.5" band	41	**146**	**111**
Untreated			60	**135**	93
Average			32.1	140.7	107.3
LSD 5%			13.0	ns(19)	15.7
CV %			35.1	11.9	12.7

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

SUMMARY

Small plot replicated trials were conducted near Breckenridge to evaluate Quadris application timings and rates. There was a lot of variability in stand at both locations and yield information was not obtained. The reliability of the data (live and dead beet counts) is considered to be fair. For dead beet counts, caused by Rhizoctonia, there are trends suggesting that the lower Quadris rates in narrow bands were less effective, however, the differences were not significantly different. On average the Quadris treatments appeared to provide about 50% disease control.

Rhizoctonia: Quadris Rate, T-Band Width & Foliar Application Timings

Blumfield, MI

Trial Quality: Fair-Good
Location: Saginaw County
Planted: May 6
Harvested: September 21
Previous Crop: Soybeans
Variety: C-RR827

Rhizoc Control: Good
Cercospora Control: Good
Spray Dates: June 8 and June 15
Seasonal Rainfall: 12.2 inches
Soil Info: Loam, 3.0% OM, 7.6 pH

Plot Size: 6 Rows X 38 ft
Reps: 4
Row Spacing: 22 inches
Seeding Rate: 4.2 inches

Treatment	Rate fl oz/A	Application Method	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Emergence B/100 Ft	
									Jun 8	Sep 14
Quadris	16.6	6-8lf 7"band	**$1,520**	**5965**	**249**	**24.0**	**17.1**	**94.3**	**146**	138
Quadris	16.6	Tb 3.5" band	**$1,501**	**5889**	**233**	**25.2**	**16.4**	**93.6**	**173**	**172**
Quadris	7.1	Tb 3.5" band	**$1,486**	**5830**	**239**	**24.4**	**16.7**	**93.6**	**183**	**173**
Quadris	14.3	2-4lf 7"band	**$1,479**	**5811**	**242**	**24.0**	**16.8**	**93.9**	**166**	**150**
Quadris	14.3	6-8lf 7"band	**$1,447**	**5680**	**245**	**23.2**	**17.1**	**93.7**	**154**	**145**
Untreated			**$1,424**	**5592**	**233**	**24.0**	**16.3**	**93.7**	**148**	**147**
Quadris Quadris	7.1 9.5	Tb 3.5" band 6-8lf 7"band	**$1,412**	**5580**	**235**	**23.7**	**16.5**	**93.6**	**164**	**172**
Quadris	14.3	Tb 3.5" band	**$1,381**	**5421**	**236**	**23.0**	**16.4**	**93.8**	**186**	**174**
Quadris	14.3	Tb 2" band	**$1,351**	**5306**	**240**	22.1	**16.6**	**94.0**	**169**	**150**
Quadris	4.1	Tb 2" band	**$1,311**	**5150**	224	**23.0**	15.8	93.5	**157**	**148**
Quadris	16.6	6-8lf 7"band	**$1,285**	**5048**	**236**	21.4	**16.5**	**93.7**	**144**	135
Quadris Quadris	7.1 14.3	Tb 3.5" band 6-8lf 7"band	$1,261	4995	220	**22.7**	15.6	93.2	**141**	**141**
Quadris	9.5	6-8lf 7"band	$1,252	4919	224	21.9	**15.9**	93.1	138	135
Quadris	14.3	Tb 7" band	$1,250	4913	218	22.4	15.5	93.4	**156**	**144**
Average			$1,383	5436	234	23.2	16.4	93.6	159	152
LSD 5%			236.2	918.6	20.5	3.1	1.2	0.8	46.4	34.4
CV %			11.7	11.7	6.1	9.1	4.9	0.6	20.4	15.9

Bold: Results are not statistically different from top-ranking treatment in each column.
Tb: T-band application
$/Acre: Figured using a $60 payment.

SUMMARY

Quadris was applied in 2 inch, 3.5 inch and 7 inch T-band treatments at planting at different rates. Quadris was also applied as a foliar treatment at the 6-8 leaf stage. The plot was inoculated with Rhizoctonia but the disease did not establish. There were very few dead beets in the untreated check plots. The in-furrow (T-band) treatments did not hurt emergence, even with high Quadris rates in narrow bands.

Rhizoctonia: Quadris In-Furrow & Foliar Applications to Tolerant & Susceptible Varieties • Average, 2 Locations

Trial Quality: Fair
Location: Gratiot County
Planted: Mid-May
Harvested: Not harvested

3.5" T-band: 10 gpa
Breckenridge Soil Info:
Sandy Loam, 3.1% OM, 7.0 pH
St. Louis Soil Info:
Soil Info: Loam, 2.8% OM, 6.1 pH

Quadris Effects

Treatment	Timing	Fl oz/A	Dead Beets per 100 Ft Mid Sep	Stand	
				B/100 Ft Early	B/100' Ft Mid-Late
Quadris	T-band	14.25	**23**	122	106
Quadris	T-band	7.125	25	**127**	106
Quadris Quadris	T-band 8 leaf	7.125 14.25	25	**132**	**112**
Quadris	8 leaf	14.25	26	118	94
Quadris Quadris +	4 leaf 8 leaf	14.25 14.25	**24**	117	95
Untreated			55	105	83
Average			18.7	97.8	74.2
LSD 5%			1.8	7.7	5.1
CV %			16.3	5.8	7.7

Variety Effects

Treatment	Dead Beets per 100 Ft Sep 9	Stand	
		B/100 Ft Early	B/100' Ft Mid-Late
SX-1281RR	**14**	118	**102**
HM-28RR	**15**	114	96
C-RR824	60	**128**	**101**
Average	18.7	97.8	82.7
LSD 5%	3.3	4.8	5.3
CV %	16.3	5.8	7.7

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

SUMMARY: Sugarbeet emergence, growth and vigor was too variable to obtain yield information. Quadris applications provided Rhizoctonia control however there were no significant differences between application methods and Quadris rates. SX-1281RR and HM-28RR tolerated Rhizoctonia pressure much better than C-RR824, however, at harvest populations were as high for C-RR824 due to better emergence.

Rhizoctonia: Evaluate Registered & Experimental Fungicides • Gilford, MI

Trial Quality: Good
Location: Tuscola County
Planted: May 17
Harvested: September 22
Previous Crop: Oilseed Radish

Rhizoc Control: Good
Cercospora Control: Good
Foliar Applic: June 10 and June 28
Soil Info: Silt Loam, 8.6% OM, 7.8 pH
Variety: C-RR827

Plot Size: 6 Rows X 35 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4.2 inches
Seasonal Rainfall: 17.4 inches

Treatment	Rate	Appl Timing	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Vigor 1-10 Jun 20 34 Day	B/100ft Jun 13 27 Day	B/100ft Aug 16 91 Day
Vertisan	29.7 fl oz/a	Tb 7" band	**$1,440**	**5555**	**236**	**23.5**	**17.4**	**91.3**	**6.5**	**208**	**202**
Vertisan	14.85 fl oz/a	Tb 3.5" band	**$1,396**	**5385**	**238**	**22.7**	**17.4**	**91.6**	**6.3**	**212**	**200**
Headline EC	9.2 fl oz/a	Tb 7" band	**$1,394**	**5379**	**229**	**23.5**	**17.0**	**91.2**	**6.3**	**200**	192
Gem SC	3.6 fl oz/a	Tb 3.5" band	**$1,390**	**5363**	**237**	**22.6**	**17.5**	**91.2**	**6.3**	**208**	**202**
Moncut DF	8.8 oz/a	Tb 3.5" band	**$1,371**	**5289**	**240**	**21.9**	**17.4**	**92.0**	5.8	**192**	**202**
Actinovate AG	12 oz/a	Tb 1" band	**$1,369**	**5281**	**230**	**23.0**	**17.0**	91.1	**6.3**	**198**	186
Gem SC	3.6 fl oz/a	4-6lf	**$1,369**	**5281**	**234**	**22.5**	**17.3**	**91.2**	**6.0**	177	176
Quadris FL	14.25 fl oz/a	Tb 3.5" band	**$1,355**	**5228**	**238**	**22.1**	**17.4**	**91.6**	5.9	**197**	**198**
Proline SC	5.7 fl oz/a	4-6lf	**$1,353**	**5219**	**232**	**22.6**	**17.2**	90.9	5.9	161	151
Moncut DF	17.6 oz/a	4-6lf	**$1,351**	**5210**	**234**	**22.4**	**17.3**	**91.2**	5.9	174	171
Actinovate AG Quadris FL	12 oz/a 14.25 fl oz/a	Tb 1" band 4-6lf	**$1,348**	**5199**	**232**	**22.4**	**17.2**	**91.2**	5.8	**193**	189
Quadris FL	16.5 fl oz/a	6-8lf	**$1,340**	**5171**	**238**	**21.8**	**17.6**	91.0	5.8	173	168
Quadris FL	14.25 fl oz/a	6-8lf	**$1,333**	**5143**	224	**23.0**	16.9	90.7	5.8	160	153
Quadris FL	14.25 fl oz/a	4-6lf	**$1,333**	**5140**	**229**	**22.5**	**17.1**	90.8	5.9	158	157
Moncut DF	17.6 oz/a	Tb 3.5" band	**$1,329**	**5127**	**235**	**21.9**	**17.4**	91.0	**6.3**	**208**	**210**
Quadris FL	14.25 fl oz/a	Tb 7" band	**$1,299**	**5012**	**237**	21.1	**17.5**	**91.3**	5.8	**204**	**197**
Quadris FL Quadris FL	14.25 fl oz/a 14.25 fl oz/a	Tb 3.5" band 4-6lf	$1,284	4952	**231**	**21.4**	**17.0**	**91.5**	**6.0**	**211**	**213**
Headline EC	9.2 fl oz/a	Tb 3.5" band	$1,283	4948	**236**	21.0	**17.4**	**91.4**	**6.2**	**199**	**197**
Proline SC	5.7 fl oz/a	Tb 3.5" band	$1,283	4948	**230**	**21.4**	**17.0**	**91.4**	**6.2**	**206**	**201**
Headline EC	4.6 fl oz/a	Tb 3.5" band	$1,276	4922	**231**	**21.3**	**17.1**	91.1	**6.0**	**205**	**201**
Vertisan	29.7 fl oz/a	4-6lf	$1,272	4905	**233**	21.2	**17.2**	**91.2**	5.6	177	171
Quadris FL	7.1 fl oz/a	Tb 3.5" band	$1,267	4887	**232**	21.2	**17.2**	91.0	**6.2**	**190**	**203**
Quadris FL	16.5 fl oz/a	4-6lf	$1,263	4872	**238**	20.5	**17.5**	**91.5**	5.8	173	167
Penthiopyrad Quadris FL	14 g/unit 14.25 fl oz/a	Seed Tmt 4-6lf	$1,259	4855	212	**23.0**	16.0	90.6	5.8	183	173
Headline EC	4.6 fl oz/a	Tb 7" band	$1,247	4809	**237**	20.3	**17.4**	**91.5**	**6.2**	**195**	**192**
Penthiopyrad	14 g/unit	Seed Tmt	$1,210	4668	200	**23.4**	15.0	91.0	**6.2**	180	177
Untreated			$1,205	4647	226	20.6	16.9	90.9	**6.0**	167	165
Average			$1,319	5089	231	22.0	17.1	91.2	6.0	189	186
LSD 5%			141.4	545.3	12.5	2.3	0.7	0.8	0.6	22.1	20.9
CV %			9.4	9.4	4.7	9.3	3.6	0.7	8.2	10.2	9.9

Bold: Results are not statistically different from top-ranking treatment in each column. • **Tb:** T-band application
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY: Fungicides were applied in-furrow at planting in a 3.5 in T-band (6502E, 25 psi, 10 gpa) or foliar (8002, 30 psi, 15 gpa) at the 4-6 or 6-8 leaf stage in this small plot replicated trial. The plot was inoculated with Rhizoctonia, but the disease did not develop. There were less than 2 dead beets per 100 ft of row in the untreated plots. All of the fungicide treatments improved sugarbeet emergence and some treatments improved plant emergence, plant vigor, yield and quality even though Rhizoctonia root rot symptoms were not apparent.

Rhizoctonia: Monocut and Other Experimental Fungicides • Blumfield, MI

Trial Quality: Fair
Location: Saginaw County
Planted: May 6
Harvested: September 21
Previous Crop: Soybeans
Variety: C-RR824

Rhizoc Control: Good
Cercospora Control: Good
Spray Dates: June 13
Seasonal Rainfall: 13.1 inches
Soil Info: Loam, 3.0% OM, 7.6 pH

Plot Size: 6 Rows X 38 ft
Reps: 4
Row Spacing: 22 inches
Seeding Rate: 4.2 inches
Application: 3.5 inch T-band 10 gpa
Foliar Sprays: 15 gpa

Treatment	Rate	Appl Timing	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Emerg B/100 Ft	Dead Beets /100 Ft
GWN-9935 DF	17.6 oz/a	T-Band	**$1,692**	**6671**	**244**	**27.3**	**17.1**	**93.5**	157	**0.5**
Moncut 70 DF	8.8 oz/a	T-Band	**$1,653**	**6515**	**239**	**27.3**	**17.0**	**92.9**	**161**	**0.0**
Moncut 70 DF	17.6 oz/a	4-6lf	**$1,631**	**6429**	**238**	**27.0**	**16.7**	**93.4**	**172**	**0.3**
Quadris FL Quadris FL	7.125 fl oz/a 9.5 fl oz/a	T-Band 4-6lf	**$1,614**	**6362**	**237**	**27.0**	**16.7**	**93.2**	**168**	**0.5**
GWN-9935 DF GWN-9935 DF	5.6 oz/a 11.2 oz/a	T-Band 4-6lf	**$1,604**	**6324**	**231**	**27.3**	**16.6**	92.6	157	**0.8**
Quadris FL	16.625 fl oz/a	4-6lf	**$1,598**	**6300**	**238**	**26.7**	**16.7**	**93.4**	**177**	**0.8**
Moncut 70 DF	11.2 oz/a	4-6lf	**$1,595**	**6288**	**231**	**27.2**	**16.3**	**93.3**	**159**	**0.8**
Quadris FL	14.25 fl oz/a	4-6lf	**$1,577**	**6217**	**237**	**26.3**	**16.6**	**93.5**	**178**	**0.8**
Moncut 70 DF Moncut 70 DF	5.6 oz/a 11.2 oz/a	T-Band 4-6lf	**$1,575**	**6209**	**238**	**26.0**	**16.8**	**93.2**	**172**	**0.5**
GWN-9935 DF	11.2 oz/a	4-6lf	**$1,558**	**6142**	**227**	**26.9**	**16.2**	**92.9**	154	**0.0**
Moncut 70 DF	17.6 oz/a	T-Band	**$1,551**	**6113**	**236**	**25.9**	**16.7**	**93.2**	147	**0.8**
Moncut 70 DF	5.6 oz/a	T-Band	**$1,547**	**6099**	**232**	**26.4**	**16.4**	**93.3**	**182**	**0.3**
GWN-9935 DF	5.6 oz/a	T-Band	**$1,540**	**6072**	**231**	**26.4**	**16.3**	**93.2**	158	**0.3**
Quadris FL	14.25 fl oz/a	T-Band	**$1,514**	**5969**	**245**	**24.6**	**17.1**	**93.7**	**167**	**0.3**
Quadris FL	7.125 fl oz/a	T-Band	**$1,462**	**5765**	**237**	**24.6**	**16.8**	**93.1**	151	**0.5**
Untreated			$1,441	5679	**243**	**23.4**	**17.0**	**93.8**	**166**	2.3
Average			$1,572	6197	237	26.3	16.7	93.3	164	0.6
LSD 5%			230.5	908.7	ns(26)	ns(4.0)	ns(1.5)	0.9	23.8	1.2
CV %			10.3	10.3	7.6	10.6	6.2	0.7	10.2	144.9

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY:

Moncut is a fungicide being developed in sugarbeets by Gowan Company. Moncut compared favorably to Quadris in our 2010 trial. The plot was inoculated with Rhizoctonia but the disease did not develop. The in-furrow treatments were applied in a 3.5 inch T-band in 10 gpa. None of the in-furrow treatments hurt sugarbeet emergence. There was not enough disease in the trial to determine the fungicide effects on Rhizoctonia.

Rhizoctonia Control Trial
Hrabal Farms • Breckenridge, MI

Trial Quality: Good
Location: Gratiot County
Planted: May 6
Previous Crop: Soybeans
Soil Type: Parkhill Loam

Spacings: Rows - 30", Seeds 52,500/A
Fertilizer: 2x2 - 250# 12-12-12-3Mn-.5 B; PPI 32 gal 25-0-0-12S
Tillage: Chisel & 1x F.C., Spring-1x F.C.
Harvest Date: October 30

Sample Date: October 5
Herbicides: 3x Glyphosate
Replicated: 4x
Fungicide: 54 DSV - Eminent
104 DSV - Headline
155 DSV - Eminent

Treatment	Net $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Populations 100 Ft of Row		Dead Beets/ 1,200 Ft
							11 Day	34 Day	
Rhizoctonia Resistant Variety HM-27RR									
In Furrow & 6-8 Leaf	$1,745	**7971**	**278**	**28.6**	**18.6**	**95.5**	—	—	**0**
6-8 Leaf	$1,699	**7730**	**277**	**27.9**	**18.4**	**95.9**	—	—	**1**
2-4 Leaf	$1,679	**7631**	**278**	**27.5**	**18.5**	**95.8**	—	—	**8**
2-4 Leaf & 6-8 Leaf	$1,645	**7603**	**277**	**27.4**	**18.3**	**96.0**	—	—	**0**
Check	$1,623	**7338**	**270**	27.0	**18.1**	**95.4**	**184**	243	**9**
In Furrow	$1,615	**7326**	**280**	26.0	**18.5**	**96.0**	159	**257**	**0**
Rhizoctonia Susceptible Variety B-18RR4N									
6-8 Leaf	$1,752	**7958**	**275**	**29.0**	**18.3**	**95.6**	—	—	109
In Furrow & 6-8 Leaf	$1,730	**7904**	**265**	**29.8**	**17.8**	**95.5**	—	—	**40**
2-4 Leaf & 6-8 Leaf	$1,642	**7570**	**266**	**28.5**	**17.7**	**95.7**	—	—	120
In Furrow	$1,548	**7005**	**263**	26.5	**17.6**	**95.6**	117	233	179
2-4 Leaf	$1,328	6052	255	23.8	17.3	**95.1**	—	—	394
Check	$1,244	5607	245	22.8	16.7	**94.9**	134	207	587
Average	$1,604	7308	269	27.1	18.0	95.6	149	235	120
LSD 5%	—	992	17	2.7	1.0	0.5 NS	22	12	108
CV %	—	9	4	7.0	3.9	0.4	14	5	62

Net $/Acre: Revenue per acre assuming a $60 payment and cost of $1.48/oz of Quadris and $7.50 for foliar applications.
Bold: Results are not statistically different from top-ranking treatment in each column.

Emergence: Excellent
Rhizoctonia: Heavy
Quadris App: See Treatments
Cerc Leafspot: Excellent Control
Nematodes: Not Detected
Weather: Wet Early

COMMENTS:
The trial was designed to test different Quadris treatments on two different varieties, a Rhizoctonia resistant variety (HM-27RR) and a susceptible variety (B-18RR4N). The field had a history of heavy Rhizoctonia pressure and had heavy pressure in 2011. The Rhizoctonia resistant variety controlled disease and yielded very well with or without Quadris applications. The best treatments on the susceptible variety yielded similar to the resistant variety. A susceptible variety left unprotected from Rhizoctonia lost about 6 tons per acre. In furrow treatments were applied at 6.2 ounces of Quadris in 6 gallons of water per acre in a 4 inch T-band (Nozzle 8002E). Foliar applications were applied in a 7 inch band at 10.5 ounces of Quadris in 10 gallons of water per acre.

Sugarbeet Advancement

Rhizoctonia Control Trial

Gene Meylan • Linwood, MI

Trial Quality: Excellent
Location: Bay County
Planted: May 7
Previous Crop: Drybeans
Soil Type: Loam

Spacings: Rows-30"
Fertilizer: 2x2 - 20 Gal. 18.5-15-0-2.5S w/ qt of Mn & B; S.D. 90 # N
Tillage: Ripper, Spring 1x Triple K
Harvest Date: November 7

Sample Date: October 6
Herbicides: 3x Glyphosate
Replicated: 4x
Fungicide: 55 DSV - Eminent
110 DSV - Headline
165 DSV - Eminent

Treatment	Net $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Populations 100 Ft of Row		Dead Beets/ 1,200 Ft
							10 Day	41 Day	
Rhizoctonia Resistant Variety HM-28RR									
2-4 Leaf & 6-8 Leaf	$1,482	6872	270	25.5	17.8	**96.2**	—	—	**0**
In Furrow	$1,455	6595	258	25.5	17.2	**96.0**	**191**	**216**	**3**
Check	$1,439	6469	263	24.6	17.5	**96.0**	**201**	211	**11**
6-8 Leaf	$1,400	6407	257	24.8	17.1	**96.1**	—	—	**0**
In Furrow & 6-8 Leaf	$1,386	6367	257	24.9	17.1	**96.1**	—	—	**0**
2-4 Leaf	$1,373	6293	262	24.0	17.4	**96.1**	—	—	**1**
Rhizoctonia Susceptible Variety B-19RR1N									
2-4 Leaf & 6-8 Leaf	$1,789	**8245**	**284**	**29.0**	**18.8**	**96.1**	—	—	**5**
In Furrow	$1,778	**8042**	**283**	**28.5**	**18.6**	**96.3**	179	**225**	**8**
2-4 Leaf	$1,757	**7999**	**275**	**29.1**	**18.3**	**95.9**	—	—	**12**
In Furrow & 6-8 Leaf	$1,739	**7979**	**279**	**28.6**	**18.5**	**95.9**	—	—	**5**
6-8 Leaf	$1,724	**7849**	**275**	**28.6**	**18.3**	**95.8**	—	—	**1**
Check	$1,718	**7725**	**273**	**28.3**	**18.2**	95.7	**187**	**224**	50
Average	$1,587	7237	270	26.8	17.9	96.0	190	219	8
LSD 5%	—	643	14	1.9	0.9	0.4	19	13	14
CV %	—	6	4	4.8	3.4	0.3	10	6	125

Net $/Acre: Revenue per acre assuming a $60 payment and cost of $1.48/oz of Quadris and $7.50 for foliar applications.
Bold: Results are not statistically different from top-ranking treatment in each column.

Emergence: Excellent
Rhizoctonia: Low
Quadris App: See Treatments
Cerc Leafspot: Good Control
Nematodes: Yes, Heavy
Weather: —

COMMENTS:

The trial was designed to test different Quadris treatments on two different varieties, a Rhizoctonia resistant variety (HM-28RR) and a susceptible variety (B-19RR1N). The field had a history of Rhizoctonia and Sugarbeet Cyst Nematode (SBCN). In 2011, the field had a low level of Rhizoctonia infection. Quadris treatments within the Rhizoctonia resistant variety (HM-28RR) and susceptible variety (B-18RR4N) were not significantly different. This would be considered a typical response with low levels of Rhizoctonia. Since the field does have SBCN, there were significantly higher yields for variety B-19RR1N, a nematode tolerant variety. In furrow treatments were applied at 8 ounces of Quadris in 5 gallons of water per acre in a 5 inch band (Nozzle 8002E). Foliar applications were applied in a 7 inch band at 10.5 ounces of Quadris with ten gallons of water per acre.

Use of these varieties is subject to them being lawful to purchase, receive, distribute and plant

Sugarbeet Advancement Rhizoctonia Control Trial

Schindler Farms, LLC • Kawkawlin, MI

Trial Quality: Good
Location: Bay County
Planted: May 5
Variety: B-18RR4N
Previous Crop: Corn

Spacings: Rows-22"; Seeds-58,500
Fertilizer: 2x2 - 19-17-0; S.D. - 126# N by 28%
Tillage: Chisel; Spring 1x Triple K
Soil Type: Loam

Hav/Sample: Nov 6 / Oct 6
Herbicides: 2x Glyphosate
Replicated: 4x
Fungicide: 62 DSV - Inspire XT
126 DSV - Headline
176 DSV - Proline

Treatment	Net $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Populations 100 Ft of Row		Dead Beets/ 1,200 Ft
							12 Day	36 Day	
Variety B-18RR4N									
In Furrow - 9 oz & 6-8 Leaf - 14.25 oz	$1,854	**8431**	**273**	**30.9**	**18.1**	**96.0**	—	—	**34**
In Furrow - 14.25 oz & 6-8 Leaf - 14.25 oz	$1,822	**8337**	**273**	**30.5**	**18.1**	**95.9**	—	—	**70**
In Furrow - 14.25 oz	$1,832	**8257**	**272**	**30.3**	**18.2**	**95.7**	**143**	**182**	123
In Furrow - 9 oz	$1,811	**8121**	**272**	**29.9**	**18.1**	**95.7**	**146**	**192**	**110**
6-8 Leaf - 19.0 oz	$1,781	**8102**	**273**	**29.7**	**18.2**	**95.7**	—	—	**111**
2-4 Leaf & 6-8 Leaf Both 14.25 oz	$1,709	**7852**	**259**	**30.4**	**17.5**	95.1	—	—	**97**
6-8 Leaf - 14.25 oz	$1,630	7390	**256**	**28.9**	**17.3**	**95.3**	—	—	132
Check	$1,393	6218	**259**	24.0	**17.4**	**95.3**	**154**	166	281
Average	$1,729	7839	267	29.3	17.9	95.6	148	180	120
LSD 5%	—	1024	19 NS	2.7	1.1 NS	0.7	17 NS	22	88
CV %	—	9	5	6.3	4.0	0.5	7	7	50

Net $/Acre: Revenue per acre assuming a $60 payment and cost of $1.48/oz of Quadris and $7.50 for foliar applications.
Bold: Results are not statistically different from top-ranking treatment in each column.

Emergence: Good
Rhizoctonia: Moderate / Heavy
Quadris App: See Treatments

Cerc Leafspot: Good Control
Nematodes: Yes
Weather: —

COMMENTS:

Trial was designed to test different Quadris timings and rates. Trial was planted to a nematode resistant variety (B-18RR4N) which is also a Rhizoctonia susceptible variety. Rhizoctonia pressure was moderate and reduced yields up to 7 tons/acre. All treatments were significantly better than the check. In furrow applications were applied in a 4 inch T-band at rates of 9 and 14.25 ounces per acre. In furrow applications, either in combination with a foliar 6-8 leaf treatment or applied alone, had the highest yield. The 9 or 14 ounce rate showed no difference in efficacy or yield. Foliar applications were applied at 14.25 and 19 ounces per acre. The rates were not significantly different for yield or control, but trended to favor the higher rate.

Rhizoctonia Control Trial
Wallace Hecht Farms, Inc • Richville, MI

Trial Quality: Good
Location: Tuscola County
Planted: May 5
Variety: C-RR824
Previous Crop: Drybeans

Spacings: Rows-30"; Seeds-53,000
Fertilizer: 100# MAP; 275 Urea; Fall - 300 # K2O
Tillage: Moldboard; 1x Triple K
Soil Type: Clay Loam

Hav/Sample: Oct 19 / Oct 12
Herbicides: 3x Glyphosate
Replicated: 4x
Fungicide: 45 DSV - Inspire XT
90 DSV - Headline
135 DSV - Eminent

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Dead Beets/ 1,200 Ft
Variety C-RR824							
Check	—	**8732**	**284**	**30.8**	**18.9**	**95.6**	**13**
Quadris + Ammonium Sulfate	—	**8592**	**279**	**30.9**	**18.7**	**95.4**	**18**
Quadris	—	**8336**	**282**	**29.6**	**18.8**	**95.6**	**14**
Quadris + AMS + Roundup PowerMax	—	**8274**	**282**	**29.3**	**18.8**	**95.7**	**5**
Quadris + Elemax Fertilizer	—	**8093**	**282**	**28.6**	**18.8**	**95.7**	**10**
Average	—	8405	282	29.8	18.8	95.6	12
LSD 5%	—	767 NS	14 NS	2.4 NS	0.7 NS	0.6 NS	23 NS
CV %	—	6	3	5.1	2.3	0.4	123

$/Acre: Not Calculated
Bold: Results are not statistically different from top-ranking treatment in each column.

Emergence: Excellent
Rhizoctonia: Low
Quadris App: See Treatments

Cerc Leafspot: Excellent Control
Nematodes: Not Found
Weather: —

COMMENTS:
Other sugarbeet growing areas have reported possibly observing an increase in Rhizoctonia control when Quadris was mixed with Roundup herbicides. This trial was designed to look at the effects of additives on Rhizoctonia control when applied with Quadris. Treatments included Quadris alone, mixed with AMS, AMS plus Roundup PowerMax, and Elemax complete foliar fertilizer. No mixing, compatibility, or foliar burn issues were seen with any of the treatments. Rhizoctonia levels where very low and arrived late in the season. As would be expected with such low levels of Rhizoctonia, there was no significant difference in yield or level of disease.

Rhizoctonia: Evaluate Foliar Applications of Quadris and Insecticides • Gayari, Owendale, MI

Trial Quality: Fair
Location: Huron County
Planted: June 1
Harvested: October 3
Variety: SX-1291RR

Rhizoc Control: Good
Cercospora Control: Good
Soil Info: Loamy Sand, 2.3% OM, 7.6 pH
Seasonal Rainfall: 18.77 inches

Plot Size: 6 Rows X 35 ft
Reps: 3
Row Spacing: 22 inches
Seeding Rate: 4.2 inches
Applic: 15 gpa, 30 psi

Treatment	Rate	Applic	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	SB Injury 0-10 Jul 22
Quadris	14.25 fl oz/a	6 lf	**$1,327**	**5390**	**241**	**22.4**	**16.7**	**94.2**	**0.0**
Quadris Mustang Max	14.25 fl oz/a 4 fl oz/a	6 lf	**$1,308**	**5331**	**253**	**21.0**	**17.2**	**94.9**	**0.2**
Quadris Mustang Max Round up	14.25 fl oz/a 4 fl oz/a 7 fl oz/a	6 lf	**$1,286**	**5265**	**240**	**21.9**	**16.6**	**94.4**	**0.2**
Mustang Max	4 fl oz/a	6 lf	**$1,263**	**5112**	**232**	**22.0**	16.2	93.9	**0.1**
Lorsban	1 pt/a		**$1,247**	**5066**	**246**	**20.6**	**16.9**	**94.5**	**0.4**
Quadris Lorsban	14.25 fl oz/a 1 pt/a	6 lf	**$1,179**	**4832**	**239**	**20.2**	16.5	**94.5**	**0.4**
Average			$1,268	5166	242	21.4	16.7	94.4	2.1
LSD 5%			ns(408)	ns(1646)	ns(12)	ns(6.3)	0.6	0.8	ns(.4)
CV %			17.5	17.5	2.8	16.2	2.1	0.5	106.0

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment.

SUMMARY:

Quadris tank mixtures with Mustang Max and Lorsban were evaluated in this small plot replicated trial. The treatments were applied in 15 gallons of water at 30 psi at the 6 leaf stage on July 7 and evaluated 2 weeks later. Minor leaf injury was noted with several treatments, however, the symptoms were short lived. Sugarbeet yield and quality were not influenced by the foliar sprays. Rhizoctonia was not a problem in the plot.

Rhizoctonia: Evaluate Foliar Applications of Quadris and Insecticides • Hoard, Breckenridge, MI

Trial Quality: Fair–Good
Location: Gratiot County
Planted: May 5
Harvested: September 16
Previous Crop: Soybeans
Variety: HM-28RR

Rhizoc Control: Good
Cercospora Control: Good
Soil Info: Silt Loam, 3.0% OM, 7.6 pH

Trts Applied: June 15
Application: 15 gpa, 30 psi
Seasonal Rainfall: 12.2 inches

Treatment	Rate	Applic	SB Injury 0-10 Jun 28	Dead Beets #/100ft Sep 14
Untreated			**0.0**	3.3
Quadris	14.25 fl oz/A	8 lf	**0.0**	**0.3**
Mustang Max	4 fl oz/a	8 lf	**0.3**	2.7
Quadris + Mustang Max	14.25 fl oz/A 4 fl oz/a	8 lf	**0.5**	**0.7**
Lorsban	16 fl oz/a	8 lf	**0.7**	2.3
Quadris + Lorsban	14.25 fl oz/A 16 fl oz/A	8 lf	**0.8**	**0.7**
Average			0.4	1.7
LSD 5%			ns(1.1)	1.7
CV %			153	56.9

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

SUMMARY:

Minor sugarbeet leaf injury was found with Quadris + Lorsban and Quadris + Mustang Max foliar applications, however, the injury was transient. Lorsban and Mustang Max alone caused similar symptoms. There was not enough disease in the trial to evaluate for rhizoctonia. Yields were not taken.

Rhizoctonia: Evaluate Foliar Applications of Quadris and Insecticides • Gilford, MI

PIONEER • BIG CHIEF
MICHIGAN SUGAR

Trial Quality: Good
Location: Tuscola County
Planted: May 18
Harvested: September 23
Previous Crop: Oilseed Radish
Variety: B-18RR4N

Rhizoc Control: Good
Cercospora Control: Good
Soil Info: Silt Loam, 8.6% OM, 7.8 pH

Plot Size: 6 Rows x 38 ft
Reps: 4
Application: 15 gpa, 30 psi
Trt Applied: June 13
Rainfall: 15 inches

Treatment	Applic	Rate	Injury 0-10 Jun 20 6 leaf
Untreated			**0**
Quadris FL	4 lf	14.25 fl oz/a	**0**
Quadris FL	4lf	14.25 fl oz/a	**0**
Mustang Max	4lf	4 fl oz/a	
Quadris FL	4lf	14.25 fl oz/a	**0**
Asana	4lf	9.6 fl oz/a	
Mustang Max	4lf	4 fl oz/a	**0**
Asana	4lf	9.6 fl oz/a	**0**
Lorsban Adv	4lf	1.33 pt/a	**0**
Stallion	4lf	11.75 fl oz/a	**0**
Quadris FL	4lf	14.25 fl oz/a	0.5
Mustang Max	4lf	4 fl oz/a	
Roundup	4lf	8 fl oz/a	
Ammonium Sulf	4lf	17 lb/100 gal	
Quadris FL	4lf	14.25 fl oz/a	0.5
Stallion	4lf	11.75 fl oz/a	
Quadris FL	4lf	14.25 fl oz/a	1.5
Lorsban Adv	4lf	1.33 pt/a	
Average			0.2
LSD 5%			0.4
CV %			132.7

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

SUMMARY:
Quadris was applied at the 4 leaf stage alone and in combination with Mustang Max, Lorsban Advance, Asana, and Stallion. Minor leaf speckling was noted with the Quadris + Lorsban treatment. The injury did not last throughout the season. Stallion is a pre-mix of Lorsban and a pyrethroid.

Rhizoctonia: Evaluate Applications of Quadris & Insecticides In-Furrow (T-band) at Planting • Crumbaugh, St. Louis, MI

Trial Quality: Fair
Location: Gratiot County
Planted: May 7
Harvested: Not Harvested
Previous Crop: Soybeans

Soil Info: Loam, 2.9% OM, 6.1 pH
Nutrient Level: Good
Added N: 100 lbs
Variety: C-RR824

Plot Size: 6 Rows x 35 ft
Reps: 6
T-band: 10 gpa, 6502E, 25 psi
Row Spacing: 22 inches
Seeding Rate: 4.2 inch

Treatment	At Planting Applic Desc	Rate	Stand B/100′		0-10 Injury	Dead B/100′ 125 Day
			28 Day	89 Day		
Quadris	3.5 inch T-band	7.1 fl oz/a	**164**	**131**	0.0	**3.5**
Quadris Mustang Max	3.5 inch T-band 3.5 inch T-band	7.1 fl oz/a 4 fl oz/a	**161**	**143**	0.1	**4.0**
Mustang Max	3.5 inch T-band	4 fl oz/a	**152**	121	0.0	11.6
Lorsban 4E	3.5 inch T-band	1 pt/a	**148**	**125**	0.1	9.0
Quadris Lorsban 4E	3.5 inch T-band 3.5 inch T-band	7.1 fl oz/a 1 pt/a	**145**	120	0.1	**3.0**
Untreated			131	106	0.0	11.0
Average			150	124	0.6	7.0
LSD 5%			24.0	19.9	2.9	5.1
CV %			10.5	10.6	304.0	48.0

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

SUMMARY:
Quadris tank mixtures with insecticides were evaluated in this small plot replicated trial. The treatments were applied in a 3.5 inch T-band at planting in 10 gallons of water per acre. All of the Quadris treatments had improved stands compared to the untreated. Minor sugarbeet injury was noted in the Lorsban and Mustang Max tank mixes. The injury (stunting) did not last long. Lorsban and Mustang added to Quadris did not reduce the effectiveness of Quadris. The trial was not harvested because of variability in the plot.

Rhizoctonia: Evaluate Applications of Quadris & Insecticides In-Furrow (T-band) at Planting • Stoutenburg, Sandusky, MI

PIONEER • BIG CHIEF
MICHIGAN SUGAR

Trial Quality: Good
Location: Sanilac County
Planted: May 13
Harvested: October 10
Variety: SX-1291RR

Application Method:
3.5" T-band at planting
3 mph, 25 psi, 9 gpa
6502E Nozzles

Soil Info: Loam, 3.9% OM, 7.2 pH
Seasonal Rainfall: 14.9 inches

Treatment	Rate	Appl Method	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Quadris + Mustang Max	7.1 fl oz/A 4 fl oz/A	T-band	**$1,528**	**5629**	**224**	**25.1**	**15.5**	**94.6**
Untreated			**$1,532**	**5587**	**218**	**25.4**	**15.3**	**93.9**
Quadris	7.1 fl oz/A	T-band	**$1,507**	**5535**	**219**	**25.3**	**15.2**	**94.3**
Mustang Max	4 fl oz/A	T-band	**$1,447**	**5298**	**214**	**24.7**	**15.0**	**94.2**
Average			$1,503	5512	219	25.1	15.2	94.2
LSD 5%			ns(175.3)	ns(639.5)	ns(10.8)	ns(2.2)	ns(0.6)	ns(0.7)
CV %			9.4	9.4	4.0	7.1	3.3	0.6

Treatment	Rate	Applic Method	Emergence B/100' 24 day	Dead Beets #/100ft 128 day
Quadris + Mustang Max	7.1 fl oz/A 4 fl oz/A	T-band	**132**	**0.2**
Untreated			**123**	**0.5**
Quadris	7.1 fl oz/A	T-band	**130**	**0.3**
Mustang Max	4 fl oz/A	T-band	**131**	**0.7**
Average			128.8	0.42
LSD 5%			ns(23.2)	ns(1.13)
CV %			14.7	220.5

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment.

SUMMARY:

Quadris + Mustang Max tank mixtures were applied in-furrow (3.5"T band) at planting in this small plot replicated trial. There was not enough disease in the field to evaluate for Rhizoctonia control. Emergence counts were not statistically different, however, the treated plots had more sugarbeets than the untreated plots. There was no injury or stand loss from Quadris or Mustang Max, whether applied alone or in combination.

Rhizoctonia: Evaluate Applications of of Quadris + Mustang Max In-Furrow (T-band) • Crumbaugh, Breckenridge, MI

Trial Quality: Good
Location: Gratiot County
Planted: May 7
Harvested: September 14
Previous Crop: Soybeans

Cercospora Control: Good
Soil Info: Loam, 2.8% OM, 6.1 pH
T-band Treatments:
3.5 inch band at planting
Quadris rate: 7.1 fl oz/A
Mustang rate: 4.0 fl oz/A

Plot Size: 6 Rows x 100 ft
Reps: 4
Row Spacing: 22 iinches
Seeding Rate: 4.2 iinches
Seasonal Rainfall: 16.7 iinches

Treatment	In-Furrow (T-band) Applic	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Stand B/100 Ft		Dead Beets/ 100 Ft Sep 13
								June 2	Sep13	
C-RR827	Qua	**$1,218**	**4110**	**233**	**17.9**	**16.4**	**93.7**	**207**	**170**	20
B-19RR1N	Qua	**$1,191**	**4112**	**226**	**18.1**	**16.1**	**93.0**	**217**	**184**	24
B-19RR1N	Qua+M	**$1,172**	**4090**	**234**	**17.2**	**16.6**	**93.1**	**227**	**173**	33
C-RR827	Qua+M	**$1,083**	**3630**	**227**	**16.4**	**16.0**	**93.4**	186	156	22
C-RR827	None	**$1,064**	**3761**	**227**	**16.1**	**16.0**	**93.6**	183	135	44
SX-1291RR	Qua	**$1,022**	**3560**	217	**16.2**	15.4	**93.1**	**225**	**188**	**8**
SX-1291RR	Qua+M	**$975**	**3352**	209	**16.0**	15.0	**93.0**	**237**	**200**	**5**
B-19RR1N	None	**$942**	**3348**	**220**	**14.7**	**15.8**	92.7	**207**	158	46
HM-28RR	Qua	**$934**	**3283**	**224**	**14.3**	**15.9**	**93.5**	187	164	**6**
HM-28RR	Qua+M	$892	3012	**229**	13.4	**16.1**	**93.6**	166	139	**3**
SX-1291RR	None	$856	3049	214	13.8	15.3	92.9	**217**	**177**	**10**
HM-28RR	None	$855	3004	**222**	13.2	**15.8**	**93.2**	144	125	**9**
Average		$1,017	3526	223	15.6	15.9	93.2	200	164	19
LSD 5%		288.6	978.0	14.9	4.2	0.8	0.7	32.9	34.0	15.0
CV %		22.7	22.3	5.3	21.5	4.2	0.6	13.2	16.8	56.2

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

Rhizoctonia: Evaluate Applications of of Quadris + Mustang Max In-Furrow (T-band) • Crumbaugh, Breckenridge, MI

In-Furrow Treatment Effects

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Stand B/100 Ft		Dead Beets/ 100 Ft Sep 13
							June 2	Sep13	
Quadris	**$1,091**	**3766**	**225**	**16.7**	**15.9**	**93.3**	**209**	**177**	**14**
Quadris + Mustang M	**$1,031**	**3521**	**225**	**15.8**	**15.9**	**93.3**	**204**	**167**	**16**
Untreated	**$929**	**3291**	**221**	**14.5**	**15.7**	**93.1**	**188**	149	27
Average	$1,017	3526	223	15.6	15.9	93.2	200	164	19
LSD 5%		ns(690)	ns(10)	ns(2.9)	ns(0.6)	ns(0.5)	ns(23)	24.1	10.6

Variety Effects

Variety	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Stand B/100 Ft		Dead Beets/ 100 Ft Sep 13
							June 2	Sep13	
C-RR827	**$1,122**	**3834**	**229**	**16.8**	**16.1**	**93.6**	192	154	28
B-19RR1N	**$1,102**	**3850**	**227**	**16.7**	**16.2**	92.9	**217**	172	34
SX-1291RR	$951	3320	213	**15.3**	15.2	93.0	**226**	**188**	**8**
HM-28RR	$894	3100	225	13.7	15.9	**93.4**	166	143	**6**
Average	$1,017	3526	223	15.6	15.9	93.2	200	164	19
LSD 5%		345	3.4	1.7	0.2	0.3	11.5	12.0	9.3

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY:
This was a "small" (6 rows X 100 ft) replicated strip trial. Quadris and Quadris + Mustang Max applied at planting in a 3.5 inch T-band improved sugarbeet emergence and the number of harvestable beets compared to an untreated check. Yields and quality were also improved but the differences were not statistically significant. There was no difference between Quadris and Quadris + Mustang Max. All treatments were applied to 4 varieties, C-RR827, B-19RR1N, SX-1291RR and HM-28RR. C-RR827 and B-19RR1N yielded higher and had better quality than SX-1291RR and HM-28RR. SX-1291RR and HM-28RR had significantly fewer dead beets at harvest. Heavy rains following planting increased variation in the trial.

Rhizoctonia: Evaluate Quadris + Starter Fertilizer Applied at Planting in a 2" T-band • Gilford, MI

Trial Quality: Fair
Location: Tuscola County
Planted: May 18
Harvested: September 23
Previous Crop: Oilseed Radish
Variety: B-18RR4N

Rhizoc Control: Good
Cercospora Control: Good
Seasonal Rainfall: 6.98 inches
Soil Info: Silt Loam, 8.6% OM, 7.8 pH

Plot Size: 6 Rows X 35 ft
Reps: 6
In-Furrow: 10 gpa, 25 psi, 6502E
Band Width: 2 inch T-band
Row Spacing: 22 inches
Seeding Rate: 4.2 inches

Treatment	Rate	Appl Timing	Net Income $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Vigor 1-10 Jun 20	Emerge B/100 Ft Jun 11
Quadris	7.1 fl oz/a	T-band	**$1,363**	**4332**	**189**	**22.9**	**14.2**	**91.1**	**5.0**	**218**
10-34-0	3 gal/a	T-band	**$1,351**	**4295**	**192**	**22.2**	**14.6**	**90.9**	**5.4**	**215**
Quadris 10-34-0	7.1 fl oz/a 3 gal/a	T-band	**$1,295**	**4148**	**185**	**22.5**	**14.2**	**90.3**	**5.5**	**213**
Quadris Alpine	7.1 fl oz/a 3 gal/a	T-band	**$1,286**	**4138**	**192**	**21.6**	**14.6**	**90.7**	**6.0**	**210**
Alpine	3 gal/a	T-band	**$1,292**	**4124**	**188**	**22.0**	**14.3**	**90.8**	**5.0**	**211**
Untreated			**$1,307**	**4123**	**189**	**21.8**	**14.4**	**90.8**	4.5	183
Average			$1,316	4193	189	22.2	14.4	90.8	5.2	209
LSD 5%			ns(233)	ns(736)	ns(12)	ns(4.0)	ns(0.7)	ns(0.9)	0.9	33.1
CV %			11.6	11.6	4.1	11.9	3.1	0.7	11.7	10.5

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment.

SUMMARY:

Quadris was applied at planting in a 2 inch T-band alone and in combination with starter fertilizers. There was not enough disease to obtain Rhizoctonia counts or ratings. Quadris alone or in combination with starter fertilizers at 3 gal/A had higher stand counts than the untreated check plots. There did not appear to be any seedling injury from the starter fertilizers. The plot was planted late and harvested early and sugar levels were very low.

Rhizoctonia: Evaluate Quadris + Starter Fertilizer Applied at Planting in a 2" T-band • Knoerr, Bay City, MI

PIONEER • BIG CHIEF
MICHIGAN SUGAR

Trial Quality: Good
Location: Bay County
Planted: May 11
Harvested: November 7
Previous Crop: Wheat/Radish

Rhizoc Control: Good
Cercospora Control: Good
Seasonal Rainfall: 19.2 inches
Soil Info: Sandy Clay Loam, 2.9% OM, 7.5 pH

Plot Size: 6 Rows X 38 ft
Reps: 5
Application: 2" T-band, 10 gpa, 25 psi
Row Spacing: 22 inches
Seeding Rate: 4.2 inches

Treatment	Rate	Appl Timing	Net Income $/Acre	RWST	RWSA	T/A	% Sugar	% CJP	Vigor 1-10 Jun 18	Emerge B/100 Ft Jun 1
Quadris	7.1 fl oz/a	T-band	**$1,630**	**8027**	**300**	**26.8**	**20.0**	**95.2**	5.5	**175**
45 lb active N/A	45 lb ai/a	2X2	**$1,589**	**7976**	289	**27.6**	19.5	94.9	**6.9**	**179**
25 lb active P/A	25 lb ai/a	2X2								
Quadris	7.1 fl oz/a	T-band	**$1,540**	**7663**	**300**	**25.6**	**20.0**	**95.3**	5.9	**174**
Alpine	3 gal/a	T-band								
Quadris	7.1 fl oz/a	T-band	**$1,521**	**7566**	**298**	**25.4**	**19.8**	**95.5**	6.1	**184**
Redline	3 gal/a	T-band								
Alpine	3 gal/a	T-band	**$1,506**	**7448**	288	**25.8**	**19.7**	94.4	5.8	**189**
10-34-0	3 gal/a	T-band	**$1,503**	**7406**	**295**	**25.1**	**19.8**	**95.1**	5.1	**191**
22-12-0	3 gal/a	T-band	**$1,465**	**7219**	**293**	24.7	**19.7**	95.0	4.7	**183**
Quadris	7.1 fl oz/a	T-band	$1,419	7046	**293**	24.1	**19.7**	95.0	5.4	**175**
10-34-0	3 gal/a	T-band								
Untreated			$1,421	6957	**294**	23.7	**19.8**	94.8	3.6	151
Redline	3 gal/a	T-band	$1,391	6856	288	23.8	19.4	95.0	5.5	**184**
Average			$1,499	7416	294	25.2	19.7	95.0	5.4	179
LSD 5%			180.0	881.0	7.4	2.8	0.4	0.5	0.7	22.7
CV %			9.2	9.2	2.0	8.5	1.7	0.4	10.0	9.8

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment.

SUMMARY:

Quadris was applied in-furrow in a 2 inch T-band alone and in combination with starter fertilizers. There was not enough disease to obtain Rhizoctonia counts or ratings. Quadris, alone or in combination with starter fertilizers, had higher stand counts than the untreated check plots. There did not appear to be any seedling injury from the starter fertilizers.

Seedling Disease Survey in Michigan

Linda Hanson, Tom Goodwill, and J. Mitch McGrath USDA-ARS

Disease Survey: Samples have been collected of diseased seedling for four years. Each year since 2008, 3-8 seedlings were sampled per field from varying numbers of fields, depending on the amount of disease observed. Results showed that many pathogens are present in MI grower fields. The most prevalent pathogen varied between years. For example, in a very wet spring, more *Aphanomyces* was observed, while in two of the four years, *Rhizoctonia* was the most commonly isolated pathogen. Three pathogens have consistently been the most commonly isolated (Table 1). Awareness of the specific seedling disease-causing organisms potentially affecting stands can allow for selection of varieties and disease management practices targeted for the particular problems.

Table 1: Percent of fields sampled that contained indicated organisms in each year out of the four for which survey data is available.

Fields with genus (%)				
Genus	**2008**	**2009**	**2010**	**2011**
Rhizoc.	100%*	30%*	72%*	36%
Aph.	50%	73%*	27%	71%
Fusarium	67%*	47%*	64%*	100%*
Pythium	14%	40%	27%	21%
Phoma	28%	18%	9%	29%
Other	5%	18%	27%	4 spp.

* Indicates that fungus was isolated from more than half of the seedlings in one or more fields that year and was the sole fungus isolate from the majority of seedling beets in at least one field in the year.

Rhizoctonia solani isolates were further characterized to anastomosis group (AG). Of the *R. solani* collected, the majority of isolates (82%) were AG-2-2, traditionally associated with crown and root rot (CRR), the majority of the remaining were AG-4 (prior to 2000 reported as the primary seedling pathogen).

In greenhouse and/or laboratory tests, MI seedling isolates of *R. solani* (both AG-4 and AG-2-2), Fusarium species, *Pythium*, Aphanomyces, and *Phoma* all caused damping-off of seedlings. All could kill some beet varieties, and reduced growth or weakened others.

Other species were isolated infrequently during the survey. These included *Alternaria* spp, *Mucor*, and *Rhizopus*. All three have been reported as weak pathogens of sugar beet seedlings. In other crops, *Rhizopus* can cause pre-emergence damping-off. Stand of some varieties was reduced when *Rhizopus* was added to the soil. No strong symptoms were observed for the other genera in greenhouse tests.

continued on next page

Seedling Diseases 2011
Determining Sugarbeet Pathogens

Figure 1. *Beet seedling samples with damping-off symptoms.*

PIONEER • BIG CHIEF
MICHIGAN SUGAR

Date of Harvest Trial

Average of 2 Locations • Sylvester & Knoerr Farms

Trial Quality: Good
Locations: Tuscola / Bay County
Variety: SX-1291RR
Plot Size: 4 Rows X 38 ft
Reps: 6
Seeding Rate: 4.4 inches

Harvest Date	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	B/100	Rain Inch	Daily GDD	Pmt/ Ton
Oct 1	$2,092	7314	264	27.8	18.1	**94.4**	**182**	1.8	23	$76.75
Oct 15	$2,043	8245	**290**	28.5	**19.6**	**94.9**	**179**	0.3	25	$71.66
Nov 1	$2,024	**9013**	273	**33.3**	18.5	**94.8**	**185**	3.2	12	$60.74
Sep 15	$1,988	5812	253	23.0	17.4	94.3	**187**	0.5	31	$86.29
Sep 1	$1,637	4304	209	20.4	15.1	92.7	**188**	1.1	34	$80.11
Aug 15	$1,476	3394	184	18.4	13.3	92.9	**182**	2.9	34	$80.27
Average	$1,877	6347	246	25.2	17.0	94.0	183.9			$75.97
LSD 5%		536.8	9.7	1.8	0.5	0.5	ns(18)			
CV %		7.1	3.3	5.9	2.5	0.4	8.1			

Bold: Results are not statistically different from top-ranking treatment in each column.
Rain and GDD: Total rainfall and average daily GDD 14-16 days prior to harvest.
$/Acre: Figured using a $60 payment.

SUMMARY:

The $/Acre payment was figured using the new early harvest payment system. Sugarbeets were planted at a 4.4 inch spacing with a 12-row Monosem drill. The plots were well maintained and diseases were not a problem. Nematodes were detected at a low level at the Bay City location. Sugarbeets were hand dug, hand topped, cleaned and weighed at the appropriate dates. Quality samples were processed at the MARL lab. The highest yield and income came from the November 1 harvest date, however, grower payment was the highest October 1. Three inches of rain fell prior to the November 1 harvest date and the sugar level was reduced from the mid Oct timing. Ten tons and one point of sugar were gained from mid-September to November 1. Warm weather and plentiful rainfall allowed for continued growth during the harvest season.

Date of Harvest Trial

Sylvester Farms • Reese, MI

Trial Quality: Very Good
Location: Tuscola County
Planting Date: May 5
Variety: SX-1291RR

Soil Info: Silt loam, 2.8% OM, 7.9 pH
Nutrients: Optimum or above
Added N: 135 lb

Plot Size: 4 Rows X 38 ft
Reps: 6

Harvest Date	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	B/100	Rain Inch	Daily GDD	Pmt/ Ton
Sep 15	$2,393	7024	251	28.0	17.2	**94.5**	**192**	0.8	31	$85.33
Oct 1	$2,375	8423	262	31.2	18.1	94.2	**181**	2.1	22	$76.23
Oct 15	$2,353	9515	**286**	33.3	**19.2**	**95.2**	**179**	0.2	25	$70.61
Nov 1	$2,303	**10378**	259	**40.0**	17.7	94.4	**197**	3.1	11	$57.58
Sep 1	$2,111	5492	216	25.4	15.5	92.7	**185**	0.9	33	$82.94
Aug 15	$1,874	4296	186	23.1	13.5	92.9	**185**	3.2	34	$81.24
Average	$2,235	7521	243	30.3	16.9	94.0	186.6			$75.66
LSD 5%		752.8	15.5	2.2	0.8	0.7	ns(23)			
CV %		8.4	5.4	6.2	3.9	0.8	10.2			

Bold: Results are not statistically different from top-ranking treatment in each column.
Rain and GDD: Total rainfall and average daily GDD 14-16 days prior to harvest.
$/Acre: Figured using a $60 payment.

SUMMARY:

The $/Acre payment was figured using the new early harvest payment system. Sugarbeets were planted at a 4.4 inch spacing with a 12-row Monosem drill. The plots were well maintained and no disease or other issues compromised the trial. Plots were hand dug, hand topped, cleaned and weighted at the appropriate dates. Quality samples were processed at the MARL lab. Sugarbeets yields were greatest when harvested on Nov 1, however, grower payment was highest during early delivery.

Date of Harvest Trial

Knoerr Farms • Bay City, MI

Trial Quality: Fair-Good
Location: Bay County
Planting Date: May 6
Variety: SX-1291RR

Soil Info: Sandy Clay loam, 2.9% OM, 7.5 pH
Nutrients: Adequate
Added N: 100 lb

Plot Size: 4 Rows X 38 ft
Reps: 6

Harvest Date	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	B/100	Rain Inch	Daily GDD	Pmt/ Ton
Oct 1	$1,805	6205	265.9	23.4	18.1	**94.7**	**183**	1.5	23	$77.28
Oct 15	$1,724	6971	**294.2**	23.7	**19.9**	94.6	**180**	0.3	25	$72.70
Nov 1	$1,702	**7648**	**287.5**	**26.6**	19.2	**95.3**	**173**	3.2	12	$63.90
Sep 15	$1,574	4599	256.3	18.0	17.7	94.1	**181**	0.2	31	$87.26
Sep 1	$1,192	3116	201.3	15.4	14.6	92.7	**191**	1.2	34	$77.30
Aug 15	$1,087	2491	181.5	13.7	13.2	92.9	**179**	2.6	34	$79.30
Average	$1,514	5172	247.8	20.2	17.1	94.0	181.2			$76.29
LSD 5%		618.1	12.2	2.2	0.6	0.6	ns(21)			
CV %		10.1	4.1	9.1	3.2	0.6	9.7			

Bold: Results are not statistically different from top-ranking treatment in each column.
Rain and GDD: Total rainfall and average daily GDD 14-16 days prior to harvest.
$/Acre: Figured using a $60 payment.

SUMMARY:

The $/Acre figures reflect the early season payment schedule. Sugarbeets were planted at a 4.4 inch spacing with a 12-row Monosem drill. The plots were well maintained and diseases were not a problem. Nematodes were detected at a low level which may have increased variability. Sugarbeets were hang dug, hand topped, cleaned and weighed at the appropriate dates. Quality samples were processed at the MARL lab. The Oct 1 and Oct 15 harvest dates returned the most in this trial. Based on previous trials, the most profitable harvest date is highly influenced by weather.

Date of Harvest Trial

Gerstenberger Farms • Sandusky, MI

Trial Quality: Good
Location: Sanilac County
Planted: May 7
Variety: B-18RR4N
Previous Crop: Soybeans

Spacings: Rows-28"; Seeds-60,000
Fertilizer: 2x2 - 24-36-22-4Mn-1B; PPI - 90# N
Soil Type: Parkhill Loam
Tillage: Chisel; Spring 1x Field Cult.

Harv/Sample: See Treatments
Herbicides: 2x Glyphosate
Replicated: 4x
Fungicide: 69 DSV - Inspire XT
121 DSV - Gem

Harvest Date	RWSA	RWST	T/A	% Sugar	$/Acre	Revenue				
						Adjust %	Early Dig Charge	Net Payment - Base $60	Revenue	Diff. from Oct 22
9/14/11	5160	248	20.8	17.0	94.4	153.2	$0.00	$83.98	$1,747	-$27
9/22/11	5680	249	22.8	16.9	95.1	142.0	$0.00	$78.30	$1,782	$8
10/3/11	6796	250	27.2	16.8	95.5	126.6	$0.00	$69.87	$1,902	$128
10/17/11	7714	278	27.7	18.4	95.9	107.0	$0.00	$65.81	$1,824	$51
10/24/11	8634	269	32.2	17.9	95.8	100.0	$2.74	$56.67	$1,822	$49
10/22/11	8329	273	30.8	—	—	100.0	$2.74	$57.64	$1,774	$0

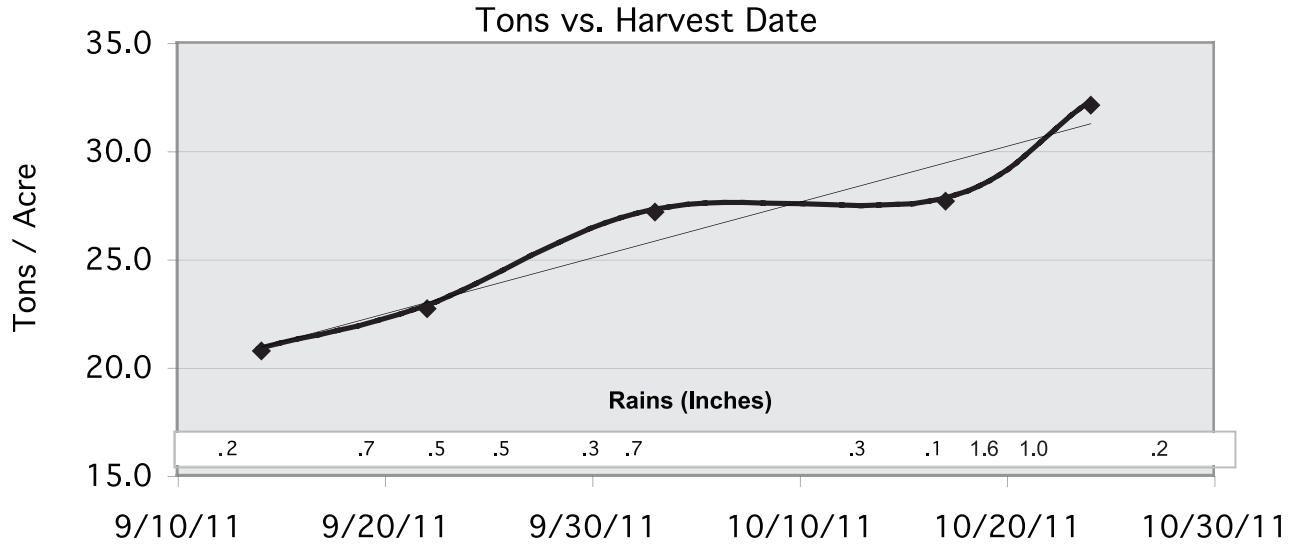
Revenue: Revenue per acre assuming a $60 payment and company average RWST=271.48.
Net Payment: Calculated by dividing RWST by company average RWST, then multiply by Adjust %, and then by $60.
Diff. from Oct. 22: The values for October 22 were not measured as part of the trial. These values are from the trendlines for tons and RWSA and are supplied for revenue comparison purposes due to this being considered the first day of permanent pile.

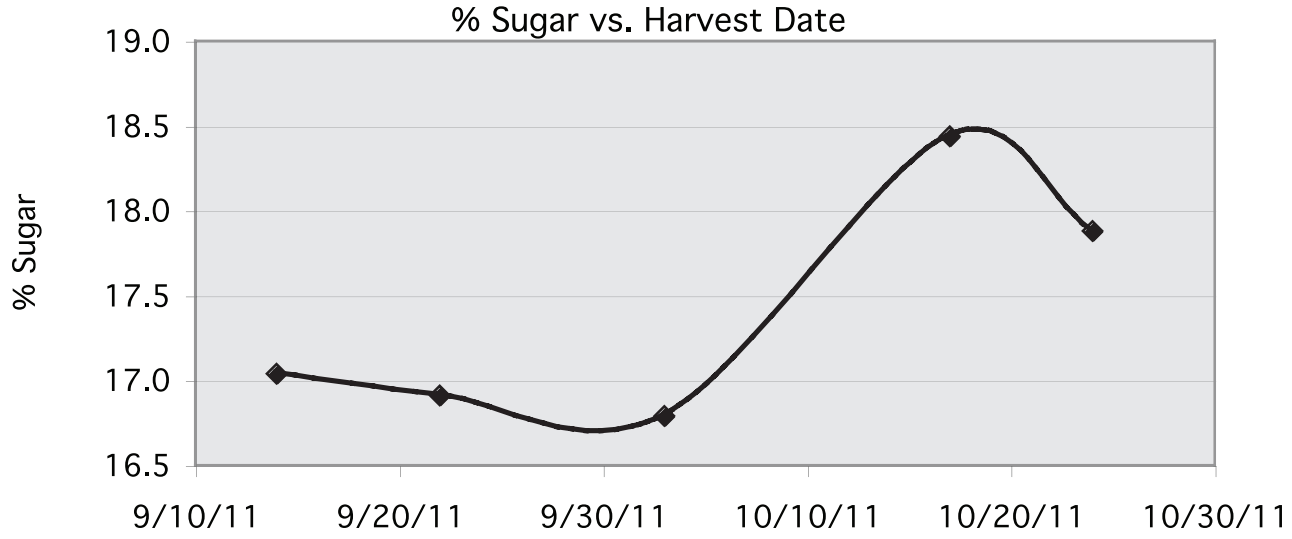
Emergence: Good
Rhizoctonia: Low / Moderate
Quadris App: In Furrow (5 oz, 4" Band) & 6-8 Leaf (5 oz)

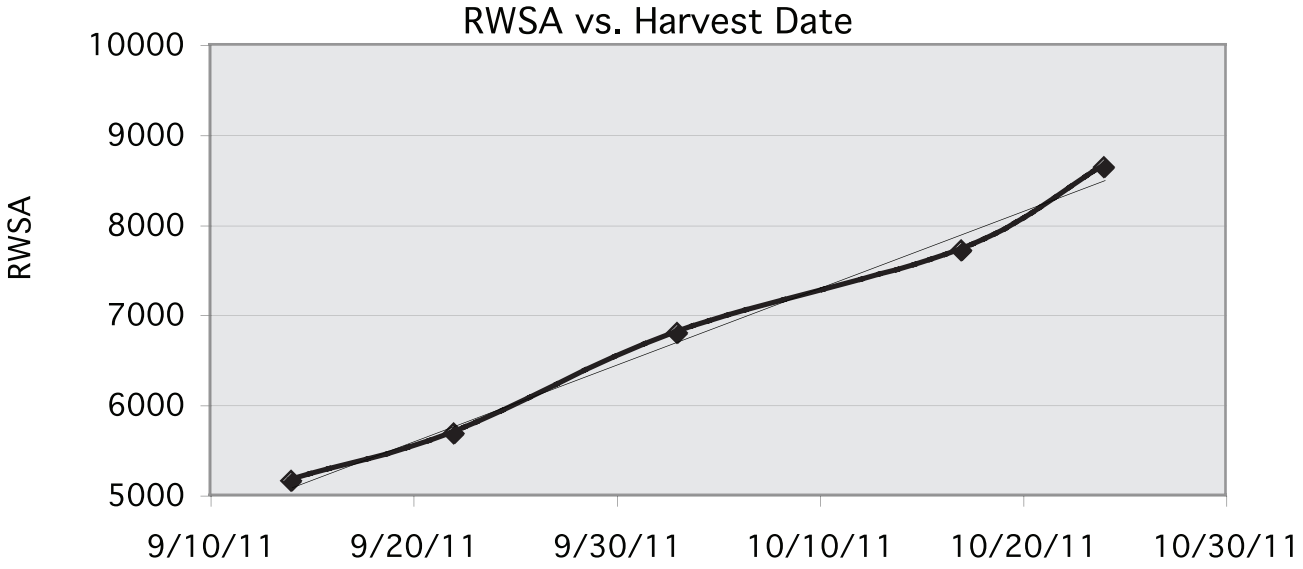
Cerc Leafspot: Good Control
Nematodes: Not Detected
Weather: Very Wet Early, Very Dry Late Summer

COMMENTS:

This field had experienced very dry conditions prior to first dig on September 14. Approximately 0.7 inches of rainfall occurred between first and second dig. A total of 3 inches of rainfall occurred between the third and final harvest. Rapid root growth occurred after moisture supplies were replenished. This study was done by opening two lands in a field, and harvesting 4 strips for each harvest date. The trendline for tonnage indicates the rate of growth was about 1.8 tons per week. The trendline for RWSA indicates a rate of growth of about 595 pounds per week. The rate of growth in this trial was much higher than a second trial done at the Saginaw Valley Research Farm and a 2010 trial done with Laracha Farms. Both of those trials showed tonnage growth rates of about 1 ton per week. When comparing revenue, keep in mind the reduction in cost to truck less tons in early delivery would econimically favor the early delivery dates. The difference in trucking cost is not accounted for in the revenue calculation.


Tons vs. Harvest Date
Tons / Acre
35.0
30.0
25.0
20.0
15.0
Rains (Inches)
.2 .7 .5 .5 .3 .7 .3 .1 1.6 1.0 .2
9/10/11
9/20/11
9/30/11
10/10/11
10/20/11
10/30/11


% Sugar vs. Harvest Date
% Sugar
19.0
18.5
18.0
17.5
17.0
16.5
9/10/11
9/20/11
9/30/11
10/10/11
10/20/11
10/30/11


RWSA vs. Harvest Date
RWSA
10000
9000
8000
7000
6000
5000
9/10/11
9/20/11
9/30/11
10/10/11
10/20/11
10/30/11

Date of Harvest Trial
Saginaw Valley Research Farm

Trial Quality: Good
Location: Tuscola County
Planted: May 6
Variety: C-RR827
Previous Crop: Corn

Spacings: Rows-30", Seeds-46,000
Fertilizer: PPI 125# N by Urea
Soil Type: Loam
Tillage: Moldboard; Spring-2x S Tine

Harv/Sample: See Treatments
Herbicides: 2x Glyphosate + Dual
Replicated: 4x
Fungicide: 42 DSV - Proline
63 DSV - Headline
111 DSV - Eminent
141 DSV - Headline

Harvest Date	RWSA	RWST	T/A	% Sugar	$/Acre	Revenue				
						Adjust %	Early Dig Charge	Net Payment - Base $60	Revenue	Diff. from Oct 22
9/21/11	5890	310	19.0	21.1	94.3	143.4%	$0.00	$98.39	$1,866	$264
9/29/11	6406	313	20.5	21.3	94.2	132.2%	$0.00	$91.43	$1,871	$269
10/10/11	6537	312	21.0	21.2	94.2	116.8%	$0.00	$80.50	$1,688	$86
10/24/11	7788	322	24.2	21.7	94.5	100.0%	$2.74	$68.32	$1,655	$53
10/22/11	7519	320	23.6	—	—	100.0%	$2.74	$68.00	$1,602	$0

Revenue: Revenue per acre assuming a $60 payment and company average RWST=271.48.
Net Payment: Calculated by dividing RWST by company average RWST, then multiply by Adjust %, and then by $60.
Diff. from Oct. 22: The values for October 22 were not measured as part of the trial. These values are from the trendlines for tons and RWSA and are supplied for revenue comparison purposes due to this being considered the first day of permanent pile.

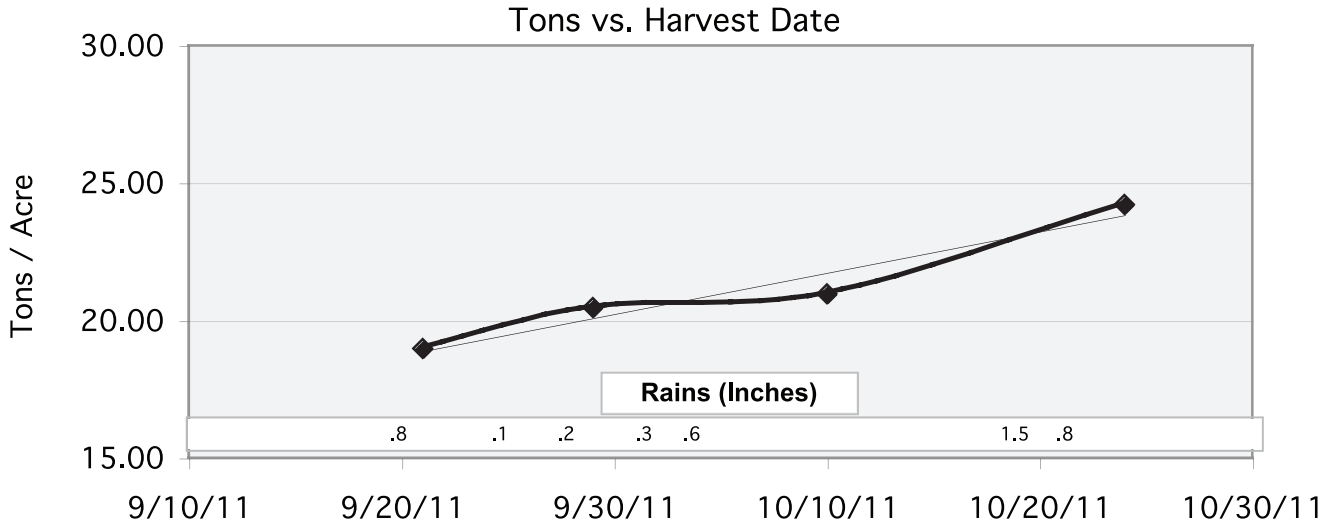
Emergence: Good
Rhizoctonia: Low / Moderate
Quadris App: 6-8 Leaf

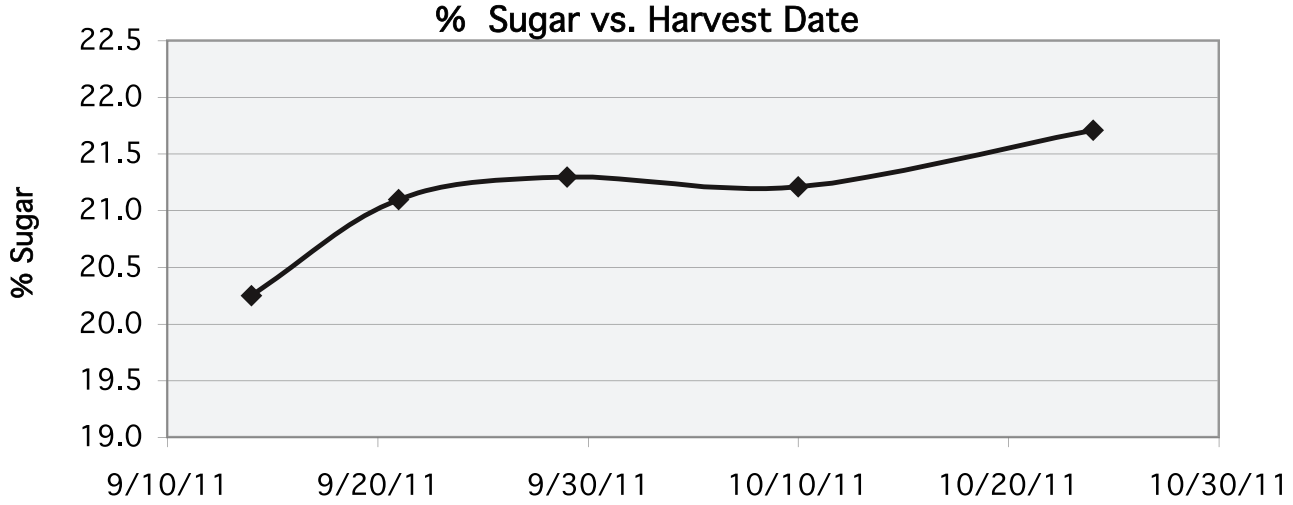
Cerc Leafspot: Good Control
Nematodes: Not Detected
Weather: —

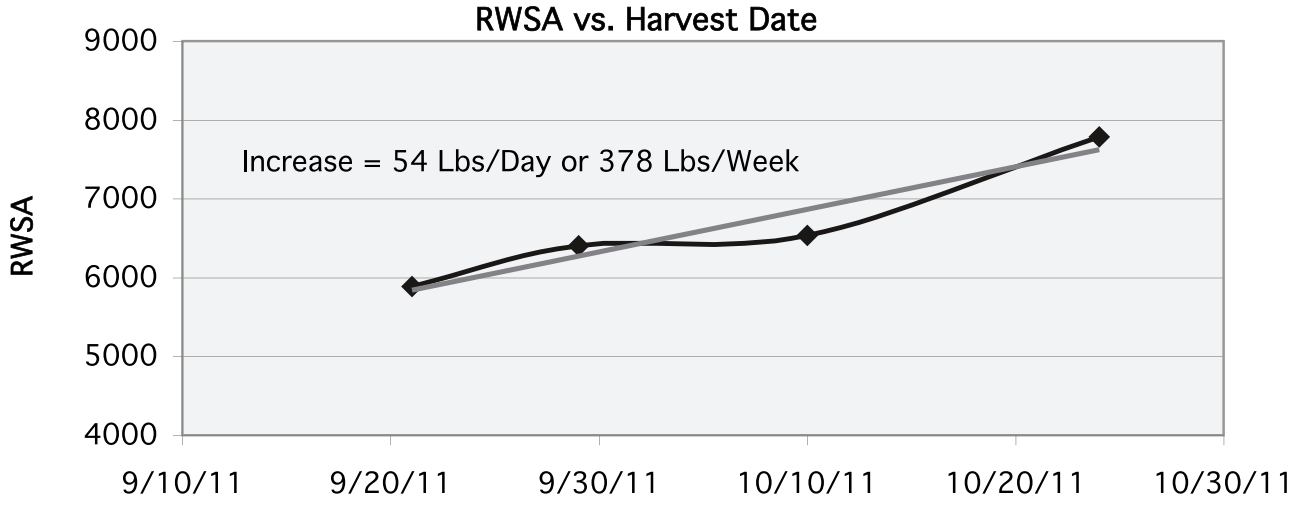
COMMENTS:

This study was done by opening two lands in a large block of beets, and harvesting 4 strips for each harvest date. Prior to the first harvest date, soil moisture was very low with less than 1 inch of rainfall in the previous 18 days. In between the first and second harvest date, approximately 0.7 inches of precipitation was received. From the second to the last harvest date almost 3 inches of rainfall occurred. The trendline for tonnage indicates the increase per week was 1.05 tons per acre. When comparing revenue, keep in mind the reduction in cost to truck less tons in early delivery would econimically favor the early delivery dates. The difference in trucking cost is not accounted for in the revenue calculation.

Date of Harvest Trial • Saginaw Valley Research Farm

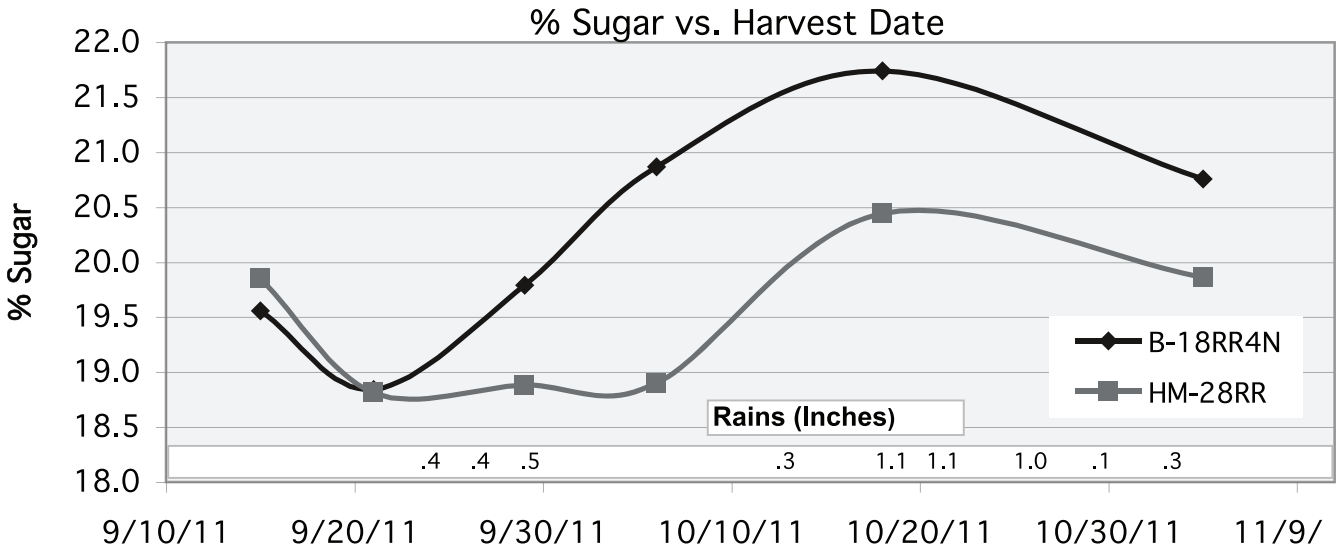


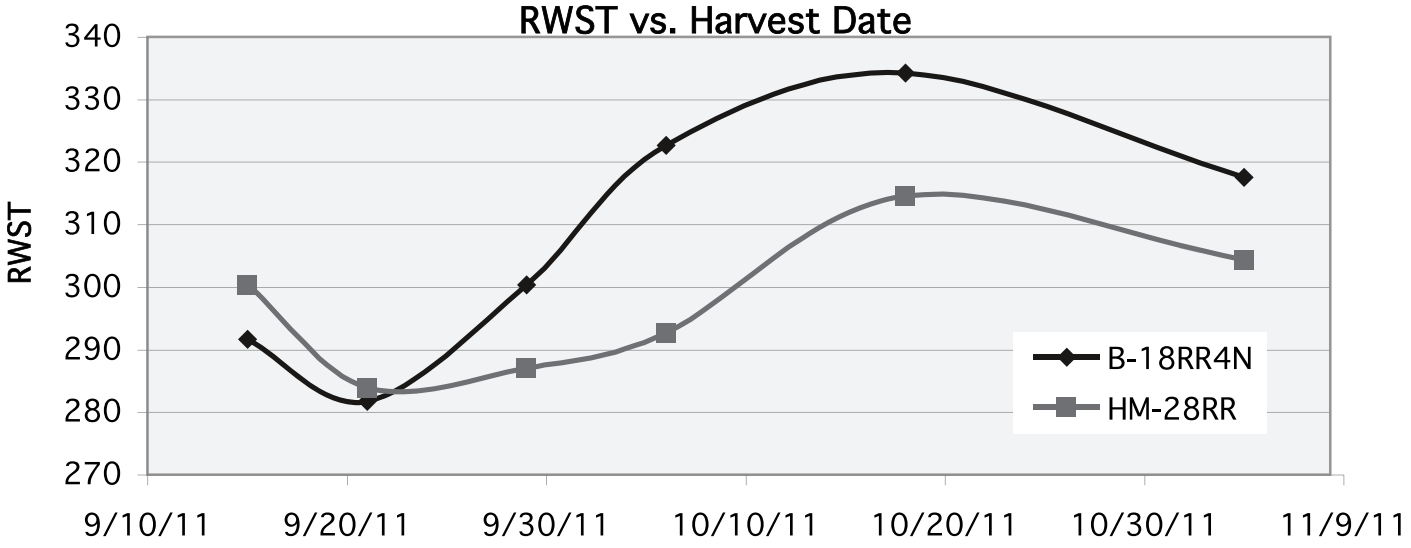




Date of Harvest Trial

Sugars • Meylan Farms • Auburn, MI





COMMENTS:

This trial was done by pulling sugar samples from the Meylan variety trial on six different occasions through the harvest season. The purpose of the trial was to compare sugar content through the entire harvest season for a medium-high sugar variety (B-18RR4N) and a low sugar variety (HM-28RR). On September 15, the sugar content of both the varieties were very similar. Previous data would indicate that a high sugar variety would always be higher than a poor variety. By mid-October, sugar content peaked for both varieties. There was a difference of about 1.5% sugar and 20 pounds of sugar per ton. From October 19 until final dig, over 3 inches of rainfall occurred which lowered sugar content of both varieties.

Row Spacing Trials: 22" vs 30"

Average of 3 Years

Overall Summary (Average of 7 Trials)

Row Spacing	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Row Close
22 inch	**$2,055**	**7895**	**254**	**30.8**	**17.5**	**94.2**	**86.6**
30 inch	$1,776	6822	**246**	27.2	16.9	**94.1**	73.5
Average	$1,916	7358	250	29.0	17.2	94.2	80.1
LSD 5%	118.9	457.1	ns(8.6)	2.1	0.5	ns(0.6)	4.1
CV %	2.8	2.8	1.5	3.2	1.3	0.3	1.5

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY:
Seven small plot replicated trials were conducted from 2009 to 2011 to compare sugarbeet row spacing (22 inch compared to 30 inch) and in-row sugarbeet populations. When averaged over all 7 trials sugarbeets grown in narrow rows (22 inch) out yielded sugarbeets grown in wide rows (30 inch) by 3.6 tons per acre. Sugar content in narrow rows was increased by 0.6 points. RWST, RWSA, canopy closure and grower income ($/Acrecre) were also significantly higher in the narrow row plots. Recoverable sugar per acre was highest with 60,000 beet per acre in narrow rows and with 40,000 beets per acre in wide rows. It appears that narrow row plots yielded more because of 2 main reasons, 1) a quicker and more complete canopy closure which allows the crop to intercept more light and thus manufacture more sugar, and 2) the ability to benefit from better spaced high beet populations. High populations in wide row plots produces too many small beets that fall through the harvester. These results are similar to other trials conducted in Michigan by Sugarbeet Advancement, Christy Sprague and researchers at Michigan State University.

Refer to next page for additional information about sugarbeet populations.

Row Spacing Trials: 22" vs 30"

Average of 3 Years

Effect of Different Sugarbeet Populations on Narrow Rows

Row Spacing	Beets/ Acre	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Row Close
22	60000	**$2,272**	**9152**	**277**	**32.9**	**18.8**	**94.7**	**92**
22	40000	$2,155	8684	262	**33.1**	17.9	94.5	**91**
22	50000	$2,137	8608	264	**32.7**	18.1	94.3	**93**
22	30000	$2,089	8417	258	**32.6**	17.8	94.0	**91**
22	20000	$1,987	8007	249	**32.2**	17.4	93.6	**89**
Average		$2,128	8574	262	32.7	18.0	94.2	91
LSD 5%		93.6	377	4.6	ns(1.7)	0.2	0.4	4.3
CV %		2.8	2.79	1.1	3.2	0.9	0.3	2.3

Effect of Different Sugarbeet Populations on Wide Rows

Row Spacing	Beets/ Acre	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Row Close
30	40000	**$1,970**	**7687**	**258**	**29.7**	**17.7**	**94.5**	**79**
30	50000	**$1,938**	**7562**	**259**	**29.1**	**17.7**	**94.6**	**78**
30	30000	**$1,923**	**7502**	**253**	**29.6**	**17.4**	**94.3**	**78**
30	20000	$1,829	7135	244	**29.2**	17.1	93.4	**75**
Average		$1,915	7471	254	29	17	94	77
LSD 5%		79.8	311.4	7.4	ns(1.0)	0.4	0.4	ns(4.8)
CV %		2.56	2.56	1.8	2.2	1.4	0.2	2.9

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

Row Spacing & Plant Population Trials: 22" vs 30"

Sylvester Farm, Reese, MI

Trial Quality: Very Good
Location: Tuscola County
Planted: May 9
Harvested: October 13
Previous Crop: Oilseed Radish
Variety: HM-27RR

Rhizoc Control: Good
2 Quadris applications
Cercospora Control: Good
4 fungicide applications
Weed Control: Good
Seasonal Rainfall: 14.5 inches

Soil Info: Silt Loam, 2.6% OM, 7.6 pH
Plot Size: 6 Rows X 38 ft
Reps: 6
Tillage: Stale seed bed

Row Spacing	Plants/A	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Row Close
22 inch	40,000	**$2,083**	**9395**	276	**34.1**	18.8	**94.4**	**93**
22 inch	60,000	**$2,076**	**9364**	**290**	32.3	**19.5**	**94.9**	**92**
22 inch	30,000	**$2,016**	**9092**	271	**33.5**	18.6	94.2	**91**
22 inch	50,000	**$1,990**	**8974**	**282**	31.8	**19.1**	**94.7**	**93**
30 inch	40,000	$1,908	8604	275	31.3	18.6	**94.9**	83
22 inch	20,000	$1,887	8512	261	**32.6**	18.1	93.8	87
30 inch	30,000	$1,815	8186	272	30.1	18.4	**94.9**	82
30 inch	20,000	$1,790	8073	263	30.6	18.1	**94.3**	78
30 inch	15,000	$1,631	7354	244	30.2	17.1	93.4	73
Average		$1,911	8617	271	31.8	18.5	94.4	86
LSD 5%		103.7	467.7	9.7	1.5	0.5	0.7	3.4
CV %		4.7	4.7	3.1	4.1	2.2	0.6	3.4

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY:
This small plot replicated trial compared narrow row (22 inch) and wide row (30 inch) sugarbeet production. In-row sugarbeet populations from 15,000 to 60,000 were also evaluated. When averaged over all populations narrow row treatments out yielded wide row treatments by 2.4 tons per acre and increased sugar levels by 0.7 points. The narrow row plots also achieved a quicker and more complete canopy cover. Higher sugarbeet populations produced higher yields and sugar content for both row spacings.

Refer to next page for additional information about sugarbeet populations.

Row Spacing & Plant Population Trials: 22" vs 30"

Sylvester Farm, Reese, MI

Row Spacing Effect (Average over all populations)

Row Spacing	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Row Close
22 inch rows	**$2,011**	**9068**	**276**	**32.9**	**18.8**	**94.4**	**91**
30 inch rows	$1,786	8054	264	30.5	18.1	**94.4**	79
Average	$1,898	8561	270	31.7	18.5	94.4	85
LSD 5%	46.3	208.9	3.5	0.5	0.2	ns(0.3)	2.1

Sugarbeet Population Effect (Average over both row spacings)

Sugarbeet Popluation	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Row Close
40,000 plants/A	**$1,995**	**8999**	**276**	**32.7**	**18.7**	**94.7**	**88**
30,000 plants/A	$1,915	8639	**272**	**31.8**	**18.5**	**94.5**	**86**
20,000 plants/A	$1,839	8292	262	31.6	18.1	94.0	83
Average	$1,917	8644	270	32.0	18.4	94.4	86
LSD 5%	63.2	285.1	6.1	1.0	0.3	0.4	2.0

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

Row Spacing Trials: 22" vs 30"

Stoutenburg Farms, Sandusky, MI

Trial Quality: Very Good
Location: Sanilac County
Planted: May 13
Harvested: October 10
Previous Crop: Dry Beans
Variety: HM-27RR

Rhizoc Control: Good
2 Quadris applications
Cercospora Control: Good
4 fungicide applications
Weed Control: Good
3 Roundup applications

Seasonal Rainfall: 13.95 inches
Soil Info: Loam, 3.9% OM, 7.2 pH
Plot Size: 6 Rows X 100 ft
Reps: 10
Tillage: Stale seed bed

Row Spacing	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Row Close	Vigor 1-10	Beets/ 100 ft
22 inch	**$1,433**	**4690**	**204**	**22.9**	**14.4**	**94.1**	**80**	**7.0**	**126**
30 inch	$1,033	3380	188	17.9	13.5	**93.5**	67	6.5	134
Average	$1,233	4035	196	20.4	13.9	93.8	73	6.7	130
LSD 5%	55.3	180.9	8.2	0.6	0.4	ns(0.8)	4.6	0.4	8.2
CV %	4.4	4.4	4.1	3.0	2.9	0.8	6.2	5.6	6.2

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY:
Sugarbeet emergence was not good enough to establish high sugarbeet populations so the trial was changed into a replicated strip trial with 6 row X 100 ft strips. The 30 inch row strips had slightly more beets per 100 feet than the 22 inch row strips. Sugarbeet yields were 5 tons higher in the narrow row strips and sugar levels were 0.9 points higher in the narrow row strips. There were 10 replications for each row spacing and the data is considered to be reliable.

Row Spacing Trials: 22" vs 30"

Row Spacing • Blumfield, MI

Trial Quality: Good
Location: Saginaw County
Planted: May 5
Harvested: September 16
Previous Crop: Soybeans
Variety: B-17RR32

Rhizoc Control: Good
2 Quadris applications
Cercospora Control: Good
4 fungicide applications
Weed Control: Good
3 Roundup applications

Seasonal Rainfall: 13.1 inches
Soil Info: Loam, 3.0% OM, 7.6 pH
Plot Size: 6 Rows X 100 ft
Reps: 12
Tillage: Stale seed bed

Row Spacing	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Row Close	Vigor 1-10	Beets/ 100 ft
22 inch	**$1,584**	**5846**	**229**	**25.6**	**16.3**	**93.0**	**82.2**	**7.4**	**131**
30 inch	$1,169	4317	214	20.1	15.4	**92.7**	70.3	6.8	**126**
Average	$1,377	5082	221	22.9	15.9	92.8	76.3	7.1	128
LSD 5%	101.6	375.2	8.1	1.3	0.4	ns(0.4)	1.3	0.4	ns(11)
CV %	9.8	9.8	4.9	7.8	3.7	0.6	2.3	7.2	11.3

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY:

Sugarbeet emergence was not good enough to establish high sugarbeet populations so the trial was changed into a replicated strip trial with 6 row X 100 ft strips. The 30 inch row strips had slightly fewer beets per 100 feet than the 22 inch row strips. Sugarbeet yields were 5.5 tons higher in the narrow row strips and sugar levels were 0.9 points higher in the narrow row strips. There were 12 replications for each row spacing and the data is considered to be reliable.

Tachigaren 20 & 45 gm Seed Treatments • Average of 4 Locations

Plot Size: 2 Rows X 38 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4.4 inches

Treatment	Rate	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Emerge First	% Emerge Second
Tach 45	45g/unit	**$1,454**	**6587**	**265.6**	**24.4**	**18.0**	**94.8**	**43**	**59**
Tach 20	20g/unit	**$1,445**	**6505**	**267.7**	**24.0**	**18.1**	**94.9**	**41**	**56**
Untreated		**$1,422**	**6384**	**268.0**	**23.6**	**18.1**	**94.8**	**42**	**56**
Average		$1,440	6492	267.1	24.0	18.1	94.8	42	57
LSD 5%		ns(112)	ns(451)	ns(5.1)	ns(2.1)	ns(0.2)	ns(0.4)	ns(3.8)	ns(5.1)
CV %		4.5	4.0	1.1	5.0	0.7	0.2	5.2	5.2

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY:

There is no significant difference for the treatments for all factors except Tach 45 has a higher stand at 97 days over the untreated at one location. This trial indicates no decrease or increase in stand or the production factors for 20 gram and 45 gram rates of Tachigaren at these four locations.

Tachigaren 20 & 45 gm Seed Treatments • Two Locations

Knoerr

Trial Quality: Good
Location: Bay County
Planted: May 6
Harvested: November 5
Previous Crop: Wheat/ Radish

Rhizoc Control: Good
Cercospora Control: Good
Seasonal Rainfall: 19.2 inches

Soil Info: Sandy Clay Loam, 2.9% OM, 7.5 pH
Plot Size: 2 Rows X 38 ft
Reps: 9
Row Spacing: 22 inches
Seeding Rate: 4.4 inches

Treatment	Rate	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Emerge June 11 36 Day	% Emerge Aug 11 97 Day
Tach 45	45 g/unit	**$1,639**	**8085**	**297**	**27.2**	**19.8**	**95.3**	**50**	**60**
Untreated		**$1,572**	**7756**	**293**	**26.5**	**19.7**	**95.1**	**47**	52
Tach 20	20 g/unit	**$1,560**	**7692**	**298**	**25.9**	**19.8**	**95.4**	**46**	**56**
Average		$1,590	7844	296	26.5	19.8	95.3	48	56
LSD 5%		ns(161)	ns(793)	ns(6.7)	ns(2.7)	ns(0.3)	ns(0.5)	ns(5.5)	5.1
CV %		10.1	10.1	2.3	10.1	1.6	0.5	11.6	9.1

Gilford

Trial Quality: Fair
Location: Tuscola County
Planted: May 18
Harvested: September 22
Previous Crop: Oilseed Radish

Rhizoc Control: Good
Cercospora Control: Good
Seasonal Rainfall: 7 inches

Soil Info: Silt Loam, 8.6% OM, 7.8 pH
Plot Size: 4 Rows X 38 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4.4 inches

Treatment	Rate	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Emerge May 24 6 Day	% Emerge June 11 24 Day
Untreated		**$1,243**	**4278**	**204**	**20.9**	**15.0**	**91.8**	**10**	**67**
Tach 20	20 g/unit	**$1,207**	**4154**	**211**	**19.6**	**15.3**	**92.4**	**10**	**64**
Tach 45	45 g/unit	**$1,095**	**3767**	**204**	**18.4**	**15.0**	**92.1**	**8**	**64**
Average		$1,182	4067	206	19.6	15.1	92.1	9	65
LSD 5%		ns(228)	ns(784)	ns(17)	ns(2.9)	ns(1.2)	ns(1.0)	ns(5.8)	ns(19.3)
CV %		15.0	15.0	6.6	11.6	6.0	0.8	48.8	23.1

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

Tachigaren 20 & 45 gm Seed Treatments • Two Locations

Bebow

Trial Quality: Fair
Location: Gratiot County
Planted: June 2
Harvested: October 28
Previous Crop: Dry Beans

Rhizoc Control: Good
Cercospora Control: Good
Seasonal Rainfall: 12.85 inches

Soil Info: Sandy Clay Loam, 3.1% OM, 6.7 pH
Plot Size: 2 Rows X 38 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4.4 inches

Treatment	Rate	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Emerge June 17 15 Day	% Emerge Aug 11 70 Day
Tach 45	45g/unit	**$1,744**	**8058**	**276**	**29.2**	**18.5**	**95.3**	**57**	**61**
Tach 20	20g/unit	**$1,719**	**7942**	**277**	**28.6**	**18.5**	**95.4**	**55**	**59**
Untreated		**$1,617**	**7469**	**279**	**26.7**	**18.7**	**95.4**	**59**	**56**
Average		$1,693	7823	277	28.2	18.6	95.4	57	59
LSD 5%		ns(402)	ns(1858)	ns(11)	ns(6.2)	ns(0.6)	ns(0.5)	ns(9.4)	ns(8.5)
CV %		18.5	18.5	3.0	17.1	2.4	0.4	12.9	11.3

Bender

Trial Quality: Fair
Location: Areanac County
Planted: May 17
Harvested: November 4
Previous Crop: Pickles/Radish

Rhizoc Control: Good
Cercospora Control: Good
Seasonal Rainfall: 14.71 inches

Soil Info: Sandy Clay Loam, 2.2% OM, 7.4 pH
Plot Size: 2 Rows X 38 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4.4 inches

Treatment	Rate	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	% Emerge June 9 23 Day	% Emerge Aug 11 86 Day
Tach 45	45g/unit	**$1,338**	**6439**	**285**	**22.9**	**18.7**	**96.5**	**57**	**50**
Tach 20	20g/unit	**$1,282**	**6169**	**290**	**21.1**	**18.9**	**96.6**	**51**	**51**
Untreated		**$1,267**	**6098**	**291**	**20.9**	**19.0**	**96.7**	**53**	**45**
Average		$1,295	6235	289	21.6	18.9	96.6	54	49
LSD 5%		ns(342)	ns(1645)	ns(9.3)	ns(5.5)	ns(0.5)	ns(0.4)	ns(12.3)	ns(7.2)
CV %		19.8	19.8	2.5	19.1	2.1	0.3	17.7	11.5

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

Seed Treatment and Priming Trials

Michigan Sugar Company has evaluated seed treatments from several seed and chemical companies. Information from these trials will not be made public because the research was paid for by the companies and we agreed to keep the data confidential. The reason we conducted these trials was because the information learned will benefit our Cooperative.

Priming Trials:

Numerous trials were conducted and it is apparent that improvements are being made by seed and priming companies. The trials were coded but we can tell that the new experimental priming treatments are superior to the commercial standard treatments.

Rhizoctonia Seed Treatments:

Several trials were conducted for different companies evaluating seed treatments for the control of Rhizoctonia. Results from these trials have been generally positive, however, these seed treatments will not be a complete solution for fields with heavy disease levels. Several seed treatments in combination with Quadris applications appear to be better than Quadris alone.

Miscellaneous Trials:

We have conducted other seed treatments and sprayable products for control of nematodes and diseases. Several of these treatments look positive but will likely need to be coupled with another method of control for badly infested fields.

Nitrogen Rates on Late Planted Beets • Roggenbuck Farm, Harbor Beach, MI

Trial Quality: Fair
Location: Huron County
Planted: June 2
Harvested: October 6
Previous Crop: Wheat/Clover

Rhizoc Control: Good
Cercospora Control: Good
Seasonal Rainfall: 15 inches

Soil Info: Loam, 3.7% OM, 7.0 pH
Plot Size: 6 Rows X 76 ft
Reps: 3
Row Spacing: 22 inches
Seeding Rate: 4.2 inches

Nitrogen Applied & Timing	Net $/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Untreated	**$1,681**	**7009**	**268**	**26.2**	**18.1**	**95.0**
50 lb 2x2	**$1,659**	**7082**	**265**	**26.6**	**18.0**	**94.9**
50 lb 2x2 + 100 lb 2-4lf	**$1,538**	**6852**	**244**	**28.1**	17.0	**93.9**
50 lb 2x2 + 25 lb 2-4lf	**$1,529**	**6610**	**241**	**27.4**	17.0	93.4
50 lb 2x2 + 75 lb 2-4lf	**$1,509**	**6663**	**239**	**27.8**	16.8	93.4
50 lb 2x2 + 50lb 2-4lf	**$1,490**	**6513**	**242**	**26.9**	16.8	**94.1**
Average	$1,568	6788	250	27.2	17.3	94.1
LSD 5%	ns(241)	ns(1005)	ns(18)	ns(3.2)	0.8	1.2
CV %	8.1	8.1	3.9	6.5	2.6	0.7

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment.

SUMMARY:

Nitrogen rates were compared on a late planted field (June 2). The previous crop was wheat seeded to clover. Sugarbeet yields improved marginally with more nitrogen, however, sugar levels were best without any nitrogen. Treatments with more than 50 lbs of N tended to have lower RWSA and grower income.

Nitrogen Rates Following Manure

Meadow Muth Farms • Frankenmuth, MI

Trial Quality: Excellent
Location: Saginaw County
Planted: May 5
Variety: C-RR827
Previous Crop: Silage Corn

Spacings: Rows-30"; 47,500
Fertilizer: 2x2 - 26# N & 9# S
Soil Type: Loam
Tillage: DMI & 1x F.C.; Spr. 1x F.C.

Harv/Sample: Oct 28 / Oct 12
Herbicides: 2x Glyphosate
Replicated: 3x
Fungicide: 55 DSV - Proline
110 DSV - Headline
165 DSV - Inspire XT

Treatment	Net $/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Starter + Sidedress 26# N + 60 # N	$1,902	**10097**	**306**	**33.0**	**20.6**	**94.7**
Starter Only - No Sidedress 26 # N	$1,936	**10022**	**322**	31.2	**21.3**	**95.6**
Starter + Sidedress 26# N + 30 # N	$1,900	**9989**	**305**	**32.8**	**20.5**	**94.8**
Average	—	10036	311	32.3	20.8	95.0
LSD 5%	—	643 NS	23 NS	1.1	1.1 NS	1.1 NS
CV %	—	3	3	1.6	2.3	0.5

Bold: Results are not statistically different from top-ranking treatment in each column.
Net $/Acre: Revenue per acre assuming a $60 payment and cost of $0.60/Lb of sidedressed N and $10 for application.

Emergence: Excellent
Rhizoctonia: Low
Quadris App: In Furrow, 4" Band, 6 oz.

Cerc Leafspot: Good
Nematodes: None
Weather: —

COMMENTS:

In this trial, 10,000 gallons of dairy manure was fall applied after corn silage harvest. Starter fertilizer was applied as a combination of 28% nitrogen and Thiosol. The total 2x2 starter applied was 26-0-0-9S. Nitrate test taken in early June indicated available nitrogen at 90 pounds per acre with a recommendation of 20 additional pounds. Sidedress nitrogen applications were applied as 28% at 30 and 60 pounds. There was no significant difference for RWSA. There was a significant difference for tonnage for the two sidedressed treatments. Sidedress nitrogen applications tended to suppress quality. When calculating the net revenue per acre for additional nitrogen and application cost, the return was highest for starter fertilizer alone. Soil Nitrate test accurately predicted crop response.

MICHIGAN STATE UNIVERSITY Extension
Michigan State University AgBioResearch

Nitrogen Rates Following Corn

Saginaw Valley Research Farm • Frankenmuth, MI

Kurt Steinke and Andrew Chomas, Michigan State University

Trial Quality: —
Location: Saginaw County
Planted: May 4
Harvested: October 4
Variety: Hilleshog 9042 Roundup Ready

Soil Type: Clay loam; 2.8 OM; 7.7 pH; 40 ppm P; 189 ppm K
Tillage: Conventional with light S-tine at sidedress
N Rates: See below
Spacings: 4.25 inches
Reps: 4

Treatment (Total lb N/A)	Net $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	NH2	Amino-N
0 – Check	$1,530	7309	299	24.5	19.9	95.5	41.3	2.5
40	$1,876	9092	297	30.6	19.9	95.0	76.3	4.5
80	$1,997	9800	307	31.9	20.5	95.1	106.0	6.3
120	$1,861	9277	305	30.4	20.4	95.2	117.5	6.8
160	$2,058	10352	301	34.5	20.1	95.4	91.0	5.6
$LSD_{(0.05)}$*	—	**944**	**NS**	**2.6**	**NS**	**NS**	**36.3**	**2.1**

***** LSD, least significant difference between means within a column at (α = 0.05).

SUMMARY:

Trial was conducted to more accurately determine sugarbeet nitrogen fertilizer needs and nitrogen response following corn. All treatments received 40 lbs. N/A as 28%, 20 lbs. P_2O_5/A, 50 lbs. K_2O/A. and 2 lbs. Mn/A as starter placed 2x2 on May 4 (check plots did not receive any N). The 40 lb. N/A treatment received no supplemental N beyond the starter application. Sidedress N (urea) applications were completed on June 2 and were followed by a light cultivation to avoid N volatilization. **PSNT testing done on May 4 revealed 31 lb. N available per acre 2 feet.** Total nitrogen rate had a significant effect on total yield, RWSA, and the NH2 and amino-N sugar impurities. The 160 lb. N treatment yielded significantly greater tonnage as compared to all other N treatments. The 40, 80, and 120 lbs. N fertilizer treatments resulted in similar tonnage though 80 lb. N yielded greater than 120 lb. N. RWSA followed a similar pattern as yield. Sugar impurities increased up to the 120 lb N treatment but were similar between the 80 and 120 lb N treatments. The 160 lb N rate appeared to promote enough top- and root-growth to dilute both NH2 and amino-N concentrations. First year preliminary data following corn indicate that 160-190 lbs. total N (fertilizer N and soil N, in this case 160 lb N applied plus 30 lb PSNT N credit) may be required to maximize sugarbeet yield and economic return. If fertilizing at N rates less than 160-190 lbs. total N, data show no benefit above 80-110 lbs. total N (in this case 80 lbs. N applied and 30 lb. PSNT N credit). Net economic return is based on a $60/ton payment, an average RWST equal to the trial average, and an N price of $0.68/lb. N.

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Nitrogen Rates Following Soybeans

Saginaw Valley Research Farm • Frankenmuth, MI

Kurt Steinke and Andrew Chomas, Michigan State University

Trial Quality: —
Location: Saginaw County
Planted: May 4
Harvested: October 4
Variety: Hilleshog 9042 Roundup Ready

Soil Type: Clay loam; 2.9 OM; 7.6 pH; 31 ppm P; 204 ppm K
Tillage: Conventional with light S-tine at sidedress
N Rates: See below
Spacings: 4.25 inches
Reps: 4

Treatment (Total lb N/A)	Net $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	NH2	Amino-N
0 – Check	$1,342	6412	297	21.6	19.8	95.6	61.8	3.8
40	$1,448	7048	298	23.6	19.9	95.3	73.8	4.5
80	$1,450	7184	283	25.4	18.9	95.4	107.0	6.9
120	$1,518	7643	292	26.2	19.4	95.5	82.0	5.3
160	$1,471	7544	282	26.8	19.0	95.0	108.5	6.8
$LSD_{(0.05)}$*	—	**826**	**10**	**2.5**	**0.5**	**NS**	**18.0**	**1.1**

***** LSD, least significant difference between means within a column at (α = 0.05).

SUMMARY:

Trial was conducted to more accurately determine sugarbeet nitrogen fertilizer needs and nitrogen response following soybean. All treatments received 40 lbs. N/A as 28%, 20 lbs. P_2O_5/A, 50 lbs. K_2O/A. and 2 lbs. Mn/A as starter placed 2x2 on May 4 (check plots did not receive any N). The 40 lb. N/A treatment received no supplemental N beyond the starter application. Sidedress N (urea) applications were completed on June 2 and were followed by a light cultivation to avoid N volatilization. **PSNT testing done on May 4 revealed 50 lb. N available per acre 2 feet.** Total nitrogen rate had a significant effect on total yield, % sugar, RWST, RWSA, and the NH2 and amino-N sugar impurities. The 80, 120, and 160 lb. N treatments yielded statistically similar tonnage. RWSA was maximized at the 120 lb. N treatment. Sugar impurities increased up to the 80 lb N treatment, decreased at 120 lbs. N, and again increased at 160 lbs. N. The 120 lb N rate minimized sugar impurities by supporting sufficient top- and root-growth to result in the greatest net economic return. First year preliminary data following soybean indicate that 120-170 lbs. total N (fertilizer N and soil N, in this case 120 lb N applied plus 50 lb PSNT N credit) may be required to maximize sugarbeet yield, quality, and economic return. If fertilizing at N rates less than 120-170 lbs. total N, data show no benefit above 90 lbs. total N (in this case, 40 lbs. N from starter and 50 lb. PSNT N credit). Net economic return is based on a $60/ton payment, an average RWST equal to the trial average, and an N price of $0.68/lb. N.

MICHIGAN STATE UNIVERSITY Extension
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Nitrogen Source and Rate Effects on Sugarbeets

Saginaw Valley Research Farm • Frankenmuth, MI

Kurt Steinke and Andrew Chomas, Michigan State University

Location: Saginaw County
Planted: May 4
Harvested: October 4
Previous Crop: Corn
Variety: Hilleshog 9042 Roundup Ready

Soil Type: Clay loam; 2.8 OM; 7.7 pH; 40 ppm P; 189 ppm K
Tillage: Conventional with light S-tine at sidedress
N Rates: See below
Spacings: 4.25 inches
Reps: 4

Treatment (Total lb N/A)	SIdedress (2-4 lf) Lb. N/A	RWSA	RWST	T/A	% Sugar	% CJP	NH2	Amino-N
80[1]	40 - Urea	9800	307	31.9	20.5	95.1	106.0	6.27
80	40 - AS	8595	301	28.6	20.1	95.2	89.3	5.30
80	40 - ASN	9640	306	31.5	20.5	95.2	74.0	4.34
80	40 - ESN	9102	301	30.2	20.0	95.5	68.8	4.20
120	80 - Urea	9277	305	30.4	20.4	95.3	117.5	6.80
120	80 - AS	9969	295	33.8	19.8	94.9	93.3	5.43
120	80 - ASN	9732	304	32.0	20.3	95.4	84.8	5.03
120	80 - ESN	9643	297	32.5	19.9	95.1	86.0	5.26
$LSD_{(0.05)}$[2]	—	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

[1] All plots received 40 lbs. N/A as starter.

[2] LSD, least significant difference between means within a column at ($\alpha = 0.05$).

SUMMARY:

Trial was conducted to determine the effects of urea, ammonium sulfate (AS), ammonium sulfate-nitrate (ASN), and ESN (Environmentally Smart Nitrogen) as N sources for sugarbeet production. All treatments received 40 lbs. N/A as 28%, 20 lbs. P_2O_5/A, 50 lbs. K_2O/A. and 2 lbs. Mn/A as starter placed 2x2 on May 4. Sidedress N applications of urea, AS, ASN, or ESN were completed on June 2 and were followed by a light cultivation to avoid N volatilization. The 40 and 80 lb. AS sidedress applications provided 46 and 91 lbs sulfate-S, respectively. The 40 and 80 lb. ASN sidedress applications provided 22 and 43 lbs. sulfate-S, respectively. **PSNT testing done on May 4 revealed 31 lb. N available per acre 2 feet.** Nitrogen source and rate had no significant effects on yield or sugar parameters in this study. Data begins to show that at higher N rates, alternative N sources such as AS, ASN, or ESN may impart greater influence upon yield and RWSA. At lower N rates, data show that urea may optimize both yield and RWSA. Poor spring weather conditions may have influenced N source results. Additional work will continue in 2012 to determine N source and rate influences on sugarbeet production.

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Environmentally Smart Nitrogen (ESN) as N Source

Saginaw Valley Research Farm • Frankenmuth, MI

Kurt Steinke and Andrew Chomas, Michigan State University

Location: Saginaw County
Planted: May 4
Harvested: October 4
Previous Crop: Corn
Variety: Hilleshog 9042 Roundup Ready

Soil Type: Clay loam; 2.8 OM; 7.7 pH; 40 ppm P; 189 ppm K
Tillage: Conventional with light S-tine at sidedress
N Rates: See below
Spacings: 4.25 inches
Reps: 4

Treatment (Total lb N/A)	SIdedress (2-4 lf) Lb. N/A	RWSA	RWST	T/A	% Sugar	% CJP	NH2	Amino-N
80[1]	40 - Urea	9800	307	31.9	20.5	95.1	106.0	6.27
120	80 - Urea	9277	305	30.4	20.4	95.2	117.5	6.80
160	120 - Urea	10352	301	34.4	20.1	95.4	91.0	5.61
80	40 - ESN	9102	301	30.2	20.0	95.5	68.8	4.20
120	80 -ESN	9643	297	32.5	19.9	95.1	86.0	5.26
160	120 - ESN	8833	288	30.6	19.5	94.7	102.0	6.17
$LSD_{(0.05)}$[2]	—	**NS**	**11.2**	**NS**	**0.6**	**NS**	**NS**	**NS**

1 All plots received 40 lbs. N/A as starter.

2 LSD, least significant difference between means within a column at ($\alpha = 0.05$).

SUMMARY:

Trial was conducted to determine the effects of ESN (Environmentally Smart Nitrogen) as an N source for sugarbeet production. ESN is one example of a polymer-coated urea product that functions as a slow-release N fertilizer by metering the N release through the polymer coating. All treatments received 40 lbs. N/A as 28%, 20 lbs. P_2O_5/A, 50 lbs. K_2O/A. and 2 lbs. Mn/A as starter placed 2x2 on May 4. Sidedress N applications of urea or ESN were completed on June 2 and were followed by a light cultivation to avoid N volatilization. **PSNT testing done on May 4 revealed 31 lb. N available per acre 2 feet.** ESN and urea had similar yields, RWSA, CJP, and sugar impurity measurements. At the high N rate, ESN did appear to have a negative effect upon % sugar and RWST as compared to the high rate of urea. Overall, 2011 performance indicates no significant ESN advantage as compared to urea. However due to poor spring conditions, the moderately later planting date may have been delayed enough to mismatch the N-release from ESN with the peak time of sugarbeet plant N uptake. Work will continue to determine the timing and suitability of ESN as an N source for sugarbeet production.

Nitrogen Need & Harvest RWST
Ontario, Canada

Dr. Laura L. Van Eerd, Jessica Turnbull and Mike Zink
University of Guelph • Ridgetown Campus

PRELIMINARY REPORT:
Developing nitrogen decision-making tools to optimize recoverable white sugar per ton in sugarbeet production Ontario 2010-2012

Trial quality: Good
Weather 2010: early planting and a 'typical' season
2011: late planting and wet season

SUMMARY:
Managing nitrogen fertilizer is critical to optimizing RWST. It would be advantageous to have tools available to predict N fertilizer requirements and RWST yield potential. Research trials at 7 sites and survey sites at 40 grower fields were established in 2010 and 2011 to determine if SPAD® chlorophyll meter can be developed to predict 1) N fertilizer need at the time of sidedress application and 2) RWST yield potential at the time of sidedress N application and at harvest. In 2010, there were significant positive correlations between SPAD® readings taken at either the time of sidedress or at harvest and sugarbeet yield, % sugar and RWST, suggesting that the tool would be useful for growers. In 2011, the SPAD® readings were significantly correlated to sugarbeet yield, % sugar and RWST at the time of sidedress but not at harvest. Perhaps the lack of relationship in 2011 at harvest was likely due to the late, spring and wet growing season. Further analysis of survey/grower fields and of SPAD® readings taken throughout the 2011 growing season is needed.

Objective: To field test the SPAD chlorophyll meter as a tool to predict 1) the need for N fertilizer or 2) RWST yield- potential.

Methods: Research trials were established in 6 farmer fields. Each site had 4 replications and consisted of 3 treatments, 1) a zero N control, and 2) typical grower practices –specific for each grower and 3) starter N only. SPAD® readings were taken at the time of sidedress N application (late May – early June) and at harvest. Root yield, % sugar and RWST were taken at harvest.

Results: In 2010, results show significant correlations between SPAD® readings and sugarbeet yield, sugar content, and RWST when sampled at sidedress and at harvest (Figure 1) in the zero N treatment at research sites. This indicates that the SPAD® meter may be useful as a prediction tool. In 2011, the SPAD® may be more useful at sidedress than at harvest at predicting yield, % sugar and RWST (Figure 2). It is likely that the less than ideal growing season in 2011 was a contributing factor as to why the SPAD® did not work at harvest in 2011 but did work in 2010.

Further analysis: Analysis is underway for 2011 data collected from 40 grower fields. Each field was randomly sampled in 6 locations/areas and had 2 to 3 sampling dates for SPAD® readings, soil and tissue samples. When soil and tissue nitrogen analysis are completed we can fully evaluate how applicable the SPAD® meter may be for sugarbeet growers.

Funding: by Agriculture and Agri-Food Canada through the Agricultural Adaptation Council through the Farm Innovation Program, Ontario Sugarbeet Growers Association, Michigan Sugar Company and Ontario Ministry of Agriculture, Food and Rural Affairs.

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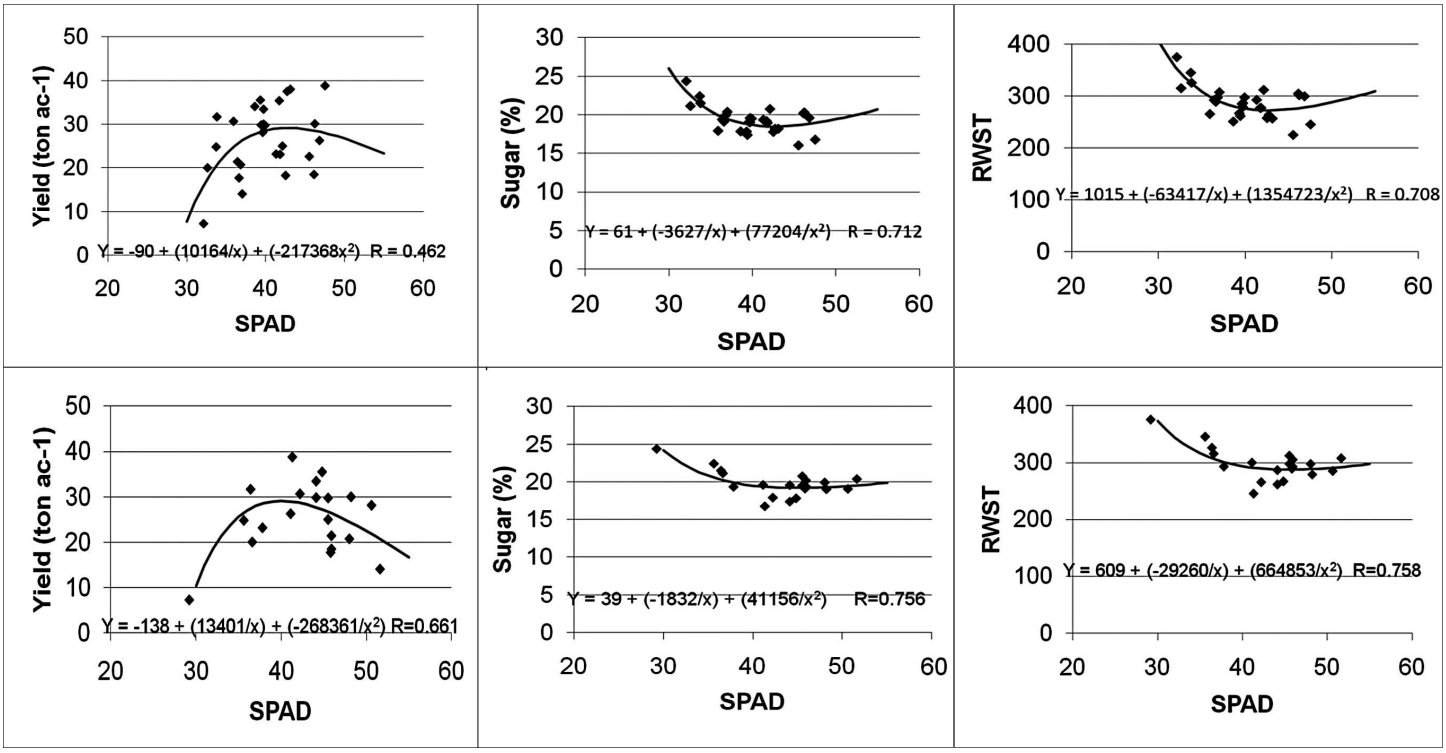

Figure 1: **In 2010, correlation between SPAD® meter values taken *at sidedress* (top) or *at harvest* (bottom) and sugarbeet root yield, percent sugar and RWST.** Data from at least 5 research trials with 4 reps in the zero N treatment. R values ≥0.444 were significant at p=0.05.

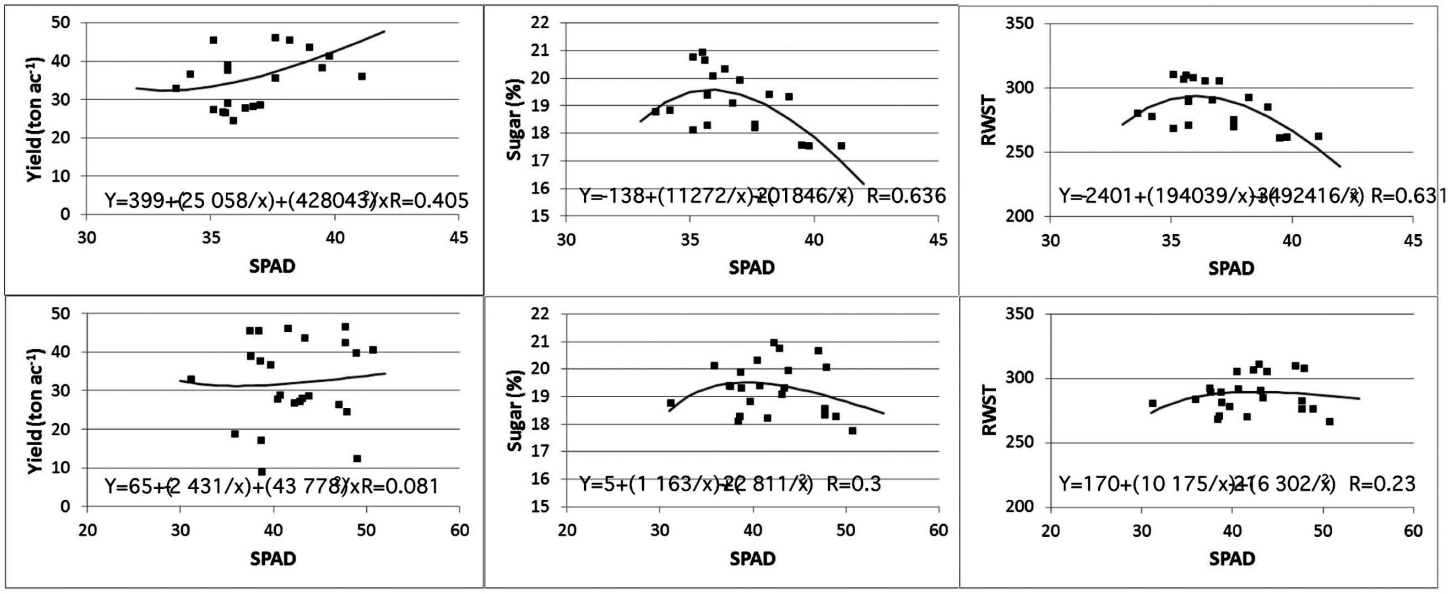

Figure 2: **In 2011, correlation between SPAD® meter values taken *at sidedress* (top) or *at harvest* (bottom) and sugarbeet root yield, percent sugar and RWST.** Data from at least 5 research trials with 4 reps in the zero N treatment. R values ≥0.444 were significant at p=0.05.

Foliar Nitrogen

Richmond Brothers Farms LLC • Pigeon, MI

Trial Quality: Excellent
Location: Huron County
Planted: May 11
Variety: HM-133RR
Previous Crop: Corn

Spacings: Rows-22"
Fertilizer: 2x2 - (Lbs.) 50-40-0-8S-.27Mn-.28B; S.D. - 110# N
Soil Type: Loam
Tillage: Dominator; Wheat Cover, Stale Seedbed

Harv/Sample: Nov. 12 / Oct. 13
Herbicides: 4x Glyphosate
Replicated: 6x
Fungicide: 47 DSV - Proline
95 DSV - Gem
143 DSV - Proline
180 DSV - Gem

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP
CoRoN	—	**9581**	**291**	**33.0**	**19.7**	**94.9**
Check	—	**9671**	**296**	**32.8**	**19.9**	**95.0**
Average	—	9626	294	32.9	19.8	94.9
LSD 5%	—	491 NS	4.6 NS	1.1 NS	0.4 NS	0.9 NS
CV %	—	3	1	1.9	1.3	0.6

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Not calculated.

Emergence: Excellent
Rhizoctonia: Low
Quadris App: In Furrow (3" Band 5.4 oz), & 6-8 Leaf (14.2 oz w/ Mustang)

Cerc Leafspot: Excellent Control
Nematodes: None Detected
Weather: —

COMMENTS:

Trial was conducted to evaluate if yield enhancement would occur if foliar nitrogen was applied to beets even if no visual deficiency symptoms were seen. The product used was CoRoN 25-0-0 controlled release foliar fertilizer. A rate of 2 gallons of CoRoN in 12 gallons of water was applied on 6/29/11 in an 11 inch band. No foliar injury, growth enhancement or color difference was seen. No significant difference in yield or quality was measured.

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Foliar Slow-Release Nitrogen

Saginaw Valley Research Farm • Frankenmuth, MI

Kurt Steinke and Andrew Chomas, Michigan State University

Location: Saginaw County
Planted: May 4
Harvested: October 4
Previous Crop: Corn
Variety: Hilleshog 9042 Roundup Ready

Soil Type: Clay loam; 2.8 OM; 7.7 pH; 40 ppm P; 189 ppm K
Tillage: Conventional with light S-tine at sidedress
N Rates: See below
Spacings: 4.25 inches
Reps: 4

Treatment (Total lb N/A)	SIdedress (2-4 lf) Lb. N/A	Foliar N (lb. N/A)	RWSA	RWST	T/A	% Sugar	% CJP	NH2	Amino-N
80[1]	40	0	9800	307	31.9	20.5	95.1	106.0	6.3
120	80	0	9277	305	30.4	20.4	95.2	117.5	6.8
80	30	10[3]	9223	303	30.3	20.2	95.3	76.8	4.7
80	20	20[4]	8613	301	28.6	20.1	95.4	62.8	3.8
120	70	10[3]	9420	299	31.6	20.0	95.2	77.8	4.7
120	60	20[4]	9792	303	32.3	20.4	94.9	102.3	6.0
$LSD_{(0.05)}$[2]	—	—	**NS**	**NS**	**NS**	**NS**	**NS**	**41.1**	**2.5**

[1] All plots received 40 lbs. N/A as starter.

[2] LSD, least significant difference between means within a column at ($\alpha = 0.05$).

[3] 3 applications at 1 gallon per acre on June 15, June 27, and July 13 for a total of 10 lb. N.

[4] 3 applications at 2 gallon per acre on June 15, June 27, and July 13 for a total of 20 lb. N.

SUMMARY:
Trial was conducted 1) to investigate the effects of N-Demand (30-0-0; 60% slow-release N, 40% urea) as a foliar slow-release in-season nitrogen application and 2) to determine whether any benefit existed to reducing sidedress N applications by 10-20% only to supplement this N through foliar mid-summer N applications. All treatments received 40 lbs. N/A as 28%, 20 lbs. P_2O_5/A, 50 lbs. K_2O/A. and 2 lbs. Mn/A as starter placed 2x2 on May 4. **PSNT testing done on May 4 revealed 31 lb. N available per acre 2 feet.** Other than a slight decrease in NH2 content, foliar applications of N-Demand did not significantly impact yield, RWSA, RWST, % sugar, and % CJP. At the lower total N rate of 80 lbs., foliar N applications appeared to negatively effect sugarbeet performance as compared to the conventional 80 lb. N treatment. At the higher N rate of 120 lbs., foliar N supplementation appeared to begin to show a positive albeit non-significant effect on RWSA and yield. All treatments did produce significantly greater yield and RWSA than the untreated control. Work will continue in 2012.

Foliar Nutrients
Richmond Brothers Farms LLC • Pigeon, MI

Trial Quality: Excellent
Location: Huron County
Planted: May 11
Variety: HM-133RR
Previous Crop: Corn

Spacings: Rows-22"
Fertilizer: 2x2 - (Lbs) 50-40-0-8S-.27Mn-.28B; S.D. - 120# N
Soil Type: Loam
Tillage: Dominator; Wheat Cover, Stale Seedbed

Harv/Sample: Nov. 12 / Oct. 13
Herbicides: 4x Glyphosate
Replicated: 6x
Fungicide: 47 DSV - Proline
95 DSV - Gem
143 DSV - Proline
180 DSV - Gem

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Check	—	**9899**	**295**	**33.6**	**19.7**	**95.3**
Manganese + Boron	—	**9782**	**291**	**33.6**	**19.4**	**95.4**
Elemax	—	**9649**	**292**	**33.1**	**19.5**	**95.2**
Manganese	—	**9604**	**286**	**33.5**	**19.2**	**95.3**
Boron	—	**9437**	**289**	**32.6**	**19.4**	**95.2**
Average	—	9674	291	33.3	19.4	95.3
LSD 5%	—	515 NS	9 NS	1.3 NS	0.5 NS	0.4 NS
CV %	—	4	2	3.3	2.1	0.4

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Not calculated.

Emergence: Excellent
Rhizoctonia: Low
Quadris App: In Furrow (3" Band 5.4 oz), & 6-8 Leaf (14.2 oz w/ Mustang)

Cerc Leafspot: Excellent Control
Nematodes: None Detected
Weather: —

COMMENTS:
Trial was conducted to evaluate the additive effects that foliar fertilizer has on crop yield and quality when already combined with a good fertility program. The field has a history of manure. Three different products were applied separately or in combination. Each treatment was applied twice at the recommended rates. The first application was applied in 7 inch band at the 6 leaf stage on 6/14/11. The second application was applied two weeks later in a 11 inch band on 6/29/11. Products applied were Ele-Max 11-8-5 Nutrient concentrate, Brandt Liquid Boron 10% B and Techmangam 19S-32Mn. All products were applied with 12 gallons of water and had no foliage burn. No significant visual, yield or quality differences occurred.

Advantage & Upplause Foliar Nutrient Trial

Roggenbuck Farm • Harbor Beach, MI

Trial Quality: Good
Location: Huron County
Planted: June 2
Harvested: October 7
Previous Crop: Wheat/Clover

Rhizoc Control: Good
2 Quadris applications
Cercospora Control: Good
3 fungicide applications
Spray Dates: July 5 and July 14
Seasonal Rainfall: 13.1 inches

Soil Info: Loam, 3.7% OM, 7.0 pH
Plot Size: 6 Rows X 150 ft
Reps: 8
Row Spacing: 22 inches
Seeding Rate: 4.2 inches

Treatment	Rate	Applic	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Vigor 1-10	Stand B/100ft
Upplause	2qt/a	6 leaf and 12 leaf	**$1,633**	**6576**	**244.3**	**27.0**	**17.1**	**93.5**	7.9	**204**
Quadris	14fl oz/a	6 leaf								
Urea	10lb/a	6 leaf								
Roundup	22fl oz/a	12 leaf								
Upplause	1qt/a	6 leaf and 12 leaf	**$1,623**	**6539**	**242.1**	**27.0**	**17.0**	**93.5**	**8.4**	**206**
Quadris	14fl oz/a	6 leaf								
Urea	10lb/a	6 leaf								
Roundup	22fl oz/a	12 leaf								
Advantage	4qt/a	6 leaf and 12 leaf	**$1,619**	**6519**	**241.0**	**27.1**	**17.0**	**93.2**	**8.3**	**205**
Quadris	14fl oz/a	6 leaf								
Urea	10lb/a	6 leaf								
Roundup	22fl oz/a	12 leaf								
Untreated			**$1,582**	**6373**	**241.1**	**26.4**	**17.0**	**93.2**	8.0	**198**
Upplause	4qt/a	6 leaf and 12 leaf	**$1,570**	**6323**	**241.5**	**26.2**	**17.0**	**93.2**	**8.2**	**201**
Quadris	14fl oz/a	6 leaf								
Urea	10lb/a	6 leaf								
Roundup	22fl oz/a	12 leaf								
Advantage	2qt/a	6 leaf and 12 leaf	**$1,552**	**6251**	**242.4**	**25.8**	**17.1**	**93.3**	**8.2**	**210**
Quadris	14fl oz/a	6 leaf								
Urea	10lb/a	6 leaf								
Roundup	22fl oz/a	12 leaf								
Advantage	1qt/a	6 leaf and 12 leaf	**$1,549**	**6240**	**239.4**	**26.1**	**16.9**	**93.3**	**8.1**	**195**
Quadris	14fl oz/a	6 leaf								
Urea	10lb/a	6 leaf								
Roundup	22fl oz/a	12 leaf								

Average	$1,590	6403	241.7	26.5	17.0	93.3	8.1	203
LSD 5%	ns(83)	ns(335)	ns(8.0)	ns(1.6)	ns(0.4)	ns(0.6)	0.3	ns(19)
CV %	5.2	5.2	3.3	5.8	2.2	0.6	4.1	6.2

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

SUMMARY:

Advantage (4.1% N and trace elements) and Upplause (10% N and trace elements) are products which claim to improve yield and quality to a greater extent than the fertilizer values. In this trial, there did not appear to be an advantage to applying either product.

Starter Fertilizer
Richmond Brothers Farms LLC • Pigeon, MI

Trial Quality: Good
Location: Huron County
Planted: May 7
Variety: C-RR827
Previous Crop: Wheat, Alfalfa Cover, Followed by Wheat Cover

Spacings: Rows-22"
Fertilizer: 2x2 - See Treatments; S.D. rates adjusted for 130# total N
Soil Type: Loam
Tillage: Dominator & 1x F.C.; Wheat Cover; Stale Seedbed

Harv/Sample: Nov. 12 / Oct. 13
Herbicides: 4x Glyphosate
Replicated: 3x
Fungicide: 47 DSV - Proline
95 DSV - Gem
143 DSV - Proline
180 DSV - Gem

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Populations 100 Ft of Row	
							10 Day	41 Day
40# N & 42# P2O5	—	**11854**	**306**	**38.8**	**20.3**	**95.6**	—	**183**
63# N & 0# P2O5	—	**11681**	**308**	**38.0**	**20.5**	**95.5**	—	**185**
63# N & 42# P2O5	—	**11638**	**304**	**38.3**	**20.2**	**95.3**	—	**182**
20# N & 42# P2O5	—	**11549**	**305**	**37.9**	**20.2**	**95.6**	—	**171**
Average	—	11681	305	38.2	20.3	95.5	—	180
LSD 5%	—	765 NS	5.4 NS	2.4 NS	0.3 NS	0.4 NS	—	19 NS
CV %	—	3	1	3.2	1.1	0.4	—	5

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Not calculated.

Emergence: Excellent
Rhizoctonia: Low
Quadris App: In Furrow (3" Band 5.4 oz), & 6-8 Leaf (14.2 oz w/ Mustang)

Cerc Leafspot: Excellent Control
Nematodes: None Detected
Weather: —

COMMENTS:

Trial was established to look at the effects of different nitrogen rates and phosphorous in starter fertilizer. Nitrogen rates in the 2x2 starter were 20, 40, and 63 pounds per acre. Phosphorous was included in some treatments at a rate of 42 pounds of P2O5. All treatments received the same amount of total nitrogen (130 Lbs.) adjusted by side-dress application. A slight visual difference in coloration was seen early in the season for the lowest starter nitrogen rate. Trial was stale seedbed planted into a wheat cover crop. Nutrient levels of soil test were considered high. Trial yielded no significant difference from any treatment. In 30 inch rows, a 60 pound starter nitrogen rate could be a concern in lighter textured fields.

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Beet Lime Trials

Helmreich Farm • Bay City, MI

Trial Quality: Good
Location: Bay County
Row Spacing: 30 inches

Application Details:
Lime applied fall of 2010
2, 4 and 6 tons/acre

Replicated Strip Trial:
Plot Size: 6 Rows X 1/4-Mile
Rep: 3

Treatment	Tons/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Cerc 0-9	Rhizoc 100 ft	Aph 0-5
Factory Lime	6	**5073**	**303**	**16.8**	**20.0**	**96.0**	**3.3**	**6.0**	**1.8**
Factory Lime	4	**4970**	**302**	**16.5**	**19.8**	**96.2**	**3.3**	**6.0**	**1.9**
Factory Lime	2	**4791**	**303**	**15.8**	**19.9**	**95.8**	**3.4**	6.5	2.3
Untreated	0	**4734**	**308**	**16.9**	**20.2**	**96.1**	**3.4**	6.7	2.6
Average		4892	304	16.5	20.0	96.0	3.3	6.3	2.2
LSD 5%		ns(765)	ns(21.2)	ns(4.9)	ns(0.9)	ns(1.4)	ns(0.5)	0.5	0.2
CV %		4.9	2.2	9.4	0.3	0.5	4.4	2.4	3.4

Bold: Results are not statistically different from top-ranking treatment in each column.
Cercospora & Rhizoctonia: Lower number is better
Agronomist Trial: Greg Clark

SUMMARY:

Lime was applied at rates of 2, 4 and 6 tons/acre in the fall of 2010 and sugarbeets were planted in 2011. There were significantly fewer dead beets from Rhizoctonia and improved Aphanomyces rating with lime applications at 4 and 6 tons per acre. There were no significant differences with respect to sugarbeet yield and quality.

Zone Till vs. Chisel Plow Trial

Clay Crumbaugh • Breckenridge, MI

Trial Quality: Excellent
Location: Gratiot County
Planted: May 4
Variety: HM-28RR
Previous Crop: Soybeans

Spacings: Rows-30"; Seeds-57,000
Fertilizer: 2x2 - 15-9-9-15S-.7Mn-.4B; Pre Broadcast 18 Gal 28%
Soil Type: Loam
Tillage: See Treatments

Harv/Sample: Nov. 6 / Oct. 5
Herb/Pesticide: 3x Gly., 1x Lorsban
Replicated: 3x
Fungicide: 55 DSV - Eminent
110 DSV - Headline
165 DSV - Agritin

Treatment	Net $/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Populations 100 Ft of Row		Dead Beets / 1200 Ft
							10 Day	41 Day	
Fall: Zone Till Spring: Stale Seedbed	**$1,630**	**7509**	**271**	**27.7**	**18.1**	**95.7**	—	**238**	**3**
Fall: Disc Chisel followed by Field Cult. Spring: Stale Seedbed	**$1,668**	**7719**	**275**	**28.1**	**18.4**	**95.6**	—	**234**	**4**
Average	$1,649	7614	273	27.9	18.2	95.7	—	236	4
LSD 5%	—	1219 NS	11 NS	2.0 NS	0.8 NS	0.4 NS	—	36 NS	3 NS
CV %	—	5	2	2.1	1.9	0.2	—	10	62

Bold: Results are not statistically different from top-ranking treatment in each column.
Net $/Acre: Revenue per acre assuming a $60 payment and cost of $18 for chisel plow, $12 for field cult, and $22 for zone tillage.

Emergence: Excellent
Rhizoctonia: Very Low
Quadris App: In Furrow (4" Band, 5 oz) & 6-8 Leaf

Cerc Leafspot: Good Control
Nematodes: Not Confirmed
Weather: —

COMMENTS:

The trial was setup with GPS guidance to perform the tillage and planting in 30 row blocks. Entire blocks were harvested using truck weights. No significant differences were measured in yield or quality. The same trial was performed in 2009 and also showed no significant differences. The Brillion zone tillage tool had a shank depth of 16 inches and was conducted in the fall after soybean harvest. All planting was done with no spring tillage into a stale seedbed. The grower estimates his cost for the zone tillage system at $22 dollars per acre. The cost for the disc chisel system were $18 for the chisel and $12 for a leveling cultivator pass.

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Fall Tillage Systems Comparison for Maximum Yield & Quality

East Lansing Agronomy Farm

Christy Sprague and Gary Powell, Michigan State University

Location: East Lansing
Planted: May 5
Variety: Hilleshog 9042 Roundup Ready
Soil Type: Loam; 3.2 OM; 7.4 pH
Tillage: Fall - Nov. 9, 2010; Spring - May 5, 2011
Spacings: 4.25 inches
Reps: 4

	SUGARBEET			
Tillage system	**Harvest stand #/100 ft**	**Yield Ton/Acre**	**RWST[2] lb/ton**	**RWSA lb/A**
Fall chisel Spring soil finish	214 a[1]	45.7 a	283 bc	12939 a
Fall disk Spring soil finish	185 b	40.0 a	293 a	11737 a
No-tillage	168 b	37.6 a	280 c	10501 a
Fall strip-tillage	168 b	36.9 a	290 ab	10700 a

[1] Means within a column with different letters are significantly different from each other.

[2] Abbreviations: RWST = recoverable white sugar per ton; RWSA = recoverable white sugar per acre

SUMMARY:
Planting sugarbeet after corn is a common rotation for many Michigan growers. However, management of corn stubble can be an issue. Strip-tillage has become more popular for sugarbeet growers in the western United States. We conducted research from 2008 to 2010 comparing spring strip-tillage, no-tillage, and conventional tillage systems with various cover crops. From this research we determined that spring strip-tillage may not be the best option for Michigan growers. However, fall strip-tillage may have a place in Michigan sugarbeet production. With this in mind we wanted to conduct a preliminary research trial that examined sugarbeet production under four different tillage systems. The treatments were: 1) fall chisel plow followed by a soil finisher in the spring, 2) fall disking followed by a soil finisher in the spring, 3) no-tillage, and 4) fall strip-tillage with a Twin Diamond Strip Cat tillage implement. All plots were kept weed-free and managed similarly with applications of Roundup PowerMax (22 fl oz/A) + ammonium sulfate (17 lb/100 gal). At harvest there were some differences in sugarbeet stand with the best stand being found in the fall chisel plow system. However, the increased number of sugarbeets did not affect sugarbeet yield or recoverable white sugar per acre. All tillage systems provided statistically similar yields. This preliminary research shows that some of these other tillage systems including strip-tillage and no-tillage following corn may be additional options of sugarbeet production. However, more in-depth research needs to be conducted under more environments and soil types to see where these systems may fit.

Clover Cover Crop Trial

Gene Meylan • Linwood, MI

Trial Quality: Fair
Location: Bay County
Planted: May 15
Variety: SX-1291RR
Previous Crop: Wheat with Clover

Spacings: Rows - 30"
Fertilizer: 2x2 - 20 Gal. 18.5-15-0-2.5S w/ qt of Mn & B; S.D. 90 # N
Soil Type: Loam
Tillage: Ripper, Spring 1x Triple K

Harv/Sample: Oct. 24 / Oct. 7
Herbicides: 3x Glyphosate
Replicated: 4x
Fungicide: 55 DSV - Eminent
110 DSV - Headline
165 DSV - Eminent

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP
Check	—	**6143**	**276**	**22.3**	**18.4**	**95.7**
Clover	—	**6118**	269	**22.8**	**18.0**	**95.5**
Average	—	6131	273	22.5	18.2	95.6
LSD 5%	—	428 NS	3	1.8 NS	0.4 NS	0.8 NS
CV %	—	3	1	3.6	1.1	0.4

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Not calculated.

Emergence: Poor
Rhizoctonia: Low
Quadris App: In Furrow

Cerc Leafspot: Good Control
Nematodes: Not Confirmed
Weather: —

COMMENTS:

Clover was frost seeded in wheat in the spring of 2010. The clover was killed and tilled in early September because of weed contamination. Clover would normally be destroyed late October or early November. Sugarbeets were planted in the spring of 2011. Because of early tillage, some of the nitrogen benefits from clover may have been lost. Sugarbeets were relatively thin due to crusting/emergence issues. No significant differences were found in tons or RWSA. There was a significant difference found for RWST. This is possibly due to some nitrogen being available from the clover and lowering quality. The applied nitrogen rates were the same for both treatments.

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Seed Treatments for Beet Cyst Nematode Control: A Next Step?

East Lansing Agronomy Farm

George W. Bird, Professor, Michigan State University

Beet cyst nematodes (BCN) have been a significant problem in Michigan sugar beet production for more than 60 years. Currently, BCN is managed through:

- Crop rotation,
- BCN trap crops,
- Cover crops for enhancement of soil quality and
- BCN resistant varieties.

It appears that the next innovation in BCN management will be seed treatments. Michigan agriculture is familiar with seed treatments for control of soil-borne disease fungi and insects. Seed treatment for nematode control is relatively new. In 2012, Avicta-treated seed will be available in Michigan for control of corn nematodes. Votivo-treated seed will be available for control of the soybean cyst nematode.

There is currently considerably interest in the development of seed treatments for BCN. Research on this was conducted in 2011 in Pigeon, Michigan and under greenhouse conditions at Michigan State University. Seed treatments for nematode control can be can be used with nematode susceptible or nematode resistant varieties. In sugar beet systems for BCN control, it is my opinion that the seed treatments under development will initially be used on BCN resistant varieties and designed for an additional two to four tons per acre yield increase.

There are three types of seed treatments under development:

- Chemical,
- Biological and
- Plant Health Regulators

Avicta is an example of a chemical seed treatment that works as a nematicide. Votivo and Pasteuria are examples of current and future seed treatment products that are living organism. In both of these cases they are bacteria. They infect and decompose the nematode. Harpin proteins, however, represent a very type of seed treatment. They work as plant health regulators and induce natural defense mechanisms.

The following two photographs were taken from a MSU 2011 BCN seed treatment project. Figure A. shows a 30-day old sugar beet root system grown from a treated seed in the presence of BCN. Note the strong root lateral root development, one egg and one second-stage juvenile. Figure B. is a 30-day-old sugar beet root system grown under the same conditions in the absence of the seed treatment. Note the almost mature BCN females and lack of strong lateral root development.

continued on next page

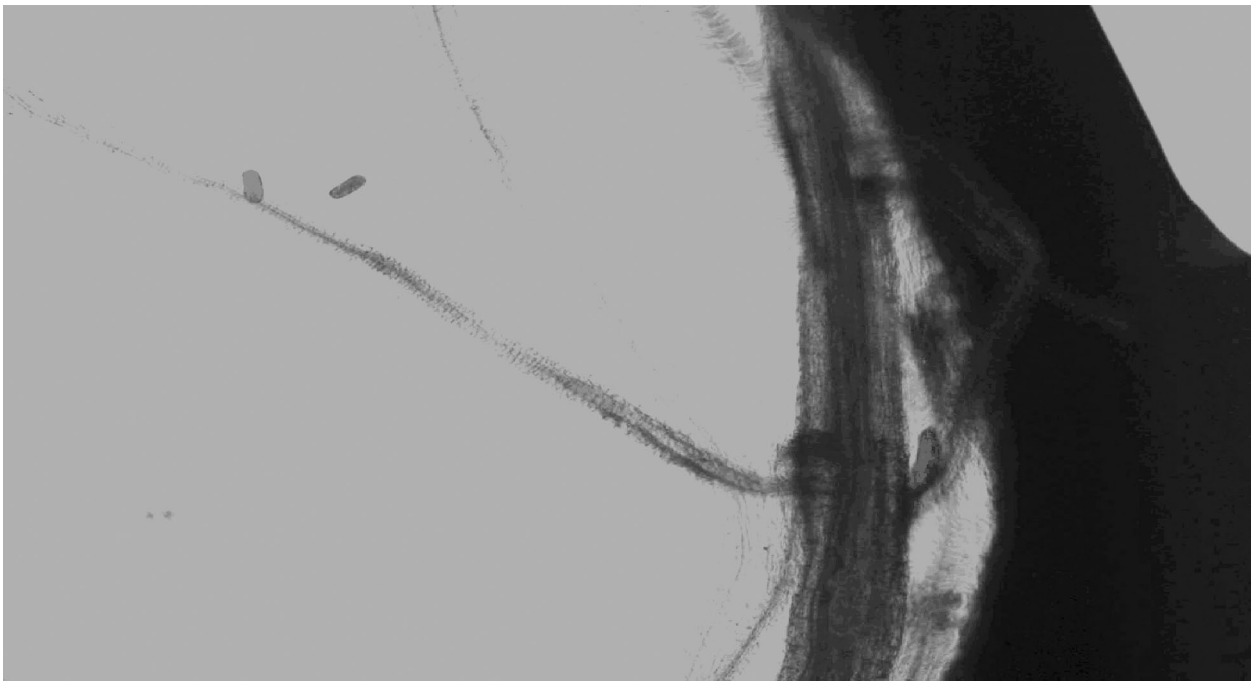

Figure A: 30-day old sugar beet root system grown from treated seed in the presence of BCN.

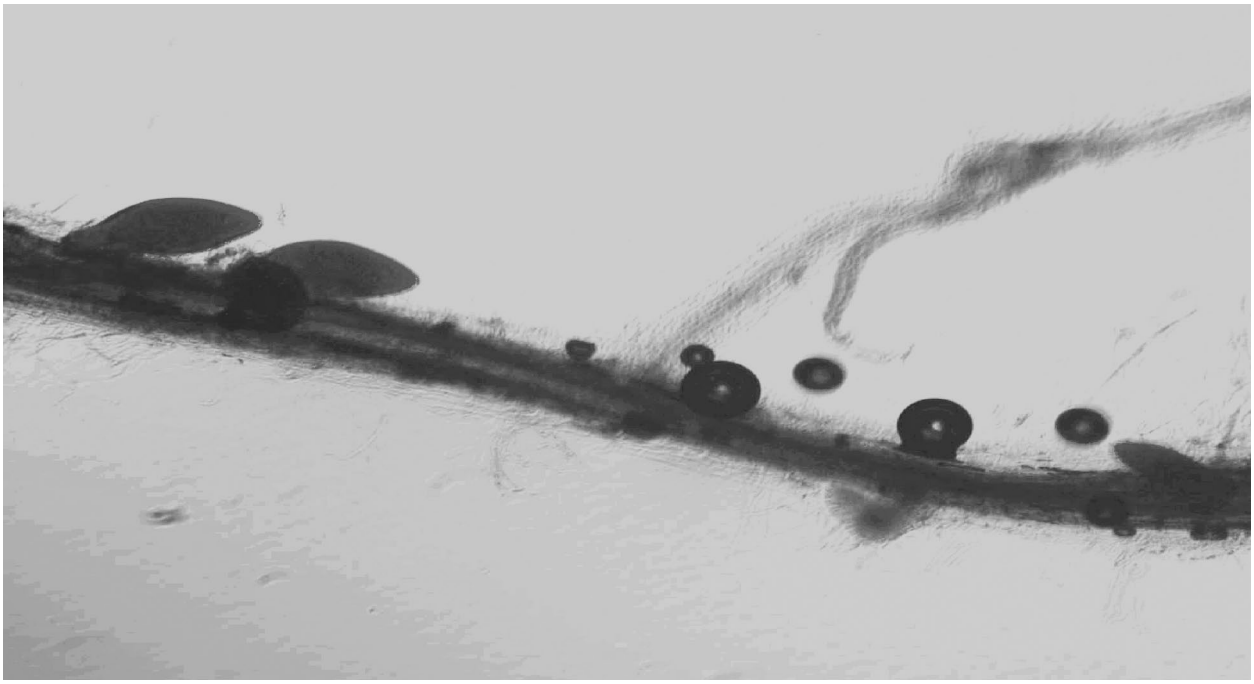

Figure B: 30-day-old sugar beet root system grown under the same conditions in the absence of the seed treatment.

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Evaluation of Nematode Tolerant Varieties

Heavy Rhizoctonia Area • Steve Hoard • Breckenridge, MI

Trial Quality: Very Good
Location: Gratiot County
Planted: May 3
Harvested: September 14

Rhizoc Control: Variety dependent
Cercospora Control: Good
3 fungicide applications
Seasonal Rainfall: 13.7 inches

Soil Info: Sandy Loam, 3.1% OM, 7.0 pH
Plot Size: 6 Rows X 100 ft
Reps: 6
Row Spacing: 22 inches
Seeding Rate: 4 inches

Variety	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Emergence Beets/100 Ft		Dead Beets/ 100 Ft Sep 13
							Jun 21	Sep 13	
B-18RR4N	**$1,229**	**4565**	**230**	**20.0**	**16.1**	**93.8**	**200**	**135**	**60**
HM-28RR	$877	3258	216	14.9	15.3	**93.4**	126	**114**	11
Average	$1,053	3911	223	17.4	15.7	93.6	163	125	35
LSD 5%	64.6	240.2	7.1	0.3	0.5	ns(0.5)	8.7	ns(28.8)	25.7
CV %	3.3	3.3	2.1	1.0	2.0	0.3	3.6	15.6	48.9

SUMMARY:
The nematode tolerant variety (B-18RR4N) achieved a much higher stand (200 compared to 135 B/100') than HM-28RR. Fewer HM-28RR beets died during the season, however, the nematode variety produced a significantly higher yield and quality.

Moderate Disease Area • Blumfield, MI

Trial Quality: Good
Location: Saginaw County
Planted: May 6
Harvested: September 21
Previous Crop: Soybeans

Rhizoc Control: Good
Cercospora Control: Good
Seasonal Rainfall: 14.2 inches

Soil Info: Loam, 3.0% OM, 7.6 pH
Plot Size: 6 Rows X 38 ft
Reps: 7
Row Spacing: 22 inches
Seeding Rate: 4.2 inches

Variety	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Stand Beets/ 100 Ft Sep 14	Dead Beets/ 100 Ft Sep 14
B-19RR1N	**$1,277**	**5333**	**255**	**21.0**	**17.6**	**93.9**	**175**	**0.7**
HM-28RR	**$1,211**	**5056**	**246**	**20.6**	**17.4**	93.3	**183**	**0.4**
Average	$1,244	5195	250	20.8	17.5	93.6	179	0.6
LSD 5%	ns(117)	ns(487)	ns(10)	ns(2.0)	ns(0.6)	0.6	ns(43)	ns(0.9)
CV %	7.2	7.2	3.2	7.5	2.7	0.5	18.4	117.7

SUMMARY:
A nematode tolerant variety (B-19RR1N) was compared to a disease tolerant variety (HM-28RR) in a small plot replicated trial. Emergence, yield and quality were similar for both varieties. Cercospora and Rhizoctonia were well controlled.

Bold: Results are not statistically different from top-ranking treatment in each column.
$/Acre: Figured using a $60 payment, gross payment unless noted as net.

New Nematode Germplasm Releases for Michigan

Mitch McGrath, USDA-ARS, East Lansing, MI

Sugar beet cyst nematode is an old but recently (re)appreciated problem in Michigan, particularly in areas where beet has been grown longer than others. Few complete control measures are available and genetic resistance appears to be an option for minimizing losses due to nematode damage. Working with scientists and company researchers, the ARS germplasm enhancement program has developed sugar beet populations that maintain yield under more severe instances of sugar beet cyst nematode infestation in Michigan grower's fields and in severely infested fields in a nematode nursery in Brawley, CA. These germplasm resources are being released to the sugar beet seed companies for incorporation into hybrid varieties, at their discretion.

Base materials were derived from a broad-based intercross of 60 Beta vulgaris spp. maritima (e.g. wild beet) lines crossed with sugar beet (C51; Dr. Bob Lewellen, USDA-ARS retired, Salinas, CA) in the late 1990's. These plants were classified as resistant or susceptible based on total number of cysts counted on roots and in the surrounding soil. "Population 3" was derived from germplasm release C927-4, and was found to be a family segregating with wide range in nematode counts (5 – 248 cysts per plant). "Population 5" was derived from germplasm release CN921-306 and was segregating for families with relatively narrow range in nematode counts (5 - 86 cysts per plant). Both populations were used as the donor nematode resistance source for the new Great Lakes areas growing region germplasm releases.

The donor nematode germplasm was allowed to inter-pollinate over three to five cycles of selection with current breeding populations maintained by USDA-ARS East Lansing. The East Lansing populations used were a wide mix of traditional source materials, for example, those used in the development of hybrids such as US H20, as well as advanced smooth-root germplasm, with an eye to selection for higher sugar content and root yield. From these inter-pollinations, selection for good root yield and root conformation was practiced under nematode pressure at four locations in Michigan over the past seven years, and evaluation of resistance was done under severe nematode pressure in Brawley, CA. At both locations, the selected materials for release were among the top 10% of entry performance. Seed was produced from these selections in East Lansing, and the breeding cycle was repeated.

Accession ID	Lineage	Female Parent	Pollen Parent	Nema RWSA	Nema RWST	Nema Tons/A	Nema Sugar %
EL-A027017	Bay City sln x 08-5E (nematode	09B098-GH5A-xx	IC w/ 2010 5A : Nema Yld Mixer	4332.3	183.6	23.7	13.4
EL-A027143	06 bay city sln's 8	09B538-xx	IC w/ 2010 5E / Nema salt mixer	3655.2	166.6	22.2	12.5
EL-A027007	(Salinas nematode x 07-5E/24A)x08-5E (some SF mixed)	09B090-GH31D-xx	IC w/ 2010 31D / nema SR	4063.3	197.4	20.6	14.2
EL-A027010	low water x nema	09B097-xx	IC w/ 2010 31D / nema SR	4140.5	202.1	20.5	14.1
EL-A027152	(Low water / HS elites) x early nema selns	10 GH-5B combined	IC w/ 2010 5B : Good Nema	3731.2	184.7	20.2	13.1
EL-A024983	(95HS2/sel) x 07-5E	08B028-xx	OP w/ 09 31C nema	3904.1	195.1	20.0	13.8
EL-A027142	M1-3	09B539-xx	IC w/ 2010 5E / Nema salt mixer	3307.7	168.8	19.6	12.6

In 2011, seven of these new releases were evaluated at the Yoder trial with the help of Michigan Sugar Company. These are presented in the table, and the performance of these germplasms is similar to the current commercial nematode resistance hybrids as evaluated at the Vader nematode variety trial. It is hoped that the seed companies will use this germplasm as a source of genetic resistance to sugar beet cyst nematodes in Michigan.

Oilseed Radish & Crowfoot Closing Wheels Trial

Bernia Family Farms • Akron, MI

Frost Seeded Oilseed Radish in the Spring Prior to Drybeans

Trial was performed to determine if spring oilseed radish, prior to drybeans, is a potential cover/trap crop option. The oilseed radish was frost seeded in mid March at approximately 28# per acre. The radish emerged fairly evenly, but was thinner than optimum for a trap crop, even though it was planted at a fairly heavy rate. The radish was allowed to grow until around the 20th of May and killed with glyphosate. The radish grew to about 12-18 inches and began to flower. It looked different than late summer seedings in that it did not gain a lot of biomass. Population and biomass may have increased if the radish was drilled. Black beans were planted in June and were yield checked to see if the radish affected the yield by removing moisture or nutrients. There is concern that leaving the radish too long will reduce available moisture. No yield difference was found. The trial had 3 replications.

Treatment	Black Bean Yield in Hundred Weight
Oilseed Radish prior to Drybeans	28.47
No Radish prior to Drybeans	28.06
LSD 5%	3.68
CV %	4

Planter Closing Wheels - Crowfoot vs Normal J.D. Wheel

Data is from emergence counts from 12 replications in a single field. The field emerged well, with no issues from crusting. The crowfoot closing wheels, from Schlagel Manufacturing, had a significantly lower emergence at the 80% confidence level. This is likely due to the crowfoot wheels changing seed depth and causing seeds to be to shallow or to deep. The intent of this style of wheel is to improve emergence in crusting situations, so these counts do not show the best scenario to check their potential benefit.

Treatment	15 Day Emergence 100 Ft of Row
Normal Closing Wheel	182
Crowfoot Closing Wheel	190
LSD 5%	10 NS
CV %	6

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Comparison of Roundup Ready and Conventional Sugarbeet Varieties and Weed Control Systems

Saginaw Valley Research Farm • Frankenmuth, MI

Christy Sprague and Gary Powell, Michigan State University

Location: Saginaw County
Planted: May 4
Varieties: ACH 963 (conventional); Hilleshog 9042 (RR)
Herbicides: See Treatments
Soil Type: Clay loam; 2.8 OM; 7.9 pH;
Tillage: Conventional
Spacings: 4.25 inches
Reps: 4

Table 1. Sugarbeet injury, weed control, sugarbeet yield and recoverable white sugar per acre (RWSA)		WEED CONTROL (AT HARVEST)			SUGARBEET	
Herbicide Treatments[1]	**Injury**[2]	**Common lambsquarters**	**Pennsylvania smartweed**	**Pigweed spp.**	**Yield**	**RWSA**
ACH 963 (Conventional variety)	—— % ——	———————— % control ————————			ton/A	lb/A
Nortron (PRE) fb. Betamix + UpBeet + Stinger (Std. split applied 2X)	28	98	84	99	14.1	3646
Betamix + UpBeet + Stinger (Std. split applied 2X)	23	86	70	93	13.3	3534
H9042 (Roundup Ready variety)						
Nortron (PRE) fb. Betamix + UpBeet + Stinger (Std. split applied 2X)	30	98	90	97	18.8	5113
Betamix + UpBeet + Stinger (Std. split applied 2X)	26	96	78	99	20.8	5985
Nortron (PRE) fb. Roundup PowerMax	9	97	99	99	21.5	6150
Roundup (applied 2X)	0	98	98	99	21.0	6045
Roundup fb. UpBeet + Roundup	0	99	99	99	21.7	6122
Roundup fb. Stinger + Roundup	0	99	99	99	20.5	5733
Roundup fb. Outlook + Roundup	0	99	99	99	20.8	6073
Roundup fb. Warrant + Roundup	0	99	99	99	21.3	6164
Roundup fb. Dual Magnum + Roundup	0	99	99	99	21.2	5919
Roundup fb. Sequence	0	99	99	99	20.7	5742
$LSD_{(0.05)}$[3]	4	8	12	5	4	1133

[1] Herbicide treatments follow recommended rates, timings, and adjuvant choices as recommended in the MSU Weed Control Guide for Field Crops.
[2] Injury was evaluated June 14
[3] Means within a column greater than least significant difference (LSD) value are different from each other

SUMMARY:

This trial was conducted to compare conventional weed control systems using a conventional variety and a Roundup Ready variety with current and future weed control systems in Roundup Ready sugarbeet. Overall using the conventional weed control systems of a standard-split program with or without Nortron applied preemergence resulted in significant sugarbeet injury, regardless of variety. Weed control with these systems were also not as consistent as the glyphosate (Roundup)-based programs and many times resulted in significantly less control of Pennsylvania smartweed. Yield and RWSA was lower with the conventional sugarbeet variety, probably due to the differences in yield potential between the two varieties. Weed control with the different glyphosate-based programs was excellent and there were no significant differences in yield or RWSA.

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Tank-mixtures of UpBeet and Glyphosate in Roundup Ready Sugarbeet

Saginaw Valley Research Farm • Frankenmuth, MI

Christy Sprague and Gary Powell, Michigan State University

Location: Saginaw County
Planted: May 4
Varieties: Hilleshog 9042 RR
Herbicides: See Treatments
Soil Type: Clay loam; 2.8 OM; 7.9 pH;
Tillage: Conventional
Spacings: 4.25 inches
Reps: 4

Table 1. Sugarbeet injury and weed control from the various Upbeet and glyphosate combinations

		WEED CONTROL			
		7 DAT		14 DAT	
Herbicide Treatments[1]	Injury[2]	Common lambsquarters	Pennsylvania smartweed	Common lambsquarters	Pennsylvania smartweed
	—— % ——	——— % control ———		——— % control ———	
TIMING (2-INCH WEEDS)					
Roundup PowerMax (11 fl oz) + AMS[1]	0	88	90	93	96
+ UpBeet (0.5 oz) + Destiny HC (1 pt)	15	96	96	97	98
+ UpBeet (1 oz) + Destiny HC (1 pt)	20	90	90	90	99
$LSD_{(0.05)}$[3]	6	7	n.s.	4	n.s.
TIMING (6-INCH WEEDS)					
Roundup PowerMax (11 fl oz) + AMS	0	74	33	99	86
+ UpBeet (0.5 oz) + Destiny HC (1 pt)	0	73	28	99	88
+ UpBeet (1 oz) + Destiny HC (1 pt)	0	81	49	99	95
$LSD_{(0.05)}$[3]	n.s.	n.s.	14	n.s.	7

1 A reduced rate of Roundup PowerMax (11 fl oz) + ammonium sulfate (AMS) 17 lb/100 gal was included in all treatments.
2 Sugarbeet injury was evaluated 7 days after treatment (DAT) and weed control was evaluated 7 and 14 DAT
3 Means within a column greater than least significant difference (LSD) value are different from each other; n.s. indicates that treatments were not different from each other.

SUMMARY:

The goal of this trial was to determine if there is a benefit to tank-mixing UpBeet with glyphosate for weed control in Roundup Ready sugarbeet. Table 1 contains a subset of treatments from a larger trial. The treatments above are comparing a reduced rate (11 fl oz/A) of Roundup PowerMax alone and in combination with two rates of UpBeet. The reduced rate of Roundup was used to help determine if UpBeet was contributing to weed control. The full rate of Roundup was also examined with these tank-mixtures, but there were very few differences in weed control. Destiny HC, a methylated seed oil, was included with all UpBeet treatments. The two application timings were 2- and 6-inch weeds; data is presented separately for the two timings. The addition of UpBeet at 0.5 oz and 1 oz caused significant sugarbeet injury compared with glyphosate alone at the earlier application timing (4-leaf beets); however by 14 DAT injury was not apparent. At the later application timing (8- to 10- leaf beets) there was no signs of sugarbeet injury. The addition of UpBeet did not improve control compared with glyphosate alone for pigweed. Initially it appeared that in some cases the addition of UpBeet may slightly improve control of common lambsquarters and Pennsylvania smartweed. However, by later evaluation times there were not any differences in control between glyphosate alone and when UpBeet was included. Overall there may be some initial benefits in the speed of control, but in our research we have not observed a benefit to the inclusion of UpBeet. However, if certain species become more difficult to control results may be different.

Use of these varieties is subject to them being lawful to purchase, receive, distribute and plant

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Sugarbeet Tolerance from Betamix and Glyphosate Tank-mixtures

Saginaw Valley Research Farm • Frankenmuth, MI

Christy Sprague and Gary Powell, Michigan State University

Location: Saginaw County
Planted: May 4
Varieties: Hilleshog 9042 RR
Herbicides: See Treatments
Soil Type: Clay loam; 2.8 OM; 7.9 pH;
Tillage: Conventional
Spacings: 4.25 inches
Reps: 4

Table 1. Sugarbeet injury, weed control, sugarbeet yield and recoverable white sugar per acre (RWSA)		WEED CONTROL (AT HARVEST)			SUGARBEET	
Herbicide Treatments[1] (application timing beet stage)	**Injury**[2]	**Common lambsquarters**	**Pennsylvania smartweed**	**Pigweed spp.**	**Yield**	**RWSA**
H9042 (Roundup Ready variety)	**—— % ——**	**———— % control ————**			**ton/A**	**lb/A**
Roundup PMax + AMS[2] (2-, 6-lf)	0	92	97	93	21.5	6077
Betamix (2 pt) + Roundup + AMS (2-lf) Roundup + AMS (6-lf)	9	98	97	99	21.3	6205
Betamix (3 pt) + Roundup + AMS (2-lf) Roundup + AMS (6-lf)	16	97	99	96	19.1	5425
Betamix (3 pt) + Roundup + AMS (2-lf) Betamix (3 pt) + Roundup + AMS (6-lf)	26	97	99	95	17.5	4665
Roundup + AMS (2-lf) Betamix (2 pt) + Roundup + AMS (6-lf)	9	99	96	95	21.5	6160
Roundup + AMS (2-lf) Betamix (3 pt) + Roundup + AMS (6-lf)	21	98	98	98	19.4	5491
Roundup + AMS (2-lf) Betamix (4.5 pt) + Roundup + AMS (6-lf)	31	99	99	99	20.9	6006
Roundup + AMS (2-lf) Betamix (6 pt) + Roundup + AMS (6-lf)	35	95	99	99	18.3	5162
$LSD_{(0.05)}$[3]	5	5	3	5	3.3	1041

1 Roundup PowerMax (22 fl oz) + ammonium sulfate (AMS) 17 lb/100 gal was included in all treatments.
2 Injury was evaluated 7 days after the 6-leaf application timing, DAT
3 Means within a column greater than least significant difference (LSD) value are different from each other.

SUMMARY:

The inclusion of additional herbicides with glyphosate may improve control of certain weeds. However, many herbicides that are labeled for sugarbeet tend to cause sugarbeet injury and may reduce yield and recoverable white sugar (RWSA). The goal of this trial was to examine various rates and application timings of Betamix in a typical glyphosate (Roundup)-based weed control program. Overall the addition of UpBeet caused significant sugarbeet injury. Injury was greatest when Betamix was applied at 3 pints per acre or higher. Sugarbeet injury persisted up to 20 DAT for the higher application rates and when Betamix was applied twice. There were no improvements in weed control when Betamix was added to glyphosate at the early evaluations. All treatments provided 99% control of common lambsquarters, Pennsylvania smartweed, and pigweed. At harvest there were some statistical improvements in common lambsquarters and pigweed control, but overall weed control was greater than 90% from two applications of glyphosate. Yield and RWSA was lower when Betamix at 3 pint per acre was applied twice. RWSA was also lower than the highest yielding treatment when Betamix was applied at 6 pint per acre in the second application. If Betamix is to be included with glyphosate for weed control in Roundup Ready sugarbeet, it should be applied at 2 pints per acre or less and at the later application timing.

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Weed Control and Crop Tolerance with Warrant, A Potential New Herbicide for Sugarbeet

Saginaw Valley Research Farm • Frankenmuth, MI

Christy Sprague and Gary Powell, Michigan State University

Location: Saginaw County
Planted: May 4
Varieties: Hilleshog 9042 RR
Herbicides: See Treatments
Soil Type: Clay loam; 2.8 OM; 7.9 pH;
Tillage: Conventional
Spacings: 4.25 inches
Reps: 4

Table 1. Sugarbeet injury, weed control, sugarbeet yield and recoverable white sugar per acre (RWSA)		WEED CONTROL (AT HARVEST)			SUGARBEET	
Herbicide Treatments[1] (application timing beet stage)	**Injury**[2]	**Common lambsquarters**	**Pennsylvania smartweed**	**Pigweed spp.**	**Yield**	**RWSA**
H9042 (Roundup Ready variety)	—— % ——	———— % control ————			ton/A	lb/A
Roundup PMax + AMS[3] (2-, 6-lf)	0	99	99	98	21.6	6049
Warrant + Roundup + AMS (2-lf) Roundup + AMS (6-lf)	4	99	99	99	21.4	5780
Outlook + Roundup + AMS (2-lf) Roundup + AMS (6-lf)	11	99	99	99	22.6	6209
Dual + Roundup + AMS (2-lf) Roundup + AMS (6-lf)	11	97	99	99	20.6	5530
Roundup + AMS (2-lf) Warrant + Roundup + AMS (6-lf)	5	99	99	99	21.7	5961
Roundup + AMS (2-lf) Outlook + Roundup + AMS (6-lf)	6	99	99	99	22.2	6250
Roundup + AMS (2-lf) Dual + Roundup + AMS (6-lf)	5	99	99	99	20.9	5898
Nortron (PRE) fb. Betamix + UpBeet + Stinger (Std. split applied 2X)	31	96	99	99	18.6	4864
$LSD_{(0.05)}$[4]	8	3	n.s.	n.s.	3	912

1 Herbicide rates: Roundup PowerMax (22 fl oz), Warrant (3 pt), Outlook (16 fl oz), Dual Magnum (1.33 pt), AMS (17 lb/100 gal), Nortron (3 pt), Betamix (3 pt), UpBeet (0.5 oz), Stinger (4 fl oz)

2 Injury was evaluated 7 days after the second standard split application.

3 Abbreviations: AMS = ammonium sulfate; RWSA = recoverable white sugar per acre.

4 Means within a column greater than least significant difference (LSD) value are different from each other; n.s. indicates that treatments were not different from each other.

SUMMARY:
Warrant is a new encapsulated acetochlor product that is being examined as a potential tank-mix partner with Roundup (glyphosate) in Roundup Ready sugarbeet. This trial compares crop tolerance, weed control and sugarbeet yield of two different application timings of Warrant with the current standards of Dual Magnum and Outlook. A conventional weed control treatment (standard-split herbicide program) was also included as a comparison. There was significant sugarbeet injury from the standard-split herbicide program and this injury resulted in a 20% reduction in RWSA compared two-applications of Roundup PowerMax. Sugarbeet tolerated applications of Warrant, Outlook, and Dual Magnum that were tank-mixed with Roundup at either 2- or 6-leaf sugarbeet, with only some injury from applications of Dual Magnum and Outlook at the 2-leaf stage, but this injury was not statistically different from Warrant at this timing. At harvest all herbicide treatments provided excellent control of common lambsquarters, Pennsylvania smartweed, and pigweed.

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Tolerance of Replanted Sugarbeet to Warrant

Saginaw Valley Research Farm • Frankenmuth, MI

Christy Sprague and Gary Powell, Michigan State University

Location: Saginaw County
Planted: May 4
Varieties: Hilleshog 9042 RR
Herbicides: See Treatments
Soil Type: Clay loam; 2.8 OM; 7.9 pH;
Tillage: Conventional
Spacings: 4.25 inches
Reps: 4

Table 1. Injury and stand counts for sugarbeet planted in to herbicide residues at various weeks after application

	WEEK-0[2]		WEEK-1		WEEK-2		WEEK-3		WEEK-4		WEEK-5	
Herbicides[1]	**Injury**	**Stand**	**Injury**	**Stand**	**Injury**	**Stand**	**Injury**	**Stand**	**Injury**	**Stand**	**Injury**	**Stand**
	%	**#/100ft**	**%**	**#/100ft**	**%**	**#/100ft**	**%**	**#/100ft**	**%**	**#/100ft**	**%**	**#/100ft**
No herbicide	0	225	0	212	0	171	0	162	0	162	0	207
Warrant (3 pt)	11	214	23	161	11	132	16	133	7	143	0	209
Warrant (6 pt)	23	205	41	130	31	110	44	98	13	113	4	205
Dual Magnum	15	211	25	167	13	135	20	123	2	160	0	209
$LSD_{(0.05)}$[3]	4	19	7	31	8	25	6	20	4	20	n.s.	n.s.

1 Herbicides were applied on May 4 into a weed-free seed bed; the application rate of Dual magnum was 1.33 pt/A.
2 Sugarbeet were planted weekly for 6 weeks, including the day of application.
3 Means within a column greater than least significant difference (LSD) value are different from each other; n.s. indicates that treatments were not different from each other..

Table 2. Main effects of herbicide and planting date for sugarbeet yield and recoverable white sugar per acre

MAIN EFFECT[1]	YIELD	RWSA
HERBICIDES	**ton/A**	**lb/A**
No herbicide	18.1 A[2]	4669 A
Warrant (3 pt)	18.4 A	4615 AB
Warrant (6 pt)	15.2 B	3690 C
Dual Magnum	17.3 A	4299 B

MAIN EFFECT[1]	YIELD	RWSA
PLANTING DATE	**ton/A**	**lb/A**
Week-0	20.9 A[2]	5631 A
Week-1	19.4 A	5086 B
Week-2	16.7 B	4155 C
Week-3	17.4 B	4193 C
Week-4	14.8 C	3474 D
Week-5	14.5 C	3371 D

1 Main effects of herbicide data are averaged over planting dates; and planting dates are averaged over herbicides
2 Means within a column with different letters are significantly different from each other.

SUMMARY: Warrant is a new encapsulated acetochlor product that is being examined as a potential tank-mix partner with Roundup (glyphosate) in Roundup Ready sugarbeet. Preemergence applications of Warrant have been shown to cause significant sugarbeet injury and in some cases reductions in yield. If sugarbeet needs to be replanted after a lay-by application of Warrant sugarbeet injury, reductions in stand, and potential reductions of yield may be a concern. This study was conducted to determine the time interval needed between Warrant applications and replanting sugarbeet. Four different treatments a no herbicide control, Warrant at 1X (3 pt) and 2X (6 pt) the suggested labeled rate, and Dual Magnum a similar herbicide to Warrant currently labeled for use in sugarbeet were examined. Injury to sugarbeet and reductions and stand were similar between the 1X rate of Warrant and Dual Magnum. If sugarbeet were planted into either of these treatments prior to the 4 week after application planting, sugarbeet stand was significantly lower than the no herbicide treatment. For the 2X Warrant application rate sugarbeet stand was lower until the 5 week planting. Overall the 2X rate of Warrant caused significant reductions in yield and RWSA. This research needs to be repeated to provide more information to growers on safe replanting intervals.

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Sugarbeet Tolerance After Valor Desiccation Applications to Dry Bean – 2 Year Summary

MSU Agronomy Farm • East Lansing, MI

Christy Sprague and Gary Powell, Michigan State University

Location: Ingham County
Planted: May 5, 2009; May 5, 2011
Varieties: Hilleshog 9042 RR
Spacings: 4.25 inches

Desiccant Herbicides Application Dates: September 9, 2008; September 30, 2010
Soil Type: 2009 – Loam; 3.2 OM; pH 6.7; 2011 – Sandy clay loam; 1.3 OM; pH 6.7

Table 1. Dry bean desiccation herbicide effects on sugarbeet planted 7 months after desiccant

	CONVENTIONAL TILLAGE				NO TILLAGE			
DESICCANTS[1]	**Injury**	**Stand**	**Yield**	**RWSA**	**Injury**	**Stand**	**Yield**	**RWSA**
	%	**#/100ft**	**ton/A**	**lb/A**	**%**	**#/100ft**	**ton/A**	**lb/A**
Valor (2 oz)	21 b[2]	123 b	26.2 a	6413 a	70 a	46 b	13.8 b	3102 b
Valor (3 oz)	43 a	85 c	21.5 a	5209 a	90 b	17 c	8.6 c	1735 c
Roundup PowerMax	0 c	162 a	27.7 a	7062 a	0 c	121 a	21.6 a	5280 a
Gramoxone Inteon	0 c	164 a	26.9 a	6793 a	2 c	106 a	19.6 a	4858 a

[1] Herbicide rates: Roundup PowerMax (22 fl oz) and Gramoxone Inteon (2 pt).
[2] Means within a column with different letters are significantly different from each other.

SUMMARY:
The registration of Valor as a dry bean desiccant and the recent changes to shorten the rotational restriction intervals for sugarbeet have caused concerns about the actual crop safety from these applications prior to planting sugarbeet. The current crop rotation restrictions for sugarbeet for the 2 oz per acre rate of Valor are 4 months for sugarbeet that is tilled prior to planting and 8 months for no-till sugarbeet. At the 3 oz per acre rate of Valor the rotation intervals are 5 months for sugarbeet tilled prior to planting and 10 months for no-till sugarbeet. We conducted research two separate years to determine what effects desiccation treatments have on sugarbeet planted the spring after desiccation. Valor at 2 oz/A and 3 oz/A (maximum labeled desiccation rate), Roundup PowerMax at 22 fl oz/A, and Gramoxone Inteon at 2 pt/A were the four desiccation treatments examined. These treatments were applied in mid-September of 2008 and 2010. Intervals between desiccant applications and sugarbeet planting were 7 month and 16 days in 2009 and 7 month and 5 days in 2011. There was not a significant year by treatment interaction, so sugarbeet data are combined over the two years. In both conventional tillage and no-tillage sugarbeet Valor applied at 2 and 3 oz/A caused significant injury and reduced stand compared with either the Roundup PowerMax or Gramoxone treatments. Differences in injury and sugarbeet stand between the treatments were greatest in the no-till sugarbeet plots, with the higher rate of Valor causing as much as 86% stand loss. In the conventional tillage plots sugarbeet stand at harvest was 25 and 50% lower when Valor was applied at the 2 and 3 oz/A rates, respectively, compared with either Roundup PowerMax or Gramoxone. Reductions in stand in the conventional tillage treatments were not reflected in yield or RWSA. In no-till sugarbeet, which was 1 and 3 months short of meeting the rotation interval yield and RWSA were significant reduced compared with Roundup PowerMax or Gramoxone. Our current recommendation if growers are using Valor as a desiccation treatment is to use a 1.5 oz/A rate. Additionally if a grower intends to plant sugarbeet after this application, tillage is essential and even with tillage there is a high probability that sugarbeet stand may be reduced.

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Nitrogen and Weed Control Timing Influences on Roundup Ready Sugarbeet Quality & Yield (2010 & 2011)

Saginaw Valley Research Farm & Agronomy Farm

Alicia Spangler and Christy Sprague, Michigan State University

Location: Saginaw County and Ingham County
Planted: May 19, 2010; May 5, 2011 (EL)
March 31, 2010; May 4, 2011 (S)
Varieties: Hilleshog 9042 RR
Spacings: 4.25 inches
Reps: 4

Herbicides: Roundup PowerMax (22 fl oz/A) + AMS
Soil Type: Clay Loam, 3.4/3.2 OM, pH 6.1/6.8 (EL, '11/'12)
Clay/Clay Loam, 3.0/2.6 OM, pH 7.3/7.8 (S, '10/'11)
Weed Removal Timing: <1, 3, 6, and 12-inch weeds
Nitrogen Rates: 0, 60, 90, 120 and 60:60 lbs N/A

Table 1. Effect of weed removal timings on sugarbeet yield and quality averaged across nitrogen rates

	EAST LANSING*		2010 SAGINAW		2011 SAGINAW	
WEED REMOVAL[1]	YIELD	RWSA	YIELD	RWSA	YIELD	RWSA
	__tons/A__	__lbs/A__	__tons/A__	__lbs/A__	__tons/A__	__lbs/A__
<1 inch	15.3 a[2]	3967 a	28.7 a	7354 a	18.7 a	5180 a
3 inches	14.0 b	3638 b	24.7 b	6212 b	18.9 a	5364 a
6 inches	14.1 b	3630 b	24.7 b	6232 b	20.4 a	5744 a
12 inches	14.0 b	3568 b	22.7 c	5874 bc	18.7 a	5200 a

* Combined over 2010 and 2011.
1 Weeds were controlled at these weed heights using Roundup PowerMax (22 fl oz/A) + AMS (17 lb/100 gal).
2 Means within a column with different letters are significantly different from each other.

Table 2. Effect of nitrogen on sugarbeet yield and quality averaged across weed removal timings

	EAST LANSING*		2010 SAGINAW		2011 SAGINAW	
NITROGEN RATE[1]	YIELD	RWSA	YIELD	RWSA	YIELD	RWSA
	__tons/A__	__lbs/A__	__tons/A__	__lbs/A__	__tons/A__	__lbs/A__
0 lb/A	13.5 b[2]	3596 a	22.2 c	5841 b	14.1 c	3932 c
60 lb/A	14.3 ab	3789 a	25.4 ab	6605 a	18.3 b	5189 b
90 lb/A	14.6 a	3761 a	24.7 b	6308 ab	20.2 a	5721 a
120 lb/A	14.7 a	3671 a	26.6 a	6612 a	21.4 a	6016 a
60:60 lb/A	13.8 a	3687 a	26.9 a	6722 a	21.8 a	6002 a

* Combined over 2010 and 2011.
1 Nitrogen was applied pre-plant for all but the split application which was applied preplant and at 4-6 leaf sugarbeet.
2 Means within a column with different letters are significantly different from each other.

SUMMARY:
This trial was conducted to determine the impact of different weed removal timing and nitrogen rates on sugarbeet yield and quality. Due to similar results at the East Lansing, data were combined over 2010 and 2011. At East Lansing and Saginaw 2010 yield and RWSA was reduced if weeds were not controlled prior to 3-inch weeds and yield was reduced further if weeds were allowed to grow with sugarbeet until 12-inches tall. The main effect of nitrogen affected yield and RWSA differently for the different locations. Overall the 90 lb/A rate of higher provided the greatest yields and RWSA. However under certain conditions, maximum yields were achieved with lower nitrogen rates. This usually occurred under lower yielding environments.

Seed Rate on Sandy Soil

Clay Crumbaugh • Breckenridge, MI

Trial Quality: Good
Location: Gratiot County
Planted: May 5
Previous Crop: HM-28RR
Soil Type: Soybeans

Spacings: Rows-30"
Fertilizer: 2x2 - 15-9-9-15S-.7Mn-.4B; Pre Broadcast 18 Gal 28%
Tillage: Fall Zone Till; Stale Seedbed
Harvest Date: Loamy Sand & Sandy Loam

Harv/Sample: Nov. 6 /Oct. 6
Herbicides: 3x Glyphosate
Replicated: 3x
Fungicide: 55 DSV - Eminent
110 DSV - Headline
165 DSV - Agritin

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Emerged Populations 35 day	
							100 Ft	Per Acre
Middle Rate - 4.25" 49,200 / Acre	—	**6548**	**282**	**23.2**	**18.8**	**95.5**	214	37,300
High Rate - 3.75" 55,800 / Acre	—	**6355**	**284**	**22.7**	**18.9**	**95.6**	237	41,300
Low Rate - 4.75" 44,000 / Acre	—	**6310**	**280**	**22.6**	**18.7**	**95.5**	176	30,700
Average	—	6404	282	22.9	18.8	95.6	209	—
LSD 5%	—	595 NS	12 NS	1.9 NS	0.6 NS	0.3 NS	21	—
CV %	—	2	2	1.9	1.5	0.1	4	—

$/Acre: Not Calculated.
Bold: Results are not statistically different from top-ranking treatment in each column.

Emergence: Excellent
Rhizoctonia: Low
Quadris App: In Furrow (4" Band, 5 oz) & 6-8 Leaf

Cerc Leafspot: Good Control
Nematodes: Not Confirmed
Weather: —

COMMENTS:

Research was conducted to look at the effects of plant population on yield and quality on light textured soil. Research done in other sugarbeet growing areas suggested that higher seeding rates in light soils improved yields. This trial was set-up with GPS guidance in 12-row planter strips. Entire strips were harvested using truck weights. All planting was done with no spring tillage into a stale seedbed. Fall tillage was done after soybean harvest with a Brillion zone tillage tool that had a shank depth of 16 inches. No significant differences were seen or measured in yield and quality.

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Seed Carryover Research 2011

2010 Seed Planted in 2011 • Average of 3 Locations

By Storage Location

Storage Location	% Emergence			Average of 3
	Sylvester	Trost	Bender	
USDA Storage	**55.8**	**32.6**	**65.7**	**51.4**
SP Lab	**53.8**	**30.4**	61.2	**48.5**
Sp Freezer	**51.5**	**31.0**	60.9	**47.8**
SP Shop	48.8	**29.9**	**61.4**	**46.7**
SVRF Shop	42.9	22.1	44.6	36.5
Average	50.6	29.2	58.7	46.2
LSD 5%	5.2	3.1	4.4	5.5
CV %	14.6	12.5	11.3	6.6

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

By Variety

Variety	% Emergence			Average of 3
	Sylvester	Trost	Bender	
HM-27RR	**57.3**	**35.7**	**68.4**	**53.8**
SX-1260RR	51.7	30.5	60.1	47.4
B-18RR26	42.6	21.3	47.7	37.2
Average	50.6	29.2	58.7	46.2
LSD 5%	3.9	2.8	3.5	5.5
CV %	14.6	12.5	11.3	6.6

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

SUMMARY:
Emergence is a concern when grower seed is carried over from one year to the next. The main conclusion from this trial is that the unheated SVRF Shop had significantly lower emergence. The USDA storage is temperature and humidity controlled. The most practical seed storage location is a heated room. The SP Shop is kept around 62°F and the Lab about 70°F. The HM-27RR emerged significantly better and B-18RR26 was significantly less.

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Seed Carryover Research

2010 Seed Planted in 2011 • Average of 3 Locations

Trial Quality: Good **Plot Size:** 2 Rows X 38 ft **Reps:** 6

Location Variety	% Emergence			Average of 3
	Bender	Sylvester	Trost	
USDA Storage SX-1260RR	**71.8**	**55.4**	**48.0**	**58.4**
SVRF Shop HM-27RR	**66.6**	**62.3**	**44.2**	**57.7**
SP Freezer HM-27RR	**71.4**	**53.8**	**47.9**	**57.7**
USDA Storage HM-27RR	**68.0**	**58.6**	**46.4**	**57.7**
SP Lab HM-27RR	**66.3**	**61.4**	**45.1**	**57.6**
SP Freezer SX-1260RR	**64.7**	**55.3**	**45.9**	**55.3**
SP Shop HM-27RR	**69.9**	50.5	**45.3**	**55.3**
SP Lab SX-1260RR	**65.3**	**54.6**	39.2	**53.0**
SP Shop SX-1260RR	61.5	**55.1**	39.4	52.0
USDA Storage B-18RR26	57.3	53.3	33.8	48.1
SP Lab B-18RR26	52.0	45.5	28.4	42.0
SP Shop B-18RR26	52.7	40.8	27.8	40.5
SP Freezer B-18RR26	46.5	45.2	29.2	40.3
SVRF Shop SX-1260RR	37.1	38.2	23.3	32.9
SVRF Shop B-18RR26	30.0	28.2	16.8	25.0
Average	58.7	50.6	37.4	48.9
LSD 5%	7.7	8.6	5.5	5.5
CV %	11.3	14.6	12.5	6.6

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

PIONEER • BIG CHIEF
MICHIGAN SUGAR

Seed Carryover Research

2009 Seed Planted in 2011 • Average of 2 Locations

By Storage Location

Storage Location	% Emergence		Average of 2
	Sylvester	Trost	
USDA Storage	**59.2**	**49.0**	**54.1**
Sp Freezer	**59.2**	**48.0**	**53.6**
SP Lab	53.6	43.1	**48.4**
Sp Shop	51.9	41.9	**46.9**
SVRF Shop	45.8	34.0	39.9
Average	53.9	43.2	48.6
LSD 5%	5.2	3.7	9.6
CV %	12.1	14.2	9.3

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

By Variety

Variety	% Emergence		Average of 2
	Sylvester	Trost	
HM-27RR	**62.3**	**46.6**	**54.4**
SX-1260RR	56.8	**46.9**	**51.8**
HM-50RR	57.5	43.4	**50.5**
B-17RR32	39.2	35.9	37.5
Average	53.9	43.2	48.6
LSD 5%	3.4	3.2	9.6
CV %	12.1	14.2	9.3

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

SUMMARY:
Emergence is a concern when grower seed is carried over from one year to the next. This trial indicated that the best storage is in a temperature and humidity controlled room or a freezer. The unheated SVRF shop was significantly worse than all other treatments. The freezer is probably not practical leaving a heated room as the next best. The SP Shop is kept around 62°F and the Lab about 70°F. Emergence of B-17RR32 was significantly less.

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Seed Carryover Research 2011

2009 Seed Planted in 2011 • Average of 2 Locations

Trial Quality: Good **Plot Size:** 2 Rows X 38 ft **Reps:** 6

Location Variety	% Emergence		Average of 2
	Sylvester	Trost	
SP Freezer SX-1260RR	**61.7**	**56.0**	**58.8**
USDA Storage SX-1260RR	**61.1**	**52.8**	**57.0**
USDA Storage HM-27RR	**64.3**	47.9	**56.1**
SP Lab SX-1260RR	**62.0**	48.5	**55.2**
USDA Storage HM-50RR	**64.5**	45.6	**55.1**
SP Lab HM-27RR	**61.3**	48.3	**54.8**
SVRF Shop HM-27RR	**63.6**	45.5	**54.6**
SP Freezer HM-27RR	**62.1**	45.6	**53.9**
SP Shop HM-27RR	**60.1**	45.6	**52.9**
SP Shop SX-1260RR	**58.3**	47.1	**52.7**
SP Freezer HM-50RR	**58.3**	45.0	**51.6**
SP Freezer B-17RR32	54.8	45.2	**50.0**
SVRF Shop HM-50RR	**57.1**	41.9	**49.5**
SP Shop HM-50RR	54.1	42.7	48.4
USDA Storage B-17RR32	47.1	**49.7**	48.4
SP Lab HM-50RR	53.5	41.9	47.7
SP Lab B-17RR32	37.7	33.9	35.8
SVRF Shop SX-1260RR	40.8	30.0	35.4
SP Shop B-17RR32	34.9	32.2	33.6
SVRF Shop B-17RR32	21.5	18.5	20.0
Average	53.9	43.2	48.6
LSD 5%	7.6	7.1	9.6
CV %	12.1	14.2	9.3

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

Sugarbeet Advancement

Air Bag Down Pressure

Richmond Brothers Farms LLC, Pigeon, MI

Trial Quality: Good
Location: Huron County
Planted: May 7
Previous Crop: C-RR827
Soil Type: Wheat, Alfalfa Cover, Followed by Wheat Cover

Spacings: Rows - 22"
Fertilizer: 2x2 - (Lbs.) 63-42-0-8S-.27Mn-.28B; S.D.-68# N
Soil Type: Loam
Tillage: Dominator & 1x F.C.; Wheat Cover; Stale Seedbed

Harv/Sample: Nov. 12 / Oct. 13
Herbicides: 4x Glyphosate
Replicated: 4x
Fungicide: 47 DSV - Proline
95 DSV - Gem
143 DSV - Proline
180 DSV - Gem

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Populations 100 Ft of Row	
							16 Day	31 Day
Medium 70 psi Air Pressure	$2,085	**10916**	**311**	**35.1**	**20.7**	**95.5**	**127**	**129**
Heavy 120 psi Air Pressure	$2,031	**10640**	**319**	**33.4**	**21.0**	**95.7**	**158**	**163**
Light 20 psi Air Pressure	$1,786	9343	**314**	29.9	**20.7**	**95.6**	**115**	**116**
LSD 5%	—	982	11 NS	2.7	0.8 NS	0.5 NS	52 NS	50 NS
CV %	—	6	2	4.8	2.1	0.3	23	21

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Populations 100 Ft of Row	
							16 Day	31 Day
Medium 65 psi Air Pressure	$2,066	**10684**	**315**	**33.9**	**20.8**	**95.8**	**164**	**162**
Medium/Heavy 90 psi Air Pressure	$2,013	**10407**	306	**34.1**	**20.2**	**95.2**	**166**	**169**
LSD 5%	—	1929 NS	9	6.2 NS	0.9 NS	1.1 NS	24 NS	20 NS
CV %	—	8	1	8.1	2.0	0.5	6	5

$/Acre: Gross dollars per acre assuming a $60 payment.
Bold: Results are not statistically different from top-ranking treatment in each column.

COMMENTS:

Planting sugarbeets into a stale seedbed has become increasingly popular with the adoption of Roundup Ready sugarbeets. Because a stale seedbed can vary in compactness between fields and soil types, particular attention needs to be paid to planting depth and seed to soil contact. In this stale seedbed trial, soil was very dense and somewhat compact. The trial used a 24 row White planter with air bag down pressure and a Precision 20/20 monitor. On the first pass across the field, three different down pressures were used by changing row unit air bag pressure in 8 row segments of the planter. Since the Heavy air pressure in the first pass seemed to be overly aggressive, in the second pass the Heavy air pressure was reduced. On the second pass, there was an error with the Light pressure so only two pressures were used. In each pass, the 8 row segment air pressure was changed for four replications. The two tables above, represent the two different passes. Trial indicates that down pressure to maintain the proper planting depth should be closely monitored. The lightest down pressure had the poorest emergence and reduced yields because seeding depth and seed to soil contact was poorer. The Heavy pressure in the first pass did not significantly yield different than the Medium rate, but it appears the yield maybe starting to be impacted. This maybe due to Heavy down pressure from the planter introducing shallow compaction. The monitor was reading unit ground pressures of about 200-350 psi for the Heavy, 125-180 psi for the Medium, and 25-40 psi for the Light.

Seed Plate Pressure
Richmond Brothers Farms LLC, Pigeon, MI

Trial Quality: Good
Location: Huron County
Planted: May 7
Previous Crop: C-RR827
Soil Type: Wheat, Alfalfa Cover, Followed by Wheat Cover

Spacings: Rows - 22"
Fertilizer: 2x2 - (Lbs.) 63-42-0-8S-.27Mn-.28B; S.D.-68# N
Soil Type: Loam
Tillage: Dominator & 1x F.C.; Wheat Cover; Stale Seedbed

Harv/Sample: Nov. 12 / Oct. 13
Herbicides: 4x Glyphosate
Replicated: Randomized Trial 3x
Fungicide: 47 DSV - Proline
95 DSV - Gem
143 DSV - Proline
180 DSV - Gem

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Populations 100 Ft of Row	
							16 Day	31 Day
High Pressure 6 psi	—	**11485**	**322**	**35.6**	**21.2**	**96.0**	201	203
Normal Pressure 3 psi	—	**11281**	**320**	**35.2**	**21.2**	95.4	158	163
Light Pressure 0.5 psi	—	**10449**	**312**	**33.5**	**20.8**	95.1	125	134
AVERAGE	—	11072	318	34.8	21.1	95.5	161	167
LSD 5%	—	1829 NS	16 NS	5.3 NS	0.9 NS	0.4	46	39
CV %	—	8	2	7.6	2.1	0.2	14	12

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

Emergence: Dependent on Treatments
Rhizoctonia: Low
Quadris App: In Furrow (3" Band 5.4 oz), & 6-8 Leaf (14.2 oz w/ Mustang)

Cerc Leafspot: Excellent Control
Nematodes: None Detected
Weather: —

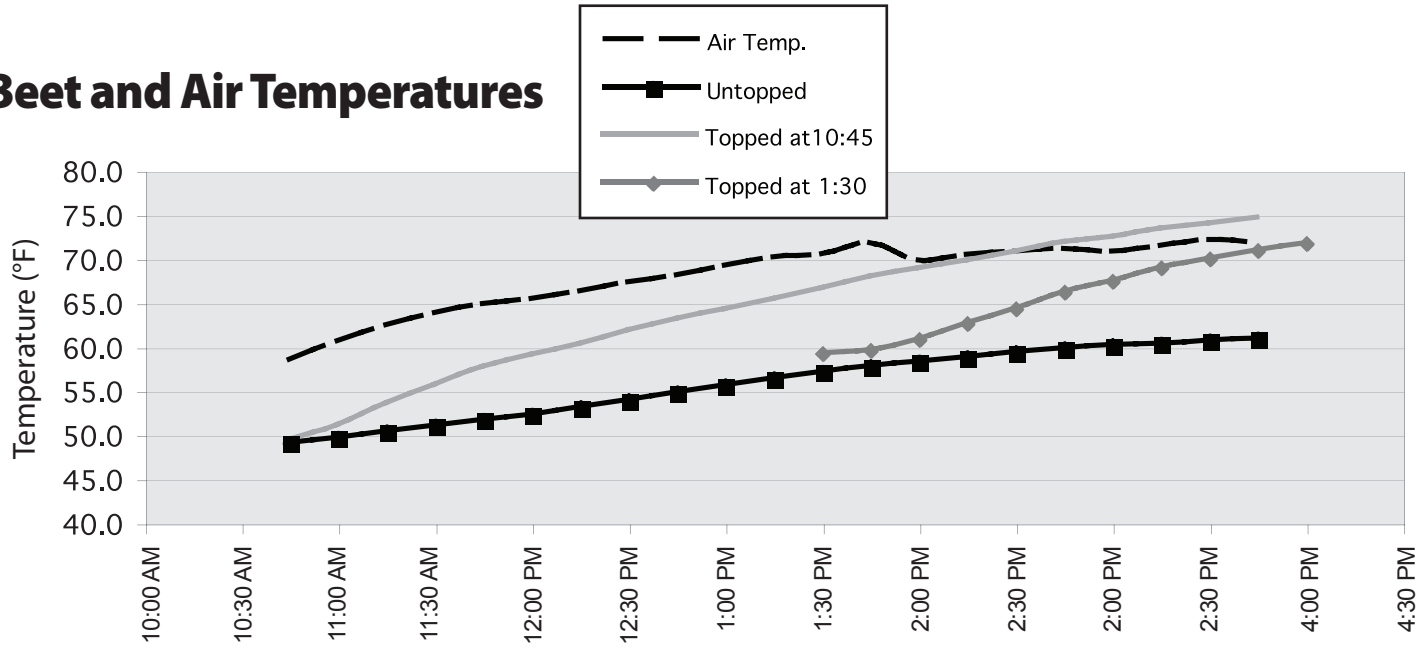
COMMENTS:
Recommended plate pressure will vary between seed sizes. This study was initiated to look at the effects of seed population and spacing when seed plate pressure is too high or too low. The trial was planted with a White planter with normal plates and a Precision 20/20 monitor. The best pressure in this trial for the seed size was 3 psi. The air pressure on the plates was adjusted from 0.5 - 6 psi to force skips and doubles. The seed monitor and stand counts indicated that under light plate pressure, planting population dropped by 18% and skips ranged from 6 to 15%. Inadequate pressure will cause seed to fall off the plate. Under too high of pressure, stands increased by 20% and doubles were between 15-20%. Proper plant spacing is important to minimize competition between plants and improve topping.

Topped Beet Temperature

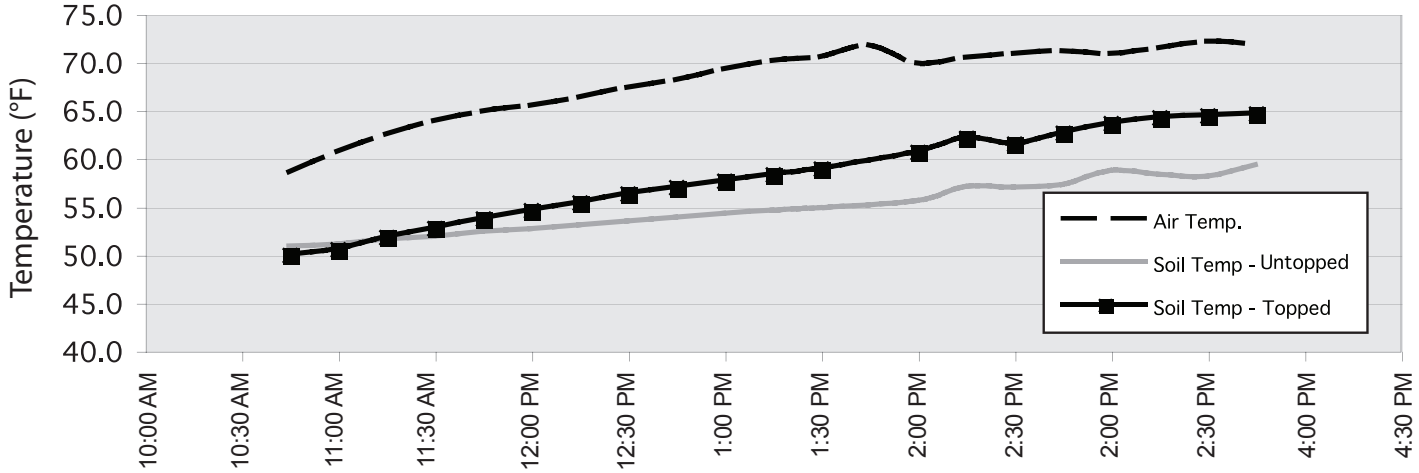
Saginaw Valley Research Farm • Frankenmuth, MI

This trial was conducted to compare how fast topped and untopped sugarbeets warm during the day. The trial was initiated during early season delivery on October 4, 2011. Two different topping times were compared (10:45 & 1:30) to untopped beets. Digital temperature probes were inserted 2 inches into the beet crowns and 2 inches into the soil. Temperature readings were taken every 15 minutes. The day was bright & sunny with initial air temperature at 10:45 a.m. about 57 degrees and peaked at 1:45 p.m. at 72 degrees. Sugarbeets that were not topped, gained temperature slowly compared to sugarbeets that were defoliated. Defoliated beets actually increased temperature faster than the air temperature, indicating radiant energy (sun) was also heating the crowns. By 2:30 p.m., the 2 inch beet temperature was higher than ambient air temperature. At the end of the day, the 10:45 defoliated beets were about 13.5 degrees warmer than non defoliated. Both the 10:45 and 1:30 topped beets increased the 2 inch beet temperature at a rate of 5 degrees per hour compared to about 2.4 degrees per hour for untopped beets. Since sugarbeet respiration doubles every 15 degrees it is recommended that defoliation not be more than 30 minutes before harvest.

Beet and Air Temperatures



Air and Soil Temperatures



ProAct Foliar Spray Trial
Schindler Farms, LLC • KawKawlin, MI

Trial Quality: Good
Location: Bay County
Planted: May 5
Previous Crop: B-18RR4N
Soil Type: Corn

Spacings: Rows-22"; Seeds-58,500
Fertilizer: 2x2 - 19-17-0; S.D. - 126# N by 28%
Soil Type: Loam
Tillage: Chisel; Spring 1x Triple K

Harv/Sample: Nov. 6 / Oct. 6
Herbicides: 2x
Replicated: 4x
Fungicide: 62 DSV - Inspire XT
126 DSV - Headline
176 DSV - Proline

Treatment	$/Acre	RWSA	RWST	T/A	% Sugar	% CJP	Dead Beets / 1200 Ft
ProAct Foliar Spray - 1x at 4 Leaf	—	**7862**	**255**	**30.7**	**17.3**	**95.1**	**101**
Check	—	**7852**	**259**	**30.4**	**17.5**	**95.1**	**97**
ProAct Foliar Spray - 2x at 4 Leaf & 8 Leaf	—	**7539**	**264**	**28.6**	**17.8**	**95.1**	**106**
AVERAGE	—	7751	259	29.9	17.5	95.1	101
LSD 5%	—	1112 NS	17 NS	2.9 NS	0.9 NS	1.0 NS	106 NS
CV %	—	8	4	5.7	3.1	0.6	61

$/Acre: Not calculated.
Bold: Results are not statistically different from top-ranking treatment in each column.

Emergence: Good
Rhizoctonia: Moderate
Quadris App: 2x Foliar at 2-4 & 6-8

Cerc Leafspot: Good
Nematodes: Yes
Weather: —

COMMENTS:
Trial was established to evaluate the effects of a Harpin Protien sold under the trade name ProAct. This protein, when applied to plants, is thought to bolster the plants immunity to fight off attacks from disease and nematodes. This trial had a moderate amount of Rhizoctonia and Sugarbeet Cyst nematodes. The variety used in this trial was B-18RR4N, which is a nematode tolerant but Rhizoctonia susceptible variety. All treatments including the check had two applications of Quadris applied at the 2-4 and 6-8 leaf stage. ProAct was applied at 1 ounce per acre with Quadris. The single application of ProAct was at the 2-4 leaf stage. The double application was applied at the 2-4 and 6-8 leaf stage. No significant effects were seen on yield or disease resistance.

Rhizomania and Sugarbeet Cyst Nematode Survey of Ontario Sugarbeet Production Region, 2006-2011

Principal Researcher:
Janice LeBoeuf, Vegetable Crop Specialist - Ontario Ministry of Agriculture, Food and Rural Affairs, Ridgetown, ON
Collaborators:
Cheryl Trueman, Christian Krupke, Ron Pitblado, Ridgetown Campus - University of Guelph;
Tom Welacky, Agriculture & Agri-Food Canada

Background

Rhizomania, caused by Beet Necrotic Yellow Vein Virus (BNYVV) and vectored by the fungus Polymyxa betae Keskin, was first identified in North America in 1983 in California. It has since spread to all of the U.S. sugarbeet growing regions, most recently the Great Lakes growing region, where it was positively identified in some Michigan counties in the fall of 2002. The disease was already widespread at that time.

Rhizomania is regarded as one of the most destructive of sugarbeet diseases. It can severely reduce tonnage and sucrose levels. The soil fungus that transmits the BNYVV is found in all sugarbeet growing regions of the world, and the virus has now spread to most areas as well. The disease is very infectious; a small amount of soil can start an infection which will eventually spread throughout a field. Once present, it cannot be eradicated, so it is important that management practices be used to slow its spread and reduce its impact. The disease can be present in a field for many years before symptoms are evident. In the meantime, it can be spread by normal farming operations.

Sugarbeet cyst nematode (SBCN) is another destructive soil-borne pest of sugarbeets. SBCN has not been reported on sugarbeets in Ontario since the crop was reintroduced to the province in 1996 after about a 30 year absence. According to Michigan information, a population of 100-200 SBCN eggs per 100 cm3 of soil can reduce the yield of susceptible sugarbeets. It is important to know if this nematode is present in the Ontario growing areas, so that growers can make appropriate management decisions.

We sampled sugarbeet fields across the Ontario growing area in 2006-2011 to determine if these pests were present, and if so, how widely distributed. With early detection, growers will be able to implement management practices to reduce or delay the impacts of rhizomania and sugarbeet cyst nematode in the region.

Sugarbeets are produced on about 10,000 acres in Ontario.

Project Objectives

- Determine if the rhizomania disease complex and/or sugarbeet cyst nematode are present in Ontario by sampling a representative number of sugarbeet fields each season.
- If rhizomania and/or sugarbeet cyst nematode are found, prepare educational materials and presentations for growers and crop consultants on preventing the spread of these pests and on managing the pests.

Method

In 2006, fields that were in sugarbeets for the third time (since 1996) were sampled, along with a random sampling of fields that were in sugarbeets for the first or second time, for a total of 95 fields. In 2007 - 2011 only fields that were in sugarbeets for at least the third time were sampled: 81 fields in 2007, 47 fields in 2008, 59 fields in 2009, 50 fields in 2010; and 48 fields in 2011.

The protocol to collect and test soil for the BNYV virus was provided by Dr. W. Wintermantel, USDA-ARS (personal communication). Soil sampling took place from June through September. Soil samples were used to grow rhizomania-susceptible sugarbeet seedlings in pots in the greenhouse facilities at Ridgetown Campus. Seedlings from each pot were washed and roots were tested for Beet Necrotic Yellow Vein Virus (Agdia Inc.).

The remaining sugarbeet seedlings from the rhizomania screening were washed and examined by Agriculture & Agri-Food Canada for evidence of SBCN. Examinations were made between 30 and 60 days after planting in 2006 and at about 60 days after planting in 2007-2011. Sugarbeet root samples were also taken from each field included in the survey. The roots were examined by OMAFRA for nematode cysts, except in 2011 when a refrigerator problem caused the roots to deteriorate prior to examination.

The project also included provision to sample fields with symptoms that might indicate the presence of rhizomania or SBCN, but there were no reports of suspicious symptoms in any of the project years.

continued on next page

Rhizomania and Sugarbeet Cyst Nematode Survey of Ontario Sugarbeet Production Region, 2006-2011

Results and Summary

A total of 380 fields were screened over five years. All of the tested samples were negative for Beet Necrotic Yellow Vein virus, the virus that causes Rhizomania.

No evidence of sugarbeet cyst nematode was found on sugarbeet root samples or on sugarbeet seedlings grown in soil from the sampled fields.

To date, sugarbeet rhizomania or sugarbeet cyst nematode have not been detected in the Ontario sugarbeet growing region.

Acknowledgements

Ontario Sugarbeet Growers' Association OSGA Promoting Profitable Sugarbeet Production In Ontario

Sponsoring Organization:
Ontario Sugarbeet Growers' Association

Agricultural Adaptation Council

2010-2011 Funding from the Agricultural Biosecurity Program
The Agricultural Biosecurity Program (ABP) flows out of the Canada-Ontario bilateral agreement to implement Growing Forward, a Federal-Provincial-Territorial initiative. The ABP is part of the Best Practices Suite of programs for Growing Forward in Ontario.

The ABP is aimed at supporting Ontario's agricultural sectors including service and supply sectors, to address their specific biosecurity needs through education, training, studies, and applied pilot projects that impact at the farm level. The focus is on initiatives that enable the sector to protect the agricultural resource base from disease, pests, and pathogens, and reduce the associated biological and economic risks.

Previous years' funding:

Ontario

Agricultural Adaptation Council

Project partners:

University of Guelph

Ridgetown Campus – University of Guelph provided greenhouse and lab facilities, equipment, and staff expertise and time.

Pioneer · Big Chief Michigan Sugar

Michigan Sugar Company provided field locations, technical advice, and access to grower fields.

Agriculture and Agri-Food Canada / Agriculture et Agroalimentaire Canada

Tom Welacky, Greenhouse & Processing Crops Research Centre, Agriculture & Agri-Food Canada provided technical advice and screened sugarbeet seedlings for SBCN.

Ontario Ministry of Agriculture Food & Rural Affairs

OMAFRA summer help was provided by OMAFRA, under the Summer Experience Program. OMAFRA Agriculture Development Branch provided office equipment and space, staff time for supervision and co-ordination, and sampling equipment.

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MICHIGAN STATE UNIVERSITY Extension
Michigan State University AgBioResearch

Respiratory Sugar Losses From Harvest to the Piling Grounds

Randolph Beaudry (MSU) and James Stewart and Lee Hubbell (Michigan Sugar)

The sugar industry has suffered unacceptable postharvest losses in beet root sugar yield. In some years, the losses have been extreme, e.g., more than $25M was estimated to be lost in 2004. This year (2011) we saw an unusually warm fall and early winter that lead to the premature processing of some field piles of sugar beets.

Under ideal conditions (38 °F), we have found that respiratory activity resulted in a loss of 0.09 to 0.27 pounds of sugar per ton per day, which translates to approximately 3 to 9% of the total sugar lost over the length of a 100-day campaign. At a slightly higher temperature (50 °F), the losses ranged from 0.2 to 0.57 pounds per ton per day or 6 to 18% of the initial sugar present. At the excessively high temperature of 68°F, the losses were estimated to be between 0.37 and 1.37 pounds of sugar per ton per day or 12 to 49% of the sugar lost over the length of the campaign. It is important to recognize the rate of respiration and sugar loss doubles for every 10 to 15°F increase. Interestingly, the rate of sugar loss for a given temperature is calculated to increase as the season progresses as sprouts and decay utilize the stored reserves of the sugar beets. We found that the rate of metabolic activity was slightly more than twice as high at the end of the storage period compared to the fall immediately after harvest.

After five months holding at 38 °F, very few of the roots had appreciable sprouting or decay. This was in contrast to those roots we obtained from the piling grounds, which had considerable shoot growth and decay. Using a remote infrared temperature sensor, we measured the temperature of beet roots on the face of storage piles being disassembled for sugar extraction. We found internal pile temperatures of 50 °F despite air temperatures in the 20's in mid February. In 2007, we held roots at a constant 50 °F and obtained levels of sprout growth and decay similar to those we found in the piles at the conclusion of the 2005, 2006, and 2007 campaign seasons.

More recently, in 2010, we conducted a study in conjunction with Michigan Sugar in which we evaluated the effect of seven harvesting and handling treatments and three storage temperatures on the respiratory sugar loss and quality loss for beet roots. The treatments included:

1. Hand defoliation, hand digging (HdefHdug)
2. Hand defoliation, machine digging (HdefMdug)
3. Machine defoliation (topping), hand digging (MdefHdug)
4. Machine defoliation, machine digging, delivered to empty truck (MdefMdugEmpty)
5. Machine defoliation, machine digging, delivered to half-full truck (MdefMdugHalfFull)
6. Machine defoliation, machine digging, delivered to full truck (MdefMdugFull)
7. Machine defoliation, machine digging, crowned (HdefHdugCrowned)

In addition, beets were stored continuously at 35 °F (optimal), 45 °F (common pile temperature), and 55 °F (abusive/hotspot temperature). After one month storage, the major effect was that of temperature, leading to a rate of sugar loss that averaged 8, 13, and 30 lbs per ton per day for 35, 45, and 55 °F, respectively (Figure 1). The method of defoliation had little effect. However, allowing the roots to traverse the machine harvester and be delivered to the beet truck resulted in a 25 to 30% increase in respiratory sugar loss.

After 3 months of storage, temperature was still the primary influence on respiratory sugar loss, again causing about a four- or five-fold increase in sugar loss as the temperature increased from the optimal storage temperature of 35 °F to 55 °F (Figure 2). However, by three months the impact of handling was much more pronounced. There was about a 2.5-fold higher rate of respiratory losses for the roots permitted to be cleaned, elevated and dumped into the beet truck, compared to those harvested by either hand or machine. Rates of sugar loss as high as 115 lbs per ton per season were recorded. A similar effect on beet quality was seen (data not shown).

Collectively the data are consistent with the previous 5 years work and continue to support the need for development of a modified, less damaging handling techniques to improve storage. Modest gains in reducing damage could yield millions of dollars in savings to the sugar beet industry.

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Figure 1. Rate of respiratory sugar loss as a function of handling regimen and storage temperature (see text for meaning of abbreviations) for sugar beet roots stored 1 month at the temperatures indicated.

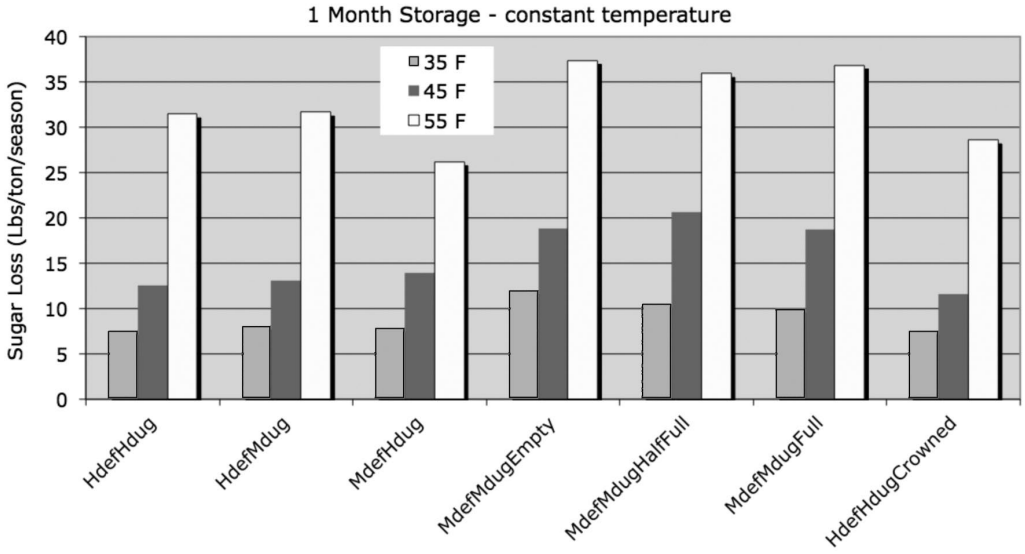
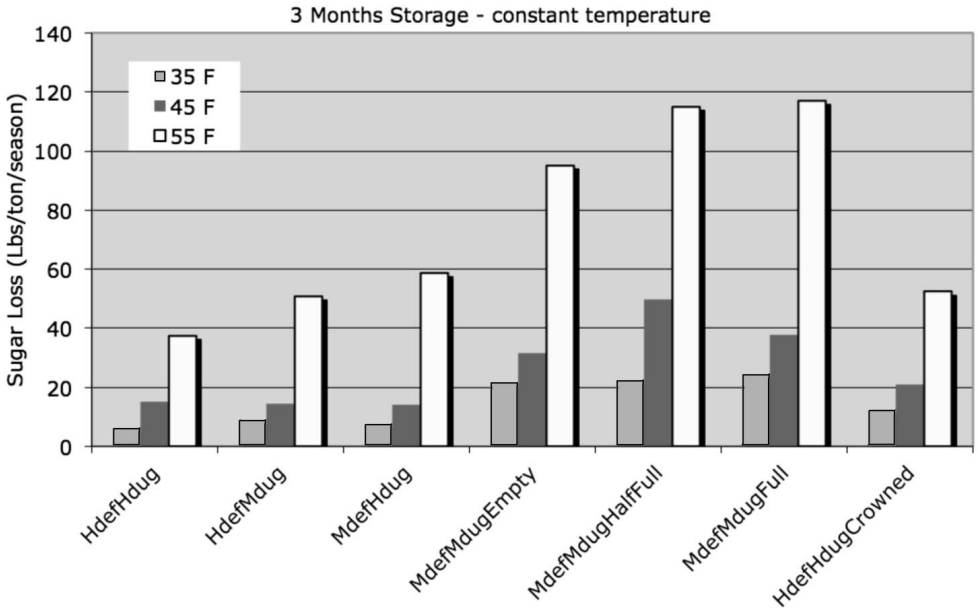


Figure 2. Rate of respiratory sugar loss as a function of handling regimen and storage temperature (see text for meaning of abbreviations) for sugar beet roots stored 3 months at the temperatures indicated.



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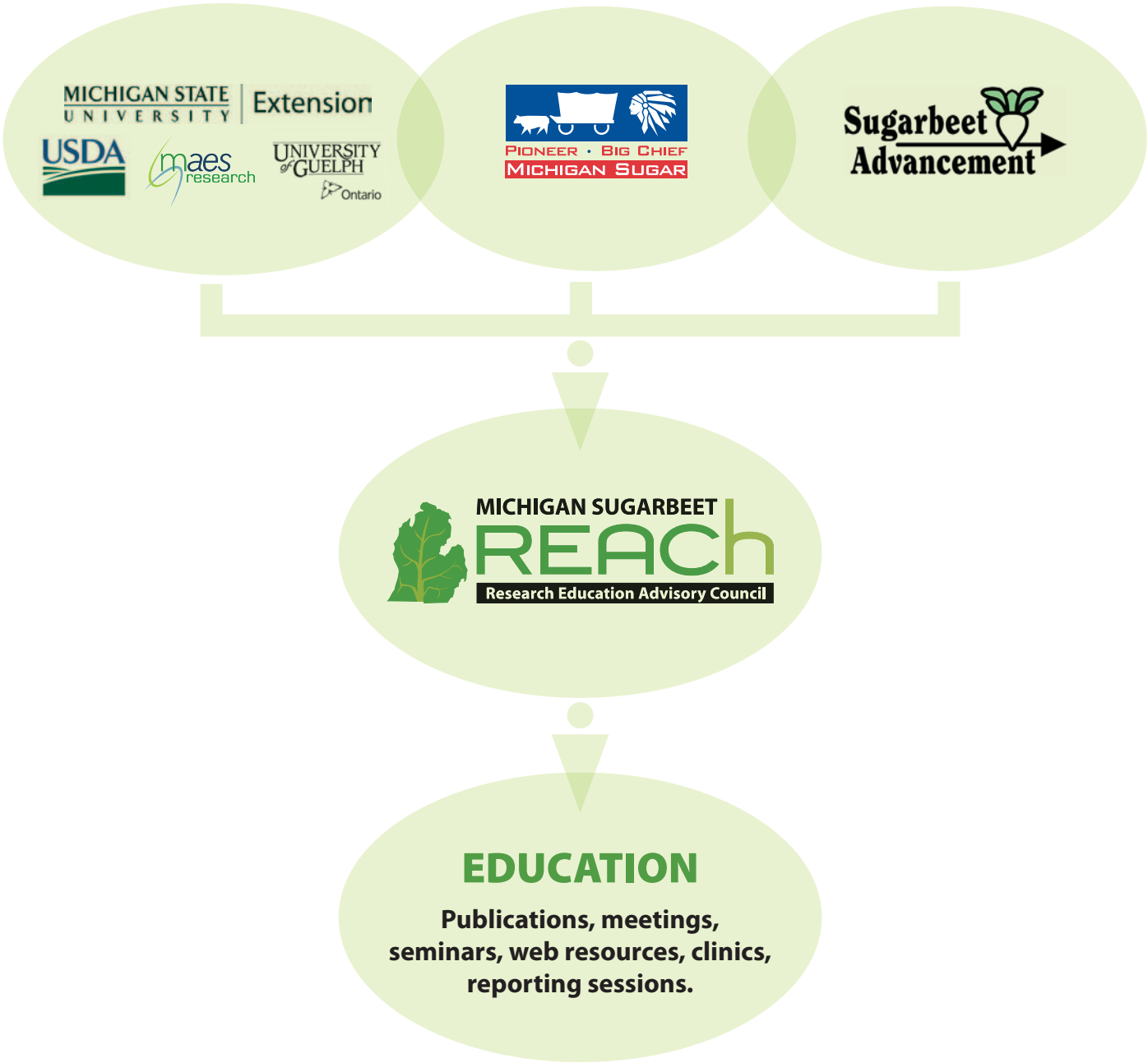

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