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T A R E
Thumb Ag Research & Education
2013 Field Trials

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TARE
Thumb Ag Research & Education

Introduction

2013 TARE Plot Report

This report represents the ninth year of a multi-county strategy for evaluating corn hybrids and soybean varieties as well as agronomic practices. The TARE Committee, comprised of farmer, and agribusiness representatives, serves as an advisory board, and provides oversight for the project's direction, finances and equipment needs. We gratefully acknowledge the committee's contributions and the support provided by our industry partners, listed on the back cover of this publication.

Each study is analyzed statistically to determine the Least Significant Difference (LSD) at the 0.05 (5%) level. The LSD represents the maximum difference between treatments (hybrid, variety, population, or evaluated input) for the difference to be attributed to the treatment rather than some external factor, like soil variability, or rainfall. An LSD at the 0.05, level means that statistically, we can be 95% confident with the results. Within studies any result that is **bolded** is statistically the same.

Therefore, if a treatment is bolded, it yielded the same, statistically speaking, as the highest yielding treatment in that study. Any treatment result, within a study, that is not bolded yielded significantly less than the highest yielding treatment. We also include the Coefficient of Variation (CV). The CV is a measure of the variability of the data that cannot be explained by the statistics. The lower the CV, the more confident you can be that the data is good. Generally, a CV of less than 10% is good data. A CV of less than 5% is very good data.

We hope you find these results useful to your operation. Ultimately it is you, the grower, whom we aim to serve with this project!

2013 MSU Extension Greater Thumb Area Field Crops Team

Bob Battel, Extension Educator, Corn and Soybeans

Phil Kaatz, Extension Educator, Forages

Martin Nagelkirk, Extension Educator, Wheat

Jim Vincent, Project Technician

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TARE
Thumb Ag Research & Education

Farm Cooperators:

Name	City	County	Planting Date	Harvest Date
Corn				
Rich D'Arcy	Kingston	Tuscola	5-16-13	11-02-13
Jason Haag	Unionville	Tuscola	5-09-13	10-25-13
Don Koth	Filion	Huron	5-15-13	10-27-13
Lynn Island Farms	Capac	St. Clair	5-18-13	11-05-13
Dale & Corey Oeschger	Bay Port	Huron	5-14-13	10-26-13
Sanilac Corn Growers	Sandusky	Sanilac	5-17-13	11-06-13
Sheldon Zimmerman	Argyle	Sanilac	5-15-13	10-14-13
Soybeans				
Rob Foster	Fairgrove	Tuscola	6-03-13	10-12-13
Jeff Furness	Avoca	St. Clair	5-25-13	10-10-13
Ron & Paul Gerstenberger	Sandusky	Sanilac	5-27-13	10-22-13
Wayne Hecht	Richville	Tuscola	Various	10-14-13
Randy & David Reibling	Elkton	Huron	6-05-13	10-15-13
Alfalfa				
Lynn Island Farms	Capac	St. Clair	5-18-13	Various
Soybean & Cover Crops				
Anton Farms	Sandusky	Sanilac	N/A	N/A
Compost Trial				
Steve Listwak	North Branch	Lapeer	Various	Various
Wheat				
Rich D'Arcy	Kingston	Tuscola	10-2-13	7-18-13
Dwight Bartle	Brown City	Sanilac	10-2-13	7-28-13
McConnachie Farms	Deckerville	Sanilac	10-7-12	7-18-13
Stoutenburg Farms	Sandusky	Sanilac	10-7-12	7-18-13

TARE Committee Members:

Seth Broilat	Huron
Tom Durand	Sanilac
Jay Ferguson	St. Clair
Matt Frostic	Sanilac
Jason Haag	Tuscola
Mike Houghtaling	Saginaw
Bill Hunt	Genesee
Jeff Krohn	Huron
Dave Rupprecht	Tuscola

Agribusiness Representatives:	**Company:**
John Kohr	Monsanto
Dale Kundinger	CPS
Chuck Kunisch	MAC
Jeff Reinbold	Great Lakes Hybrids

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TARE
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Pigeon/Bad Axe

	Precipitation				GDD			
	2013	2012	2011	Normal	2013	2012	2011	Normal
May	5.31	1.01	2.3	2.92	357	351	279	291
June	1.67	1.9	3.06	2.91	462	548	482	467
July	3.54	1.27	2.08	3.04	601	699	713	601
August	1.94	1.86	3.36	3.68	519	578	572	551
September	1.63	1.57	3.16	3.82	347	334	357	360
Total	14.09	7.61	13.96	16.37	2,286	2,510	2,403	2,270

Sandusky

	Precipitation				GDD			
	2013	2012	2011	Normal	2013	2012	2011	Normal
May	3.44	3.31	2.92	2.57	365	337	294	317
June	4.91	0.98	3.16	2.81	479	547	497	486
July	3.66	2.39	2.43	2.71	616	722	745	622
August	2.24	2.81	0.56	2.86	541	593	602	575
September	0.87	4.1	4.6	4.1	378	342	380	377
Total	15.12	13.59	14.04	15.05	2,379	2,541	2,518	2,377

Fairgrove/Caro

	Precipitation				GDD			
	2013	2012	2011	Normal	2013	2012	2011	Normal
May	2.99	4.31	3.5	2.86	402	360	325	353
June	1.16	1.81	1.79	3.3	503	552	526	519
July	2.07	3.65	1.84	2.75	609	780	730	644
August	1.39	4.34	4.74	3.26	549	589	594	594
September	1.22	1.45	2.68	4.22	403	356	380	402
Total	8.83	15.56	12.56	16.39	2,465	2,637	2,555	2,512

Emmett

	Precipitation				GDD			
	2013	2012	2011	Normal	2013	2012	2011	Normal
May	1.48	2.36	4.63	3.22	380	371	272	294
June	2.97	1.63	6.33	3.73	480	576	502	519
July	2.85	2.67	3.19	2.61	633	752	785	663
August	2.99	2.02	2.5	2.74	557	601	611	604
September	1.48	0.06	3.85	2.56	387	371	340	380
Total	11.77	8.74	20.50	14.85	2,437	2,671	2,509	2,460

Richville

	Precipitation				GDD			
	2013	2012	2011	Normal	2013	2012	2011	Normal
May	3.43	3.92	3.86	2.35	409	377	296	342
June	1.73	1.1	1.51	2.89	502	574	527	525
July	2.03	3.62	1.34	2.62	617	773	773	633
August	1.85	4.03	2.98	2.7	537	566	591	591
September	0.58	1.6	2.28	2.66	383	342	336	416
Total	9.62	14.27	11.97	13.22	2,449	2,632	2,524	2,507

Summary of Precipitation and Growing Degree Days 2013

[1]GDD is the growing degree days based on 50°F and 86°F cutoff (corn method).

[2]"Normal" is the average precipitation from 1971 –2000 and is based on data collected at Bad Axe, Caro and Sandusky.

Corn Studies Introduction

Corn is established in 90 foot long by 15 foot wide plots. A planter modified for research is used for establishment. It plants six-30 inch wide rows. Plots are planted perpendicular to the tile. No starter fertilizer was used at planting. All N-P-K fertilizer was applied by the farm cooperator prior to planting, except for the Argyle corn silage N plot. Corn is harvested with a 2144 Case IH combine with an attached HarvestMaster weigh system that records weight, moisture and test weight. The center 10 feet (four rows) is harvested for data.

The target planted population was 34,000 seeds per acre. Corn population across all plots was assessed about a month after planting. Plant stands at that time were 33,085 plants per acre, or about 97.3% of target population. Plots are established in a randomized complete block design (RCB) with four replications.

Studies included 85-94 RM hybrids, 95-99 RM hybrids, 100-105 RM hybrids (not planted at the Filion site), corn population (planted at the Filion and Pigeon site), and a nitrogen products study (planted at the Unionville and Sandusky site).

Planting was delayed by wet spring weather. The Unionville site was planted on May 8, followed by a five-day delay. After that, plots were established at the rate of one plot per day. Harvest of the final two plots (Sandusky and Capac) was also delayed by moisture. Lodging was minimal at all sites this year.

In the results, a number of abbreviations were used under the Seed Treatment category. Refer to the following table for the full name of abbreviations.

Treatment	Abbreviation
Acceleron	AC
Apron	AC
Cruiser	CR
Cruiser Max	CRM
Escalate	ES
Maxim	MX
Poncho	P
Quattro	Qt
VOTiVO	Vo

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Corn Hybrid Trials
100-105 Day RM
Glyphosate Resistant
Average of Locations

TARE Thumb Ag Research & Education

Company Hybrid	RM	Trait	Seed Trt	MS %	T.W.	Yield Bu/A
Beck's 5131	105	RR2/LL/ HX1/YGCB	P1250/Vo	22.2	55.8	**208.0**
Beck's 5140HR	105	RR/LL/HXX	P1250/Vo	20.2	56.2	**205.8**
Beck's 4530HXR	104	RR/LL/HXX	P1250/Vo	21.3	56.1	**204.8**
Beck's 5246HR	101	RR/LL/HX1	P1250/Vo	21.3	56.0	**204.5**
Channel 202-32STXRIB	104	SS	P500/Vo	21.5	55.9	**202.6**
Channel 201-39STXRIB	101	SS	P500/Vo	21.4	55.9	**200.3**
Croplan 4975VT3P	102	VT3P	AC	20.8	56.2	**203.8**
Croplan 4199VT3P	101	VT3P	AC	20.7	56.1	196.2
Dairyland DS-9501	101	R A	P250	20.5	56.3	**200.0**
Dairyland DS-9903	102	VT3	P250	21.3	56.1	196.7
Dairyland DS-3702-9	104	SSX	P250	21.2	56.1	196.4
Dairyland DS-9604SSX	104	SSX	P250	20.9	56.2	190.4
Dekalb DKC52-04	103	VT3Pro	AC	21.3	55.9	**200.8**
Dekalb DKC53-56	102	VT2Pro	AC	21.1	56.0	**199.6**
Dekalb DKC52-61	102	SS	AC/Vo	20.5	56.1	197.7
Dyna-Gro DG 42SS42	102	SS	AC	21.2	56.1	**203.4**
Dyna-Gro DG 40SS09	100	SS	AC	21.2	56.0	196.3
Garst/Golden Harvest G01P52-3011A	101	BT/RW/GT/LL/ART	CM250	21.0	56.2	**201.9**
Garst/Golden Harvest G05T82-3122	105	BT/RW/GT/LL	CM250	21.6	55.9	**198.2**
Great Lakes 5525	103		P500/Vo	20.7	56.3	**198.8**
Great Lakes 5283	102	SS	P500/Vo	22.6	55.6	**198.6**
Great Lakes 5368	105	VT3 Pro	P500/Vo	21.4	56.0	**198.0**
Great Lakes 5015	100	VT3 Pro	P500/Vo	22.2	55.7	194.7
Great Lakes 5529	105		P500/Vo	22.1	55.7	193.5
Hyland 3505	103		P250	21.0	56.0	**199.8**
Hyland 8552RA	101	SS/R A	P250	21.0	56.0	**197.9**
Hyland 8486RA	104	SS/R A	P250	21.5	55.8	195.5
Hyland 8515RA	101	SS/R A	P250	21.0	56.0	194.7
Hyland 8505RA	100	SS/R A	P250	20.5	56.2	194.5
Hyland 8521RA	101	SS/R A	P250	21.2	55.9	191.7
Mycogen 2A557	103	SSX/ RA	CM250	21.2	55.9	196.2
Mycogen 2A509	101	SSX/ RA	CM250	21.2	55.9	190.0
NK Brand N45P-4011	101	BT/RW/GT/LL/ART	CM250	21.0	56.2	**204.3**
NK Brand N53W-3122	105	BT/RW/GT/LL	CM250	21.6	56.0	**198.2**
Nu-Tech 5N-001	101	Ag3000GT	Mx Qt	21.5	55.9	**199.0**
Nu-Tech 5N-803	101	Ag3000GT	Mx Qt	21.1	56.0	195.4
Nu-Tech/G2 5H-805	105	AMX/RR2	Mx Qt	21.3	56.0	**204.3**
Nu-Tech/G2 5Z-200	100	HX1/RR2	Mx Qt	21.7	55.8	**202.9**
NuTech/G2 Genetics 5H-202	102	HX1/RR2	P1250/Vo	21.4	55.9	197.5
NuTech/G2 Genetics 3D-802	102	YGCB/HX1/RR2	P1250/Vo	21.5	56.0	197.5
Rupp xrD00-27	103	SSX	AC	21.6	57.8	**196.3**
Rupp xrJ03-31	100	VT2 Pro	AC	20.8	58.3	**201.5**
Rupp xr8414	100	SSX	AC	22.3	55.7	**201.3**
Specialty 32A323	102	VT3 Pro	AC/P/Vo	20.5	56.4	**202.1**
			Average	21.3	56.1	198.9
Yields adjusted to 15% moisture			High	22.6	58.3	208.0
			Low	20.2	55.6	190.0
Bolded yields are not statistically different than highest yielding hybrid			LSD @ 0.05 =			10.2
			CV (%) =			6.9

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Corn Hybrid Trial
100-105 Day RM
Glyphosate Resistant
Yield By Location

TARE
Thumb Ag Research & Education

Company Hybrid	RM	Trait	Seed Trt	Yield By Location Bu/A				
				Capac	Kingston	Pigeon	Sandusky	Unionville
Beck's 5131	104	RR2/LL/HX1/YGCB	P1250/VO/Esc	**215.0**	**214.1**	**198.0**	**215.1**	**181.7**
Beck's 4530HXR	101	RR/LL/HXX	P1250/VO/Esc	**211.3**	**215.6**	189.0	**214.6**	**192.0**
Beck's 5140HR	105	RR/LL/HX1	P1250/VO/Esc	**214.8**	**218.1**	**209.0**	**214.9**	**183.3**
Beck's 5246HR	105	RR/LL/HX2	P1250/VO/Esc	**208.4**	**220.8**	**200.5**	**209.8**	**189.7**
Channel 201-39STXRIB	101	SS	P500/VO	**198.3**	**219.6**	**196.5**	**210.6**	176.4
Channel 202-32STXRIB	104	SS	P500/VO	194.8	**218.8**	**206.2**	**216.8**	176.4
Croplan 4199VT3P	101	VT3P	AC	191.0	203.6	190.5	**213.2**	**182.8**
Croplan 4975VT3P	102	VT3P	AC	**211.7**	202.2	194.9	**212.0**	**198.4**
Dairyland 9903	104	RA	P250	182.0	**212.1**	194.1	**216.5**	177.3
Dairyland 3702-9	102	VT3	P250	186.1	204.4	**202.5**	**210.8**	**179.8**
Dairyland 9604SSX	104	SSX	P250	161.9	194.8	**201.8**	**206.5**	**186.9**
Dairyland DS9501	101	RA	P250	185.0	**215.9**	194.1	**217.6**	**187.5**
Dekalb DKC52-04	102	VT3Pro	AC	**202.6**	203.6	**204.1**	**211.5**	176.4
Dekalb DKC52-61	102	VT2Pro	AC	195.8	196.3	**209.3**	198.3	**188.9**
Dekalb DKC53-56	103	SS	AC/VO	**200.6**	198.7	**207.2**	200.5	**197.1**
Dyna-Gro DG 40SS09	100	SS	AC	**198.4**	193.0	**203.7**	195.6	**191.1**
Dyna-Gro DG 42SS42	102	SS	AC	**202.4**	**215.2**	191.4	**227.1**	**180.9**
GoldenHarvest G01P52-3011A	101	BT/RW/GT/LL/Art	CM250	186.6	**218.4**	**208.9**	**219.9**	175.7
GoldenHarvest G05T82-3122	105	BT/RW/GT/LL	CM250	181.1	**212.4**	**206.7**	**210.0**	**180.7**
Great Great Lakes 5015	100		P500/VO	164.4	**209.9**	**200.8**	205.9	**192.4**
Great Lakes 5283	102	SS	P500/VO	**203.3**	205.8	**196.8**	**218.2**	168.9
Great Lakes 5368	103	VT3 Pro	P500/VO	180.1	**227.7**	191.6	**213.3**	**181.1**
Great Lakes 5525	105	VT3 Pro	P500/VO	189.8	202.7	**206.7**	**219.7**	171.4
Great Lakes 5529	105		P500/VO	193.3	**213.2**	186.8	205.4	168.6
Hyland 3505	101		P250	162.5	**223.5**	195.4	**215.5**	176.5
Hyland 8486RA	100	SSX RA	P250	**200.4**	201.1	192.8	**210.9**	167.2
Hyland 8505RA	101	SSX RA	P250	164.2	206.2	194.2	**210.2**	**183.5**
Hyland 8515RA	101	SSX RA	P250	192.6	197.9	**201.6**	**210.8**	**186.7**
Hyland 8521RA	104	SSX RA	P250	**200.4**	204.1	193.4	199.9	**179.5**
Hyland 8552RA	103	SSX RA	P250	**204.3**	**210.5**	195.0	**211.6**	177.5
Mycogen 2A509	101	SSX RA	CM250	**197.0**	189.0	195.3	181.0	**187.9**
Mycogen 2A557	103	SSX RA	CM250	167.0	**210.9**	**199.6**	**207.2**	**196.2**
NK Brand N45P-4011	101	BT/RW/GT/LL/Art	CM250	**197.0**	**211.8**	**201.9**	**221.7**	**189.1**
NK Brand N53W-3122	105	BT/RW/GT/LL	CM250	179.7	**210.6**	**197.6**	**215.6**	**187.5**
NuTech 5N-001	101	Ag3000GT	MX QT	188.6	**225.6**	187.7	**220.9**	172.1
NuTech 5N-803	101	Ag3000GT	MX QT	185.5	207.1	193.8	200.7	**189.7**
NuTech/G2 3D-802	102	AMX/RR2	MX QT	187.3	**214.6**	**213.7**	193.8	178.3
NuTech/G2 5H-202	102	HX1/RR2	MX QT	192.0	**211.7**	**205.7**	**209.1**	168.9
NuTech/G2 5H-805	105	HX1/RR2	P1250/VO	192.9	**218.6**	**198.8**	**219.2**	**191.9**
NuTech/G2 5Z-200	100	YGCB/HX1/RR2	P1250/VO	**205.4**	207.4	**199.6**	**217.7**	**184.3**
Rupp xr8414	100	Gen SSX	AC	**200.0**	**233.5**	**201.1**	198.5	173.5
Rupp xrD00-27	100	VT2 Pro	AC	191.4	**227.2**	180.4	**210.2**	172.3
Rupp xrJ03-31	103	Gen SSX	AC	**203.5**	**224.8**	191.7	206.1	**181.4**
Specialty 32A323	102	VT3 Pro	AC/P/VO	191.9	**221.3**	192.1	**221.5**	**183.7**
			Average	192.3	211.2	198.2	210.6	182.1
Yields adjusted to 15% moisture			High	215.0	233.5	213.7	227.1	198.4
			Low	161.9	189.0	180.4	181.0	167.2
Bolded yields are not statistically different than highest yielding hybrid			LSD @ 0.05	18.6	24.5	17.6	20.6	19.1
			CV (%)	5.8	7.0	5.3	5.9	6.3

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Corn Hybrid Trial
99 - 95 Day RM
Glyphosate Resistant
Yield By Location

TARE Thumb Ag Research & Education

Company Hybrid	RM	Trait	Seed Trt	Yield By Location Bu/A					
				Capac	Filion	Kingston	Pigeon	Sandusky	Unionville
Channel 197-33STXRIB	97	SS	P500/VO	**201.8**	**231.5**	**223.6**	**186.7**	**208.2**	**183.6**
Channel 197-68STXRIB	97	SS	P500/VO	190.0	**222.3**	**216.2**	**194.3**	**211.6**	177.7
Croplan 3737SS/RIB	97	SS/RIB	AC	178.1	**234.6**	**213.1**	**185.7**	**214.0**	**183.2**
Croplan 4099SS	99	SS	AC	**214.0**	**222.0**	**219.8**	**194.2**	**218.2**	178.0
Dairyland 9898SSX	98	SSX	P250	190.3	**225.3**	**221.4**	174.3	**210.3**	173.4
Dekalb DKC48-12	98	SS	AC/VO	191.1	**224.2**	**211.4**	**194.9**	201.4	**187.9**
Dekalb DKC49-29	99	SS	AC/VO	**202.8**	**226.8**	**213.6**	**194.8**	**216.8**	**186.4**
Dekalb DKC49-94	99	SS	AC/VO	159.0	**219.7**	**212.4**	175.7	**211.6**	169.9
DekalbDKC46-20	96	VT3Pro	AC	**213.8**	213.5	**210.0**	**201.9**	**213.6**	**186.1**
Dyna-Gro DG 35VC40	95	Double Pro	AC	183.0	**219.7**	195.6	169.7	189.7	172.6
Dyna-Gro DG 39SS17	99	SS	AC	182.9	**220.6**	**210.0**	**186.5**	**219.5**	179.4
Dyna-Gro DG 39VP14	99	Triple Pro	AC	164.0	214.6	**214.9**	180.2	196.6	180.6
GoldenHarvest G96A69-3011	96	BT/RW/GT/LL	CM250	**197.0**	213.7	208.5	**191.1**	**215.5**	182.3
GoldenHarvest G97S12-3000GT	97	BT/RW/GT/LL	CM250	193.2	209.3	193.1	**194.2**	**203.6**	172.0
GoldenHarvest G99Z33-3011A	99	BT/RW/GT/LL/Art	CM250	192.8	213.7	**211.1**	175.4	**214.0**	**186.6**
Great Lakes 4567	95	VT3 Pro	P500/VO	**198.6**	207.6	193.8	175.2	**203.9**	181.0
Great Lakes 4727	97	SS	P500/VO	183.2	211.2	205.1	**191.4**	**209.6**	**183.2**
Great Lakes 4879	98	SS	P500/VO	**200.1**	**222.5**	**232.2**	**192.5**	**209.0**	**183.5**
Hyland 3450	96		P250	**195.2**	**215.1**	**222.5**	181.6	**214.8**	172.5
Hyland 4398	95	GT/CB/LL/RW	P250	172.1	**223.5**	**220.3**	176.2	**212.3**	180.6
Hyland 8450RA	98	SS RA	P250	193.4	**223.0**	**218.5**	**201.5**	**221.2**	**188.5**
Hyland HL CVR68	98	YGVT3/RR2	P250	183.4	**222.7**	201.8	**194.6**	**212.4**	**183.6**
Mycogen 2H492	98	SSX RA	CM250	170.7	211.2	204.2	**194.0**	**208.3**	172.3
Mycogen 2T388	95	SSX RA	CM250	178.7	**215.3**	197.6	178.4	**203.9**	181.0
Mycogen 2Y479	98	SSX RA	CM250	188.9	213.8	**217.9**	**190.6**	**211.7**	**190.2**
NK Brand N36A-3000GT	96	BT/RW/GT/LL	CM250	**204.7**	212.3	**210.2**	**203.0**	**213.0**	**186.3**
NK Brand N37S-3000GT	97	BT/RW/GT/LL	CM250	**194.1**	209.6	**214.0**	**194.0**	**205.5**	**185.2**
NK Brand N42Z-3011A	99	BT/RW/GT/LL/Art	CM250	**206.9**	**222.1**	**220.9**	**186.7**	**212.8**	**188.5**
NuTech 5N-498	98	Ag3000GT	MX AP	**204.1**	**224.8**	**215.3**	**189.4**	**220.4**	174.7
NuTech/G2 3F-198	98	AM/RR2	MX QT	191.9	209.9	207.1	**190.0**	**206.5**	**187.0**
NuTech/G2 5H-399	99	HX1/RR2	MX QT	170.0	**225.2**	**217.0**	177.6	**208.2**	171.1
NuTech/G2 5Z-9605	96	YGCB/HX1/RR2	P1250/VO	**207.6**	213.4	**211.1**	**193.4**	197.0	**185.2**
Rupp xr T97-06	97	VIP 3111	CM250	184.1	**215.9**	189.2	168.5	188.8	178.9
Rupp xrJ97-17	97	Gen SSX	AC	174.6	205.1	189.8	**186.8**	200.3	**189.2**
Rupp xrJ98-11	98	SSX	AC	184.4	**217.5**	203.5	172.1	198.8	180.3
Specialty 29A263	99	SS	AC/P/VO	189.1	**227.2**	**221.6**	**191.4**	**209.1**	**201.8**
Specialty 42R32GENVT3P	96	VT3 Pro	AC/ P/VO	**194.7**	**216.9**	188.9	175.1	**215.2**	176.1
Specialty 42R77GENVT3P	99	VT3 Pro	AC/ P/VO	187.8	205.1	**210.0**	173.9	**216.1**	178.9
Specialty 82R08	97	SS	AC/ P/VO	192.3	**217.2**	203.5	177.1	**212.1**	180.7
Stine 9417VT3	98	VT3	AC	172.5	208.4	200.9	172.5	**213.6**	166.8
Stine R9422VT3Pro	96	VT3Pro	AC	178.5	211.0	196.8	167.6	**212.1**	**192.0**
			Average	189.1	217.5	209.5	185.2	209.3	181.4
Yields adjusted to 15% moisture			High	214.0	234.6	232.2	203.0	221.2	201.8
			Low	159.0	205.1	188.9	167.6	188.8	166.8
Bolded yields are not statistically different than highest yielding hybrid			LSD @ 0.05 =	20.2	19.9	23.1	18.6	19.1	18.8
			CV (%)	6.4	5.5	6.6	6.0	5.5	6.2

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Corn Hybrid Trial
95 - 99 Day RM
Glyphosate Resistant
Average of Locations

TARE Thumb Ag Research & Education

Company Hybrid	RM	Trait	Seed Trt	MS (%)	T.W.	Yield (Bu./A)
Channel 197-33STXRIB	97	SS	P500/VO	20.7	56.3	**205.9**
Channel 197-68STXRIB	97	SS	P500/VO	20.3	56.4	**202.0**
Croplan 3737SS/RIB	97	SS/RIB	AC	20.0	56.6	**201.4**
Croplan 4099SS	99	SS	AC	19.7	56.6	**207.7**
Dairyland 9898SSX	98	SSX	P250	20.1	56.6	**199.2**
Dekalb DKC48-12	98	SS	AC/VO	19.7	56.6	**201.8**
Dekalb DKC49-29	99	SS	AC/VO	20.2	56.4	**206.9**
Dekalb DKC49-94	99	SS	AC/VO	19.9	56.5	191.4
DekalbDKC46-20	96	VT3Pro	AC	20.5	56.4	**206.5**
Dyna-Gro DG 35VC40	95	Double Pro	AC	19.5	56.8	188.4
Dyna-Gro DG 39SS17	99	SS	AC	20.2	56.4	**199.8**
Dyna-Gro DG 39VP14	99	Triple Pro	AC	19.5	56.7	191.8
GoldenHarvest G96A69-3011	96	BT/RW/GT/LL	CM250	19.1	56.9	**201.3**
GoldenHarvest G97S12-3000GT	97	BT/RW/GT/LL	CM250	19.7	56.7	194.2
GoldenHarvest G99Z33-3011A	99	BT/RW/GT/LL/Art	CM250	20.0	56.4	**198.9**
Great Lakes 4567	95	VT3 Pro	P500/VO	18.6	57.0	193.3
Great Lakes 4727	97	SS	P500/VO	19.8	56.6	197.3
Great Lakes 4879	98	SS	P500/VO	19.9	56.6	**206.6**
Hyland 3450	96		P250	19.7	56.5	**200.3**
Hyland 4398	95	GT/CB/LL/RW	P250	19.2	57.0	197.5
Hyland 8450RA	98	SS RA	P250	20.0	56.4	**207.7**
Hyland HL CVR68	98	YGVT3/RR2	P250	19.3	56.8	**199.8**
Mycogen 2H492	98	SSX RA	CM250	20.4	56.3	193.5
Mycogen 2T388	95	SSX RA	CM250	19.3	56.7	192.5
Mycogen 2Y479	98	SSX RA	CM250	20.5	56.3	**202.2**
NK Brand N36A-3000GT	96	BT/RW/GT/LL	CM250	19.2	56.8	**204.9**
NK Brand N37S-3000GT	97	BT/RW/GT/LL	CM250	19.7	56.6	**200.4**
NK Brand N42Z-3011A	99	BT/RW/GT/LL/Art	CM250	19.8	56.7	**206.3**
NuTech 5N-498	98	Ag3000GT	MX AP	20.4	56.3	**204.8**
NuTech/G2 3F-198	98	AM/RR2	MX QT	19.1	58.2	**198.7**
NuTech/G2 5H-399	99	HX1/RR2	MX QT	20.5	56.2	194.9
NuTech/G2 5Z-9605	96	YGCB/HX1/RR2	P1250/VO	19.2	56.8	**201.3**
Rupp xr T97-06	97	VIP 3111	CM250	19.9	56.4	187.6
Rupp xrJ97-17	97	Gen SSX	AC	20.1	56.4	191.0
Rupp xrJ98-11	98	SSX	AC	19.7	56.5	192.8
Specialty 29A263	99	SS	AC/P/VO	19.9	56.7	**206.7**
Specialty 42R32GENVT3P	96	VT3 Pro	AC/ P/VO	19.5	58.3	194.5
Specialty 42R77GENVT3P	99	VT3 Pro	AC/ P/VO	19.5	56.7	195.3
Specialty 82R08	97	SS	AC/ P/VO	19.1	57.0	197.1
Stine 9417VT3	98	VT3	AC	19.6	56.7	189.1
Stine R9422VT3Pro	96	VT3Pro	AC	19.2	56.9	193.0
			Average	19.8	56.7	198.7
Yields adjusted to 15% moisture			High	20.7	58.3	207.7
			Low	18.6	56.2	187.6
Bolded yields are not statistically different than highest yielding hybrid			LSD @ 0.05 =			9.6
			CV (%) =			6.6

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Corn Hybrid Trial
85 - 94 Day RM
Glyphosate Resistant
Yield By Location

TARE Thumb Ag Research & Education

				Yield By Location Bu/A					
Company Hybrid	**RM**	**Trait**	**Seed Trt**	**Capac**	**Filion**	**Kingston**	**Pigeon**	**Sandusky**	**Unionville**
Croplan 3499VT3P	94	VT3P	AC	**174.2**	**223.5**	**200.6**	**185.4**	**207.5**	**172.4**
Dairyland DS-9590RA	90	RA	P250	**178.4**	**203.7**	179.6	159.2	**208.7**	**173.1**
Dekalb DKC43-10	93	VT2Pro	AC/Vo	**169.5**	199.8	**208.9**	157.9	**208.1**	**181.2**
Dyna-Gro DG 29VC30	89	Double Pro	AC	**174.6**	**207.7**	**205.9**	176.6	179.3	**177.6**
Dyna-Gro DG 31VP31	91	Triple Pro	AC	**172.5**	**203.0**	**198.8**	157.6	**189.0**	**179.4**
Dyna-Gro DG 34VP52	94	Triple Pro	AC	167.8	**204.8**	**202.5**	169.9	**206.6**	**175.4**
GoldenHarvest G85L42-3110A	85	BL/BT/ART	CM 250	157.6	**212.6**	178.3	**193.1**	**195.8**	169.3
GoldenHarvest G88M78-3110A	88	BL/BT	CM 250	**173.5**	200.4	183.8	153.9	178.9	170.0
GoldenHarvest G92T43-3220	92	BL/BT/ART	CM 250	159.5	194.1	**202.0**	163.9	**203.9**	**172.5**
Great Lakes 4206	92	SS	P 500/Vo	**174.3**	**203.8**	**197.1**	168.1	**200.7**	**187.6**
Great Lakes 4457	94	VT3 Pro	P 500/Vo	153.5	**218.3**	191.2	177.8	**193.1**	**179.8**
Mycogen 2J340	92	SSX RA	CM 250	**181.5**	**206.3**	**198.2**	151.6	**206.6**	**178.9**
NuTech 5N-9404	94	Ag3000GT	Mx AP	166.9	**215.5**	187.2	169.6	**205.6**	**184.3**
NuTech/G2 5X-894	94	HXT/RR2	P 1250/Vo	**180.5**	**224.7**	192.3	**182.4**	**192.0**	**183.4**
Rupp xrD90-64	90	VIP 3220	C250	157.5	**203.2**	**208.8**	169.0	**190.1**	**176.5**
Rupp xrT94-06	94	VT3 Pro	AC	160.7	**215.3**	**212.8**	159.4	**201.2**	**183.7**
Specialty 81R88GENSS	94	SS	AC/P/Vo	**176.7**	**213.5**	188.9	157.5	**193.7**	**189.7**
Stine 9207 GTCBLL	91	GT/CB/LL	AC	**174.5**	**214.7**	**206.6**	154.6	**208.6**	**184.6**
Stine R9311VT3Pro	94	VT3Pro	AC	165.6	**205.0**	**192.8**	149.0	**200.6**	**175.7**
			Average	169.4	208.9	196.7	166.1	198.4	178.7
Yields adjusted to 15% moisture			High	181.5	224.7	212.8	193.1	208.7	189.7
			Low	153.5	194.1	178.3	149.0	178.9	169.3
Bolded yields are not statistically different than highest yielding hybrid			LSD @0.05	12.5	22.0	20.2	13.9	20.8	17.9
			CV (%)	4.2	6.2	5.8	4.9	6.2	5.8

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Corn Hybrid Trial
85 - 94 Day RM
Glyphosate Resistant
Average of Locations

TARE Thumb Ag Research & Education

Company Hybrid	RM	Trait	Seed Trt	MS (%)	T.W.	Yield (Bu/A)
Croplan 3499VT3P	94	VT3P	AC	17.8	57.6	**193.9**
Dairyland DS-9590RA	90	RA	P250	16.8	58.2	183.8
Dekalb DKC43-10	93	VT2Pro	AC/Vo	17.2	58.0	**187.6**
Dyna-Gro DG 29VC30	89	Double Pro	AC	17.3	57.9	**186.9**
Dyna-Gro DG 31VP31	91	Triple Pro	AC	16.9	58.1	183.4
Dyna-Gro DG 34VP52	94	Triple Pro	AC	17.5	58.0	**187.8**
GoldenHarvest G85L42-3110A	85	BL/BT/ART	CM 250	16.9	58.2	184.4
GoldenHarvest G88M78-3110A	88	BL/BT	CM 250	16.6	58.3	176.8
GoldenHarvest G92T43-3220	92	BL/BT/ART	CM 250	16.8	58.2	182.6
Great Lakes 4206	92	SS	P 500/Vo	17.9	57.7	**188.6**
Great Lakes 4457	94	VT3 Pro	P 500/Vo	18.0	57.6	**185.6**
Mycogen 2J340	92	SSX RA	CM 250	17.4	57.9	**187.2**
NuTech 5N-9404	94	Ag3000GT	Mx AP	17.7	57.7	**188.2**
NuTech/G2 5X-894	94	HXT/RR2	P 1250/Vo	17.4	57.9	**192.5**
Rupp xrD90-64	90	VIP 3220	C250	16.9	58.1	184.2
Rupp xrT94-06	94	VT3 Pro	AC	17.7	57.7	**188.9**
Specialty 81R88GENSS	94	SS	AC/P/Vo	17.7	57.7	**186.7**
Stine 9207 GTCBLL	91	GT/CB/LL	AC	17.3	57.9	**190.6**
Stine R9311VT3Pro	94	VT3Pro	AC	17.4	57.9	181.4
			Average	17.3	57.9	186.4
Yields adjusted to 15% moisture			High	18.0	58.3	193.9
			Low	16.6	57.6	176.8
Bolded yields are not statistically different than highest yielding hybrid			LSD @ 0.05 =			8.9
			CV (%) =			5.9

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Corn Hybrid Trial
3 Yr. Averages

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Early Hybrids 84-94 Day RM

Company	Hybrid	2013 Yield	2012 Yield	2011 Yield	2 yr. ave.	3 yr. ave
Dekalb	DKC43-10	187.6	174.4	178.7	181.0	180.2
Great Lakes Hybrids	4457	185.6	170.8	177.4	178.2	177.9
Stine Seed Company	9207 GTCBLL	190.6	168.8	182.1	179.7	180.5

Mid Hybrids 95-99 Day RM

Company	Hybrid	2013 Yield	2012 Yield	2011 Yield	2 yr. ave.	3 yr. ave.
Channel Seed	197-33STXRIB	205.9	189.5		197.7	
Croplan	3737SS/RIB	201.4	193.0		197.2	
Dekalb	DKC46-20	206.5	196.9		201.7	
Dekalb	DKC48-12	201.8	186.9	186.6	194.4	191.8
Dekalb	DKC49-94	191.4	191.6	177.8	191.5	186.9
Great Lakes Hybrids	4727	197.3	190.0	184.3	193.7	190.5
Hyland Seeds	Hyland HL CVR68	199.8	185.9	161.1	192.9	182.3
NK Brand (Syngenta)	N36A-3000GT	204.9	188.4		196.7	
NuTech/G2 Genetics	5H-399	194.9	186.5		190.7	
Specialty Hybrids	42R32GENVT3P	194.5	194.1		194.3	
Specialty Hybrids	42R77GENVT3P	195.3	192.3		193.8	
Stine Seed Company	9417VT3	189.1	196.6	169.9	192.8	185.2

Late Hybrids 100-105 Day RM

Company	Hybrid	2013 Yield	2012 Yield	2011 Yield	2 yr. ave.	3 yr. ave.
Beck's Superior Hybrids	5246HR	205.8	198.3		202.0	
Beck's Superior Hybrids	4530HXR	204.5	186.7		195.6	
Channel Seed	202-32STXRIB	202.6	189.7		196.2	
Dekalb	DKC52-04	199.6	196.0		197.8	
Dekalb	DKC52-61	197.7	191.4		194.6	
Dyna-Gro	DG 40SS09	196.3	180.6	162.4	188.4	179.8
Great Lakes Hybrids	5529	193.5	182.1		187.8	
Hyland Seeds	Hyland 8552RA	199.8	195.4		197.6	
Hyland Seeds	Hyland 8505RA	191.7	189.6		190.7	
NK Brand (Syngenta)	N45P-4011	204.3	196.5		200.4	
NK Brand (Syngenta)	N53W-3122	198.2	184.7		191.5	
NuTech Seed LLC	5N-001	199.0	191.2	199.5	195.1	196.6
NuTech/G2 Genetics	5H-202	197.5	193.5		195.5	
Rupp Seeds Inc	xr8414	201.3	190.1		195.7	

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Corn Population Study

TARE Thumb Ag Research & Education

	Pigeon			Filion			Average			
Planted Pop X 1000	Final Pop X 1000	% of Planted	Yield (Bu/A)	Final Pop X 1000	% of Planted	Yield (Bu/A)	Final Pop X 1000	% of Planted	Yield (Bu/A)	Return per Acre
44	43.7	99%	**183.3**	43.4	99%	**227.0**	43.6	99%	**205.1**	$ 730.85
42	42.8	102%	**174.8**	42.8	102%	**225.4**	42.8	102%	**200.1**	$ 716.16
40	38.5	96%	**185.0**	39.3	98%	**223.8**	38.9	97%	**204.4**	$ 741.29
38	37.3	98%	**178.9**	38.3	101%	**226.6**	37.8	99%	**202.7**	$ 741.14
36	35.7	99%	**176.8**	36.0	100%	**220.8**	35.9	100%	**198.8**	$ 731.20
34	33.6	99%	**174.2**	33.8	99%	**222.3**	33.7	99%	**198.2**	$ 735.58
32	31.8	99%	173.4	32.3	101%	**218.7**	32.1	100%	**196.1**	$ 733.08
30	30.8	103%	170.9	30.3	101%	209.9	30.6	102%	190.4	$ 715.62
Average			177.2			221.8			199.5	
Max			185.0			227.0			205.1	
Min			170.9			209.9			190.4	
LSD @ 0.05			11.2			13.9			14.2	
CV (%)			3.5			3.2			4.7	

Yields adjusted to 15% moisture

Bolded yields are not statistically different than highest yielding hybrid

Assumptions:
Corn price = $4.30
Seed price = $275/ bag
Hybrid: Great Lakes 4879 AT2RIB

Purpose:
The purpose of this study was to evaluate the effect of planting populations on corn yield in 30 inch rows.

Methods:
Corn was planted in eight populations ranging from 30,000 seeds per acre to 44,000 seeds per acre in increments of 2,000 seeds, at two locations (Pigeon and Filion). Plots were established in RCB, with four replications at each site. Population counts were measured in June.

Results:
Plant stand compared to planted populations was very nearly 100%. At the Pigeon site, all populations of 34,000 and greater yielded similarly. At the Filion site, all populations of 32,000 and greater yielded similarly.

When results were averaged across both sites, all populations of 32,000 and greater yielded similarly.

Economically, populations of 38,000 and 40,000 seeds per acre provided the greatest return per acre.

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Agroculture Liquid Fertilizer Trial

TARE Thumb Ag Research & Education

Purpose:

The purpose of these trials was to evaluate the application of two products, one is a replacement of 28% UAN, and the other is an additive to 28% UAN. Both products were compared to 28% UAN alone at similar rates. This is the second year of evaluation for these products; however, the rates were decreased from last year.

Methods:

High NRG-N is marketed as a direct application nitrogen source. eNhance is marketed as a nutritional supplement that allows plants to more effectively utilize applied nitrogen, allowing UAN solutions to be used at a lower rate. The hybrid used for the trial was Great Lakes 4879VT2RIB.

These products were applied to corn plots established in Unionville and Sandusky on 6/19/13 (42 days after planting) and 6/20/13 (34 days after planting) respectively. The High NRG-N was applied at two rates: 125#N/A and 110#N/A. eNhance (1.4 oz/gallon) was mixed with 28% UAN at the rates of 155#N/A, 140#N/A, and 125#N/A.
28% UAN was also applied alone at 155#N/A, 140#N/A, and 125#N/A.

Results:

At the Unionville site, all treatment yielded statistically similarly. At the Sandusky site, the eNhance + 28% at 155#N/A and the High NRG - N at 125#N/A yielded significantly greater than the eNhance + 28% UAN at 125#N/A.
When the two sites were averaged together, there was no statistical difference between the treatments.

	Unionville			Sandusky			Average			
Treatment	MS %	T.W.	Yield Bu/A	MS %	T.W.	Yield Bu/A	MS %	T.W.	Yield Bu/A	Net/A
eNhance + 28% UAN 155	17.3	57.7	187.4 a	23.2	55.1	233.4 a	20.2	56.4	210.4 a	$777.82
28% UAN 140	16.9	57.8	185.3 a	22.9	55.2	231.3 ab	19.9	56.5	208.3 a	$785.88
High NRG-N 125	17.1	57.8	183.4 a	22.7	55.2	232.7 a	19.9	56.5	208.0 a	$749.82
eNhance + 28% UAN 140	17.2	57.7	186.1 a	22.7	55.2	226.6 ab	19.9	56.5	206.4 a	$772.90
28% UAN 155	17.2	57.7	178.4 a	23.4	55.0	229.7 ab	20.3	56.3	204.1 a	$755.98
28% UAN 125	17.1	57.8	180.2 a	23.0	55.1	222.0 ab	20.1	56.4	201.1 a	$766.79
High NRG-N 110	17.3	57.4	175.3 a	22.7	55.2	226.2 ab	20.0	56.3	200.7 a	$733.76
eNhance + 28% UAN 125	17.0	57.8	178.3 a	23.1	55.1	219.0 b	20.0	56.5	198.7 a	$756.28
Average	17.1	57.7	181.8	23.0	55.1	227.6	20.0	56.4	204.7	$762.40
Max	17.3	57.8	187.4	23.4	55.2	233.4	20.3	56.5	210.4	$785.88
Min	16.9	57.4	175.3	22.7	55.0	219.0	19.9	56.3	198.7	$733.76
LSD @ 0.05			14.7			13.6			12.7	
CV (%)			4.9			4.1			13.7	

Prices Used: Corn - $4.30/Bu. 28% UAN - $440/T ($2.35/gallon)
High NRG - N - $3.10/gallon eNhance - $14.75/gallon

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Corn Silage N Trial

TARE Thumb Ag Research & Education

"Evaluating Nitrogen Response in Corn Silage Hybrids"

Purpose:

Corn silage is approximately 12.5% of Michigan's annual corn crop. This study is intended to provide corn silage growers with recommendations for applications of N fertilizer. Two types of corn hybrids were selected for this trial. Three grain type hybrids (Channel 209-85VT3, Channel 207-13VT3P, and Pioneer P34A90) and one brown mid-rib (BMR) hybrid (Pioneer P1376XR) were used to demonstrate the response in corn silage to varying amounts of side-dressed nitrogen.

Methods:

Each hybrid received N rates (0, 50, 100, 150, & 200 lbs/A) in a RCBD with four replications and planted in plots 15 feet by 90 feet across tile lines. Corn was planted May 15, 2013 with a planted population of 34,000 plants/A. Side-dressing of N was done June 19, 2013 with 28% UAN. Harvest was completed on October 14, 2013. Each plot was harvested by a custom harvester, weighed on platform scales and sampled.

Each treatment and replication had a sample submitted for wet lab analysis at A & L Labs, Inc. Each sample was tested for moisture, crude protein, acid detergent fiber, neutral detergent fiber, TDN, net energy, DDM, and DMI.

Results:

Statistical differences were observed for crude protein in each of the hybrids. A distinction was also evident when comparing differences between hybrids.

Results - All hybrids per N treatment

N Rate	% MS	% DM	% CP	% ADF	% NDF	% TDN	NE L
200	53.4	46.6	7.71	25.78	52.98	65.66	0.67
150	52.3	47.7	7.48	24.71	51.03	66.41	0.68
100	53.8	46.3	6.28	26.37	51.94	65.25	0.67
50	53.5	46.5	5.87	25.83	53.28	65.63	0.68
0	56.6	43.4	5.33	28.16	55.66	63.99	0.66

Results - All N rates

	% MS	% DM	% CP	% ADF	% NDF	% TDN
Channel 207-13	53.2	46.8	6.32	26.12	52.17	65.43
Channel 209-85	50.4	49.6	6.49	25.85	53.00	65.62
Pioneer 1376 XR	55.2	44.8	6.82	24.72	51.32	66.40
Pioneer 34A90	56.9	43.1	6.51	27.99	55.41	64.11

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Soybean Studies Introduction

Soybeans are established in 75 foot long by 15 foot wide plots. A planter modified for research is used for establishment. It plants six-30 inch wide rows. Plots are planted perpendicular to the tile. No starter fertilizers were used for the plots.

Soybeans are harvested with a 2144 Case IH combine with an attached HarvestMaster weigh system that records weight, moisture and test weight. All six rows are harvested for data. The target population was 140,000 seeds per acre. Stand counts were taken in August, and it was determined that plant stands were 133,842, or 95.6% of target population. Plots are established in a randomized complete block design (RCB) with four replications at each site.

Studies include conventional varieties (Sandusky site only), Liberty Link (Sandusky site only), Maturity Group 1.9 and less; Maturity Group 2.0-2.2; and Maturity Group 2.3 and more. Agronomic studies included population, planted at the Elkton and Fairgrove sites.

In the results, a number of abbreviations were used under the Seed Treatment category. Refer to the following table for the full name of abbreviations.

Treatment	Abbreviation
Acceleron	AC
Cruiser	CR
Cruiser Maxx	CRM
Vibrance	Vi
Escalate	ES
Smart Cote Extra	SCE
Starburst IM	SIM

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Soybean Variety Trials
Late Maturity 2.3 or More
Glyphosate Resistant
Yield by Location

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Company Variety	Mat	Trait	Seed Trt	SCN Res/Source	Yield by Location Bu/A Elkton	Fairgrove	Sandusky	Yale
Asgrow AG2632	2.6	RR2Y	AC	MR3	**62.8**	**49.0**	**56.9**	**51.4**
Asgrow AG2433	2.4	RR2Y	AC	MR3	54.2	44.7	**53.0**	43.7
Asgrow AG2933	2.9	RR2Y	AC	R3	53.0	43.4	46.4	41.7
Beck's 241NR	2.4	RR/SCN	P1250/Vo	R3,R14(4)	55.9	44.5	**53.4**	**46.9**
Beck's 229NR	2.3	RR/SCN	P1250/Vo	R1,R3,R5	53.4	41.5	**51.5**	43.2
Channel 2505R2	2.5	R2	AC	R3,MR14/PI88788	57.4	**48.8**	**55.4**	**52.6**
Channel 2305R2	2.3	R2	AC	R3/PI88788	56.3	43.9	**53.2**	**46.3**
Channel 2306R2	2.3	R2	AC	R3/PI88788	51.8	41.1	**52.1**	**45.6**
Croplan R2C2633	2.5	RR2Y/SCN	CM	R3,MR14/PI88788	54.7	42.6	**50.6**	**45.6**
Croplan R2C2423	2.4	RR2Y/SCN	CM	R3,MR14/PI88788	53.4	42.1	**50.1**	42.8
Dairyland DSR 2340	2.3	R2Y	CM/OPT		55.8	42.4	**52.8**	**47.2**
Dairyland DSR 2411	2.4	R2Y	CM		50.9	41.9	**51.0**	**46.1**
DF 5263 R2Y/STS	2.5	R2Y	AC/P/Vo	PI88788	54.4	**50.6**	**55.9**	**52.0**
DF 5252 N R2Y	2.5	R2Y STS	APV		52.7	43.4	**55.1**	**50.4**
Dyna-Gro DG S24RY73	2.4	RR2Y	AC	R3,MR14/PI88788	**57.9**	44.2	**54.0**	**51.0**
Dyna-Gro DG S25RY44	2.5	RR2Y	AC	R3,MR14/PI88788	56.9	40.9	**51.9**	43.4
Great Lakes 2319	2.3	R2			**61.2**	45.2	**52.8**	**51.5**
Great Lakes 2569	2.5	R2			**58.0**	44.3	**52.7**	**47.6**
Hyland HS 26RYS16	2.6	RR2Y	CM		**58.8**	44.4	**54.2**	**46.6**
Hyland HS 24RYS01	2.4	RR2Y/SCN	CM	PI88788	56.7	43.9	**49.1**	**45.0**
Hyland HS 24RY05	2.4	RR2Y/SCN	CM	PI88788	55.7	41.0	**48.2**	43.1
Mycogen 5B255R2	2.4	RR2	CM	R3,MR14	54.4	**50.8**	**54.0**	42.6
NK Brand S25-E5	2.5	RR2	CM/Vi	PI88788	51.0	44.6	**50.4**	**48.7**
NuTech/G2 7230	2.3	RR	SCE	PI88788	**57.7**	**46.2**	**55.7**	**51.2**
NuTech/G2 7261	2.6	RR	SCE	Peking	56.9	45.2	**55.6**	**47.0**
NuTech/G2 7250	2.5	RR	SCE	Peking	53.1	44.2	**54.3**	**45.8**
NuTech/G2 7240	2.4	RR	SCE	PI88788	52.7	43.9	**51.2**	39.6
Rupp RS 7251N	2.5	RR2Y	CR	PI88788	**58.6**	44.6	**55.8**	**49.8**
Rupp RS 7222	2.2	RR2Y	CR	PI88788	54.2	43.7	**49.4**	34.9
Specialty 2480CR2	2.4	RR2Y	AC/P/Vo	PI88788	57.0	43.5	**55.3**	**46.8**
Specialty 2595CR2	2.5	RR2Y	AC/P/Vo	PI88788	54.0	41.7	**55.0**	44.4
Stine 24RD03	2.4	RR2		PI88788	51.8	41.2	**51.8**	41.2
				Average	55.4	44.2	52.8	46.1
Yields adjusted to 13.5% moisture				High	62.8	50.8	56.9	52.6
				Low	50.9	40.9	46.4	34.9
Bolded yields are not statistically different than the highest yielding variety				LSD @ 0.05 % = bu/a	5.2	4.8	10.1	7.3
				CV (%) =	5.6	6.5	11.5	9.4

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Soybean Variety Trials
Late Maturity 2.3 or More
Glyphosate Resistant
Average of Locations

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Thumb Ag Research & Education

Company Variety	Mat	Trait	Seed Trt	SCN Res/Source	MS %	T.W.	White Mold Sandusky	Yield (Bu/A)
Asgrow AG2632	2.6	RR2Y	AC	MR3	14.0	58.4	1.75	**49.7**
Asgrow AG2433	2.4	RR2Y	AC	MR3	13.8	58.4	1.75	**49.7**
Asgrow AG2933	2.9	RR2Y	AC	R3	13.7	58.4	4.75	48.6
Beck's 241NR	2.4	RR/SCN	P1250/Vo	R3,R14(4)	13.7	58.4	2.25	48.1
Beck's 229NR	2.3	RR/SCN	P1250/Vo	R1,R3,R5	13.5	58.5	2.25	47.0
Channel 2505R2	2.5	R2	AC	R3,MR14/PI88788	13.4	58.5	2.00	**51.1**
Channel 2305R2	2.3	R2	AC	R3/PI88788	13.6	58.5	2.50	**49.2**
Channel 2306R2	2.3	R2	AC	R3/PI88788	13.9	58.4	1.75	47.7
Croplan R2C2633	2.5	RR2Y/SCN	CM	R3,MR14/PI88788	13.8	58.5	2.25	47.5
Croplan R2C2423	2.4	RR2Y/SCN	CM	R3,MR14/PI88788	13.9	58.4	2.25	46.3
Dairyland DSR 2340	2.3	R2Y	CM/OPT		14.0	58.3	2.50	48.5
Dairyland DSR 2411	2.4	R2Y	CM		13.6	58.6	2.50	46.3
DF 5263 R2Y/STS	2.5	R2Y	AC/P/Vo	PI88788	13.5	58.5	2.75	**51.8**
DF 5252 N R2Y	2.5	R2Y STS	AC/P/Vo		13.8	58.4	3.25	**49.4**
Dyna-Gro DG S24RY73	2.4	RR2Y	AC	R3,MR14/PI88788	13.4	58.6	3.25	**51.0**
Dyna-Gro DG S25RY44	2.5	RR2Y	AC	R3,MR14/PI88788	13.7	58.5	2.00	47.1
Great Lakes 2319	2.3	R2			13.8	58.6	2.50	**52.3**
Great Lakes 2569	2.5	R2			13.9	58.5	2.00	**50.3**
Hyland HS 26RYS16	2.6	RR2Y	CM		14.3	58.2	1.75	**49.2**
Hyland HS 24RYS01	2.4	RR2Y/SCN	CM	PI88788	13.5	58.6	1.75	**48.9**
Hyland HS 24RY05	2.4	RR2Y/SCN	CM	PI88788	14.4	58.3	2.75	47.0
Mycogen 5B255R2	2.4	RR2	CM	R3,MR14	13.7	58.4	2.75	**49.3**
NK Brand S25-E5	2.5	RR2	CM/Vi	PI88788	13.8	58.5	2.25	48.1
NuTech/G2 7230	2.3	RR	SCE	PI88788	13.7	58.6	1.25	**51.7**
NuTech/G2 7261	2.6	RR	SCE	Peking	14.1	58.3	2.25	**48.9**
NuTech/G2 7250	2.5	RR	SCE	Peking	13.7	58.5	1.75	48.4
NuTech/G2 7240	2.4	RR	SCE	PI88788	14.0	58.3	1.75	45.5
Rupp RS 7251N	2.5	RR2Y	CR	PI88788	13.5	58.6	2.50	**51.0**
Rupp RS 7222	2.2	RR2Y	CR	PI88788	13.9	58.4	2.25	44.3
Specialty 2480CR2	2.4	RR2Y	AC/P/Vo	PI88788	13.6	58.5	1.50	48.1
Specialty 2595CR2	2.5	RR2Y	AC/P/Vo	PI88788	14.5	58.2	2.25	47.7
Stine 24RD03	2.4	RR2		PI88788	13.3	58.7	1.50	44.8
White mold ratings **Sandusky ONLY**				Average	13.8	58.5	2.27	48.6
Yields adjusted to 13.5% moisture				High			4.75	52.3
				Low			1.25	44.3
Bolded yields are not statistically different than the highest yielding variety				LSD @ 0.05 = bu/a				3.6
				CV (%) =				7.6

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Soybean Variety Trials
Mid Maturity 2.0 - 2.2
Glyphosate Resistant
Yield By Locations

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					Yield By Location Bu/A			
Company Variety	**Mat**	**Trait**	**Seed Trt**	**SCN Res/Source**	Elkton	Fairgrove	Sandusky	Yale
Asgrow AG2031	2.0	RR2Y	AC	R3	**53.8**	**44.9**	58.9	**48.8**
Asgrow AG2134	2.1	RR2Y	AC	R3	**52.1**	**43.5**	58.8	**46.6**
Asgrow AG2232	2.2	RR2Y	AC	R3	48.4	**41.8**	57.6	42.9
Channel 2207R2	2.2	R2	AC	R3/PI88788	48.2	**41.8**	**60.1**	**47.5**
Croplan R2C2072	2.0	RR2/SCN	CM	R3/PI88788	**53.5**	**41.2**	**60.9**	**51.7**
Croplan R2C2263	2.2	RR2/SCN	CM	R3,MR14/PI88788	49.5	**41.2**	**59.8**	44.2
Dairyland DSR 2105	2.1	R2Y	CM/Vi		**52.7**	**42.1**	**65.5**	**52.6**
DF 5211 N R2Y	2.1	R2Y	APV	PI88788	**52.6**	**42.1**	**61.2**	**46.5**
Dyna-Gro DG 35RY21	2.1	RR2Y	AC	R3,MR14/PI88788	**52.0**	**43.4**	**61.6**	**52.7**
Dyna-Gro DG S22RY64	2.2	RR2Y	AC	R3,MR14/PI88788	**50.4**	**41.5**	58.6	**47.9**
Dyna-Gro DG S20RY94	2.0	RR2Y	AC	MR3,MR14/PI88788	46.0	37.6	57.3	**46.2**
Great Lakes 2289	2.2	R2			**53.5**	**47.3**	**62.4**	**51.7**
Great Lakes 2019	2.0	R2			**52.4**	**43.7**	57.6	**48.7**
Great Lakes 2069	2.0	R2			**51.3**	39.2	56.2	**48.3**
Hyland HS 22RYS03	2.2	RR2Y/SCN	CM	PI88788	49.8	39.6	56.4	**52.6**
Mycogen 5B241R2	2.1	RR2	CM	R3,MR14	**55.0**	**41.8**	**60.3**	**50.9**
Mycogen 5N210R2	2.1	RR2	CM	R3,MR14	46.2	**41.2**	58.2	**49.1**
NK Brand S20-T6	2.0	RR2	CM/Vi	PI88788	**54.2**	**41.9**	**62.3**	**48.0**
NK Brand S20-Y2	2.0	RR2	CM/Vi	PI88788	**51.2**	**41.4**	**61.1**	**47.7**
NK Brand S22-S1	2.2	RR2	CM/Vi	PI88788	48.7	39.8	58.6	44.9
NuTech/G2 7213	2.1	RR	SCE	PI88788	**50.4**	**44.5**	**61.3**	**47.3**
NuTech/G2 7208	2.0	RR	SCE	PI88788	48.6	**41.1**	58.8	**47.0**
Rupp RS 7212N	2.1	RR2Y	CR	PI88788	**51.9**	**44.9**	**60.6**	**51.0**
Specialty 2218CR2	2.2	RR2Y	AC/P/Vo	PI88788	**50.8**	**41.5**	**61.0**	**46.5**
Stine 20RD20	2.0	RR2		PI88788	49.1	**42.0**	**62.4**	**52.1**
Stine 22RD00	2.2	RR2		PI88788	48.2	38.6	58.9	43.7
				Average	50.8	41.9	59.9	48.3
Yields adjusted to 13.5% moisture				High	55.0	47.3	65.5	52.7
				Low	46.0	37.6	56.2	42.9
Bolded yields are not statistically different than the highest yielding variety				LSD @ 0.05% = bu/a	5.1	6.8	5.8	7.6
				CV (%) =	5.1	9.7	5.8	9.4

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Soybean Variety Trials
Mid Maturity 2.0 - 2.2
Glyphosate Resistant
Average of Locations

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Thumb Ag Research & Education

Company Variety	Mat	Trait	Seed Trt	SCN Res/Source	MS %	T.W.	White Mold Sandusky	Yield (Bu/A)
Asgrow AG2031	2.0	RR2Y	AC	R3	14.1	58.3	1.00	**50.7**
Asgrow AG2134	2.1	RR2Y	AC	R3	13.9	58.4	1.25	**49.9**
Asgrow AG2232	2.2	RR2Y	AC	R3	14.2	58.3	1.00	48.9
Channel 2207R2	2.2	R2	AC	R3/PI88788	14.9	57.9	1.25	49.4
Croplan R2C2072	2.0	RR2/SCN	CM	R3/PI88788	14.4	58.2	1.25	**51.8**
Croplan R2C2263	2.2	RR2/SCN	CM	R3,MR14/PI88788	14.6	58.1	1.00	48.7
Dairyland DSR 2105	2.1	R2Y	CM/Vi		14.8	58.0	1.25	**53.2**
DF 5211 N R2Y	2.1	R2Y	APV	PI88788	14.3	58.2	1.00	**50.6**
Dyna-Gro DG 35RY21	2.1	RR2Y	AC	R3,MR14/PI88788	14.1	58.3	1.00	**50.5**
Dyna-Gro DG S22RY64	2.2	RR2Y	AC	R3,MR14/PI88788	14.7	58.0	1.25	49.4
Dyna-Gro DG S20RY94	2.0	RR2Y	AC	MR3,MR14/PI88788	14.7	58.0	1.50	48.9
Great Lakes 2289	2.2	R2			14.0	58.4	1.25	**51.8**
Great Lakes 2019	2.0	R2			14.2	58.3	0.75	**50.8**
Great Lakes 2069	2.0	R2			14.6	58.0	1.25	**50.5**
Hyland HS 22RYS03	2.2	RR2Y/SCN	CM	PI88788	14.4	58.2	1.25	49.6
Mycogen 5B241R2	2.1	RR2	CM	R3,MR14	14.3	58.3	1.00	**51.5**
Mycogen 5N210R2	2.1	RR2	CM	R3,MR14	14.5	58.1	1.00	49.1
NK Brand S20-T6	2.0	RR2	CM/Vi	PI88788	14.1	58.3	0.75	**50.7**
NK Brand S20-Y2	2.0	RR2	CM/Vi	PI88788	14.2	58.3	1.25	**50.0**
NK Brand S22-S1	2.2	RR2	CM/Vi	PI88788	14.8	58.0	1.00	49.3
NuTech/G2 Genetics 7213	2.1	RR	SCE	PI88788	14.0	58.4	0.50	**50.9**
NuTech/G2 Genetics 7208	2.0	RR	SCE	PI88788	14.5	58.1	0.75	48.8
Rupp RS 7212N	2.1	RR2Y	CR	PI88788	14.0	58.4	0.75	**52.1**
Specialty 2218CR2	2.2	RR2Y	AC/P/Vo	PI88788	14.2	58.3	1.00	**49.9**
Stine 20RD20	2.0	RR2		PI88788	14.4	58.2	0.75	49.4
Stine 22RD00	2.2	RR2		PI88788	14.7	58.1	0.75	49.3
				Average	14.4	58.2		50.2
				High				53.2
				Low				48.7
				LSD @ 0.05 = 3.4				3.4
				CV (%) = 7.9				7.9

Yields adjusted to 13.5% moisture

Bolded yields are not statistically different than the highest yiedling variety

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Soybean Variety Trials
Early Maturity 1.9 or Less
Glyphosate Resistant
Yield By Location

TARE
Thumb Ag Research & Education

Company Variety	Mat	Trait	Seed Trt	SCN Res/Source	Yield By Location Bu/A Elkton	Fairgrove	Sandusky	Yale
Asgrow AG1832	1.8	RR2Y	AC	MR3	**53.3**	**45.7**	**57.0**	30.9
Croplan R2C1972	1.9	RR2/SCN	CM/Vi	R3/PI88788	50.6	**45.4**	**56.1**	33.5
Dairyland DSR 1808	1.8	R2Y	CM/Vi	R3/PI88788	49.7	36.1	**59.5**	35.5
DF 5193 N R2Y	1.9	R2Y	SIM	PI88788	50.9	**43.4**	**59.5**	**42.4**
Dyna-Gro DG S19RY84	1.9	RR2Y	AC	R3,MR14/PI88788	**52.0**	**44.0**	**62.0**	36.4
Dyna-Gro DG 34RY17	1.7	RR2Y	AC	R3/PI88788	51.2	**43.3**	**56.2**	36.3
Dyna-Gro DG S18RY33	1.8	RR2Y	AC	MR3/PI88788	51.1	42.5	51.0	30.8
Great Lakes 1929	1.9	R2			**53.8**	**46.8**	**56.1**	**40.2**
Great Lakes 1689	1.6	R2			**52.1**	**46.5**	**56.0**	**37.9**
Great Lakes 1849	1.8	R2			**52.0**	**43.0**	52.9	33.2
Hyland HS 18RY09	1.8	RR2Y	CM		**54.0**	**44.4**	**60.5**	**36.8**
Hyland HS 11RY07	1.4	RR2Y	CM		**52.5**	42.6	**59.3**	35.5
Hyland HS 18RYS13	1.8	RR2Y/SCN	CM	PI88788	50.1	35.9	**59.3**	33.2
NK Brand S17-B3	1.7	RR2	CM/Vi	PI88788	**53.8**	38.7	**60.3**	**41.1**
NuTech/G2 7171	1.7	RR	SCE	PI88788	**52.0**	**45.3**	**58.6**	**40.4**
NuTech/G2 7183	1.8	RR	SCE	PI88788	49.4	35.3	**57.1**	**39.3**
Rupp RS 7172N	1.7	RR2Y	CR	PI88788	**55.2**	**46.3**	53.7	36.1
Rupp RS 7184	1.8	RR2Y	CR	PI88788	**55.1**	**44.3**	52.6	31.5
Specialty 1844CR2	1.8	RR2Y	AC/P/Vo	PI88788	**52.1**	**45.1**	55.3	31.2
Stine 16RA02	1.6	RR2		PI88788	51.0	40.4	**58.8**	33.4
				Average	52.1	42.7	57.1	35.8
Yields adjusted to 13.5% moisture				High	55.2	46.8	62.0	42.4
				Low	49.4	35.3	51.0	30.8
Bolded yields are not statistically different than the highest yielding variety				LSD @ 0.05% = bu/a	3.9	4.1	6.0	5.8
				CV (%) =	4.5	5.5	6.2	9.6

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Soybean Variety Trials
Early Maturity 1.9 or Less
Glyphosate Resistant
Average of Locations

TARE
Thumb Ag Research & Education

Company Variety	Mat	Trait	Seed Trt	SCN Res/Source	MS %	T.W.	White Mold Sandusky	Yield (Bu/A)
Asgrow AG1832	1.8	RR2Y	AC	MR3	14.3	58.2	2.50	**46.7**
Croplan R2C1972	1.9	RR2/SCN	CM/Vi	R3/PI88788	14.6	58.1	1.75	**46.4**
Dairyland DSR 1808	1.8	R2Y	CM/Vi	R3/PI88788	14.5	58.1	3.00	45.2
DF 5193 N R2Y	1.9	R2Y	SIM	PI88788	14.6	58.1	2.25	**49.0**
Dyna-Gro DG S19RY84	1.9	RR2Y	AC	R3,MR14/PI88788	14.4	58.1	3.25	**48.0**
Dyna-Gro DG 34RY17	1.7	RR2Y	AC	R3/PI88788	14.6	58.1	1.75	**46.7**
Dyna-Gro DG S18RY33	1.8	RR2Y	AC	MR3/PI88788	14.4	58.2	1.50	44.4
Great Lakes 1929	1.9	R2			14.2	58.3	1.50	**48.2**
Great Lakes 1689	1.6	R2			14.1	58.4	1.75	**48.2**
Great Lakes 1849	1.8	R2			14.1	58.3	3.00	**46.2**
Hyland HS 18RY09	1.8	RR2Y	CM		14.8	58.1	3.00	**48.5**
Hyland HS 11RY07	1.4	RR2Y	CM		14.7	58.1	3.75	**47.4**
Hyland HS 18RYS13	1.8	RR2Y/SCN	CM	PI88788	14.6	58.0	4.25	45.2
NK Brand S17-B3	1.7	RR2	CM/Vi	PI88788	15.0	57.9	4.25	**48.5**
NuTech/G2 7171	1.7	RR	SCE	PI88788	14.5	58.1	2.25	**48.7**
NuTech/G2 7183	1.8	RR	SCE	PI88788	14.6	58.1	1.75	45.6
Rupp RS 7172N	1.7	RR2Y	CR	PI88788	14.3	58.2	2.50	**47.0**
Rupp RS 7184	1.8	RR2Y	CR	PI88788	14.4	58.2	1.00	**46.7**
Specialty 1844CR2	1.8	RR2Y	AC/P/Vo	PI88788	14.4	58.2	2.75	45.9
Stine 16RA02	1.6	RR2		PI88788	14.6	58.1	2.25	45.9
White mold ratings **Sandusky ONLY**				Average	14.5	58.1	2.50	46.9
Yields adjusted to 13.5% moisture				High	15.0	58.4	4.25	49.0
				Low	14.1	57.9	1.00	44.4
Bolded yields are not statistically different than the highest yielding variety				LSD @ 0.05 = bu/a				2.8
				CV (%) =				7.2

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Soybean Variety Trial
Liberty Link
Conventional Non-GMO
Specialty Soybeans
Sandusky, MI

TARE
Thumb Ag Research & Education

Conventional Non-GMO

Company	Variety	Mat	Trait	Seed Treat	SCN Res Source	T.W.	MS %	Yield Bu/A	DM Prot %	DM Oil %
DF Seeds, Inc	**DF 155F**	2.5	Tofu	APV		57.5	16.5	**61.4**	41.87	19.01
DF Seeds, Inc	**DF 242 N/S**	2.4	Non-GMO	APV	PI88788	57.0	17.3	**55.7**	40.68	18.10
DF Seeds, Inc	JACKSON F	2.5		APV		58.0	15.7	52.5	39.23	23.31
DF Seeds, Inc	**LILLY**	2.5	Tofu	APV		57.9	15.7	**54.5**	39.41	19.43
Organic Bean & Grain	**DH410**	1.6	Hi Pro/Tofu			57.3	17.1	**60.5**	40.65	18.48
Organic Bean & Grain	DH530	1.6	Soymilk			58.0	15.6	50.2	37.16	20.37
Organic Bean & Grain	**MK1016**	1.0	Natto			57.6	16.4	**59.1**	39.66	18.21
Organic Bean & Grain	**MK9101**	1.1	Black			57.8	16.0	**57.6**	40.56	18.55
Organic Bean & Grain	S2020	2.0	Soymilk			57.9	15.9	52.0	40.92	19.14
ZFSelect	**e2611**	2.6		CM	PI88788	57.8	15.9	**56.6**	42.67	18.05
ZFSelect	**1326**	2.6		CM		57.7	16.3	**61.8**	39.41	18.78
ZFSelect	**251 LS**	2.5	LS	CM		57.4	16.7	**53.7**	38.06	19.19
ZFSelect	**728 LL**	2.6	LL	CM		57.4	16.8	**59.6**	38.80	19.13
					Average	57.6	16.3	56.5	39.9	19.2
					High	58.0	17.3	61.8	42.7	23.3
Yields adjusted to 13.5% moisture					Low	57.0	15.6	50.2	37.2	18.1
Bolded Yields are not significantly different than the highest yielding variety								LSD @0.05	8.8	
								CV (%)	9.0	

Liberty Link

Company Variety	Mat	Trait	Seed Treatment	SCN Res Source	T.W.	MS %	White Mold Sandusky	Yield Bu/A
DF Seeds DF 9181 N LL	1.8	LL	APV	PI88788	58.0	15.8	1.00	**63.9**
DF Seeds DF 9221 N LL	2.2	LL	APV	PI88788	57.9	16.0	0.00	**62.2**
DF Seeds DF 9251 N LL	2.5	LL	APV	PI88788	57.9	16.0	1.75	**60.3**
DF Seeds DF 9261 LL	2.7	LL	APV	MS	57.7	16.2	1.75	**61.9**
NuTech/G2 Genetics 3223L	2.2	LL	SCE	PI88788	57.4	16.9	1.75	**62.1**
NuTech/G2 Genetics 3243L	2.4	LL	SCE	PI88788	57.8	16.3	1.50	**63.0**
NuTech/G2 Genetics 3273L	2.6	LL	SCE	PI88788	57.8	16.1	2.00	**61.8**
				Average	57.8	16.2		62.1
Yields adjusted to 13.5% moisture				High	58.0	16.9		63.9
				Low	57.4	15.8		60.3
Bolded Yields are not significantly different than				LSD @ 0.05				NS
the highest yielding variety				CV (%)				4.1

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Soybean Variety Trials
3 Yr. Average

TARE
Thumb Ag Research & Education

Liberty Link

Company	Variety	2013 Yield	2012 Yield	Average
DF Seeds Inc	DF 9181 N LL	63.9	60.2	62.0
DF Seeds Inc	DF 9221 N LL	62.2	66.9	64.5
DF Seeds Inc	DF 9251 N LL	60.3	68.1	64.2

Conventional/Specialty

Company	Variety	2013 Yield	2012 Yield	2011 Yield	2 yr. ave.	3 yr. ave.
DF Seeds Inc	DF 155F	61.4	68.5	47.7	64.9	59.2
DF Seeds Inc	DF 242 N/S	55.7	71.1		63.4	
DF Seeds Inc	LILLY	54.5	73.9		64.2	
Organic Bean & Grain Inc	DH410	60.5	65.5		63.0	
Organic Bean & Grain Inc	DH530	50.2	74.4		62.3	
Organic Bean & Grain Inc	MK1016	59.1	61.0		60.1	
Organic Bean & Grain Inc	S2020	52.0	69.3		60.6	
ZFSelect	ZFSelect 251 LS	53.7	68.5		61.1	
ZFSelect	ZFSelect 728 LL	59.6	70.5	47.0	65.1	59.0

Late Varieties 2.3 RM or more

Company	Variety	2013 Yield	2012 Yield	2011 Yield	2 yr. ave	3 yr. ave.
Asgrow	AG2433	49.7	51.0		51.0	
Asgrow	AG2632	49.7	47.6	56.1	47.6	51.1
Beck's Superior Hybrids	229NR	47.0	47.2		47.2	
Beck's Superior Hybrids	241NR	48.1	48.0		48.0	
Channel Seed	2305R2	49.2	49.3		49.3	
Channel Seed	2505R2	51.1	49.0		49.0	
Dairyland Seed	2411	46.3	48.2		48.2	
DF Seeds Inc	DF 5252 N R2Y	49.4	48.7		48.7	
Dyna-Gro	DG S24RY73	51.0	49.7		49.7	
Great Lakes Hybrids	2569	50.3	47.3		47.3	
Hyland Seeds	HS 24RY05	47.0	47.0	56.0	47.0	50.0
Hyland Seeds	HS 24RYS01	48.9	48.8		48.8	
Hyland Seeds	HS 26RYS16	49.2	49.5	54.6	49.5	51.1
Rupp Seeds Inc	RS 7251N	51.0	47.0		47.0	
Specialty Hybrids	2595CR2	47.7	47.1		47.1	

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Soybean Variety Trials
3 Yr. Average

TARE
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Early Varieties 1.9 RM or less

Company	Variety	2013 Yield	2012 Yield	2011 Yield	2 yr. ave.	3 yr. ave.
Asgrow	AG1832	46.7	57.0	52.7	46.7	52.1
Asgrow	AG2031	50.7	54.2	52.6	50.7	52.5
Asgrow	AG2232	48.9	55.7	52.3	48.9	52.3
DF Seeds Inc	DF 5211 N R2Y	50.6	55.3		50.6	
Dyna-Gro	DG 34RY17	46.7	56.9	55.9	46.7	53.2
Dyna-Gro	DG 35RY21	50.5	51.1	52.2	50.5	51.3
Dyna-Gro	DG S18RY33	44.4	52.5		44.4	
Great Lakes Hybrids	1849	46.2	56.2		46.2	
Great Lakes Hybrids	1929	48.2	53.4	54.1	48.2	51.9
Great Lakes Hybrids	2019	50.8	54.1	55.5	50.8	53.5
Great Lakes Hybrids	2069	50.5	55.5		50.5	
Great Lakes Hybrids	2289	51.8	55.4		51.8	
Hyland Seeds	HS 11RY07	47.4	53.4	50.0	47.4	50.3
Hyland Seeds	HS 18RY09	48.5	55.4	53.9	48.5	52.6
Hyland Seeds	HS 18RYS13	45.2	52.9	54.0	45.2	50.7
Hyland Seeds	HS 22RYS03	49.6	55.2	53.4	49.6	52.7
Mycogen Seeds	5N210R2	49.1	54.4	53.6	49.1	52.4
NK Brand	S20-Y2	50.0	52.2	53.4	50.0	51.9
Rupp Seeds Inc	RS 7172N	47.0	52.7		47.0	
Specialty Hybrids	1844CR2	45.9	54.9		45.9	
Specialty Hybrids	2218CR2	49.9	56.5	54.9	49.9	53.8
Stine Seed	16RA02	45.9	57.4	54.7	45.9	52.7

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Soybean Population Study 2013

TARE Thumb Ag Research & Education

	Elkton			Fairgrove			Average			
Planted Pop X 1000	Final Pop X 1000	% of Planted	Yield (Bu/A)	Final Pop X 1000	% of Planted	Yield (Bu/A)	Final Pop X 1000	% of Planted	Yield (Bu/A)	Return per Acre
210	173.9	83%	**53.7**	153.5	73%	**48.2**	163.7	78%	**51.0**	$ 567.10
190	151.5	80%	**53.0**	146.4	77%	**48.6**	149.0	78%	**50.8**	$ 574.09
160	129.3	81%	**54.2**	127.9	80%	**51.8**	128.6	80%	**53.0**	$ 616.17
130	111.6	86%	**54.8**	106.4	82%	**50.3**	109.0	84%	**52.6**	$ 624.32
100	85.9	86%	52.7	87.1	87%	46.5	86.5	87%	49.6	$ 599.57
Average			53.7			49.1			51.4	
High			54.8			51.8			53.0	
Low			52.7			46.5			49.6	
LSD @ 0.05=			2.0			4.7			3.2	
CV (%)			3.2			5.1			6.2	

Yields adjusted to 13.5% moisture
Bolded yields are not statistically different from highest yielding population.

Assumptions for Return Per Acre:
Soybean value = $13/Bu
Seed cost = $63.50 / 140,000 seeds

Purpose:
The purpose of this study was to evaluate the effect of planting populations on soybean yield in 30 inch rows.

Methods:
Soybeans were planted in five populations (100K, 130K, 160K, 190K, and 210K) at two locations (Elkton and Fairgrove). Plots were established in an RCBD with four replications at each site. Population counts were measured in August. The variety used was Rupp 7251, treated with Cruiser, fungicide, and an inoculant.

Results:
Final plant stand compared to planted populations was about 80%. The 100,000 and 130,000 final plant stands were closer to planted populations than the 190,000 and 210,000 planted populations. All populations with a final plant stand of greater than 100,000 plants per acre yielded similarly. There was no advantage, either economically, or by yield, in planting more than 160,000 seeds per acre. The greatest return per acre was realized at the 130,000 per acre planting population.

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Soybean Study
Population by Planting Date

TARE Thumb Ag Research & Education

Purpose:

The Michigan Soybean Promotion committee supported a study to evaluate the effect of soybean planting date in relation to planting populations. The purpose of the study was to determine the optimum yield at various planted populations at early, mid-season, and late planting dates. This is the third and final year of the study.

County:	Tuscola
Cooperator:	Wayne & Chris Hecht
Nearest town:	Richville
Soil Type:	Tappan-Londo Loam
Tillage:	Conventional
Previous crop:	Edible beans
Fertilizer:	200 lbs. 0-0-60
Herbicide:	Glyphosate
Row width:	20 inch
Variety:	Hyland HS 26RYS16
Harvest date:	23-Oct-13
Exp. Design:	RCBD

Methods:

Hyland HS 26RYS16 CMV soybeans were planted in population treatments of 80K, 120K, 160K, 200K and 240K sees/A in 20 inch rows using a Monosem planter. Three plantings were established in the same field in a randomized complete block design (RCBD) at approximately two week intervals (May 9, May 20, & June 5). Each plot was 16 feet by 100 feet and replicated four times. Each treatment was harvested using a 2144 Case IH combine with a HarvestMaster weight system that records grain weight, moisture, and test weight.

Results:

The early planting had a hard packing rain that decreased emergence and final plant stands by approximately 18%. The final two plantings had excellent emergence and plant vigor. In the late season planting, one replication showed an infestation of white mold (~50%) especially in the higher populations.

Yield differences for the plantings showed a 6% reduction in the mid-season planting compared to the early planting. The late season planting resulted in a 15.3% yield reduction compared to the early season planting. This is consistent with the previous two years that the study has been done. The average reduction in yield for three years was (6.1%) for the mid-season planting and (15.2%) for the late season planting.

In 2013, income per acre was reduced ($40.18/A) for the mid-season and ($100.81/A) for the late season planting. Although different planting conditions exist from year to year this study demonstrates the clear advantage to early planting of soybeans. The average soybean price received at the time of harvest for the three years was $12.78/Bu. The average gross income for the early planted soybeans was $829.42. **The average difference in gross income per acre for a two week delay in planting would be a loss of ($51.12/A) and for a four week delay in planting the loss would be ($125.27/A).**

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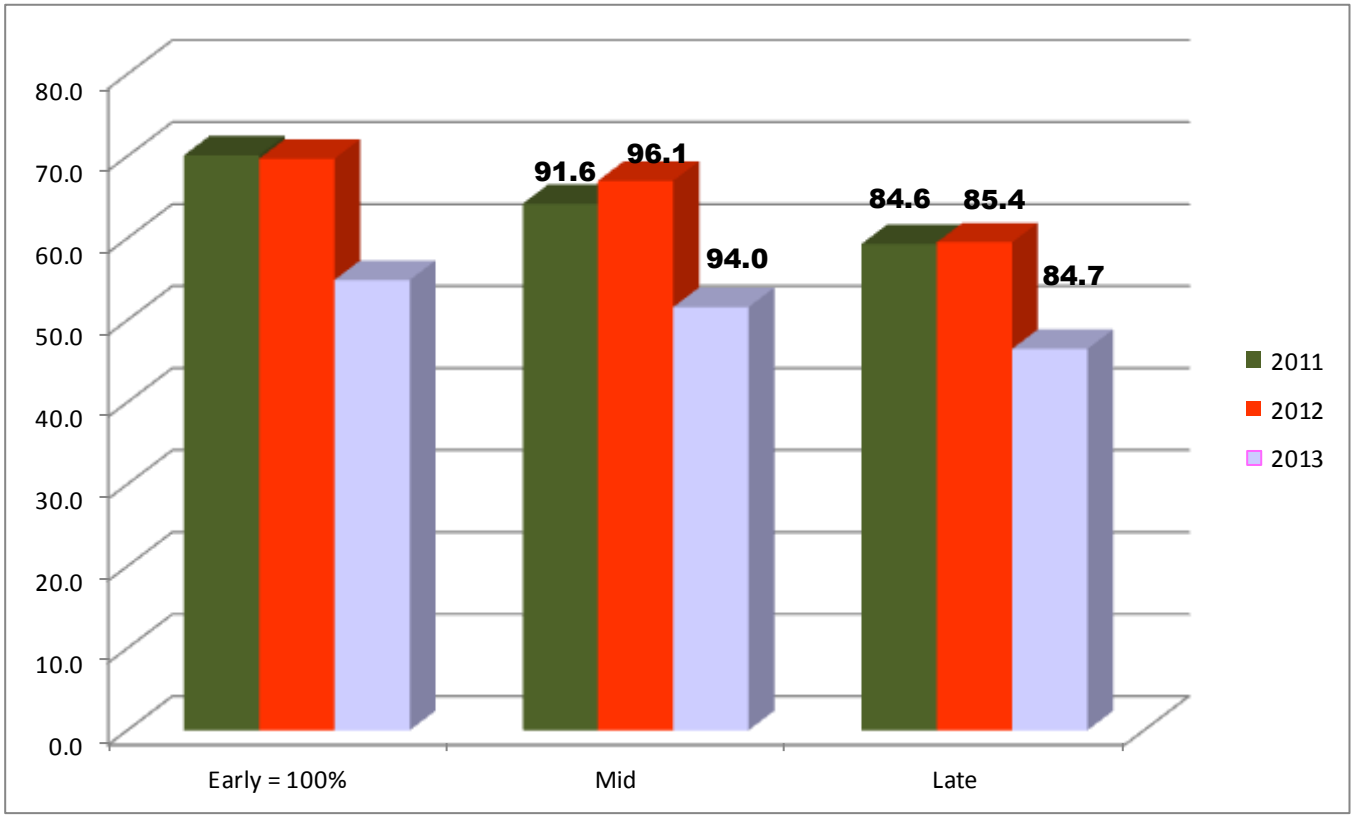
Soybean Study
Population by Planting Date

TARE Thumb Ag Research & Education

Planted Populations	May 9 Early Planting			May 20 Mid-Season			June 5 Late Season		
	Final Stand (000)	Final Stand %	Yield Bu/A	Final Stand (000)	Final Stand %	Yield Bu/A	Final Stand (000)	Final Stand %	Yield Bu/A
80K	57 a	72%	51.0 a	85 a	107%	51.0	89 a	112%	48.7 a
120K	106 b	88%	55.0 b	125 b	104%	49.8	130 b	109%	47.0 a
160K	141 c	88%	57.6 b	159 c	99%	51.9	170 c	106%	45.9 ab
200K	168 d	84%	54.6 b	200 d	100%	51.8	203 d	102%	46.2 ab
240K	188 d	78%	56.3 b	212 de	88%	53.3	213 d	89%	44.8 b
Average	132	82%	54.9	156	100%	51.6	161	103%	46.5
LSD @ 0.05%	26.61		3.83	8.71		NS	30.59		2.48
CV%	10.7		4.6	3.0			10.1		3.5
Percent of total yield:			100%			94.8%			85.6%
Soybeans $/Bu: $12.03									
Gross Income:			$660.45			$620.27			$559.64
Gain/Loss:						($ 40.18)			($100.81)

% Yield



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Soybean Variety Study
Soybean Cyst Nematode Resistance Analysis

TARE Thumb Ag Research & Education

Purpose:

Soybean cyst nematode (SCN) remains the number one cause of yield loss for soybeans in the United States. In order to determine the significance of this pest at sites in the Thumb area, the Michigan Soybean Promotion Committee funded this project to measure the effect that variety selection has on SCN. Identifying varieties that are able to yield in environments that have confirmed SCN will enable producers to make informed decisions about resistance management.

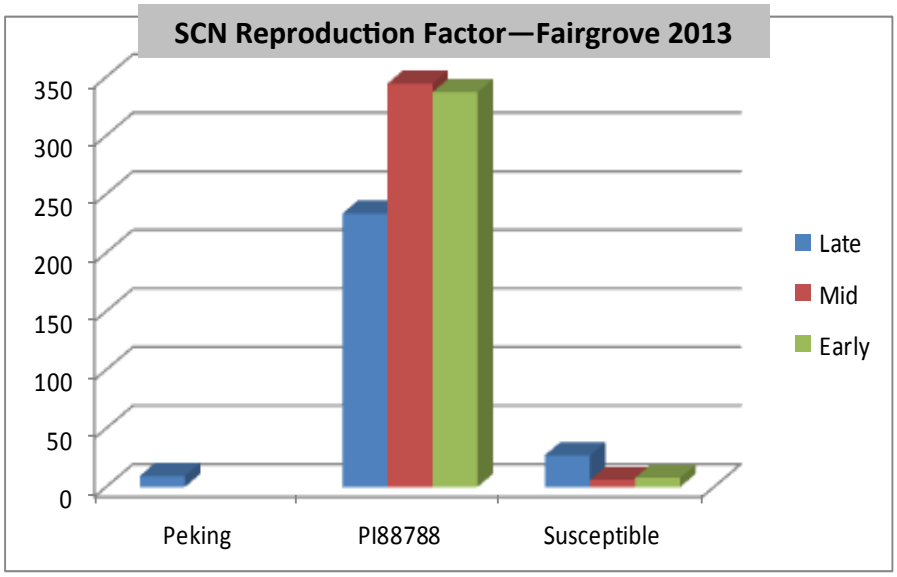
Since each site is unique and may have different types of SCN, **the ability to withstand SCN at one site may not indicate the ability of the variety to withstand SCN at other farms and field sites.** Several genes provide resistance to SCN in soybeans for each of the sources of resistance (PI88788, Peking, etc.). And not every soybean variety described as resistant to SCN necessarily possesses all of the resistance genes. Therefore, SCN-resistant soybean varieties can vary greatly in the amount for nematode resistance they possess, as well as in their agronomic performance.

Methods:

At the Fairgrove soybean variety trials for TARE, each replication of each variety (20 early, 26 mid, and 32 late maturity) was sampled for SCN. The sampling of each treatment was done at the time of planting (Pi) and after harvest (Pf) to detect if there had been an increase in SCN during the growing season. The four treatment samples were combined according to variety and submitted to the MSU Diagnostic Lab for detection of SCN cysts, SCN eggs, and SCN juveniles. The samples from this site will also be type tested to determine which population of SCN is predominant at this site. Other TARE soybean sites were not tested.

Results:

The results for this study are reported showing yield, source of resistance (supplied by seed companies), and the SCN reproduction factor. The SCN reproduction factor is: (Pf) # SCN eggs & juveniles at harvest divided by (Pi) # SCN eggs & juveniles at planting (Pf/Pi=SCN reproduction factor). A SCN reproduction factor of 1.0 or less indicates that there was no increase or a reduction in SCN eggs & juveniles during the growing season. The graph provides a visual observation of the results listed on the next three pages.



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Soybean Variety Study
Soybean Cyst Nematode Resistance Analysis
Late Maturity Trial

TARE
Thumb Ag Research & Education

Company Variety	Eggs & Juv (Pi)	Eggs & Juv (Pf)	Yield Bu/A	Factor Pi/Pf	Resistance Source
Asgrow AG2433	1560	8960	43.4	5.7	MR3
Asgrow AG2632	220	3120	44.7	14.2	MR3
Asgrow AG2933	2280	5920	**49.0**	2.6	R3
Beck's 229NR	490	1340	44.5	2.7	Race 3, Race 14(4)
Beck's 241NR	450	8640	41.5	19.2	Race 1, Race 3, Race 5
Channel 2305R2	1380	2440	43.9	1.8	R3,MR14/PI88788
Channel 2306R2	160	150	41.1	0.9	R3/PI88788
Channel 2505R2	840	4880	**48.8**	5.8	R3/PI88788
Croplan R2C2423	880	4320	42.6	4.9	R3,MR14
Croplan R2C2633	230	540	42.1	2.3	R3,MR14
Dairyland DSR2340	1920	130	41.9	0.1	
Dairyland DSR2411	80	7680	42.4	96.0	
DF 5252 N R2Y	4	1340	43.4	335.0	PI88788
DF 5263 R2Y/STS	700	4960	**50.6**	7.1	
Dyna-Gro DG S24RY73	2200	2320	44.2	1.1	R3,MR14/PI88788
Dyna-Gro DG S25RY44	1720	1180	40.9	0.7	R3,MR14/PI88788
Great Lakes 2319	300	2520	44.3	8.4	PI88788
Great Lakes 2569	430	10240	45.2	23.8	PI88788
Hyland HS 24RY05	920	5200	41.0	5.7	
Hyland HS 24RYS01	1	5600	44.4	5600.0	PI88788
Hyland HS 26RYS16	410	210	43.9	0.5	PI88788
Mycogen 5B255R2	1180	19040	**50.8**	16.1	R3, MR14
NK Brand S25-E5	5680	5320	44.6	0.9	PI88788
NuTech/G2 Genetics 7230	1420	2400	**46.2**	1.7	PI88788
NuTech/G2 Genetics 7240	60	1080	44.2	18.0	Peking
NuTech/G2 Genetics 7250	290	300	45.2	1.0	Peking
NuTech/G2 Genetics 7261	2360	6080	43.9	2.6	PI88788
Rupp RS 7222	780	1540	43.7	2.0	PI88788
Rupp RS 7251N	230	720	44.6	3.1	PI88788
Specialty 2480CR2	800	1140	43.5	1.4	PI88788
Specialty 2595CR2	80	800	41.7	10.0	PI88788
Stine 24RD03	2320	5840	41.2	2.5	PI88788

Bolded yields are not statistically different than the highest yielding variety.

Factor (Pf/Pi) that are less than 1.0 had no SCN increase during the growing season.

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Soybean Variety Study
Soybean Cyst Nematode Resistance Analysis
Mid Maturity Trial

TARE
Thumb Ag Research & Education

Company Variety	Eggs & Juv (Pi)	Eggs & Juv (Pf)	Yield Bu/A	Factor Pf/Pi	Resistance Source
Asgrow AG2031	140	260	**43.5**	1.9	R3
Asgrow AG2134	920	2960	**44.9**	3.2	R3
Asgrow AG2232	0	490	**41.8**	490.0	R3
Channel 2207R2	200	310	**41.8**	1.6	R3/PI88788
Croplan R2C2072	70	240	**41.2**	3.4	R3/PI88788
Croplan R2C2263	940	2640	**41.2**	2.8	R3,MR14/PI88788
Dairyland 2105	650	3880	**42.1**	6.0	
DF 5211 N R2Y	0	130	**42.1**	130.0	PI88788
Dyna-Gro DG 35RY21	0	1520	**43.4**	1520.0	R3,MR14/PI88788
Dyna-Gro DG S20RY94	70	1320	37.6	18.9	R3,MR14/PI88788
Dyna-Gro DG S22RY64	4	940	**41.5**	235.0	MR3,MR14/PI88788
Great Lakes 2019	390	4080	**47.3**	10.5	PI88788
Great Lakes 2069	0	110	39.2	110.0	PI88788
Great Lakes 2289	1260	1100	**43.7**	0.9	PI88788
Hyland HS 22RYS03	0	5000	39.6	5000.0	PI88788
Mycogen 5B241R2	0	700	**41.8**	700.0	R3, MR14
Mycogen 5N210R2	350	2920	**41.2**	8.3	R3, MR14
NK Brand S20-T6	160	11520	39.8	72.0	PI88788
NK Brand S20-Y2	30	7360	**41.4**	245.3	PI88788
NK Brand S22-S1	600	0	**41.9**	0.0	PI88788
NuTech/G2 Genetics 7208	700	1100	**41.1**	1.6	PI88788
NuTech/G2 Genetics 7213	180	6320	**44.5**	35.1	PI88788
Rupp RS 7212N	440	7120	**44.9**	16.2	PI88788
Specialty 2218CR2	470	880	**41.5**	1.9	PI88788
Stine 20RD20	620	0	38.6	0.0	PI88788
Stine 22RD00	220	1000	**42.0**	4.5	PI88788

Bolded yields are not statistically different than the highest yielding variety.

Factor (Pf/Pi) that are less than 1.0 had no SCN increase during the growing season.

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Soybean Variety Study
Soybean Cyst Nematode Resistance Analysis
Early Maturity Trial

TARE Thumb Ag Research & Education

Company Variety	Eggs & Juv (Pi)	Eggs & Juv (Pf)	Yield	Factor (Pf/Pi)	Resistance Source
Asgrow AG1832	1440	290	**45.7**	0.2	MR3
Croplan R2C1972	300	350	**45.4**	1.2	R3/PI88788
Dairyland 1808	880	7440	36.1	8.5	R3/PI88788
DF 5193 N R2Y	250	1200	**43.4**	4.8	PI88788
Dyna-Gro DG 34RY17	340	15520	**43.3**	45.6	R3,MR14/PI88788
Dyna-Gro DG S18RY33	110	4880	**44.0**	44.4	R3/PI88788
Dyna-Gro DG S19RY84	1	5120	42.5	5120.0	MR3/PI88788
Great Lakes 1689	110	170	**43.0**	1.5	PI88788
Great Lakes 1849	1	70	**46.5**	70.0	PI88788
Great Lakes 1929	5280	1920	**46.8**	0.4	PI88788
Hyland HS 11RY07	1	0	**44.4**	0.0	
Hyland HS 18RY09	500	7840	42.6	15.7	
Hyland HS 18RYS13	0	0	35.9	0.0	PI88788
NK Brand S17-B3	190	21000	38.7	110.5	PI88788
NuTech/G2 Genetics 7171	1	0	**45.3**	0.0	PI88788
NuTech/G2 Genetics 7183	720	3000	35.3	4.2	PI88788
Rupp RS 7172N	280	3960	**44.3**	14.1	PI88788
Rupp RS 7184	1	640	**46.3**	640.0	PI88788
Specialty 1844CR2	120	0	**45.1**	0.0	Yes/PI88788
Stine 16RA02	110	210	40.4	1.9	PI188788

Bolded yields are not statistically different than the highest yielding variety.

Factor (Pf/Pi) that are less than 1.0 had no SCN increase during the growing season.

Michigan Soybean Checkoff. Effective. Efficient. Farmer-Driven.

This project had funds provided by the Soybean Promotion Committee

Effect of various cover crops on subsequent soybean crop

Martin Nagelkirk, Paul Gross & Jim Vincent, MSU Extension

Purpose:

The objectives of this trial were to: 1) observe the establishment and growth of various cover crops; 2) measure the effect of cover crops on SCN populations and 3) determine any effect of the cover crop on the performance of a subsequent crop of soybeans.

Procedure:

Following the 2012 wheat harvest, several cover crops (listed in the table below) were planted into both undisturbed stubble (no-till) and lightly tilled zones using a JD 750 drill. The plot design was a randomized complete block and individual plots measured 15 by 150 feet. There were four replications. In the fall (November), samples of the cover crops were taken to determine above ground biomass. The following spring, soybeans were no-tilled across all treatments. In July, soil samples were collected and mailed to the MSU Diagnostic Center for determination of Soybean Cyst nematode populations. The trial area was harvested with an International Harvester combine equipped with a Juniper weigh system for recording weight, grain moisture and test weight.

Results:

There were no differences between the no-till zone and the minimum tilled zone, so the data presented in Table 1 represents an average across all replications and tillage zones. All cover crops emerged successfully in both the no-till and tilled zones. By fall, all crops provided at least 80 percent ground cover. Oats provided the greatest biomass and annual ryegrass the least. Soybean Cyst Nematode populations ranged greatly within and between treatments. There were no statistically significant differences. The cover crop history did not significantly affect the grain yields, moistures or test weights of soybeans.

Summary:

Despite successful establishment of several individual and mixed cover crops, they did not add or detract from SCN populations or soybean performance.

Table 1: The effect of cover crops on soybean cyst nematode populations and the performance of a subsequent soybean crop (Sandusky, MI 2013)

Cover crop* (preceding soybeans)	Biomass Lbs DM/A Nov, 2012	Cysts	Eggs + juveniles	MS %	Yield Bu/A
control (no cover)	229	9	175	14.5	62.0
annual ryegrass	491	8	45	14.5	62.5
pea & radish	1062	6	523	14.5	60.4
oats & radish	1658	4	351	14.5	62.3
oats	2445	2	120	14.5	60.4
crimson clover	1344	2	113	14.7	59.1

**** planted July, 2012*** ***no statistically significant differences***

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This project had funds provided by the Soybean Promotion Committee

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Alfalfa Trial

TARE Thumb Ag Research & Education

Michigan State University Alfalfa Variety Trial Yields (DM tons/acre)

					2013	2012	2011	
Variety	June 3	July 9	Aug 13	Sept 16	Total	Total	Seeding Year	Grand Total
5312	1.96	1.38	1.33	0.89	5.55	5.27	3.31	14.13
Pioneer 54Q32	2.02	1.55	1.44	1.10	6.10	5.42	3.00	14.52
PLH-resistant check	1.62	1.45	1.34	0.75	5.15	4.34	3.12	12.61
Pioneer 55V12	1.80	1.38	1.27	0.90	5.35	4.73	3.02	13.11
Pioneer 55V50	2.03	1.55	1.40	0.95	5.94	5.22	3.20	14.35
AmeriStand 407TQ	1.99	1.64	1.46	1.03	6.12	5.12	3.28	14.52
DG 4210	1.95	1.57	1.42	1.04	5.98	4.97	3.47	14.42
Gunner	1.91	1.60	1.47	1.03	6.00	4.95	3.16	14.11
HybriForce-2400	2.08	1.60	1.49	1.01	6.17	5.32	3.53	**15.02**
Legendary 5.0	1.89	1.58	1.47	1.02	5.97	5.12	3.33	14.42
Prolific II	1.97	1.49	1.54	1.07	6.07	5.50	3.88	**15.45**
Rebound 6.0	1.90	1.59	1.43	1.08	5.99	4.97	3.53	14.48
Sonic	1.98	1.46	1.46	0.99	5.88	5.34	3.59	14.81
Vernal	1.88	1.34	1.37	0.92	5.51	4.97	3.63	14.10
WL 354HQ	1.96	1.52	1.44	1.06	5.97	5.06	3.16	14.18
WL363HQ	1.86	1.47	1.39	1.00	5.72	4.86	3.12	13.70
Mean	1.93	1.51	1.42	0.99	5.84	5.07	3.33	14.25
Max					6.17	5.50	3.88	15.45
Min					5.15	4.34	3.00	12.61
LSD 0.05	0.16	0.11	0.11	0.08	0.30	0.40	0.59	0.91
CV%	5.7	5.2	5.6	5.9	3.7	5.6	12.5	4.5

Location	Lynn Island Farm - Capac, Michigan - St Clair County
Design	Randomized Complete Block, 4 replications.
Plot Size	3x25 ft plot (3x22 ft harvested)
Seeded	May 7, 2011
Cuttings	Two in 2011 (seeding year). Four in 2012, Four in 2013.
Soil Type	Miami-Dighton sandy loam
Fertilizer	800 lbs/acre 0-14-42 plus Boron after cut 2 in 2012
	800 lbs/acre 0-14-42 plus Boron in 2013
MSUE cooperator	Phil Kaatz, Extension Educator - Forage Management & Field Crops

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Corn & Soybean Study
Yard Waste Compost

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County:	Lapeer
Cooperator:	Steve Listwak
Nearest town:	North Branch
Soil Type:	Boyer loamy sand
Tillage:	Conventional
Previous crop:	Corn
Fertilizer:	200 lbs. 37-0-10
Herbicide:	1 pt. Buctril 2.2 oz Capreno
Row width:	30 inch
Hybrid	
Planting date:	3-May-13
Harvest date:	25-Oct-13
Exp. Design:	RCBD

Purpose:

This study was started to see if compost generated from yard waste and applied in a corn/soybean rotation could be done economically. Compost has been used to increase soil quality in soils through increased organic matter, increased water holding capacity, providing an environment for diversity in soil life, increasing plant nutrient levels, and reduced fertilizer input levels. This project will be continuing for up to five years.

Corn Treatment	MS %	T.W.	Yield Bu/A
With compost	18.1	56.1	155.6
Without compost	18.2	55.9	149.4
		LSD @ 0.05 =	NS
		CV (%) =	2.09

Methods:

Yard wasted generated from the Metropolitan Detroit area was composted and the end product was spread in two separate fields (corn/soybean rotations) at a rate of approximately five tons per acre providing approximately 2.2 tons of dry matter compost per acre. The product was incorporated just after application and then planted to corn and soybeans. There were three replications of a control and the five ton compost treatment. Normal fertilizer and herbicide applications were applied at appropriate times. The middle of each plot was harvested using a JD 9500. Plots were weighed using a weigh wagon.

Results:

Initial results were encouraging and showed a trend of 4.0% increase in corn yields where compost was compared to the control wit no compost. Soybean yields showed a 3.3% increase in yield. Each of these was not a significant difference in the first year.

County:	Lapeer
Cooperator:	Steve Listwak
Nearest town:	North Branch
Soil Type:	McBride sandy loam
Tillage:	Conventional
Previous crop:	Corn
Fertilizer:	90 lbs. 0-0-60 5 lbs. 20-20-20 w/ Boron foliar
Herbicide:	1 pt. glyphosate (2X)
Row width:	30 inch
Variety:	DF 5242
Planting date:	27-May-13
Harvest date:	28-Oct-13
Exp. Design:	RCBD

Soybean Treatment	MS %	T.W.	Yield
With compost	14.9	56.8	52.7
Without compost	14.8	56.4	51.0
		LSD @ 0.05 =	NS
		CV (%) =	1.21

MICHIGAN STATE UNIVERSITY | Extension **Wheat Trial**

TARE Thumb Ag Research & Education

Effect of fungicides on the performance of winter wheat, 2013

Condensed report

Martin Nagelkirk, Michigan State University Extension

As in past years, a field trial was conducted to observe the efficacy of selected products. The variety used was Ambassador soft white winter wheat. The variety is known to be susceptible to Septoria leaf spot, Stagonospora leaf blotch and Fusarium head blight.

The products, along with application rates and timings are provided in table 1. Other than a trace of Septoria leafspot, leaf diseases were nearly nonexistent throughout April and May. However, following flowering, Septoria tritici aggressively spread to the number 2 leaf and flag leaf.

The use of individual fungicide products improved yields by 12 to 21 bushels per acre and decreased the severity of leaf spot on the flag leafs by 73 to 90 percent. There was a relatively strong correlation (R = 0.81) between leaf spot severity and grain yield.

Location:	JGDM McConnachie Farms Deckerville, MI
Collaborators:	Dupont & Bayer
Soil Type	Parkhill silt loam
Soil pH:	6.5
Previous crop:	soybeans
Variety:	Ambassador
Nitrogen rate:	125 lbs/ac
Plot design:	RCB
Replications:	four
Plot area:	20 x 75 ft
Treatment area:	17 x 75 ft
Harvest area:	16.5 x 70 ft
Planting date:	Oct 7, 2012
Seeding rate:	1.8 m/ac
Harvest date:	July 18, 2013
Herbicide:	none
Insecticide:	none

Table 1: Effect of fungicides on the performance of winter wheat, Sandusky, MI 2013

Products and rates per acre	Timing[1] T1	T2	T3	Yield [2] 13% M (bu/ac)	Harv [2] moist (%)	Test [2] weight (lbs)	Septoria [2,3] leaf spot %	Head [2, 4] scab index	D.O.N.[2] ppm
untreated control	-	-	-	87.8 a	13.9 ab	60.8 a	36.5 a	32 abc	3.7 c
Aproach, 6 oz.		x		100.5 bcd	14.8 bc	60.4 ab	9.8 b	41 a	4.4 ab
Aproach, 8 oz.		x		99.4 bc	15.5 cd	60.0 bc	8.4 bc	29 abc	4.9 a
Aproach Prima, 6.8 oz		x		101.9 de	15.5 cd	60.0 bc	6.0 d	38 ab	4.7 ab
Stratego YLD, 4 oz		x		103.9 e	13.8 a	60.0 bc	9.5 cd	33 abc	4.1 bc
Prosaro 421 SC, 6.5oz.			x	104.5 e	16.2 d	59.6 bc	6.0 d	9 c	1.7 de
Prosaro 421, 6,5 oz + Sonata ASO, 16.5 oz.			x	103.8 e	17.1 de	59.2 de	6.7 cd	8 c	1.9 de
Stratego YLD, 2 oz fb Prosaro 421 SC, 6.5 oz.	x		x	109.2 f	17.9 e	58.9 e	3.5 e	3 d	1.4 e
Prosaro 421, 6.5 oz. + Baythroid XL, 1 oz			x	103.2 de	16.4 de	59.5 cde	6.6 cd	4 d	2.3 d

[1] T1 application: May 9, Feekes g.s.(fully tillered); T2 application: May 25, Feekes g.s.9 (flag leaf); T3 application: June 18, Feekes g.s. 10.51 (early flower).

[2] Means with the same letter are not significantly different; P≥0.05.

[3] Severity of Septoria on the flag leaf expressed as percent of leaf area exhibiting disease.

[4] Index derived from multiplying incidence and severity of scab

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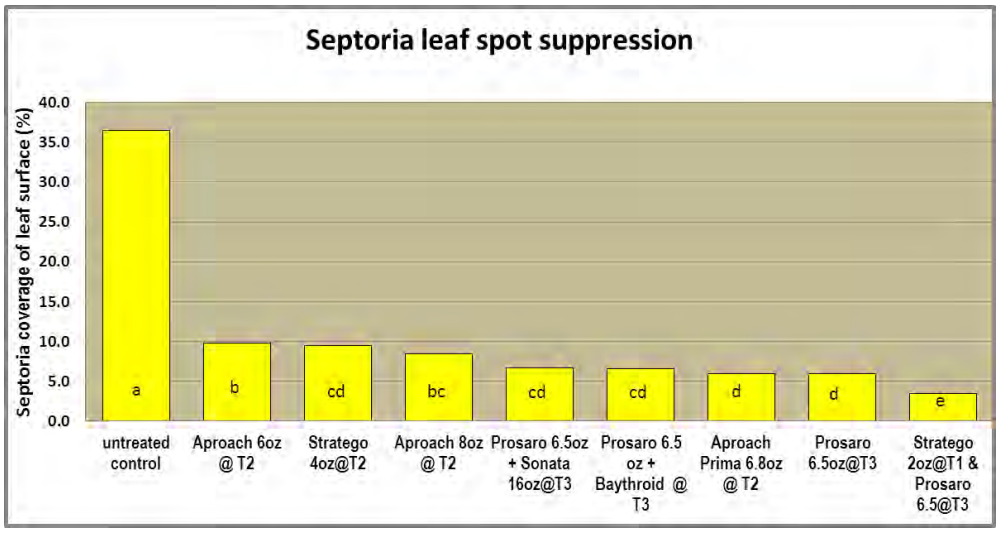
The products containing Aproach were applied at flag leaf emergence weeks before Septoria's aggressive spread to the flag leaf. Nevertheless, significant yield improvements were realized. Aproach Prima reduced Septoria levels significantly more than where Aproach was used alone. The Aproach treatments tended to elevate DON levels.

Figure 1: Septoria leaf spot on untreated wheat

Treatments that included Prosaro at early flowering reduced DON levels by nearly 50 percent. They also tended to increase harvest moisture levels and lower test weight. When compared to Prosaro used alone, the Prosaro tank-mixed with Sonata resulted in comparable grain yield and suppression of Septoria and DON, but lower test weight . There was no adverse effect on the performance of Prosaro when tank-mixed with the insecticide Baythroid XL. Stratego YLD (4 oz/ac) applied at flag leaf performed as well as Prosaro applied at flowering relative to Septoria suppression and grain yield . The double fungicide application consisting of only 2 oz. of Stratego at growth stage 6 followed by Prosaro at flowering resulted in the trial's greatest Septoria suppression and grain yield.



Acknowledgements: gratefully recognize the collaboration and support of Bayer CropScience, Dupont and JGDM McCononnachie Farms; and to Envirologix, Portland, ME and Michigan Agriculture Commodities, Marlette, MI for donating DON test kit and use of facilities and equipment

Fungicide trial, 2013.

MICHIGAN STATE UNIVERSITY | Extension

Wheat Trial
Courtesy of MCIA

TARE
Thumb Ag Research & Education

Response of wheat varieties to fungicides and fertilizer nitrogen, 2013

Condensed report

Martin Nagelkirk, MSU Extension

As in past years, we established field trials in collaboration with MCIA to measure the response of various varieties to fungicides and higher levels of fertilizer nitrogen (N). Unlike past years, the trial site was badly damaged by ice and water stress during early spring. Nevertheless, we did have enough good wheat to make some reasonable comparisons within varieties.

Trial Background

Location:	Stoutenburg Farms, Sandusky, MI
Soil type:	Parkhill loam
Tillage:	minimum
Previous crop:	dry beans
Plot area:	15 x 65 ft.
Harvest area:	15 x 60 ft.
Planting date:	Oct 6, 2011
Harvest date:	July 18, 2013
Herbicide:	Affinity Broadspec
Insecticide:	none

The varieties included the soft white variety, Jupiter, and five red varieties: Blazer, Red Devil, Red Dragon, Red Ruby and Sunburst. The fungicide treatments included an untreated control, Prosaro (6.5 oz/ac) at early flowering, and Twinline (6 oz/ac) followed by Prosaro. All applications included a nonionic surfactant. These fungicide treatments were used at two levels of fertilizer N : 90 and 140 lbs/ac. All N applications were made using UAN 28 % at tillering.

Table 1 provides the grain yields of the selected varieties. Under our modified trial design, one should keep in mind that supporting data between varieties is weak. This being said, Blazer, Red Dragon, Red Devil and Sunburst appeared to be most productive varieties in this trial. Lodging was prevalent in this trial as it was in many commercial fields. The severity of lodging (table 1) was affected by variety (Red Dragon and Blazer tended to lodge the most) and N rate, but not by fungicide use.

Only a trace of foliar diseases was evident during the majority of the season. However, following heading,

Table 1: Effect of fungicides and nitrogen rate on the grain yields and lodging of soft winter wheat varieties, 2013

Fungicide treatment *grain yield bu/ac*	Jupiter *2 comparisons*		Blazer *3 comparisons*		Red Dragon *2 comparisons*		Red Ruby *1 comparisons*		Red Devil *2 comparisons*		Sunburst *2 comparisons*		*average* *12 comparisons*	
	90 lbs N	140 lbs N	90 lbs N	140 lbs N	90 lbs N	140 lbs N	90 lbs N	140 lbs N	90 lbs N	140 lbs N	90 lbs N	140 lbs N	90 lbs N	140 lbs N
untreated control	91	93	114	113	120	122	90	97	110	109	113	119	106	109
Prosaro only	111	107	121	118	133	131	116	116	125	123	124	121	121	119
Twinline & Prosaro	119	115	127	126	130	132	119	127	138	122	123	130	126	126
ave. lodging %	*37*	*68*	*46*	*89*	*62*	*85*	*7*	*50*	*2*	*55*	*18*	*60*	29	68

Septoria leaf spot became very aggressive and spread upward to ultimately occupy a third of the flag leaf surface of some varieties by early dough stage. As in past years, the use of fungicides significantly improved wheat yields (table 1). Averaged across all varieties and N rates, the use of Prosaro improved yields by approximately 13 bushels. Where a Twinline treatment preceded the Prosaro application, yield improved on average by some 18 bushels.

What was particularly notable again this season, is the varying level of response to fungicides between varieties. Admittedly, the data set is limited, but the results tend to support past observations that varieties less susceptible to foliar diseases benefit markedly less to intensive fungicide use.

Figure 1 is an attempt to illustrate this point. The brown bar represents the amount of Septoria found on the flag leaves of untreated wheat, and is an indication of its level of genetic resistance. The green bar represents the yield advantage of suppressing diseases through the use of a fungicide program (in this case Twinline followed by Prosaro) versus yields from wheat that did not receive a fungicide treatment.

Prosaro also reduced the incidence of Fusarium head scab. Averaged across all varieties and both treatments having Prosaro, head scab incidence was reduced by 44 percent from the use of Prosaro at early flowering.

figure 1: Relationship between septoria severity and yield advantage from fungicide use, 2013

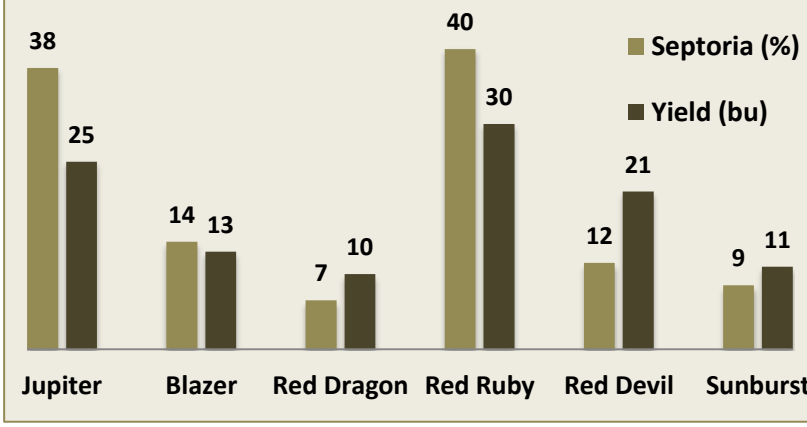


Table 2: Effect of fungicides on grain moisture and test weight of soft winter wheat varieties, 2013

Fungicide treatment	Jupiter *4 comparisons*		Blazer *6 comparisons*		Red Dragon *4 comparisons*		Red Ruby *2 comparisons*		Red Devil *4 comparisons*		Sunburst *4 comparisons*		*average* *24 comparisons*	
	harv. moist. %	test wt lbs	harv. moist. %	test wt lbs	harv. moist. %	test wt lbs	harv. moist. %	test wt lbs	harv. moist. %	test wt lbs	harv. moist. %	test wt lbs	harv. moist. %	test wt lbs
untreated control	12.4	61.8	13.2	61.7	13.5	61.4	12.6	61.7	15.9	59.9	15.7	60.2	14	61
Prosaro only	13.2	61.4	13.8	61.4	14.2	60.4	14.9	60.5	17.9	59.4	19.5	58.7	16	60
Twinline & Prosaro	14.5	60.7	14.0	61.3	14.6	60.7	17.7	59.0	21.1	57.7	19.7	58.4	17	60
average	*13*	*61*	*14*	*61*	*14*	*61*	*15*	*60*	*18*	*59*	*18*	*59*	*15*	*60*

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TARE Thumb Ag Research & Education

Palisade growth regulator use on wheat

On-farm wheat trials, 2012 & 2013

Rich D'Arcy, D'Arcy Farms, Kingston, MI
Dwight Bartle, Bartle Farms, Brown City, MI
Reported by Martin Nagelkirk, MSU Extension

Replicated, on-farm strip trials were conducted in both 2012 and 2013 to observe the effect of a growth regulator (*Palisade* by Syngenta) on the performance of soft winter wheat. Palisade 2EC (6 oz/ac) was used during 2012 and, in 2013, Palisade EC (12 oz/ac) was applied.

The product was applied at flag emergence in all cases. D'Arcy used Palisade with 15 gal/ac water and Bartle applied it with 25 gal of water. D'Arcy applied Palisade with a low rate of NIS in 2012 but not in 2013. Bartle used NIS in 2013 but not the first year. The plots were harvested using conventional combines, and grain weights were determined using commercial weigh wagons. The exception is the Bartle site in 2013 where MSU Extension harvested the trial with their plot combine equipped with a weigh system.

In both seasons, the plant height was reduced by approximately 1 inch. During 2012, neither site experienced plant lodging, nor was there significant differences in grain yield, test weight or grain moisture.

During 2013, severe lodging occurred at both sites. Despite the improvement in standability, the Palisade treated plots tended to yield slightly less than the non-treated plots at the D'Arcy site. At the Bartle site, grain moisture levels were higher where Palisade was used.

D'Arcy Farm, Kingston, MI
2012 / 2013

Collaborator:	Rich D'Arcy
Soil Texture:	silt loam
Previous crop:	dry beans
Variety:	Pioneer 25R62 / 25R56
Trtmt area / plot:	0.73 ac / 3 ac
Harv. Area / plot:	0.73 ac / 3 ac
Replications:	eight / four
Fertilizer N rate:	118 / 140 lb/ac
N source:	UAN 28%
Herbicide:	Osprey, Harmony
Fungicide:	Prosaro
Insecticide:	none

Bartle Farms, Brown City, MI
2012 / 2013

Collaborator:	Dwight Bartle
Soil texture:	silt loam
Previous crop:	soybeans
Variety:	Shirley / DynaGro 9042
Trtmt area / plot:	1.7 ac / 2 ac
Harv. area / plot:	1.03 ac / 0.15 ac
Replications:	four
Fertilizer N rate:	150 lbs/ac (estimate)
N source:	urea/AMS & manure
Herbicide:	none
Fungicide:	Headline, Caramba
Insecticide:	Tombstone

On-farm Palisade trial results, 2012 & 2013, Kingston & Brown City, MI

treatment		yield bu/ac	harvest moist %	test wt lbs	lodging %
2012 season					
D'Arcy:	nontreated	104	14.1	58.0	0
D'Arcy:	Palisade 2EC	104	14.0	58.0	0
Bartle:	nontreated	147	13.7	63.5	0
Bartle:	Palisade 2EC	144	13.5	63.0	0
2013 season					
D'Arcy:	nontreated	122	13.7	---	50
D'Arcy:	Palisade EC	120	13.9	---	1
Bartle:	nontreated	133	12.8	62.0	85
Bartle:	Palisade EC	132	14.2	61.3	25

Palisade treatment (right side)

MICHIGAN STATE UNIVERSITY | Extension **Wheat Trial**

TARE Thumb Ag Research & Education

The effect of Palisade EC plant growth regulator on the performance of soft winter wheat, 2013

Martin Nagelkirk, MSU Extension

A field trial was conducted to observe the effect of Palisade®EC plant growth regulator on the performance of soft winter wheat.

A randomized complete block design with four replications was superimposed on a commercial stand of Ambassador soft white winter wheat. The Palisade treatments (listed in table 1) included various product rates and application timings.

The results are provided in table 1. Wheat yields were unaffected by Palisade use despite the high level of lodging. Measurements associated with yield components were largely unaffected by the various Palisade treatments. Reduced levels of nitrogen did significantly decrease grain yield.

This season's trial reinforced the claim that Palisade can significantly reduce plant lodging. As in a 2012 study, plant lodging was correlated with plant height. Unlike the 2012 trial results, grain yields did not improve with a decreased level of plant lodging.

Trial information

Collaborator:	JGDM McConnachie Farms, Deckerville, MI
Soil Type:	Parkhill silt loam
Previous crop:	dry beans
Wheat variety:	Ambassador
Planting date:	October 7, 2011
Harvest date:	July 18, 2013
Plot design:	RCB
Replications:	four
Plot size:	20 x 75 ft
Treatment area:	178 x 75 ft
Harvest area:	16.5 x 70 ft
Fertilizer N rate:	95, 135,155 lbs
Fungicide:	Prosaro

Figure 1: note severe lodging in foreground where Palislade was not applied.

Table 1: Effect of Palisade on the performance of soft winter wheat
Deckerville, MI, 2013

Comparisons		Treatment (oz/ac & growth stage)	Grain yield bu/ac	Harv. Moist. %	Test weight lbs.	Plant height in.	Plant lodging %
nontreated:		control	**103** *ab*	19 *a*	58 *c*	36 *a*	48 *a*
split application:		5 oz at g.s. 6 & 8	101 *ab*	18 *abc*	59 *abc*	39 *ab*	29 *ab*
application timings:		12 oz at g.s. 7 *	105 *a*	18 *abc*	59 *abc*	33 *b*	8 *bc*
		12 oz. g.s. 8	102 *ab*	19 *ab*	59 *bc*	33 *bc*	18 *b*
application rates:		8 oz. at g.s.7	102 *ab*	18 *abc*	59 *abc*	34 *ab*	25 *ab*
		10 oz at g.s.7	106 *a*	18 *abc*	59 abc	34 *ab*	16 *b*
		12 oz at g.s. 7 *	105 *a*	18 *abc*	59 *abc*	33 *b*	8 *bc*
		14 oz. at g.s.7	103 *ab*	18 *abc*	59 *abc*	32 *b*	0
variable N rates (lb/ac)	*95*	nontreated	95 *c*	16 *c*	60 *a*	35 *ab*	0
	135	12 oz at g.s.7	99 *bc*	17 *bc*	59 *ab*	34 *ab*	1 *bc*
	155	12 oz at g.s.7*	105 *a*	18 *abc*	59 *abc*	33 *b*	8 *bc*

* same data source used for application timing and rate comparisons.
** data within the same column sharing the same letter, are not significantly different

For a full report of this trial, contact M.Nagelkirk nagelkir@msu.edu or 810-404-3400

2014 Custom Machine and Work Rate Estimates

FIRM Team Fact Sheet Number 13-06
Available at http://www.firm.msue.msu.edu
Author : Dennis Stein, District Farm Business Management Educator
Michigan State University Extension • November 2013

$3.60 per gallon of fuel

$3.96 per gallon lube & fuel cost

		max.	min.	Custom $/Acre [1]	Machine Cost $/Hour	Est. Fuel Gal. / Hour	Est. Fuel Cost per Hour
	MFWD - +260 hp.	$ 143.00	$ 143.00	$143.00	$111.17	9.95	$39.40
	MFWD - 200 hp.	$ 125.00	$ 55.47	$86.44	$77.13	7.04	$27.88
	MFWD - 130 hp.	$ 80.60	$ 42.60	$63.57	$51.25	5.72	$22.65
Est. Tractor Cost $0.27/hp/hr.	2- WD - 75 hp.	$ 56.88	$ 20.25	$36.13	$23.30	3.3	$13.07
Est. Fuel use .044 gal. diesel/PTO hp / hour	2- WD - 40 hp.			$25.00	$11.66	1.76	$6.97
Auto Steer systems charge per acre				$2.29			

TILLAGE OPERATIONS:	Custom $/Acre [1]	max.	min.	Total Machine Cost/ Ac [3]	Machine Rate per Hour [4]	Acres/Hr. [5]	Est. Fuel Gal./Acre [6]
Plowing: Moldboard (6 bottom)	**$18.69**	$ 21.34	$ 14.67	**$23.38**	$97.49	4.17	1.32
Chisel Plow (23 ft.)	**$16.65**	$ 20.50	$ 11.65	**$11.14**	$145.15	13.03	0.60
Chisel – front disk (16.3 ft.)	**$16.68**			**$13.87**	$127.74	9.21	0.97
Vertical tillage	**$19.25**	$ 22.45	$ 15.48				
Disk-V.Ripper combo (17.5 ft)	**$20.53**	$ 21.00	$ 19.50	**$21.60**	$194.83	9.02	1.47
Subsoiler 30" - 10ft (12-15")	**$18.98**	$ 21.67	$ 15.56				
Discing - tandem (21 ft)	**$14.42**	$ 20.40	$ 9.96	**$10.67**	$130.39	12.22	0.58
Field Cultivator (23 ft.) + incorp.	**$13.34**	$ 13.35	$ 12.69	**$11.75**	$194.93	16.59	0.38
Field Cultivator (23 ft.)	**$12.45**			**$6.46**	$107.17	16.59	0.32
Harrow	**$11.04**	$ 17.00	$ 7.43				
Soil Finisher	**$15.99**	$ 18.44	$ 13.85				
Strip tillage	**$18.71**						
Row Cultivate (12 rows)	**$12.84**	$ 14.50	$ 9.56	**$7.39**	$114.18	15.45	0.46
Row Cultivate-high residue (12rows)	**$15.58**						
Stalk Shredder (20 ft.)	**$14.38**	$ 16.88	$ 11.40	**$13.13**	$101.89	7.76	0.74
Rotary Hoe (21 ft.)	**$8.81**	$ 9.15	$ 8.14	**$2.62**	$68.02	25.96	0.18
Land Rolling	**$8.10**						
Highboy spraying	**$7.69**						
Boom Sprayer-self-Prop.80ft.	**$7.85**	$ 11.20	$ 5.56	**$6.58**	$290.31	44.12	0.14
Boom Sprayer-pull type 50ft.	**$6.69**			**$3.70**	$94.76	25.61	0.10
Spraying- road ditches/ hr	**62.83/hr**						

PLANTING:	Custom $/Acre [1]	max.	min.	Total Machine Cost/ Ac [3]	Machine Rate per Hour [4]	Acres/Hr. [5]	Est. Fuel Gal./Acre [6]
Planter- conventional (12row) w/fert 30" corn-soys	**$18.84**	$ 21.77	$ 14.29	**$11.92**	$166.88	14.00	0.32
Planter- soybean 15" rows	**$17.37**	$ 21.11	$ 14.62				
Planter- No Till w/fert (12 row)	**$20.33**	$ 22.56	$ 17.54				
Planter- Min Till (12 row)	**$19.78**	$ 21.60	$ 17.00	**$15.12**	$192.48	12.73	0.53
GPS mapping addition to planting	**$2.51**						
Variable rate seeding	**$2.51**						
Air Seeder Drill w/cart 52ft	**$18.14**			**$18.50**	$408.11	22.06	0.45
Drill Soybeans Conventional	**$17.43**	$ 19.90	$ 15.75				
Drill-AirSeeder with cart	**$19.58**						
Drill- No Till (15 ft.)	**$18.60**	$ 22.07	$ 16.01	**$24.29**	$154.48	6.36	0.81
Drill- No Till - drill only no tractor	**$12.25**						

PLANTING:	Custom $/Acre [1]	max.	min.	Total Machine Cost/ Ac [3]	Machine Rate per Hour [4]	Acres/Hr. [5]	Est. Fuel Gal./Acre[6]
Drill press wheels - (20 ft)	$16.26	$ 20.90	$ 12.46	$12.81	$108.63	8.48	0.61
Grain drill- only-no tractor	$10.17						
Seed Tender	$3.13						
Pest Control- scouting	$5.00						

SUGAR BEETS:	Custom $/Acre [1]	max.	min.	Total Machine Cost/ Ac [3]	Machine Rate per Hour [4]	Acres/Hr. [5]	Est. Fuel Gal./Acre[6]
Sugar Beets - Planting (12 row)	$28.25				$0.00	4.67	0.99
Sugar Beet Cultivation	$14.91				$0.00	5.60	0.81
Sugar Beet Topper (8 rows)	$15.63				$0.00	7.13	0.56
Sugar Beet Harvester (6 rows)	$97.38				$0.00	3.03	2.22
Sugar Beet Cart (20 ton)	$35.88				$0.00	5.20	1.80

HARVESTING:	Custom $/Acre [1]	max.	min.	Total Machine Cost/ Ac [3]	Machine Rate per Hour [4]	Acres/Hr. [5]	Est. Fuel Gal./Acre[6]
Combine - (Corn -8 row head)	$31.15	$ 32.90	$ 26.36	$43.53	$295.57	6.79	2.35
Combine - stalk chopper head	$33.18	$ 38.00	$ 26.41				
Combine Small grains (20 ft head)	$28.95	$ 32.10	$ 22.00	$0.00	$0.00	6.79	1.49
Combine Soybeans (25 ft. head)	$30.72			$0.00	$0.00	7.42	1.95
Combine Soybeans- air reel- flex	$38.21	$ 39.55	$ 35.00				
Combine, cart, haul to storage - Corn	$42.87	$ 46.15	$ 37.50				
Combine, cart, haul to storage - Soybeans	$36.99	$ 43.80	$ 29.45				
GPS mapping addition to harvesting	$2.51						
Picker 2 row- Ear Corn + 3 wagons	$28.24						
Combine Field Beans (belt pickup)	$33.75			$33.90	$226.79	6.69	1.81
Pulling Dry Beans (knife 6 row)	$9.50			$0.00	$0.00	8.73	0.66
Pulling Dry Beans (rod 6 row)	$8.50			$0.00	$0.00	8.73	0.66
Dry Bean – windrowing (6 row)	$9.50			$21.34	$186.30	8.73	0.66
Grain Cart- corn / acre	$6.30	$ 6.80	$ 5.50	$0.00	$0.00	6.87	1.44
Chopping Forage - Pull type (2 Row corn head) / ton	$6.12/ ton	$ 6.50	$ 5.45	$60.27	$83.17	1.38	3.35
Chopping Forage - Pull type Pickup head-10ft/hr.	$9.45/ ton			$25.00	$101.75	4.07	1.40
Chopping Forage-Self-propelled (6 row corn head)	$247/ hr.			$47.61	$65.70	1.38	2.35
Silo Filling-Tower silo: 1 Tractor, 1Chopper & Driver, Wagons	$9.53/ ton	$ 13.62	$ 7.90				
Bunker: Chopper and forage wagons or trucks & packer	$13/ ton						
Haylage	$9.50/ ton						
Silage Bagging per ft. (9 ft diameter)	$8.54/ ton	$ 10.15	$ 4.85				
Mowing	$15.14	$ 20.33	$ 11.45				
Raking – Hay 9ft.	$8.00	$ 13.85	$ 4.19	$6.04	$21.08	3.49	0.50
Tedding	$6.27						
Windrowing - hay or straw	$12.30	$ 12.50	$ 11.50				
Mower-Conditioner Pull-type (9 ft.)	$15.55	$ 19.35	$ 12.62	$13.50	$59.27	4.39	0.40
Mower-Conditioner- Self Propelled (16ft)	$16.13	$ 19.35	$ 13.00	$0.00	$0.00	7.76	0.64
Mower - Conditioner- Rotary (12ft)	$14.99	$ 15.75	$ 13.49	$9.28	$72.01	7.76	0.38
Small Square Baling Hay	$0.82 per bale	$ 0.97	$ 0.60	$13.95	$48.83	3.50	0.40
Straw	$0.75 per bale	$ 0.85	$ 0.55				
Mow, Rake, Baler & Handle - small square	$1.77 per bale	$ 2.00	$ 1.45				
Baler, Rake & Handle: Lrg Round	$20.50/bale						
Complete Hay harvesting per ton	$34.44						
Baling Round- 600-800 # per bale	$9.00 per bale	$ 10.00	$ 7.70				
Baling Round -1200 -1500 #	$11.23 per bale						
Baler 1000# Round/ with wrapper	$11.97 per bale	$ 12.36	$ 11.00	$9.18	$27.63	3.01	0.35
Mow-Rake-Bale-fld Haul- Lrg. Round/bale	$19.76 per bale	$ 20.05	$ 18.50				
Baling -1500 #- Lrg. Round - stalks/straw	$12.47 per bale	$ 14.00	$ 11.00				
Baling -1500 #- Lrg. Round stalks / straw - with wrap	$13.82 per bale	$ 15.45	$ 12.00	$13.00	$39.52	3.04	0.49
Baling – Lrg Sqr. Hay 4x3x6	$10.58 per bale	$ 12.17	$ 8.35	$12.96	$150.85	11.64	0.49
Baling – Lrg Sqr. Hay 4x3x8	$13.98 per bale	$ 14.02	$ 13.25				

FERTILIZER:	Custom $/Acre [1]	max.	min.	Total Machine Cost/ Ac [3]	Machine Rate per Hour [4]	Acres/Hr. [5]	Est. Fuel Gal./Acre [6]
Fertilizer Dry Bulk: Spreading	$6.99	$ 10.70	$ 4.95				
Lime application	$9.29	$ 12.90	$ 6.30				
Fertilizer- Liquid-Knifed In	$11.18	$ 12.30	$ 8.94				
Liquid-Sprayed:	$7.60	$ 11.30	$ 5.37				
Fertilizer- Anhydrous: 21 ft.	$12.10	$ 12.40	$ 10.99				
Manure Hauling-semi-solid - Load&Spread / hr.	87.59 per hr	$ 126.00	$ 54.20	$38.66	$77.32	2.00	2.31
Liquid Manure Haul - Injected Spreader- 1000 gal.	11.22 per 1000 gal.	$ 11.90	$ 10.00	$11.35	$5.68	0.50	2.86
Manure Pump, Hauling, Spreading - liquid (9500 gallon cap.) per hour	$92 / hour						
Manure Pump, Hauling, Injecting 1000 gal. - liquid (9500 gallon cap.)	$12.50 per 1000 gal.						
Bobcat/Skid Loader / hr.	$75.85 per hr.	$ 76.00	$ 72.00				
Ditch Mowing	$59.81 per hour						
Brush Hogging	$22.05	$ 28.60	$ 14.46				
Grain Drying- continuous flow / point / bu.	$0.04/pt./bu.	$ 0.05	$ 0.03				
Grain Drying- in bin dryer / point / bu.	$0.06/pt/bu.	$ 0.07	$ 0.04				
Grain Auger / bu.	$0.07 per bu.						
Grain Storage / mo.	$0.05/bu./mo.	$ 0.06	$ 0.03				
Grain Storage for season	$ 0.21 per bu.						
Grain Haul - per bu.- field to farmstead	$0.09/ up to 10 miles			.16/25mi			
Grain Haul - per bu.- farm to market - 25mi	$0.17/ up to 25 miles	$ 0.18	$ 0.16				
Power Washing per hr.	42.38						
Rock picking	$13.79						
Custom Farming- Corn	$115.44	$ 126.65	$ 95.00	(all machine operations for growing & harvest)			
Custom Farming- Soybeans	$97.18	$ 112.40	$ 80.00	(all machine operations for growing & harvest)			
Custom Farming- Small Grains	$85.00	$ 89.50	$ 76.67	(all machine operations for growing & harvest)			

Fuel cost is calculated by adding fuel, oil and lube calculated by adding 10% to the power fuel cost.

$3.60 Fuel Price : $3.960 ** base fuel & lube price used

1 Custom $ per acre: Represents the rate obtained from surveys of actual farm data surveys for 2009 & 2010 from Universities listed below to do this type of machine work for another farm on a general basis. Higher or lower rates apply in each situation depending on crop conditions, soil conditions, size of fields and there locations. This numbers includes machine, power unit & operator where needed. Values have been adjusted higher to reflect the change in power fuel costs noted above. Rate adjusted 2.5% above 2013 values.

3 Total Machine Cost/Acre: Includes tractor, fuel cost, lubricants, repairs, maintenance, labor and overhead costs including depreciation. This could be considered as an estimate of the ownership cost and operation of this machine on a per acre basis. No profit or return to management, which would be necessary for on going enterprises were included in this number. Values are based on "Farm Machinery Economic Cost Estimates for 2012, University of Minnesota**

4 Machine Rate per Hour: This number takes the Total Machine Cost per Acre and factors in the estimated Acres per Hour to give a value that represents an estimate of the hourly operational and ownership cost of machinery supported by ©University of Minnesota, Machinery Economic cost estimates for 2012. If the machine is run at full capacity (or engine clock hours) this per acre rate should be in the custom work value generated.

5 Acres/ Hour: This is an estimate of the acres this machine should average on a per hour basis with normal down time.

6 Gal./ Acre: This is an estimated machine use of fuel consumed to do this activity and is based on a factor of 0.044 gallons of diesel fuel. per PTO hoursepower-hour on an average. Your individual machines fuel use may vary from this number.

7 Labor cost : Charged for this table at a rate of $15.00 per hour for unskilled tasks and $20.00 per hour for skilled labor (planter, sprayer, harvester).

Costs were developed as an adjusted estimate of common rates being used by farms in this area to cover their cost of operation.

Major shifts in power fuel cost during the past few year has had an impact on and has changed the cost of machine operational cost.

As a thumb rule it is estimated that each $1.00 increase in fuel cost, will increase most machine operations by an additional 15%.

- **University of Minnesota: Machinery Economic cost estimates for 2013 © -- http://faculty.apec.umn.edu/wlazarus/documents/machdata.pdf**
- **Iowa State University: 2013 Iowa Farm Custom Rate Survey - Ag Decision Maker @ http://www.extension.iastate.edu/agdm/crops/html/a3-10.html**
- **Kansas State Univeristy: 2013 Projected Custom Rates for Kansas @ http://www.agmanager.info/farmmgt/machinery/Tools/KCD_CustomRates(Sep2013).pdf**
- **Texas A&M University: 2011 Texas Agricultural Custom Rates @ http://agecoext.tamu.edu/files/2013/08/2011TxCustomRates04-22-11.pdf**
- **NASS- USDA & Pennsylvania Department of Ag: 2013 Machinery Custom Rates- Adam Pike, April 2013 http://pss.uvm.edu/vtcrops/articles/PA_CustomRates_2013.**
- **University of Kentucky: Custom Machinery Rates March 2013 @ http://www2.ca.uky.edu/cmspubsclass/files/ghalich/CustomMachineryRatesKentucky2013.pdf**
- **Purdue Extension: 2013 Indiana Farm Custom Rates 06-13 @ http://www.extension.purdue.edu/extmedia/ec/ec-130-w.pdf**
- **University of Illinois: Machinery Cost Estimates© 5-2012, Univ. of Illinois @ http://farmdoc.illinois.edu/manage/machinery/summary%202012.pdf**
- **University of Nebraska Lincoln: 2012 Nebraska Farm Custom Rates May2012 @ http://ianrpubs.unl.edu/epublic/live/ec823/build/ec823.pdf**

*** This report is a summary of information extracted from various sources. Your actual cost may vary greatly from the numbers presented. It is recommended that you calculate your own cost and economic returns necessary for the operation of machinery and equipment on your individual farm.**

This document was compiled by: Dennis Stein, District Farm Business Management, Extension Educator, Michigan State University Extension. revised 11/2013

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HOW TO FIGURE YOUR MACHINE WORK RATES

If you are hiring or doing custom work, the following will help you determine the custom rate. Custom rates are based on tradition or usual rates set in the community, the bargaining positions of both parties (i.e., availability of machinery services and demand for machinery services in your local area) and cost of operating the machines on your farm.

Cost of ownership and operation can be determined as follows:

Ownership cost per unit (e.g., acre, bushel, ton, hour)using the DIRTI 5:

1. **D**epreciation: $\frac{\text{original cost - salvage value}}{\text{years of use}}$		$ _____
2. **I**nterest: interest rat x AIV[a]		$ _____
3. **R**epairs: estmated 2 to 5 % of original cost		$ _____
4. **T**axes: (0 in Michigan - i.e., no taxes on personal property used in agriculture)		$ _____
5. **I**nsurance: (estimated 0.5% x AIV for insurance premium)		$ _____
6. Total ownership cost per year (add lines 1 thru 5)		$ _____
A. Ownership cost per unit: total ownership cost ÷ estimated annual use (acre, hour, bushel, ton)	(A)	$ _____
Operating Cost per (acre, hour, bushel, ton)		
1. Tractor: fuel (gallon fuel per unit x price/gallon) x 1.15[b]		$ _____
2. Machine: gas or fuel gallons per unit x 1.15[b]		$ _____
3. Labor: hours per unit x wage rate (if labor wage unit is per acre, bushel or ton multiply this wage by acres bushels or tons per hour to determine wage/hour)		$ _____
B. Total operating cost per unit	(B)	$ _____
C. Total ownership and **operating cost** per unit	(A+B)	$ _____
D. Desired profit margin and / or risk premium	%	
E. Custom Rate (per acre, hour, bushel, ton) Line C x [1+(Line D/100)]		$ _____

a Average investment value (AIV) = (original cost basis - salvage value) ÷ 2.
b The addition of 15 percent above fuel cost is for oil & lube. maintenance.

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2013 Participating Seed Companies:

ASGROW / DEKALB
Monsanto Company
800 N. Lindbergh Blvd.
St. Louis, MO 63167
www.monsanto.com

BECK'S SUPERIOR HYBRIDS
Beck's Hybrids
6767 E 276th St.
Atlanta, IN 46031
www.beckshybrids.com

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St. Louis, MO 63167
www.channel.com

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Croplan Genetics
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St. Paul, MN 55164-5324
www.croplangenetics.com

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Dansville, MI 48819
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www.greatlakeshybrids.com

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www.hylandseeds.com

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Indianapolis, IN 46268
www.mycogen.com

NU TECH/G2 GENETICS
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Ames, IA 50010
www.nutechseed.com

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1795 W. Akron Rd.
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http://www.orbng.com

RUPP
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www.ruppseeds.com

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Stine Seed Co.
22555 Laredo Trl.
Adel, IA 50003
www.stineseed.com

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Zeeland Farm Services, Inc.
2525 84th Avenue
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www.zfsinc.com

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