

TARE

**Thumb Ag Research
& Education**

2015 Field Trials

**MICHIGAN STATE
UNIVERSITY**

Extension



TABLE OF CONTENTS

Introduction	1
Cooperating Farms and Plot Information.....	2
Summary of Precipitation and Growing Degree Days.....	3
CORN	
Corn Study Introduction	4
Corn Hybrid Trial Results – 100 to 105 RM	5-6
Corn Hybrid Trial Results – 95 to 99 RM	7-8
Corn Hybrid Trial Results – 85 to 94 RM	9-10
Corn Seed Treatment Study: Traits and Seed Treatments.....	11
SOYBEAN	
Soybean Study Introduction	12
Soybean Variety Trial Results – 2.3 RM or more.....	13-14
Soybean Variety Trial Results – 2.0 – 2.2 RM	15-16
Soybean Variety Trial Results – 1.9 RM or less	17-18
Soybean Variety Trial Results - Liberty Link	19
Soybean Variety Trial Results – Conventional.....	20
Soybean Population Trial – 30 Inch Rows	21
Soybean White Mold Study – Endura Fungicide	22
Soybean SCN Resistance Variety Study	23-24
CORN / SOYBEAN COMPOST STUDY	
Yard Waste in Corn/Soybean Rotation.....	25-26
MICHIGAN ALFALFA SULFUR SURVEY	27
CONSERVATION DISTRICT PHOSPHORUS REDUCTION	
Wheat Phosphorus Reduction Study.....	28
WHEAT	
Effect of fungicide application timing on head blight	29
Fungicide efficacy on soft winter wheat	30
Response of wheat varieties to intensive management inputs.....	31
2014 Custom Machine and Work Rate Estimates.....	32-35
2015 Participating Seed Companies	36
Sponsors and Funding Partners.....	Back Cover



Introduction

2015 TARE Plot Report

This report represents the eleventh year of a multi-county strategy for evaluating corn hybrids and soybean varieties as well as agronomic practices in Michigan's Thumb. 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.

Studies are analyzed 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**, or has a similar letter following the result 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. 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 helpful as you make decisions for your farm business. We are most interested in conducting studies that area growers will find valuable, within the constraints of our line of equipment and supplies. If there is anything that you would like us to include in a future year, feel free to send an e-mail message to Bob Battel at battelro@anr.msu.edu. It is you, the grower that we aim to provide with practical and useful information.

2015 Greater Thumb Area Field Crops Team

Bob Battel, Extension Educator, Corn and Soybeans

Phil Kaatz, Extension Educator, Forages & Field Crops

Martin Nagelkirk, Extension Educator, Wheat

Jim Vincent, Lead Technician

Chad Alexander, Assistant Technician



Corn Plots						
City	Filion	Fairgrove	Pigeon	Kingston	Sandusky	Capac
Location	N/E Iseler & Redman	N/W Merry & Gilford	S/E Caseville & Stein	N/E Richards & M53	S/E Banner & Eddy	S/E Martin & Speaker
Grower	Don Koth	Rob Foster	Corey Oeschger	Rich D'Arcy	Mark Stone	Don Koning
Previous crop	Sugar Beets	Soybeans	Sugar Beets	Soybeans	Soybeans	Soybeans
Fall Tillage	Disc Ripper	None	Chisel plow	Chisel Plow	Chisel plow	None
Spring tillage	VT Disc	Strip till	Field cultivator	Field cultivator	Disc	Field cultivator
Spring tillage	Field Cultivator	x	x	x	Field Cultivator	Field Cultivator
Spring tillage	x	x	x	x	x	x
Plot length (feet)	90	90	90	90	90	90
Plot population	34,000	34,000	34,000	34,000	34,000	34,000
Planting date	5/3/2015	5/3/2015	5/5/2015	5/7/2015	5/6/2015	5/14/2015
Soil pH	7.3	7.1	6.9	6.4	5.8	6.2
Harvest date	10/22/2015	10/20/2015	10/21/2015	10/30/2015	11/9/2015	10/26/2015

Soybean Plots				
City	Capac	Pigeon	Fairgrove	Sandusky
Location	S/E Dudley & Cade	N/E Gagetown & Richardson	N/E Gilford & N Kirk	S/E Applegate & Hull
Grower	Steve Kalbfleisch	Randy Sturm	Greg Wagner	Ben Hulett
Previous crop	Corn	Dry Beans	Corn	Soybeans
Fall Tillage	Chisel plow	Chisel plow	Chisel plow	none
Spring tillage	Field cultivator	Field cultivator	VT Disc	Disc
Spring tillage	Field cultivator	Field cultivator	VT Disc	Field cultivator
Spring tillage	x	Roller after planter	Roller after planter	x
Plot length (feet)	75	75	75	75
Plot population	130,000	130,000	130,000	130,000
Planting date	5/16/2015	5/19/2015	5/18/2015	5/21/2015
Soil pH	6.9	7.3	7.5	6.2
Harvest date	10/10/2015	10/16/2015	10/19/2015	10/12/2015



Pigeon/Bad Axe

	Precipitation				GDD			
	2015	2014	2013	Normal	2015	2014	2013	Normal
May	2.51	3.16	5.31	2.92	367	303	357	291
June	3.12	2.72	1.67	2.91	414	525	462	467
July	3.76	4.09	3.54	3.04	582	546	601	601
August	4.99	3.97	1.94	3.68	571	396	519	551
September	3.79	3.24	1.63	3.82	519	348	347	360
Total	18.17	17.18	14.09	16.37	2,453	2,118	2,286	2,270
	11%	5%	-14%		8%	-7%	1%	

Sandusky

	Precipitation				GDD			
	2015	2014	2013	Normal	2015	2014	2013	Normal
May	2.45	3.61	3.44	2.57	396	282	365	317
June	2.65	2.40	4.91	2.81	472	519	479	486
July	1.87	4.06	3.66	2.71	558	525	616	622
August	4.38	3.55	2.24	2.86	644	353	541	575
September	2.72	3.96	0.87	4.1	535	310	378	377
Total	14.07	17.58	15.12	15.05	2,605	1,989	2,379	2,377
	-7%	17%	0%		10%	-16%	0%	

Fairgrove/Caro

	Precipitation				GDD			
	2015	2014	2013	Normal	2015	2014	2013	Normal
May	2.74	3.15	2.99	2.86	393	340	402	353
June	4.1	2.87	1.16	3.3	461	553	503	519
July	2.69	4.26	2.07	2.75	596	524	609	644
August	7.65	4.54	1.39	3.26	566	549	549	594
September	3.97	2.89	1.22	4.22	487	371	403	402
Total	21.15	17.71	8.83	16.39	2,503	2,337	2,465	2,512
	29%	8%	-46%		0%	-7%	-2%	

Emmett

	Precipitation				GDD			
	2015	2014	2013	Normal	2015	2014	2013	Normal
May	7.34	2.44	1.48	3.22	418	345	380	294
June	6.3	1.79	2.97	3.73	502	538	480	519
July	3.37	3.30	2.85	2.61	632	541	633	663
August	3.21	5.06	2.99	2.74	603	576	557	604
September	2.51	2.64	1.48	2.56	542	386	387	380
Total	22.73	15.23	11.77	14.85	2,697	2,386	2,437	2,460
	53%	3%	-21%		10%	-3%	-1%	

Richville

	Precipitation				GDD			
	2015	2014	2013	Normal	2015	2014	2013	Normal
May	3.37	3.06	3.43	2.35	383	327	409	342
June	3.16	2.74	1.73	2.89	492	553	502	525
July	1.94	4.17	2.03	2.62	585	506	617	633
August	2.33	3.90	1.85	2.7	558	546	537	591
September	2.74	3.03	0.58	2.66	490	356	383	416
Total	13.54	16.9	9.62	13.22	2,508	2,288	2,449	2,507
	2%	28%	-27%		0%	-9%	-2%	

**MSU Enviro-weather
Summary of Precipitation and
Growing Degree Days 2014**
<http://enviroweather.msu.edu>

¹GDD 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.

Percent change based on normal for each location.



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 field tile.

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 recorded about a month after planting. See the following table for stand counts and soil test information at each of the sites.

Plots are established in a randomized complete block design (RCB) with four replications. Hybrid comparisons included 85-94 RM hybrids, 95-99 RM hybrids, and 100-105 RM hybrids. The 100-105 RM hybrids are not planted at the Filion site because of the cooler temperature regime at that site.

Planting commenced on May 2, and five of the six plots went in without delay. A rain storm on May 8 delayed planting of the sixth plot until May 15.

Harvest began on October 20, and five of the plots were harvested by October 30. The final plot was delayed in harvest due to scheduling conflicts with the cooperating growers. Harvest of that plot was completed on November 9.

Cooperator - Site	Average Plants/Acre	Soil Test Results					
		PPM					
		pH	P	K	Mg	Ca	CEC
Koning - Capac	32,747	6.2	97	316	325	2158	15.5
Stone - Sandusky	33,739	5.8	70	231	194	1062	9.9
Foster - Fairgrove	32,972	7.1	68	212	381	2179	14.6
Koth - Filion	32,976	7.3	52	151	274	1541	10.4
Oeschger - Pigeon	28,975	6.9	52	135	317	2063	13.3
D'Arcy - Kingston	32,307	6.4	46	146	194	1115	7.6

USDA Corn Yield Projections predict
a record crop for Michigan

Previous record—2014 - 161 Bu/A

New record—2015 - 167 Bu/A



Company Hybrid	RM	Trait	Seed Trt.	Ave. MS %	Ave. TW	Ave. Yield	Ave. Value	
Channel 200-48STRIB	100	STX	A500 Poncho/Votivo	25.9	57.1	188.0	\$529.26	
Channel 202-52STXRIB	102	STX	A500 Poncho/Votivo	26.3	56.9	196.0	\$549.00	
Dairyland Seed DS-9903RA	103	SSX/RA	Poncho 250	25.9	57.1	196.1	\$552.75	
Dairyland Seed HIDF 3702-9	102	3000GT		25.3	57.4	190.9	\$543.29	
Dyna-Gro D40SS27	100	Smart Stax	P500 Votivo	25.2	57.3	188.9	\$537.68	
Dyna-Gro D40SS48	100	Smart Stax	P500 Votivo	25.5	57.2	189.3	\$536.59	
Dyna-Gro D43VC50	103	VT Double Pro	P500 Votivo	26.8	56.6	193.8	\$536.75	
Golden Harvest G01P52-3011	101	GT,CB,RW	Avicta Complete 250	25.8	57.2	190.7	\$538.55	
Great Lakes 5134STXRIB	101	Smart Stax	Poncho 500/Votivo	24.7	57.8	189.2	\$543.06	
Great Lakes 5283STXRIB	102	Smart Stax	Poncho 500/Votivo	25.7	57.2	201.4	\$569.70	
Great Lakes 5470STXRIB	104	Smart Stax	Poncho 500/Votivo	25.8	57.2	192.3	\$542.93	
Legacy Seeds L4424	100	GenssRIB	Poncho Votivo 500	24.9	57.6	196.1	\$561.01	
Mycogen Seeds 2V489	100	SmartStax	Cruiser/vibrance/intego/myconate	24.5	57.9	188.3	\$543.36	
Mycogen Seeds X13526VH	102	SmartStax	Cruiser/vibrance/intego/myconate	25.7	57.2	190.4	\$538.07	
NK Brand N45P-3011A	101	GT/CB/LL/RW	Avicta Complete 250	24.9	57.7	195.7	\$560.62	
NuTech Seed 5F-002	102	Mon810/TC1507/NK603	P500 Votivo	26.6	56.7	196.2	\$547.02	
NuTech Seed 5F-701	101	Mon810/TC1507/NK603	P500 Votivo	25.8	57.2	195.3	\$552.69	
NuTech Seed 5H-502	102	Hx1/NK603	P500 Votivo	26.9	56.6	192.2	\$534.60	
NuTech Seed 5Z-504	104	Mon810/TC1507/NK603	P500 Votivo	26.5	56.8	200.8	\$561.19	
Rupp Seeds xrD03-71	103	VT2Pro DroughtGard	Poncho500/Votivo	26.3	56.9	190.4	\$533.91	
Rupp Seeds xrD05-04	105	VT2Pro	Acceleron 250	25.8	57.2	194.5	\$548.36	
Rupp Seeds xrJ03-31	103	Smart Stax	Poncho500/Votivo	25.9	57.1	194.2	\$549.00	
Steyer Seeds 10102	101	VT2 Pro	Cruiser 250	24.0	58.2	191.6	\$556.72	
Steyer Seeds 10503	105	VT2 Pro	Cruiser 250	24.8	57.8	196.3	\$562.40	
Stine R9424	101	SS	Acceleron 250	24.0	58.2	191.2	\$555.86	
Yields adjusted to 15.0% moisture				Ave	25.6	57.3	193.2	\$547.37
				High	26.9	58.2	201.4	\$569.70
				Low	24.0	56.6	188.0	\$529.26
Bolded yields are not significantly different from highest yielding hybrid.				CV(%)			9.6	
				LSD(0.05)			9.6	

Averages based on Capac, Fairgrove, Kingston, Pigeon, and Sandusky plots.

Value = gross value/acre based on \$3.30/Bu with drying charges deducted for moisture over 15.0 %. Average value from Capac, Fairgrove, Kingston, Pigeon, and Sandusky plots.

Yield by Location Bu/A

Company Hybrid	RM	Capac	Fairgrove	Kingston	Pigeon	Sandusky
Channel 200-48STRIB	100	183.3	188.6	209.4	166.2	197.2
Channel 202-52STXRIB	102	183.9	202.2	215.0	188.7	195.6
Dairyland Seed DS-9903RA	103	173.8	207.8	223.3	178.4	202.3
Dairyland Seed HIDF 3702-9	102	182.1	191.3	207.7	175.3	203.2
Dyna-Gro D40SS27	100	175.7	191.8	211.1	180.9	190.4
Dyna-Gro D40SS48	100	185.8	190.1	214.7	165.9	194.9
Dyna-Gro D43VC50	103	183.5	202.4	215.0	169.0	204.0
Golden Harvest G01P52-3011	101	179.4	196.3	203.6	179.5	200.0
Great Lakes 5134STXRIB	101	170.7	186.9	215.0	187.4	191.5
Great Lakes 5283STXRIB	102	177.7	222.4	223.0	187.0	202.5
Great Lakes 5470STXRIB	104	182.1	183.5	217.0	178.4	205.8
Legacy Seeds L4424	100	186.8	206.9	214.8	178.3	198.9
Mycogen Seeds 2V489	100	173.0	203.2	200.5	166.9	202.7
Mycogen Seeds X13526VH	102	185.3	192.9	212.7	169.1	197.1
NK Brand N45P-3011A	101	178.9	212.1	212.9	180.0	199.6
NuTech Seed 5F-002	102	170.5	208.3	212.2	192.5	203.0
NuTech Seed 5F-701	101	184.5	207.2	209.0	172.8	208.0
NuTech Seed 5H-502	102	183.9	189.2	217.8	173.2	202.1
NuTech Seed 5Z-504	104	192.5	214.5	225.3	178.5	198.4
Rupp Seeds xrD03-71	103	185.8	183.4	208.6	182.2	197.5
Rupp Seeds xrD05-04	105	186.9	194.7	208.6	184.8	203.0
Rupp Seeds xrJ03-31	103	181.0	193.9	219.2	181.0	201.3
Steyer Seeds 10102	101	181.5	200.3	212.1	172.3	196.9
Steyer Seeds 10503	105	185.2	210.3	212.0	182.7	196.6
Stine R9424	101	166.0	194.4	218.3	180.2	202.5
Ave		180.8	199.0	213.5	178.0	199.8
High		192.5	222.4	225.3	192.5	208.0
Low		166.0	183.4	200.5	165.9	190.4
CV (%)		6.1	4.3	5.4	6.0	4.4
LSD (0.05)		12.9	10.1	13.6	12.6	10.3

Yields adjusted to 15.0 % moisture.

Bolded Yields are not statistically different than highest yielding hybrid in column.

Company Hybrid	RM	Trait	Seed Trt	Ave. MS %	Ave. TW	Ave. Yield	Ave. Value
Channel 197-68STXRIB	97	STX	A500 PONCHO/VOTIVO	24.0	58.2	192.8	\$555.70
Croplan 3611VT2P/RIB	96	GENSS	Acceleron 250	23.2	58.8	186.9	\$545.52
Croplan 3899VT2P/RIB	96	VT2P	Acceleron 250	24.2	58.1	192.5	\$554.84
Dairyland Seed HIDF 3099-6	99	RR2	Poncho 250	25.2	57.6	191.4	\$541.57
Dyna-Gro D35VP40	95	VT triple Pro	P500 Votivo	23.5	58.4	192.8	\$559.51
Dyna-Gro D37SS60	97	Smart Stax	P500 Votivo	24.1	58.1	189.9	\$547.42
Dyna-Gro D39VC69	99	VT Double Pro	P500 Votivo	24.0	58.2	184.8	\$534.20
Golden Harvest G97X48-3111	97	GT,CB,RW,WBC	Avicta Complete 250	24.6	57.8	189.2	\$540.32
Great Lakes 4548STXRIB	95	Smart Stax	Poncho500/Votivo	24.1	58.2	188.4	\$543.26
Great Lakes 4879STXRIB	98	Smart Stax	Poncho500/Votivo	24.4	58.0	189.5	\$543.94
Legacy Seeds L3423	95	GenSSRIB	Poncho-Votivo 500	23.9	58.3	186.6	\$540.58
Legacy Seeds L3845	97	GenSSRIB	Poncho-Votivo 500	24.3	58.1	188.2	\$539.99
NK Brand N35T-3110	95	GT,CB,WBC	Avicta Complete 250	23.0	58.5	190.5	\$558.96
NuTech Seed 5F-196	96	Mon810/TC1507/NK603	P500 Votivo	24.5	58.0	190.5	\$545.58
NuTech Seed 5F-198	98	Mon810/TC1507/NK603	P500 Votivo	23.5	58.5	191.1	\$555.81
Rupp Seeds xrD97-56	97	VT2Pro	Acceleron 250	23.4	58.5	186.5	\$543.51
Rupp Seeds xrD99-30	99	VT2Pro		24.3	58.1	184.3	\$528.32
Steyer Seeds 9603	96	VT2 Pro	Cruiser 250	23.4	58.7	187.5	\$546.34
Yields adjusted to 15.0% moisture			Ave	24.0	58.2	189.1	\$545.85
			High	25.2	58.8	192.8	\$559.51
Bolded yields are not significantly different from highest yielding hybrid.			Low	23.0	57.6	184.3	\$528.32
			CV (%)			8.7	
			LSD (0.05)			7.1	

Value = gross value/acre based on \$3.30/Bu with drying charges deducted for moisture over 15.0 %. Average value from Capac, Filion, Kingston, Pigeon, and Sandusky plots.

Company Hybrid	Yield by Location Bu/A					
	RM	Capac	Filion	Kingston	Pigeon	Sandusky
Channel 197-68STXRIB	97	172.2	202.0	206.6	185.1	197.9
Croplan 3611VT2P/RIB	96	171.9	187.6	202.6	181.5	190.8
Croplan 3899VT2P/RIB	96	184.8	191.8	209.7	179.3	197.1
Dairyland Seed HIDF 3099-6	99	181.2	196.4	200.2	173.6	205.5
Dyna-Gro D35VP40	95	171.2	192.5	215.1	181.4	203.9
Dyna-Gro D37SS60	97	178.4	197.6	215.6	165.3	192.9
Dyna-Gro D39VC69	99	179.3	187.5	190.4	176.5	190.3
Golden Harvest G97X48-3111	97	189.8	189.6	204.0	164.3	198.1
Great Lakes 4548STXRIB	95	185.6	188.8	210.1	170.6	187.1
Great Lakes 4879STXRIB	98	183.7	191.9	198.4	173.6	199.9
Legacy Seeds L3423	95	170.2	182.6	199.9	176.2	203.8
Legacy Seeds L3845	97	176.3	200.0	190.6	177.5	196.5
NK Brand N35T-3110	95	176.0	191.4	206.6	178.3	200.2
NuTech Seed 5F-196	96	181.9	199.0	200.8	174.0	196.8
NuTech Seed 5F-198	98	176.2	191.9	210.9	181.8	194.7
Rupp Seeds xrD97-56	97	172.8	194.1	200.2	174.3	191.3
Rupp Seeds xrD99-30	99	175.9	195.6	191.4	173.3	185.4
Steyer Seeds 9603	96	175.7	192.7	211.1	163.7	194.1
Ave		177.9	192.9	203.5	175.0	195.9
High		189.8	202.0	215.6	185.1	205.5
Low		170.2	182.6	190.4	163.7	185.4
CV (%)		6.4	5.4	7.5	6.0	7.0
LSD (0.05)		13.4	12.2	18.2	12.3	16.2

Yields adjusted to 15.0 % moisture

Bolded yields are not significantly different from highest yielding hybrid.



Company Hybrid	RM	Traits	Seed Trt	Ave. MS %	Ave. TW	Ave. Yield	Ave. Value
Channel 192-09VT3PRIB	92	VT3P	A500 PONCHO/ VOTIVO	22.1	59.2	188.7	\$559.93
Croplan 3499VT3/RIB	94	VT3	Acceleron 250	22.4	59.0	187.9	\$555.95
Dairyland Seed DS-9791RA	92	SSX/RA	Poncho 250	22.0	59.3	187.3	\$555.29
Dyna-Gro D31SS31	91	Smart Stax	P500 Votivo	21.6	59.6	182.6	\$546.09
Dyna-Gro D32SS32	92	Smart Stax	P500 Votivo	21.0	59.9	182.3	\$549.76
Golden Harvest G94B95-3110	94	GT,CB,WBC	Avicta Complete 250	22.1	59.3	181.8	\$539.64
Great Lakes 3847VT2RIB	88	VT2	Poncho500/Votivo	21.4	59.7	182.3	\$548.03
Great Lakes 4250VT2RIB	92	VT2	Poncho500/Votivo	21.4	59.6	184.8	\$552.68
Great Lakes 4452STX	94	Smart Stax	Poncho500/Votivo	22.0	59.3	183.4	\$546.00
Legacy Seeds L3022	92	GenssRIB	Poncho-Votivo 500	22.4	59.1	187.4	\$554.01
Mycogen Seeds 2V357	93	SmartStax	Cruiser 500/vibrance/ intego/myconate	22.3	59.0	186.2	\$551.45
NK Brand N27P-3110A	90	GT,CB,WBC	Avicta Complete 250	22.0	59.3	183.1	\$544.98
NuTech Seed 5D-091	91	Mon810/TC1507/ DAS59122/NK603	P500 Votivo	21.8	59.4	184.9	\$551.79
NuTech Seed 5X-894	94	TC1507/DAS59122-7/ NK603	P500 Votivo	21.6	59.5	183.4	\$549.10
Rupp Seeds xrD90-64	90	VIP 3220	Cruiser 250	22.0	59.3	183.6	\$545.32
Rupp Seeds xrD92-74	92	VT2Pro	Acceleron 250	21.9	59.3	187.7	\$558.47
Rupp Seeds xrT94-06	94	VT3Pro	Acceleron 250	22.2	59.2	187.2	\$555.69
Stine 9207	90	GTCBLL	Cruiser 250	21.5	59.5	186.9	\$561.25
Stine R9208	91	VT2Pro	Acceleron 250	21.3	59.7	184.7	\$555.56
Yield adjusted to 15.0% moisture			Average	21.8	59.4	185.1	\$551.63
			High	22.4	59.9	188.7	\$561.25
			Low	21.0	59.0	181.8	\$539.64
Bolded yields are not significantly different from highest yielding hybrid.			CV (%)			7.8	
			LSD (0.05)			6.5	

Value = gross value/acre based on \$3.30/Bu with drying charges deducted for moisture over 15.0 %. Average value based on Capac, Fairgrove, Filion, Kingston, Pigeon, and Sandusky plots.

Yield by Location Bu/A

Company Hybrid	RM	Capac	Fairgrove	Filion	Kingston	Pigeon	Sandusky
Channel 192-09VT3PRIB	92	191.3	179.5	191.8	203.6	164.9	200.9
Croplan 9934VT3/RIB	94	176.9	200.0	190.7	202.5	160.7	196.5
Dairyland Seed DS-9791RA	92	173.8	202.6	195.5	194.1	168.5	189.1
Dyna-Gro D31SS31	91	171.6	180.5	185.4	199.4	166.9	191.5
Dyna-Gro D32SS32	92	178.7	192.4	182.5	194.6	158.0	187.7
Golden Harvest G94B95-3110	94	170.2	183.7	184.5	205.3	161.3	186.0
Great Lakes 3847VT2RIB	88	168.7	194.9	182.7	197.9	168.6	181.0
Great Lakes 4250VT2RIB	92	173.6	182.3	193.2	200.5	174.9	184.2
Great Lakes 4452STX	94	173.5	192.5	181.4	199.8	169.9	183.2
Legacy Seeds L3022	92	171.2	191.8	189.6	201.6	175.4	195.0
Mycogen Seeds 2V357	93	174.0	189.8	193.4	202.3	163.7	194.1
NK Brand N27P-3110A	90	174.0	187.2	185.4	199.3	161.7	191.0
NuTech Seed 5D-091	91	180.1	186.0	185.5	200.6	167.8	189.7
NuTech Seed 5X-894	94	172.5	187.9	186.2	199.9	164.6	189.0
Rupp Seeds xrD90-64	90	169.3	189.8	189.7	201.3	158.5	193.2
Rupp Seeds xrD92-74	92	177.6	206.9	191.5	197.2	162.7	190.1
Rupp Seeds xrT94-06	94	178.0	190.5	195.0	204.3	162.5	193.1
Stine 9207	90	176.6	202.3	186.4	204.6	159.7	191.8
Stine R9208	91	175.8	194.7	188.1	195.3	161.0	193.1
Ave		175.1	191.3	188.3	200.2	164.8	190.5
High		191.3	206.9	195.5	205.3	175.4	200.9
Low		168.7	179.5	181.4	194.1	158.0	181.0
CV (%)		4.7	3.8	3.8	4.0	4.0	4.7
LSD (0.05)		9.8	8.5	8.5	9.4	7.9	10.6

Yields adjusted to 15% moisture

Bolded yields are not statistically different than highest yielding hybrid



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 field tile.

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 130,000 seeds per acre at four sites. Stand counts were taken in June, and it was determined that plant stands were 124,560, or 95.8% of target population. Plots are established in a randomized complete block design (RCB). The Capac, Pigeon, and Sandusky sites were replicated four times, and the Fairgrove site was replicated three times.

Studies include conventional varieties (Sandusky site only), Liberty Link (Sandusky site only), Group 1.9RR and less, Group 2.0-2.2RR, and Group 2.3RR and more.

Planting began on May 16, and three of the four plots were planted in quick succession. The fourth plot was delayed by rain. It was planted on May 21.

The Pigeon site was severely infected with white mold. As a result, none of the variety trials from that site are reported in this booklet. There was an Endura fungicide plot planted at that site, and the results are reported on page 22.

Varieties were scored for white mold severity on a 0-3 scale, where 0 = no infection, 1 = infection only on branches, 2 = infection on the main stem but pod fill was normal, and 3 = infection on the main stem resulting in plant death and poor pod fill. Three plants were inspected in 20 random spots in the center of each plot. The 20 scores were totaled, and divided by 60 (the total if all 20 scores were given a rating of 3) and multiplied by 100 to give a disease severity index (DSI). A DSI of 100 would be given to a plot where all evaluated plants had a rating of 3. A DSI of 0 would be given to a plot where all evaluated plants had a rating of 0.

Soy Plot Cooperator

Soil Test - PPM

	pH	P	K	Mg	Ca	CEC
Pigeon - Randy Sturm	7.3	85	232	287	1805	12.0
Capac - Steve Kalbfleisch	6.9	100	202	228	1624	10.5
Fairgrove - Steve Wagner	7.5	49	155	315	2218	14.1
Sandusky - Ben Hullet	6.2	35	133	282	1262	10.2

USDA Soybean Yield Projections predict a record crop for Michigan. Previous record - 2006 = 46 Bu/A
New Record - 2015 = 48 Bu/A



This project had funds provided by the Michigan Soybean Promotion Committee



Company Variety	Average MS %	Average TW	Average Bu/A	Average Value	White Mold (DSI)		
					Fairgrove	Pigeon	Average
Channel 2306R2	12.6	58.6	63.1	\$ 546.62	36.00	86.67	61.33
Channel 2508R2	13.0	58.2	64.6	\$ 537.34	44.00	84.67	64.33
Croplan R2C2394	12.6	58.3	63.1	\$ 524.15	43.33	99.33	71.33
DF Seeds DF 5263 N R2Y	12.6	58.6	60.4	\$ 512.66	36.67	99.67	68.17
Dyna-Gro S23RY85	12.5	58.7	63.5	\$ 533.95	42.33	86.00	64.17
Dyna-Gro S25RY44	12.7	58.4	61.7	\$ 534.13	33.33	100.00	66.67
Dyna-Gro S26RS75	12.5	58.7	62.0	\$ 517.00	35.67	96.33	66.00
Great Lakes GL2469R2	12.8	58.3	60.7	\$ 538.26	40.00	86.00	63.00
Great Lakes GL2551NR2	12.7	58.4	62.1	\$ 521.61	42.33	99.33	70.83
Mycogen 5B241R2	12.5	58.6	63.6	\$ 539.41	45.00	88.00	66.50
NK Brand S25-L9	12.8	58.4	61.2	\$ 511.65	34.00	96.67	65.33
NuTech 7233 G2 Genetics	12.9	58.3	60.4	\$ 525.03	40.00	81.33	60.67
NuTech 7240 G2 Genetics	13.2	57.9	60.6	\$ 518.20	50.00	91.67	70.83
NuTech 7250 G2 Genetics	12.5	58.6	61.0	\$ 514.78	50.00	95.00	72.50
Stine 24RE03	12.7	58.6	63.6	\$ 511.38	38.33	100.00	69.17

Yields adjusted to 13.0% moisture	Ave	12.7	58.4	62.1	\$ 525.75	40.73	92.71	66.72
	High	13.2	58.7	64.6	\$ 546.62	50.00	100.00	72.50
	Low	12.5	57.9	60.4	\$ 511.38	33.33	81.33	60.67

Bolded yields are not statistically different than the highest yielding variety in column.	CV %			9.4				
	LSD (Bu/A)	ns	ns	4.0		10.28	17.71	6.32

Value = gross value/acre based on \$8.50/Bu with discounts of \$0.05/point of moisture over 13%.

White Mold Disease Severity Index (DSI) ratings are an average rating and were taken at the Fairgrove, Pigeon, and Sandusky sites. A "0" rating represents no infection, and a "3" represents infection on the main stem resulting in plant death and or pod fill. See explanation of White Mold DSI on Page 12, Soybean Introduction.



This project had funds provided by the Michigan Soybean Promotion Committee



Company Variety	Mat.	SCN		Seed Trt	Yield by Location Bu/A		
		Source	Trait		Capac	Fairgrove	Sandusky
Channel 2306R2	2.3	PI 88788	R2	Acceleron FI	65.0	69.1	59.6
Channel 2508R2	2.5	PI 88788	R2	Acceleron FI	63.9	69.0	57.7
Croplan R2C2394	2.3	PI 88788	RR2/SCN	Warden CX	63.6	70.1	52.3
DF Seeds DF 5263 N R2Y	2.5	PI 88788	R2Y	APV	62.9	66.9	52.0
Dyna-Gro S23RY85	2.3	PI 88788	RR2Y	CM, Vibrance, Clariva	62.8	66.7	59.7
Dyna-Gro S25RY44	2.5	PI 88788	RR2Y	CM, Vibrance, Clariva	62.4	67.9	58.9
Dyna-Gro S26RS75	2.6	PI 88788	RR2Y/STS	CM, Vibrance, Clariva	62.1	69.5	51.5
Great Lakes GL2469R2	2.4	PI 88788	R2	Poncho/VoTivo	61.6	67.7	61.5
Great Lakes GL2551NR2	2.5	PI 88788	R2	Poncho/VoTivo	61.3	69.0	54.6
Mycogen 5B241R2	2.4	PI 88788	RR2	Clariva Max	61.1	67.2	62.5
NK Brand S25-L9	2.5	PI 88788	RR2Y	Clariva Complete Beans	61.0	68.1	52.2
NuTech 7233 G2 Genetics	2.3	PI 88788		SmartCote Extra	60.8	66.5	58.9
NuTech 7240 G2 Genetics	2.4	Peking		SmartCote Extra	60.7	64.5	58.4
NuTech 7250 G2 Genetics	2.5	Peking		SmartCote Extra	60.3	63.1	58.8
Stine 24RE03	2.4	PI 88788	R2	None	57.9	65.4	57.9
Yields adjusted to 13.0% moisture				Ave	61.8	67.4	57.1
				High	65.0	70.1	62.5
				Low	57.9	63.1	51.5
Bolded yields are not statistically different than the highest yielding variety in column.				CV (%)	7.4	4.0	5.3
				LSD (0.05)	5.4	5.4	5.2



This project had funds provided by the Michigan Soybean Promotion Committee



Company Variety	Ave. MS %	Ave. TW	Ave. Bu/A	Ave. Value	White Mold (DSI)				
					Fairgrove	Pigeon	Sandusky	Average	
Channel 2108R2	13.1	57.9	60.0	\$507.68	51.67	64.67	38.00	51.44	
Croplan R2C2025	12.5	58.3	62.7	\$530.71	47.33	76.67	24.33	49.44	
Dairyland DSR-2110	12.5	58.4	59.6	\$504.83	35.67	81.67	23.33	46.89	
DF Seeds DF 5216 N R2Y	12.5	58.4	59.6	\$504.68	42.33	79.67	31.33	51.11	
Dyna-Gro S20RY94	12.7	58.2	63.5	\$537.51	35.00	51.33	21.00	35.78	
Dyna-Gro S21RY56	12.6	58.3	61.8	\$523.41	39.33	75.33	26.33	47.00	
Great Lakes GL2039R2	13.0	57.8	62.5	\$528.30	46.67	76.00	26.00	49.56	
Great Lakes GL2258NR2	12.9	58.1	63.9	\$540.37	40.00	59.33	33.00	44.11	
Great Lakes GL2289R2	12.8	58.1	61.2	\$517.83	41.67	68.33	22.00	44.00	
Mycogen 5N296R2	13.0	57.6	65.3	\$552.52	46.67	73.00	23.33	47.67	
NK Brand S20-T6	12.6	58.3	61.2	\$518.32	35.00	61.00	31.67	42.56	
NK Brand S21-M7	12.7	58.2	61.1	\$517.08	46.67	70.00	37.67	51.44	
NK Brand S22-S1	12.6	58.3	61.6	\$521.91	41.00	83.67	26.67	50.44	
NuTech 7204R2 G2 Genetics	13.1	57.9	61.8	\$523.11	39.00	72.67	26.00	45.89	
NuTech 7217R2 G2 Genetics	13.2	57.8	61.0	\$516.20	43.33	77.67	25.00	48.67	
Steyer Seeds 2202R2	12.7	58.2	61.8	\$523.10	46.67	58.00	36.67	47.11	
Stine 20RD20	12.8	58.1	62.8	\$531.78	50.00	52.00	35.00	45.67	
Yields adjusted to 13.0% moisture	Ave	12.8	58.1	61.8	\$523.49	42.82	69.47	28.67	46.99
	High	13.2	58.4	65.3	\$552.52	51.67	83.67	38.00	51.44
	Low	12.5	57.6	59.6	\$504.68	35.00	51.33	21.00	35.78
Bolded yields are not statistically different than the highest yielding variety.	CV (%)			9.6					
	LSD (0.05)	ns	ns	4.4		12.65	24.37	16.03	10.30

Value = gross value/acre based on \$8.50/Bu with discounts of \$0.05/point of moisture over 13%.

White Mold Disease Severity Index (DSI) ratings are an average rating and were taken at the Fairgrove, Pigeon, and Sandusky sites. A “0” rating represents no infection, and a “3” represents infection on the main stem resulting in plant death and or pod fill. See explanation of White Mold DSI on Page 12, Soybean Introduction.



This project had funds provided by the Michigan Soybean Promotion Committee



Yield by Location Bu/A

Company Variety	Mat.	SCN Source	Trait	Seed Trt	Yield by Location Bu/A		
					Capac	Fairgrove	Sandusky
Channel 2108R2	2.1	PI 88788	R2	Acceleron FI	61.0	60.6	58.5
Croplan R2C2025	2.0	PI 88788	RR2/SCN	Warden CX	66.5	70.5	51.2
Dairyland DSR-2110	2.1				61.6	68.6	48.6
DF Seeds DF 5216 N R2Y	2.1	PI 88788	R2Y	APV	60.3	68.4	50.2
Dyna-Gro S20RY94	2.0	PI 88788	RR2Y	CM, Vibrance, Clariva	59.5	70.7	60.2
Dyna-Gro S21RY56	2.1	PI 88788	RR2Y	CM, Vibrance, Clariva	66.9	65.3	53.4
Great Lakes GL2039R2	2.0	PI 88788	R2	Poncho/VoTivo	60.5	70.5	56.4
Great Lakes GL2258NR2	2.2	PI 88788	R2	Poncho/VoTivo	64.1	70.5	57.1
Great Lakes GL2289R2	2.2	PI 88788	R2	Poncho/VoTivo	58.4	67.7	57.4
Mycogen 5N296R2	2.0	PI 88788	RR2	Clariva Max	64.9	72.1	58.8
NK Brand S20-T6	2.0	PI 88788	RR2Y	Clariva Complete Beans	60.5	65.8	57.3
NK Brand S21-M7	2.1	PI 88788	RR2Y	Clariva Complete Beans	59.4	67.9	56.2
NK Brand S22-S1	2.2	PI 88788	RR2Y	Clariva Complete Beans	62.6	67.7	54.7
NuTech 7204R2 G2 Genetics	2.0	PI 88788		SmartCote Extra	62.0	67.6	55.9
NuTech 7217R2 G2 Genetics	2.1	PI 88788		SmartCote Extra	57.9	66.8	58.4
Steyer Seeds 2202R2	2.2	PI 88788	R2	Cruiser Maxx	62.7	65.8	56.9
Stine 20RD20	2.0	PI 88788	R2	None	58.8	68.9	60.7
Yields adjusted to 13.0% moisture				Ave	61.6	68.0	56.0
				High	66.9	72.1	60.7
				Low	57.9	60.6	48.6
Bolded yields are not statistically different than the highest yielding variety.				CV (%)	6.2	4.3	5.9
				LSD (0.05)	4.5	5.8	5.6



This project had funds provided by the Michigan Soybean Promotion Committee



Company Variety	Ave. MS %	Ave. TW	Ave. Bu/A	Ave. Value	White Mold (DSI)			
					Fairgrove	Pigeon	Sandusky	Average
Dairyland DSR-1515 R2Y	12.6	58.4	62.4	\$528.99	45.00	71.67	32.00	49.56
Dairyland DSR-1721 R2Y	12.6	58.5	63.5	\$537.45	44.00	58.67	36.00	46.22
Dairyland DSR-1990 R2Y	12.6	58.6	62.5	\$529.47	27.33	83.67	35.33	48.78
DF Seeds DF 5173 N R2Y	12.5	58.6	64.1	\$542.78	42.00	63.67	20.00	41.89
DF Seeds DF 5193 N R2Y	12.8	58.3	63.9	\$540.96	38.33	68.67	25.00	44.00
Dyna-Gro S17RY06	12.6	58.5	63.8	\$539.83	41.00	69.33	28.67	46.33
Dyna-Gro S18RY25	12.7	58.4	65.2	\$551.54	42.33	69.67	29.33	47.11
Dyna-Gro S19RY65	12.7	58.4	65.3	\$553.08	31.67	80.00	27.00	46.22
Great Lakes GL1441R2	12.7	58.5	63.0	\$533.48	38.33	54.67	28.67	40.56
Great Lakes GL1953NR2	12.8	58.4	65.1	\$551.59	37.33	73.00	32.00	47.44
Mycogen 5N182R2	12.8	58.4	63.8	\$540.11	33.33	72.00	30.33	45.22
NK Brand S19-B2	12.8	58.4	62.6	\$530.11	37.33	81.33	34.67	51.11
NuTech 7169 G2 Genetics	12.9	58.3	63.6	\$538.13	39.00	63.00	30.00	44.00
NuTech 7172 G2 Genetics	12.9	58.3	64.1	\$542.69	46.00	75.33	29.33	50.22
Steyer Seeds 1901 R2	12.9	58.3	64.5	\$546.24	42.67	76.67	30.33	49.89
Stine 14RD62	12.6	58.4	64.3	\$545.33	32.67	61.00	30.33	41.33
Stine 17RF26	12.7	58.3	61.7	\$523.19	41.67	64.67	32.67	46.33

Yields adjusted to 13.0% moisture

Ave	12.7	58.4	63.7	\$539.70	38.82	69.82	30.10	46.25
High	12.9	58.6	65.3	\$553.08	46.00	83.67	36.00	51.11
Low	12.5	58.3	61.7	\$523.19	27.33	54.67	20.00	40.56
CV %			7.9					
LSD (Bu/A)	ns	ns	ns		10.97	24.29	12.06	6.72

Value = gross value/acre based on \$8.50/Bu with discounts of \$0.05/point of moisture over 13%.

White Mold Disease Severity Index (DSI) ratings are an average rating and were taken at the Fairgrove, Pigeon, and Sandusky sites. A "0" rating represents no infection, and a "3" represents infection on the main stem resulting in plant death and or pod fill. See explanation of White Mold DSI on Page 12, Soybean Introduction.





Yield by Location Bu/A

Company Variety	Mat.	SCN	Trait	Seed Trt	Capac	Fairgrove	Sandusky
Dairyland DSR-1515 R2Y	1.5	PI 88788	R2Y SCN	CM ODT 400	64.5	67.9	54.9
Dairyland DSR-1721 R2Y	1.7		R2Y	CM ODT 400	64.9	65.4	60.2
Dairyland DSR-1990 R2Y	1.9	PI 88788	R2Y SCN	CM ODT 400	65.3	63.8	58.6
DF Seeds DF 5173 N R2Y	1.7	PI 88788	R2Y	APV	66.7	66.6	58.8
DF Seeds DF 5193 N R2Y	1.9	PI 88788	R2Y	APV	67.3	64.8	59.7
Dyna-Gro S17RY06	1.7	PI 88788	RR2Y	CM, Vibrance, Clariva	67.3	63.6	60.4
Dyna-Gro S18RY25	1.8	PI 88788	RR2Y	CM, Vibrance, Clariva	67.0	68.8	59.7
Dyna-Gro S19RY65	1.9	PI 88788	RR2Y	CM, Vibrance, Clariva	68.5	65.7	61.6
Great Lakes GL1441R2	1.4		R2	Poncho/VoTivo	62.4	67.9	58.7
Great Lakes GL1953NR2	1.9	PI 88788	R2	Poncho/VoTivo	62.3	70.2	63.0
Mycogen 5N182R2	1.8	PI 88788	RR2	Clariva Max	68.3	64.2	58.9
NK Brand S19-B2	1.9	PI 88788	RR2Y	Clariva Complete Beans	65.5	65.8	56.6
NuTech 7169 G2 Genetics	1.6	PI 88788		SmartCote Extra	63.8	66.4	60.5
NuTech 7172 G2 Genetics	1.7	PI 88788		SmartCote Extra	64.8	66.4	61.1
Steyer Seeds 1901 R2	1.9	PI 88788	R2	Cruiser Maxx	66.1	66.0	61.5
Stine 14RD62	1.4	PI 88788	R2	None	64.8	70.2	58.0
Stine 17RF26	1.7	PI 88788	R2	None	59.6	68.9	56.7

Yields adjusted to 13.0% moisture

Ave	65.2	66.6	59.3
High	68.5	70.2	63.0
Low	59.6	63.6	54.9
CV (%)	6.9	4.2	5.0
LSD (0.05)	7.4	5.5	5.0

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



This project had funds provided by the Michigan Soybean Promotion Committee



Company Variety	Mat	SCN Source	Seed Trt	MS %	TW	Yield Bu/A	Value	White Mold (DSI)
DF Seeds DF 9171 N LL	1.7	PI 88788	APV	11.8	58.7	61.4	\$ 522.07	28.00
DF Seeds DF 9221 N LL	2.2	PI 88788	APV	11.5	58.9	65.2	\$ 554.29	33.33
DF Seeds DF 9232 N LL	2.3	PI 88788	APV	12.5	58.1	60.0	\$ 510.26	26.33
Great Lakes GL2239LL	2.2	PI 88788	Poncho/VoTivo treatment	12.0	58.6	62.6	\$ 531.76	29.33
NuTech Seed 3205L	2.0	PI 88788	SmartCote Extra	12.8	57.1	61.1	\$ 519.44	24.67
NuTech Seed 3252:	2.5	PI 88788	SmartCote Extra	12.0	58.6	64.5	\$ 548.51	31.33
Rupp Seeds rs6xp536	2.3		Cruiser Maxx	12.2	58.1	65.2	\$ 553.86	26.33
Steyer Seeds 2402L	2.4	PI 88788	Cruiser Maxx	12.0	58.6	61.3	\$ 520.97	26.00

Yields adjusted to 13.0% moisture	Average	12.1	58.3	62.7	\$ 532.64	28.17
	High	12.8	58.9	65.2	\$ 554.29	33.33
Bolded yields are not statistically different than the highest yielding variety.	Low	11.5	57.1	60.0	\$ 510.26	24.67
	CV (%)			5.6		
	LSD (0.05)	ns	ns	ns		7.65

Value = gross value/acre based on \$8.50/Bu with discounts of \$0.05/point of moisture over 13%.

White Mold Disease Severity Index (DSI) ratings are an average rating taken at the Sandusky site. A “0” rating represents no infection, and a “3” represents infection on the main stem resulting in plant death and or pod fill. See explanation of White Mold DSI on Page 12, Soybean Introduction.





Company Variety	Mat	Seed Trt	SCN Source	MS %	TW	Yield Bu/A	Prot %	Oil %	Premium \$/Bu	Value	White Mold (DSI)
DF Seeds DF 155F	1.5	APV		12.8	57.5	55.4	42.6	20.7	\$2.00	\$ 582.12	32.7
DF Seeds DF 161 N/STS	1.6	APV	PI 88788	11.5	59.1	54.7	41.4	20.4	\$1.00	\$ 519.65	24.3
DF Seeds DF 242 N/S	2.4	APV	PI 88788	12.4	58.0	60.7	41.0	20.1	\$1.00	\$ 576.94	29.3
DF Seeds Jackson F	2.5	APV		12.4	58.3	64.5	41.9	20.4	\$2.00	\$ 676.73	21.0
DF Seeds Lily	2.5	APV		11.8	58.9	65.0	42.6	20.4	\$2.00	\$ 682.61	33.3
Great Lakes GL2254N	2.2	Poncho/ VoTivo	PI 88788	11.9	58.8	57.2	41.6	19.4	\$1.00	\$ 543.50	22.7
Huron Commodities OAC Brooke	2.3	Cruiser Maxx		11.3	59.3	62.3	41.6	20.2	\$2.00	\$ 654.36	17.7
Huron Commodities OAC Marvel	2.0	Cruiser Maxx	PI 88788	12.1	58.5	61.7	42.6	20.1	\$2.00	\$ 647.43	26.7
Rupp rs2130	2.1	Cruiser Maxx		12.3	58.5	61.4	39.6	21.2	\$1.00	\$ 583.11	32.7
Zeeland Farm Service eMerge 1993	1.9	CMVIB	PI 88788	13.5	56.0	59.3	41.1	21.1	\$1.00	\$ 561.58	22.7
Zeeland Farm Service ZFS 1326	2.6		PI 88788	11.9	58.7	58.7	40.9	20.3	\$1.00	\$ 557.65	37.7
Zeeland Farm Service ZFS 1414	1.4	CMVIB		12.9	57.7	60.0	42.7	20.3	\$2.00	\$ 630.42	30.0
Zeeland Farm Service ZFS 1420 LS	2.2	CMVIB		12.2	58.3	62.4	40.7	20.0	\$1.00	\$ 592.90	24.3
Zeeland Farm Service ZFS 251 LS	2.5	CMVIB		11.8	58.7	56.6	40.9	20.3	\$1.00	\$ 538.08	24.3

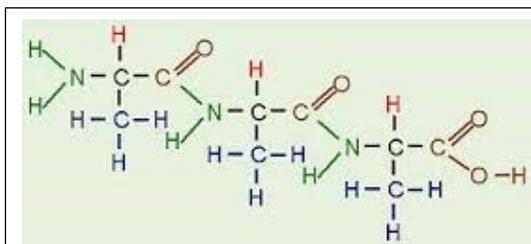
Yields adjusted to 13.0% moisture

Average	12.2	58.3	60.0	41.5	20.4		\$596.22	27.1
Max	13.5	59.3	65.0	42.7	21.2		\$682.61	37.7
Min	11.3	56.0	54.7	39.6	19.4		\$519.65	17.7
CV (%)			7.8					
LSD (0.05)	ns	ns	8.0					16.00

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

Value = gross value/acre based on \$8.50/Bu with discounts of \$0.05/point of moisture over 13%.

White Mold Disease Severity Index (DSI) ratings are an average rating and were taken at the Fairgrove, Pigeon, and Sandusky sites. A "0" rating represents no infection, and a "3" represents infection on the main stem resulting in plant death and or pod fill. See explanation of White Mold DSI on Page 12, Soybean Introduction.



Soy is one of the few plants that provides a complete protein as it contains all eight amino acids essential for our health.

Source: World Soy Foundation, The North Carolina Soybean Producers Association, UC Clermont College



This project had funds provided by the Michigan Soybean Promotion Committee



Soybean Population Trial in 30 Inch Rows

Purpose:

The purpose of this study was to determine the most economical seeding rate for soybeans at four rates. The four seeding rates were 80,000, 100,000, 130,000 and 160,000 seeds per acre in a randomized complete block design (RCB) with four replications. The variety planted was NK S21-M7 Brand soybeans.

The table below shows the actual population, yield, and net income for each of the planting rates. This trial was planted at the Wagner farm, near Fairgrove.

Results:

The 160,000 seeds planted per acre (151,000 plants per acre) provided the greatest yield. The 130,000 seeds planted per acre, (122,000 plants per acre) was statistically similar to the 160,000 seeds per acre rate, and also generated more net income per acre. Both of those rate yielded statistically greater than the 100,000 seeds per acre (92,000 plants per acre) and the 80,000 seeds per acre (73,000 plants per acre).

These results agree with the recommendation of planting soybeans at a population such that the final plant stand is greater than 100,000 plants per acre.

Planted Population	Actual Population	MS %	TW	Yield Bu/A	Net Income*
160,000	151,000	12.1	59.0	69.4	\$513.67
130,000	122,000	12.2	59.0	67.9	\$515.28
100,000	92,000	12.2	59.0	65.8	\$511.78
80,000	73,000	12.2	59.0	65.0	\$514.47
Average				67.1	
High				69.4	
Low				65.0	
CV (%)				2.60	
LSD (0.05)				2.80	

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

* Soybeans at \$8.50 per bushel, and seed at \$67 for 140,000 seeds





White Mold Control Using Endura Fungicide

Purpose:

The purpose of this study was to compare different timing strategies using Endura fungicide as a preventative control measure for white mold which has been a significant problem for soybean producers the last two growing seasons.

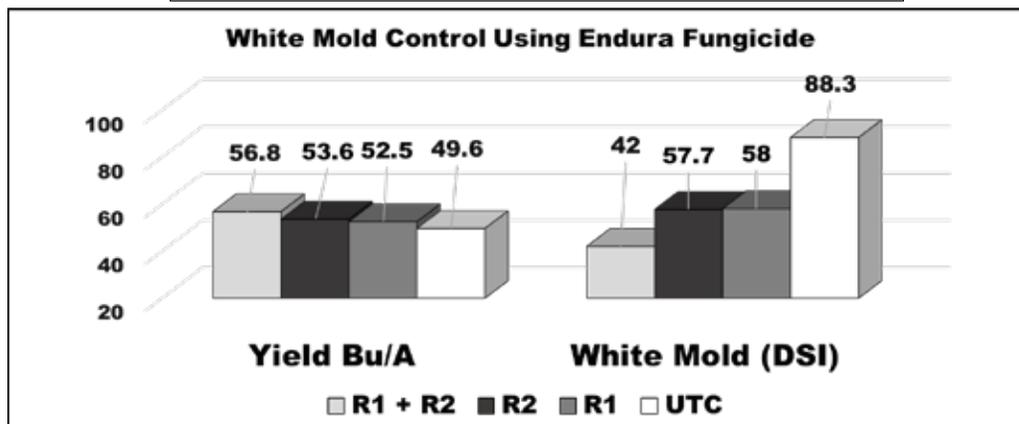
Method:

This plot was established at the Randy Sturm Farm, Pigeon, where there was significant white mold present throughout the plot. Four treatments were established in a randomized complete block (RCB). Endura Fungicide was sprayed at 8.0 oz/a at the R1 growth stage, the R2 growth stage, at both R1 and R2 growth stages, and an untreated check. The variety was NK Brand NK S22-S1.

Results:

Endura at 8 oz. had a significant effect on test weight, soybean yield and white mold severity. The R1 or R2 single sprayed treatments yielded similarly, had similar test weight, and similar disease severity as each other, and the test weight and disease severity for each of those treatments were significantly greater than the untreated check. The treatment that included sprays at both the R1 and R2 growth stages had significantly better test weight than each of the other three treatments, significantly less disease severity than each of the other three treatments, and significantly more yield than the untreated check.

Treatment	TW	Yield Bu/A	White Mold (DSI)
R1+R2	58.4 a	56.8 a	42.0 a
R2	57.9 b	53.6 ab	57.7 b
R1	57.9 b	52.5 ab	58.0 b
UTC	57.6 c	49.6 b	88.3 c
Ave	58.0	53.1	61.5
High	58.4	56.8	88.3
Low	57.6	49.6	42.0
CV (%)	0.3	7.6	11.5
LSD (0.05)	0.2	5.2	9.3



This project had funds provided by the Michigan Soybean Promotion Committee

Purpose:

Soybean cyst nematode (*Heterodera glycines*), or 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 Capac soybean variety trials for TARE, each of the four replications for each variety (17 early season, 17 mid-season, and 15 late-season maturity) were 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 MSU Diagnostic Services 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. (See next page.)

Results:

Two different sources of resistance were entered into the plots. One susceptible variety was entered, 46 varieties had PI88788 as the source of resistance and two varieties had Peking as their source of resistance. Low levels of SCN were detected in the field at planting and harvest. No detectible yield differences were apparent due to sources of resistance.

The SCN Type Test = 2, which means the SCN developed essentially only on both the PI88788 sources of resistance and the susceptible variety. Peking (PI548402) is resistant to this SCN population, whereas PI88788 is moderately resistant. Varieties in this location with PI88788 resistance should still yield well but SCN populations densities will continue to increase under consistent use of PI88788 cultivars.

Early Season 1.9 or Less					
Company	SCN Source	Pi Σ Eggs & Jvs	Pf Σ Eggs & Jvs	P- RpF Pf/Pi	Yield Bu/A
Dairyland DSR-1515 R2Y	PI 88788	220	0	0.0	64.5
Dairyland DSR-1721 R2Y	PI 88788	150	420	2.8	64.9
Dairyland DSR-1990 R2Y	PI 88788	10	220	22.0	65.3
DF Seeds DF 5173 N R2Y	PI 88788	480	430	0.9	66.7
DF Seeds DF 5193 N R2Y	PI 88788	310	90	0.3	67.3
Dyna-Gro S17RY06	PI 88788	1	370	370.0	67.3
Dyna-Gro S18RY25	PI 88788	210	880	4.2	67.0
Dyna-Gro S19RY65	PI 88788	150	210	1.4	68.5
Great Lakes GL1441R2	Susceptible	50	2120	42.4	62.4
Great Lakes GL1953NR2	PI 88788	35	800	22.9	62.3
Mycogen 5N182R2	PI 88788	1	620	620.0	68.3
NK Brand S19-B2	PI 88788	260	220	0.8	65.5
NuTech 7169 G2 Gen	PI 88788	620	0	0.0	63.8
NuTech 7172 G2 Gen	PI 88788	150	200	1.3	64.8
Steyer Seeds 1901 R2	PI 88788	120	310	2.6	66.1
Stine 14RD62	PI 88788	40	280	7.0	64.8
Stine 17RF26	PI 88788	0	0	0.0	59.6
Average		165.1	421.8	64.6	65.2

Mid-Season 2.0 - 2.2					
Company	SCN Source	Pi Σ Eggs & Jvs	Pf Σ Eggs & Jvs	P- RpF Pf/Pi	Yield Bu/A
Channel 2108R2	PI 88788	360	0	0.0	61.0
Croplan R2C2025	PI 88788	1	180	180.0	66.5
Dairyland DSR-2110	PI 88788	1	350	350.0	61.6
DF Seeds DF 5216 N R2Y	PI 88788	80	0	0.0	60.3
Dyna-Gro S20RY94	PI 88788	250	160	0.6	59.5
Dyna-Gro S21RY56	PI 88788	0	0	0.0	66.9
Great Lakes GL2039R2	PI 88788	90	30	0.3	60.5
Great Lakes GL2258NR2	PI 88788	260	0	0.0	64.1
Great Lakes GL2289R2	PI 88788	100	1540	15.4	58.4
Mycogen 5N296R2	PI 88788	170	500	2.9	64.9
NK Brand S20-T6	PI 88788	5	2080	416.0	60.5
NK Brand S21-M7	PI 88788	1	190	190.0	59.4
NK Brand S22-S1	PI 88788	420	20	0.0	62.6
NuTech 7204R2 G2 Gen	PI 88788	420	45	0.1	62.0
NuTech 7217R2 G2 Gen	PI 88788	380	0	0.0	57.9
Steyer Seeds 2202R2	PI 88788	20	170	8.5	62.7
Stine 20RD20	PI 88788	1	95	95.0	58.8
Average		150.5	315.3	74.1	61.6

Late Season 2.3 or Later					
Company	SCN Source	Pi Σ Eggs & Jvs	Pf Σ Eggs & Jvs	P- RpF Pf/Pi	Yield Bu/A
Channel 2306R2	PI 88788	480	0	0.0	62.8
Channel 2508R2	PI 88788	500	450	0.9	65.0
Croplan R2C2394	PI 88788	140	410	2.9	62.4
DF Seeds DF 5263 N R2Y	PI 88788	380	8240	21.7	57.9
Dyna-Gro S23RY85	PI 88788	430	170	0.4	63.9
Dyna-Gro S25RY44	PI 88788	560	540	1.0	61.3
Dyna-Gro S26RS75	PI 88788	70	280	4.0	63.6
Great Lakes GL2469R2	PI 88788	55	900	16.4	60.3
Great Lakes GL2551NR2	PI 88788	90	280	3.1	60.8
Mycogen 5B241R2	PI 88788	460	2960	6.4	61.1
NK Brand S25-L9	PI 88788	290	720	2.5	60.7
NuTech 7233 G2 Genetics	PI 88788	190	340	1.8	61.0
NuTech 7240 G2 Genetics	Peking	110	170	1.5	62.9
NuTech 7250 G2 Genetics	Peking	95	860	9.1	62.1
Stine 24RE03	PI 88788	1	500	500	61.6
Average		256.7	1121.3	38.1	61.8



This project had funds provided by the Michigan Soybean Promotion Committee

Purpose:

The purpose of this study is to evaluate the use of compost generated from yard waste as a soil amendment applied in a corn/soybean rotation. The goal is to determine if an economical rate can be applied that will maintain crop yields, increase soil quality, and reduce commercial fertilizer use. This study is funded as a Farmer/Rancher grant by North Central SARE for two years.

Methods:

Three farmers were selected in Lapeer and St. Clair County that have a corn/soybean rotation. A control with no compost added and 5 tons/acre were applied in a RCB with three or four replications on the same strips for each year of the trial. The application was done just prior to planting and incorporated into the soil.

At the conclusion of the two-year trial, each farm had composite soil tests for the control replications and the 5 ton/A compost replications done by Woods End Soil Laboratory in Mount Vernon, ME. The Woods End Laboratory is utilizing the USDA-ARS **H₃A Extraction Method** Soil Test. In addition they utilize Solvita - CO₂ respiration and the Solvita SLAN, amino-N tests to evaluate soil health. (Table 1.)

Available phosphorus and potassium (P₂O₅ and K₂O), is the total available fraction from the H₃A extract. These numbers will be slightly lower than Bray P₂ extracts. No statistical analysis was done on the soil test numbers

The overall fertility score (0 - 100, with 100 implying optimal) is a representation of the overall status of fertility which combines nutrient sufficiency and biological health and aggregate stability quality. Overall Soil Health Score (0 - 50, with 50 implying optimal) is the biological index which includes soil respiration, humic-N (SLAN), aggregate stability and other factors if tested.

Results:

Yield results for the plot are found in Table 2. The China location had excessive rain and the plot yield data was unable to be used due to very high variability. The sandier, coarse textured soils found in North Branch had a significant difference in yield and provided a value (including the cost of the compost) over the control. This is the third year for the study on this farm and there was a dramatic visual difference in the corn during the growing season.

The Almont site had outstanding yields with no significant statistical difference, however there was a trend for higher yields that has been consistent during the length of the two-year trial.

Based on the results of this study, two years appears to be too short to show a significant difference in soil health and fertility to be a value over and above the cost of the compost application.

Site:	North Branch		China		Almont	
Soil type:	Boyer Loamy Sand		Allendale-Lenawee-Toledo Complex		Conover Loam	
	Control	5 Ton/A	Control	5 Ton/A	Control	5 Ton/A
pH:	6.5	6.5	6.6	6.7	6.1	6.3
O.M.	1.9 L	1.9 L	3.6 M	3.1 M	4.0 MH	4.4 MH
Available N LBS/A:	79	78	79	79	93	95
Available P2O5 LBS/A:	21	21	92	78	127	87
Available K2O LBS/A:	127	218	430	353	365	343
Aggregate stability:	15 L	22 L	36 M	40 M	58 H	58 H
Overall Fertility Score:	55	55	69	69	69	70
Soil Health Score:	11	11	19	19	19	20
Fertilizer applied:	250 lbs. 30-0-15		250 lbs. 20-23-5 w/ 1.5% Zn		7 Gal 9-18-9 + micros in-furrow starter	
Other:			32 Gal 28% N		100 lbs. 46-0-0 broadcast 45 Gal 28% N	
Population:	24,000		32,000		35,000	
Hybrid:	Dairyland DX 6399		Croplan 3146 SS RIB		Pioneer P0157	
Prev crop:	soybean		soybean		soybean	
Plant date:	4-May-15		5-May-15		1-May-15	
Harvest date:	26-Oct-15		26-Oct-15		11-Nov-15	

Table 1.

Location										
Treatment	North Branch				Almont				Average	
	% MS	TW	Yield Bu/A	*Value	% MS	TW	Yield Bu/A	*Value	Yield Bu/A	*Value
Control	20.4	51.9	142.8 b	\$434.83	18.6	58.0	250.1	\$779.75	196.5	\$607.29
5 Ton/A	20.1	52.7	157.9 a	\$445.81	18.6	58.0	255.3	\$760.90	206.6	\$603.36
CV (%)	3.3				2.48					
LSD (Bu/A)	11.7				ns					
*Value = gross value/acre based on \$3.30/Bu with drying charges deducted for moisture over 15%. Cost of compost is deducted at \$7/T.										

Table 2.

Michigan Alfalfa Sulfur Survey

Purpose:

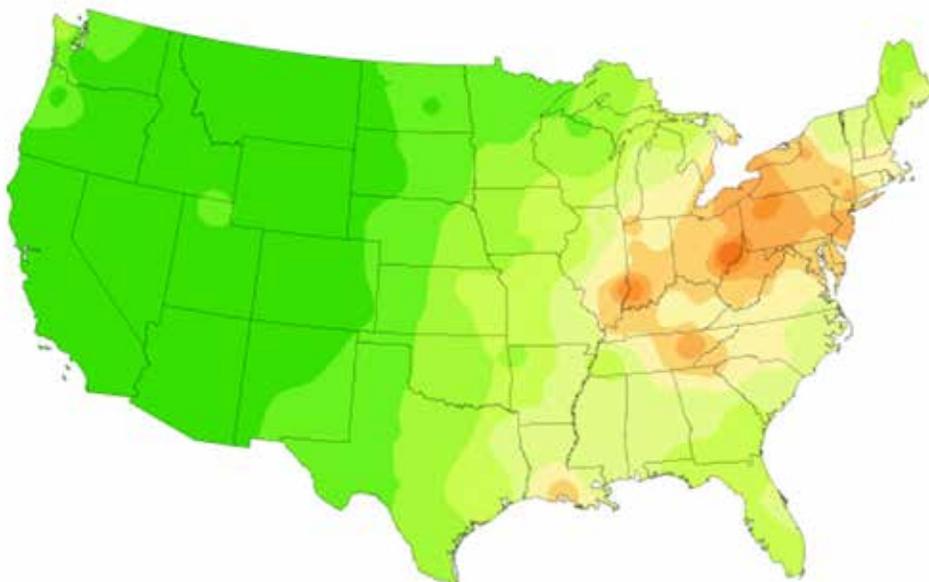
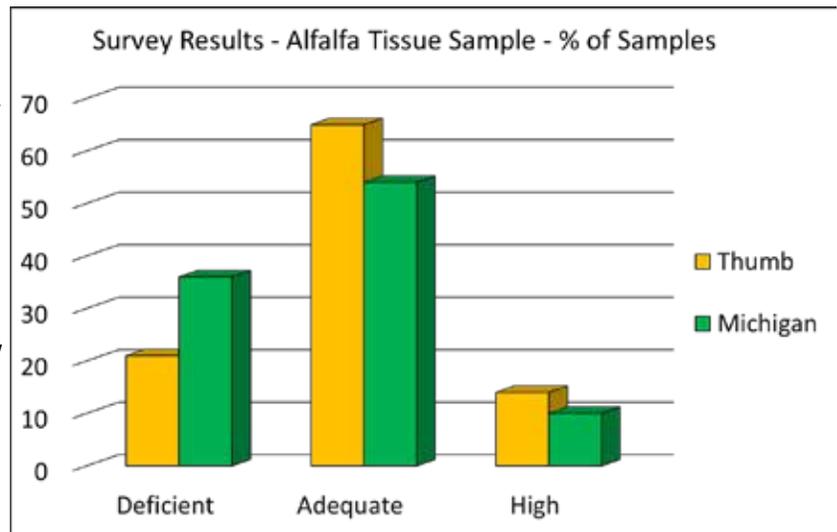
Determine current levels of sulfur through plant tissue sampling in alfalfa fields and assess sufficiency levels for high production alfalfa. The hypothesis is that alfalfa yields are reduced due to the lower deposition of sulfur following the implementation of The Clean Air Act originally passed in 1973.

Methods:

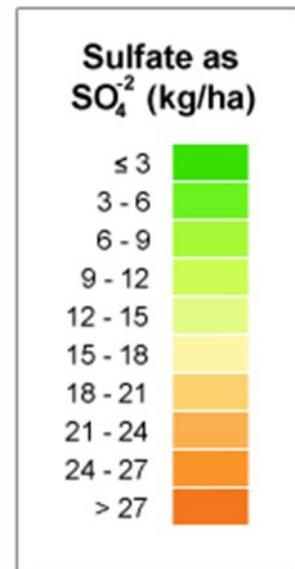
Alfalfa tissue samples were collected from primarily pure alfalfa fields in every region of Michigan when alfalfa was in the late bud—early bloom stage of maturity for 2nd - 4th cutting. 60-80 stems were randomly collected from all areas of the field, air dried and sent for analysis. Information about years in production, soil texture, cutting, and fertilizer and manure application information was collected. 51 samples were collected. 14 of the samples were collected in Michigan’s Thumb.

Results:

Michigan’s Thumb region has predominantly fine textured soils. Three out of 14 samples showed a deficiency for sulfur. The soils were coarse textured soils that are more prone to nutrient losses due to leaching. Therefore alfalfa tissue samples on these soils are prone to have soil nutrient levels below the critical value of ~ 0.25% S.



Sulfate Ion Wet Deposition 1985-2005





Huron Conservation District Phosphorus Reduction Study

Purpose:

The purpose of the trial is to determine the impact of the three P fertilizer rates on net income while growing crops common to the area, and on soil P levels.

Methods:

Two fields, located outside Elkton, have had continuous strips of no (0), low (50 lbs./A), and high(100 lbs./A) phosphorus. Ambassador white soft winter wheat was planted on October 10, 2014 at 2 million seeds per acre. All strips received 22# N, 60# K₂O, 5# manganese, and 20# sulfur, plus the appropriate P fertilizer. Shallow vertical tillage was used to incorporate the fertilizer. On April 15, 106#/A nitrogen was broadcast. On May 12, Harmony Extra and Palisade were applied. On June 8, Prosaro was applied. The plot was harvested on July 24. The table below shows the average grain moisture, test weight, and yield of each strip. The final column shows the income minus the cost of phosphorus fertilizer.

Front Field

Per acre P Rate	MS%	TW	Yield	Income less P cost*
No - 0 Lb	14.3	57.4	121.9	\$792.11
Low - 50 Lb	14.2	56.7	127.1	\$783.34
High - 100 Lb	14.1	56.9	123.0	\$714.58

Back Field

Per acre P Rate	MS%	TW	Yield	Income less P cost*
No - 0 Lb	13.6	57.2	117.7	\$765.31
Low - 50 Lb	13.5	56.6	122.5	\$753.59
High - 100 Lb	13.5	56.5	125.1	\$727.97

*White wheat at \$6.50 per acre and P fertilizer at \$0.85 per unit

Statistics were not run on these results. All strips that received P fertilizer did have a greater yield than the strips that received no P. However, the increase in yield was not enough to offset the cost of additional phosphorus fertilizer.



What is the best fungicide application timing to minimize head blight?

Martin Nagelkirk, Michigan State University Extension

Martin Chilvers, Michigan State University, Plant Pathology

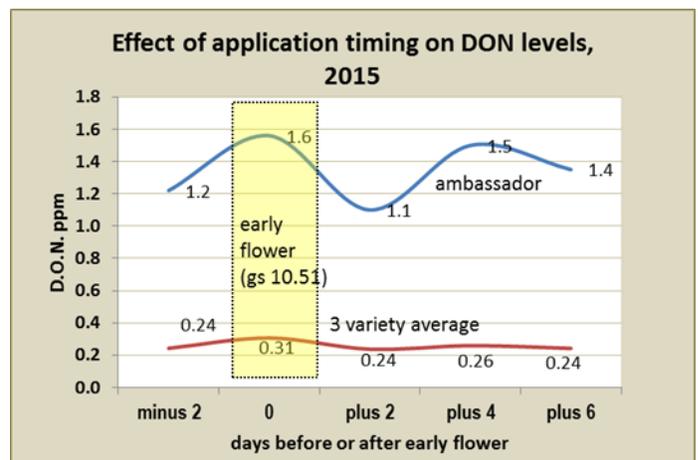
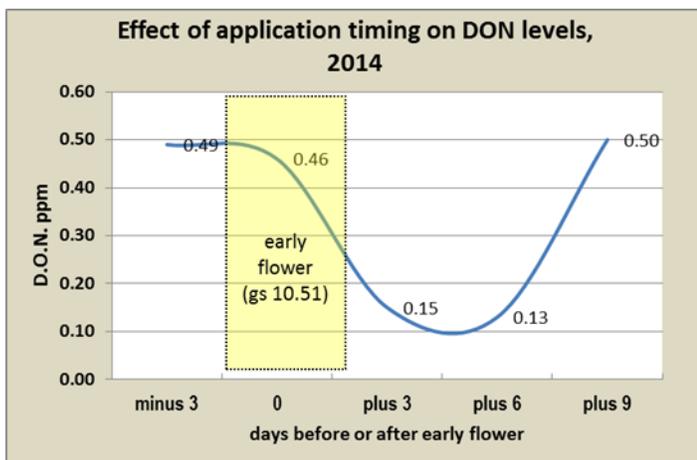
As part of a multi-state research study funded by the US Scab Initiative, a field trial was conducted in 2014 and 2015 to measure the effect of various application timings on the level of Fusarium head blight (FHB) and mycotoxin (DON). The trials were initiated, in part, to see if the standard recommendation that fungicide targeting FHB should be applied when the first anthers appear – a time referred to as “early flowering” or Feekes growth stage 10.51.

The variety used in 2014 was Ambassador, a variety susceptible to FHB. In 2015, two soft white winter varieties (Ambassador, DynaGro 9242) and two soft red varieties (Pioneer 25R34, and Whale) were grown. DG 9242 and P25R34 were selected because of their reduced susceptibility to FHB.

The fungicide used in both seasons was Prosaro. It was applied at 6.5 oz/ac, along with a NIS at 0.125 %, using a tractor mounted boom sprayer and Turbo TeeJet Duo bodies with 11001 nozzles. In 2014, the product was applied at three day intervals beginning at heading (3 days prior to early flower (Feekes g.s. 10.5)). During 2015, Prosaro was applied at 2 day intervals beginning at heading (2 days prior to early flower).

Dry conditions at the trial sites limited the amount of fusarium that infected the wheat, especially during 2014. Nevertheless, differences in fusarium damaged kernels and disease index did occur (data not shown), as well as DON levels. The charts below illustrate the DON levels as the application timing of Prosaro went from pre-flower to several days after early flowering (“0” days).

The untreated control treatment in 2014 resulted in a DON level of 0.60 ppm. As can be seen in the chart, all application timings tended to reduce DON levels. However, the greatest reduction in DON occurred when the Prosaro application was delayed for 3 to 6 days following the standard recommended timing of early flowering. In 2015, the average DON level of the untreated plots was 0.9 ppm and the results are quite similar. The chart below for 2015 separates Ambassador from the other 3 varieties because of its elevated DON levels. As in 2014, it appears that there may be an advantage to delaying application for a couple days beyond the early flower stage. The results also suggest that there may be a much larger application window for reducing DON than once thought.



Fungicide efficacy trial on winter wheat, 2015

Each year a fungicide efficacy trial is conducted on soft winter wheat in collaboration with industry to observe the performance of various fungicide products. The trial was superimposed on a commercial stand of Pioneer 25W43 soft white winter wheat. The variety is rated as being comparatively susceptible to powdery mildew and moderately susceptible to Septoria leaf spot, Stagonospora leaf blotch, leaf rust and Fusarium head blight.

The trial was harvested on July 24 using an Int'n 2144 combine equipped with a Juniper HarvestMaster system that provided grain weight, test weight, and moisture. Grain samples were sent to University of Minnesota where DON analyses were performed. Statistical analysis was performed by Adam Byrne, Research Associate, MSU.

For a complete report, contact Martin Nagelkirk nagelkir@msu.edu

Location:	JGDM McConnachie Fms Deckerville, MI
Collaborators:	Dupont, Bayer, BASF
Soil Type	Capac silt loam
Previous crop:	dry beans
Variety:	P25W43
Nitrogen rate:	125 lbs/ac
Plot design:	RCB
Replications:	four
Plot area:	18 x 65 ft
Treatment area:	17 x 65 ft
Harvest area:	15 x 60 ft
Planting date:	Oct 2, 2014
Seeding rate:	1.8 m/ac
Harvest date:	July 24, 2015

Table 1: Effect of fungicides on the performance of soft winter wheat and disease levels																
Deckerville, MI, 2015																
fungicide treatment ¹	timing ²			harvested grain				powdery mildew ³	leaf ⁴		fusarium head scab					
				moist.	test wt.	yield			spot	sev. ⁶		DON				
	T1	T2	T3	%	lbs/bu	bu/ac	13M	0-3	%	incid. ⁵	%	ppm				
non treated control				13.5	60.7	a	114.3	e	1.25	a	14.8	a	18	30	0.44	bc
Stratego Yld 4oz		x		13.9	60.5	abc	116.9	de	0.25	bc	5.8	b	12	24	0.68	a
Prosaro 6.5oz			x	14.2	60.0	cdef	120.5	bcd	1.50	a	0.3	de	2	8	0.29	cde
Prosaro 8.2oz			x	14.4	59.9	def	125.2	ab	0.75	ab	0.4	cde	1	9	0.34	cd
Stratego Yld 2oz ; Prosaro 6.5oz	x	x		14.2	60.0	cdef	126.6	ab	0.00	c	0.1	e	2	5	0.24	de
Priaxor 2oz; Caramba 13.5oz	x	x		14.1	60.2	bcdef	122.5	abc	0.75	abc	0.9	cde	2	9	0.20	de
Priaxor 4oz; Caramba 13.5oz	x	x		13.8	60.2	bcdef	123.8	ab	0.00	c	1.0	c	2	1	0.25	de
Priaxor 2oz; Caramba 17.0oz	x	x		14.2	60.1	cdef	122.6	abc	0.75	ab	1.4	cd	1	12	0.24	de
Priaxor 2oz; Caramba 13.5oz		x	x	14.3	60.0	def	124.6	ab	0.25	bc	0.4	cde	1	11	0.18	e
Caramba 13.5oz			x	14.0	60.3	abcde	121.4	bcd	0.75	ab	0.8	cde	2	7	0.18	e
Approach 3oz; Appr. Prima 6.8	x	x		14.1	60.4	abcd	118.1	cde	0.25	bc	4.8	b	17	17	0.54	ab
Appr. Prima 6.8oz			x	13.8	60.6	ab	118.6	cde	0.25	bc	4.9	b	11	17	0.60	ab
Appr. Prima 6.8oz; Prosaro 8.2		x	x	14.5	59.8	f	126.3	a	0.25	bc	0.3	cde	3	8	0.29	cde
Appr. Prima 3.4oz		x		13.8	60.7	a	117.3	de	0.25	bc	13.8	a	15	27	0.55	ab
Prosaro 6.5oz + Baythroid 3oz			x	14.2	60.1	cdef	118.9	cde	1.50	a	0.8	cde	2	13	0.19	e
Caramba 13.5oz; Prosaro 6.5oz ⁷			x	14.5	59.8	ef	122.8	abc	0.75	abc	0.4	cde	2	15	0.24	de
P value				0.074	<0.0012		<0.0001		<0.0077	<0.0001			<0.0001	<0.0002	<0.0001	

¹ all fungicides applied with Induce nonionic surfactant at 0.125% ;

² T1 = full tillering (g.s. 5-6); T2 = full flag (g.s.9); T3 = early flower (F10.51).

³ P.M.levels were low; rated on a relative scale of 0 to 3 (0= on disease).

⁴ primarily stagonospora with some leaf rust; expressed as amount of visable disease on surface of flag leaf as percent

⁵ incidence of heads within 15 feet of row exhibiting fusarium symptom.

⁶ severity of fusarium as average amount of infected heads exhibiting symptoms expressed as percent.

⁷ Caramba applied at 10.51 followed by Prosaro 2 days later



Response of wheat varieties to intensive management inputs

Deckerville, MI, 2015

A trial was established in collaboration with MCIA to measure the response of various varieties to selected inputs. The varieties included the soft white variety, Jupiter, and four soft red varieties: Red Devil, Red Dragon, Sunburst and Whale. The five treatments, in addition to the non-treated control, are listed in the table. The treatments represent an escalating progression of inputs involving fungicides (Prosaro at 6.5 oz/ac applied at flowering; Priaxor at 2 oz/ac applied at first joint), applying 45lbs/ac nitrogen (N) in addition to a base rate of 95 lbs/ac N, and a growth regulator (Palisade applied at 11 oz/ac at first joint). Fungicide applications included the use of an NIS at 0.125 %.

The yields of all varieties increased several bushels by applying either Prosaro at the time of flowering (treatment 2) or an additional 45 lbs/ac N at tillering (treatment 3). When both Prosaro and the extra N was applied (treatment 4), yield improvement ranged from 11 to 17 Bu/ac. Across all varieties, yields improved by an average of 15 Bu/ac. When an early application of Priaxor was added to this combination for additional protection against fungal diseases, the yields of all varieties consistently improved, but by only an average of 3 Bu/ac. In the absence of plant lodging, the addition of Palisade to the combination of Prosaro and extra N did not significantly affect yields. However, Palisade did reduce plant height of Jupiter, Red Devil, Red Dragon, Sunburst, and Whale by 2, 4, 4, 1 and 2 inches respectively.

For additional information, contact Martin Nagelkirk (nagelkir@msu.edu)

BACKGROUND	
Location:	JGDM Farms Deckerville, MI
Soil Type:	Capac silt loam
Previous crop:	dry beans
Variety:	various
Fall fertilizer:	225 lbs 9-16-24-8
Planting date:	Oct 2. '15
Seeding rate:	1.8 m/ac
Harvest date:	July 15,'15
PLOT DESIGN	
Design:	randomized split block
Replications:	four
Plot area:	18 x 65 ft
Treatment area:	17 x 65 ft
Harvest area:	15 x 60 ft
VARIABLES	
Varieties:	Jupiter, Red Devil, Whale, Red Dragon, Sunburst
Nitrogen rate:	95 or 140 lbs/ac as 28% UAN
Fungicide variable:	Prosaro 6.5 oz/ac w/ 45psi, 15 gal/ac, NIS
Fungicide variable:	Priaxor 2oz/ac w/ 40psi 12 gal/ac, NIS
Growth Regulator:	Palisade, 11oz/ac 40psi 12 gal/ac

Response of soft winter wheat varieties to selected inputs, Deckerville, MI, 2015

treatment	Jupiter			Red Devil			Red Dragon			Sunburst			Whale			average		
	yield bu/ac; 13M	tst wt lbs/ac	moist. %															
1. untreated control	99	62	13	102	61	14	104	62	13	101	58	14	101	60	14	101	60	13
2. Prosaro	104	61	13	108	60	14	108	61	13	110	60	15	111	60	15	108	61	14
3. 140 # N	106	62	13	113	61	14	113	62	13	109	60	15	109	59	15	110	61	14
4. Prosaro, 140# N	112	61	14	119	60	15	115	61	13	116	59	16	117	59	15	116	60	15
5. Prosaro, 140# N, Prioxor	116	60	14	122	60	15	117	61	13	120	59	16	120	58	16	119	60	15
6. Prosaro, 140# N Palisade	110	61	14	118	59	15	113	61	14	121	58	16	123	58	17	117	59	15
average	108	61	13	114	60	15	112	61	13	113	59	15	114	59	15	112	60	14



2015 Custom Machine and Work Rate Estimates

FIRM Team Fact Sheet Number 15-01
 Available at <http://www.firm.msue.msu.edu>
 Author ; Dennis Stein, District Farm Business Management Educator, MSUE
 Michigan State University Extension • April 2015

2015 Production Season Costs								updated 05.05.15
Farm Labor Unskilled ⁷ = \$ per hour	\$12.70							\$2.95 per gallon of fuel
Farm Labor skilled ⁷ = \$ per hour	\$15.70							\$3.25 per gallon lube & fuel cost
TRACTORS ONLY:								
		max.	min.	Custom \$/Hour	Machine Cost \$/Hour	Est. Fuel Gal. / Hour	Est. Fuel Cost per Hour	
No driver, or fuel cost	4WD - 260 hp.	\$ 144.00	\$ -	\$143.00	\$107.88	9.95	\$32.29	
Ohio = 0.34/ hp hr	MFWD - 200 hp.	\$ 58.40	\$ 51.90	\$86.44	\$55.81	7.04	\$22.84	
Iowa=\$0.28/ hp-hour (fuel not included)	MFWD - 130 hp.	\$ 38.10	\$ 34.57	\$63.57	\$36.70	5.72	\$18.56	
Est. Tractor Cost \$0.27/hp/hr.	2- WD - 75 hp.	\$ 32.00	\$ 17.14	\$36.13	\$23.36	3.3	\$10.71	
Est. Fuel use .044 gal. diesel/PTO hp / hour	2- WD - 40 hp.	\$ 25.00	\$ 14.50	\$25.00	\$14.65	1.76	\$5.71	
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)	\$18.63	\$ 25.00	\$ 13.00	\$23.51	\$98.04	4.17	1.32	
Chisel Plow (23 ft.)	\$16.35	\$ 22.00	\$ 12.00	\$11.36	\$148.02	13.03	0.60	
Chisel - front disk (16.3 ft.)	\$17.95	\$ 25.00	\$ 17.00	\$14.65	\$134.93	9.21	0.97	
Vertical tillage	\$16.03	\$ 21.00	\$ 10.00					
Disk - V - Ripper combo (17.5 ft)	\$23.90	\$ 33.00	\$ 14.75	\$21.57	\$194.56	9.02	1.47	
Subsoiler 30" - 10ft (12-15")	\$20.10	\$ 25.00	\$ 13.50					
Discing - tandem (21 ft)	\$15.12	\$ 20.00	\$ 7.50	\$10.87	\$132.83	12.22	0.58	
Field Cultivator (23 ft.)	\$13.19	\$ 21.00	\$ 8.00	\$7.10	\$117.79	16.59	0.32	
Harrow	\$11.25	\$ 13.00	\$ 4.00					
Soil Finisher	\$14.32	\$ 20.00	\$ 10.00					
Strip tillage	\$18.50							
Row Cultivate (12 rows)	\$14.12	\$ 19.00	\$ 8.00	\$7.55	\$116.65	15.45	0.46	
Row Cultivate-high residue (12rows)	\$12.66							
Stalk Shredder (20 ft.)	\$12.80	\$ 17.50	\$ 6.50	\$13.12	\$101.81	7.76	0.74	
Rotary Hoe (21 ft.)	\$9.07	\$ 15.00	\$ 5.50	\$2.78	\$72.17	25.96	0.18	
Land Rolling	\$7.90	\$ 12.00	\$ 5.00					
Highboy spraying	\$10.13	\$ 16.00	\$ 4.50					
Boom Sprayer - self-Prop.80ft.	\$8.25	\$ 8.80	\$ 5.20	\$5.01	\$221.04	44.12	0.14	
Boom Sprayer - pull type 50ft.	\$8.15	\$ 15.00	\$ 5.00	\$3.78	\$96.81	25.61	0.10	
Spraying- road ditches/ hr	\$63.80	\$ 85.00	\$ 30.00					
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 - w/fert & insect 30" corn-soys	\$19.13	\$ 30.00	\$ 13.00	\$15.00	\$191.25	12.75	0.32	
Planter- conventional no attachments	\$18.25	\$ 28.00	\$ 12.00	\$13.07	\$169.91	13.00	0.32	
Planter only	\$12.55							
Planter only - notill	\$13.15							
Planter- soybean 15" rows	\$18.59							
Planter- No Till w/splitter & w/fert	\$20.52	\$ 30.00	\$ 15.00	\$17.11				
Planter- Min Till with fert&insect	\$21.07	\$ 27.00	\$ 15.00	\$14.83	\$188.79	12.73	0.53	
Planter conventional - Dry Beans	\$19.63							
Variable rate seeding	\$3.15	\$ 5.00	\$ 1.00					
Air Seeder Drill w/cart 52ft				\$19.76	\$435.91	22.06	0.45	
Drill Soybeans Conventional	\$15.92	\$ 24.00	\$ 12.00					
Drill - No Till (15 ft.)	\$18.37	\$ 28.00	\$ 14.00	\$24.78	\$157.60	6.36	0.81	
Drill - No Till - drill only no tractor	\$12.15	\$ 18.00	\$ 8.00					
Drill Grain, press wheels	\$15.72	\$ 20.00	\$ 10.00	\$13.78	\$116.85	8.48	0.61	
Grain drill- only-no tractor	\$10.35	\$ 15.00	\$ 6.00					
Seed Tender	\$3.75	\$ 6.00	\$ 2.00					
Pest Control - scouting	\$2.00							

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)	\$28.28				\$0.00	4.67	0.99
Sugar Beet Cultivation	\$16.03				\$0.00	5.60	0.81
Sugar Beet Topper	\$15.40				\$0.00	7.13	0.56
Sugar Beet Harvester	\$95.95				\$0.00	3.03	2.22
Sugar Beet Cart	\$35.35				\$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)	\$31.76	\$ 55.00	\$ 25.00	\$46.92	\$318.59	6.79	2.35
Combine - stalk chopper head	\$41.05	\$ 57.00	\$ 30.75				
Combine Small grains (20 ft head)	\$30.44	\$ 35.00	\$ 20.00	\$33.33	\$226.31	6.79	1.49
Combine Soybeans (25 ft. head)	\$31.82	\$ 53.00	\$ 24.00		\$0.00	7.42	1.95
Combine Soybeans- air reel- flex	\$37.05	\$ 42.00	\$ 32.00	\$39.82			
Combine, cart, haul to storage - Corn	\$42.63	\$ 90.00	\$ 30.00				
Combine, cart, haul to storage - Soybeans	\$41.88	\$ 85.00	\$ 30.00				
GPS mapping addition to harvesting	\$2.90	\$ 5.00	\$ 1.00				
Picker 2 row - Ear Corn + 3 wagons	\$29.27	\$ 35.00	\$ 25.00				
Combine Field Beans (belt pickup)	\$36.67			\$31.08	\$207.93	6.69	1.81
Pulling Dry Beans (knife 6 row)	\$9.50						
Pulling Dry Beans (rod 6 row)	\$8.50						
Dry Bean – windrowing (6 row)	\$9.50						
Grain Cart - corn / acre	\$5.83	\$ 15.00	\$ 2.00	\$21.42	\$147.16	6.87	1.44
Grain Cart only - corn / acre	\$4.23	\$ 10.00	\$ 2.00				
Chopping Forage- Pull type	\$6.50/ ton	\$ 175.00	\$ 60.00				
Chopping Forage -Pull type Pickup hd-10ft	\$9.50/ ton						
Chopping Forage-Self-propelled /hr	\$247/ hr.	\$ 750.00	\$ 70.00	\$50.36	\$69.50	1.38	2.35
Chopping Silage- Self propelled- per ton	\$6.18	\$ 10.00	\$ 5.00				
Chopping Haylage- Self propelled	\$8.09	\$ 12.50	\$ 7.50				
Snaplage/ acre	\$54.05	\$ 69.50	\$ 50.00				
Silo Filling-Tower silo; /ton 1Tractor, 1Chopper & Driver, Wagons	\$9.53 per ton						
Haylage chopping per ton	\$8.53 per ton						
Bunk Filling- chop, haul, filling & packing / ton	\$9.85						
Silage Bagging per ft. (9 ft diameter)	\$9.15	\$ 13.33	\$ 9.00				
Mowing	\$13.47	\$ 16.00	\$ 9.00				
Raking	\$7.02	\$ 10.00	\$ 4.00	\$6.52	\$22.75	3.49	0.50
Tedding	\$7.30	\$ 8.00	\$ 8.00				
Windrowing - hay or straw	\$7.70	\$ 16.50	\$ 5.00				
Mower-Conditioner Pull-type (9 ft.)	\$14.88	\$ 19.00	\$ 11.00	\$14.22	\$62.43	4.39	0.40
Mower-Conditioner- Self Propelled (16ft)	\$13.66						
Mower - Conditioner- Rotary (12ft)				\$9.48	\$73.56	7.76	0.38
Small Square Baling Hay	\$0.89 per bale	\$ 1.10	\$ 0.50				
Straw	\$0.72 per bale						
Mow, Rake, Baler & Handle - small sq.	\$1.85 per bale	\$ 1.00	\$ 4.00				
Baler, Rake & Handle - Lrg Round	\$20.50/bale						
Complete Hay harvesting per ton	\$35.00						
Wrapping Bales		\$ 10.00	\$ 4.00				
Baling Round- 600-800 # per bale	\$8.23 per bale	\$ 10.00	\$ 5.50				
Baling Round -1200 -1500 # per bale	\$11.14 per bale	\$ 14.00	\$ 8.00				
Baler 1000# Round/ with wrapper	\$12.08 per bale						
Mow-Rake-Bale-fld Haul- Lrg. Round/bale	\$19.76 per bale						
Baling -1500 # Lrg. Round - straw	\$14.24 per bale						
Baling -1500 # Lrg. Round - corn stalks	\$15.50 per bale						
Baling -1500 # Lrg. Round - straw - with wrap	\$16.24 per bale	\$ 16.00	\$ 10.00		\$0.00	3.04	0.49
Baling -1500 # Lrg. Round - Corn Stalks w/wrap	\$17.50 per bale						
Picking up w/accumulator- lrg.sq.bale	\$3.42	\$ 4.00	\$ 1.75				
Baling – Lrg Sqr. Hay 4x3x6	\$12.58 per bale	\$ 12.00	\$ 8.00		\$0.00	11.64	0.49
Hauling round bales/bale/loaded mile	\$0.14	\$ 0.20	\$ 0.01				
Hauling square bales/bale/loaded mile	\$0.09	\$ 0.20	\$ 0.01				
Baled & Wrapped - plastic	\$18.00						
Baling – Lrg Sqr. Hay 4x3x8	\$13.75						

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	\$5.93	\$ 9.00	\$ 2.00				
Fertilizer dry Bulk Spreader only	\$3.63	\$ 4.50	\$ 3.00				
Lime application	\$7.15	\$ 10.00	\$ 3.00				
Fertilizer- Liquid-Knifed In	\$12.90	\$ 20.00	\$ 13.00				
Fertilizer - side dressing	\$11.58	\$ 18.50	\$ 6.00				
Liquid-Sprayed:	\$7.54	\$ 12.00	\$ 5.00				
Fertilizer- Anhydrous: 21 ft.	\$13.00	\$ 20.00	\$ 6.75				
Soil Testing - GPS grid samples	\$7.65	\$ 10.00	\$ 2.50				
Manure Hauling-semi-solid Load & Spread per hr.	\$115.60	\$ 150.00	\$ 75.00				
Liquid Manure Spreader Injected -1000 gal.	\$10.98	\$ 16.00	\$ 10.00	74.47/ 6000GAL			
Liquid Manure spreader only /hr.	\$41.35	\$ 50.00	\$ 35.00				
Solid Manure spreader only /hr	\$53.63	\$ 45.00	\$ 35.00				
Liquid Manure injected Drag Line -1000 gal.	\$12.35	\$ 15.00	\$ 10.00				
Manure Pump, Hauling, Spreading - liquid (9500 gallon cap.) per hour	\$92 per hour						
Manure Pump, Hauling, Injecting 1000 gal. liquid (9500 gallon cap.)	\$12.50/1000 gal.						
Bobcat/Skid Loader / hr.	\$53.40	\$ 80.00	\$ 30.00				
Mowing CRP or pasture / acre	\$18.35	\$ 30.00	\$ 10.00				
Ditch Mowing	\$59.81 per hour						
Brush Hogging / acre	\$23.42	\$ 40.00	\$ 20.00				
Grain Drying- continuous flow /point/ bu.	\$0.04/pt./bu.	\$ 0.06	\$ 0.04				
Grain Drying - inbin dryer /point/bu.	\$0.06/pt./bu.	\$ 0.07	\$ 0.05				
Grain Auger/ bu.	\$0.05	\$ 0.10	\$ 0.01				
Grain Auger only / bu	\$0.04	\$ 0.08	\$ 0.02				
Blower- silo filling / hour	\$19.90	\$ 35.00	\$ 9.00				
Grain Storage/ mo.	\$0.06/bu./mo.	\$ 0.10	\$ 0.03				
Grain Storage for season	\$ 0.21 per bu.	\$ 0.50	\$ 0.09				
Grain Haul - per bushel - field to farmstead	\$0.09/ up to 10 miles	\$ 0.15	\$ 0.06	.098/ 5miles			
Grain Haul - per bushel - farm to mkt 25mi	\$0.17/ up to 25 miles	\$ 0.30	\$ 0.09				
Power Washing per hr.	42.38						
Rock picking	\$14.85	\$ 20.00	\$ 9.00				
Auto Steer System	\$1.36						
Machine storage square foot per year	\$0.51						
Custom Farming - Corn	\$111.44	\$ 175.00	\$ 82.00	(all machine operations for growing & harvest)			
Custom Farming - Soybeans	\$97.31	\$ 170.00	\$ 78.00	(all machine operations for growing & harvest)			
Custom Farming - Sm Grains	\$96.43	\$ 100.00	\$ 82.50	(all machine operations for growing & harvest)			

Fuel cost is calculated by adding fuel, oil and lube **\$2.95 Fuel Price ==>**

\$3.245 ** base fuel & lube price used

1 **Custom \$ per acre:** Represents the rate obtained from surveys of actual farm data surveys for 2014 & 2015 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 their locations.

This numbers includeds machine, power unit & operator where needed. Values have been adjusted higher to reflect the change in power fuel costs noted above.

2 **Custom \$ per acre:** Is the Custom \$ per acre: adjusted to reflet a fuel and lubrication from the base fuel price noted above.

3 **Total Machine Cost/Acre:** Includes tractor, fuel cost⁷, 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 2014, 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 2014.

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 horsepower-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 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 2014 © - <http://faculty.apec.umn.edu/wlazarus/documents/machdata.pdf>
- Iowa 2015 Iowa Farm Custom Rate Survey - Ag Decision Maker - <http://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf>
- Ohio State University - Ohio Farm Custom Rates 2014 - by Barry Ward http://ohioline.osu.edu/ae-fact/pdf/Ohio_Farm_Custom_Rates_AEDE_11_14.pdf
- Texas A&M University, 2013 Texas Agricultural Custom Rates - <http://agecoext.tamu.edu/files/2013/07/CustomRateSurveyMay2013.pdf>
- NASS- USDA & Pennsylvania Department of Ag, by Adam W. Pike - http://www.nass.usda.gov/Statistics_by_State/Pennsylvania/Publications/Machinery_Custom_Rates/CustomRates%202014.pdf
- Nebraska 2014 Farm Custom Rates Part 1 by Roger Wilson - <http://www.ianrpubs.unl.edu/live/ec823/build/ec823.pdf>
- Nebraska 2014 Farm Custom Rates Part 2 by Roger Wilson - <http://www.ianrpubs.unl.edu/public/live/ec826/build/ec826.pdf>
- University of Illinois - Machinery Cost Estimates© 5-2012, Univ. of Illinois @ <http://farmdoc.illinois.edu/manage/machinery/summary%202012.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, Senior Extension Educator, Michigan State University Extension. revised April 2015
362 Green Street, Caro, Michigan 48723 email: steind@msu.edu or web page: <http://www.msu.edu/user/steind/>

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 DIRT 1 5:

1. Depreciation: $\frac{\text{original cost} - \text{salvage value}}{\text{years of use}}$		\$ _____
2. Interest: interest rate x AIV ^a		\$ _____
3. Repairs: estimated 2 to 5 % of original cost		\$ _____
4. Taxes: (0 in Michigan - i.e., no taxes on personal property used in agriculture)		\$ _____
5. Insurance: (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.

Custom Machine rate calculator is available on line at Ohio State University: <http://aede.osu.edu/research/osu-farm-management/decision-tools>

Author: Dennis Stein, District Farm Business Management Educator, Michigan State University Extension
362 Green Street, Caro, Michigan 48723-1998 ♦ phone: 989.672.3870 ♦ email: steind@msu.edu ♦ web: <http://www.msu.edu/user/steind/>



MSU is an affirmative-action, equal-opportunity employer, committed to achieving excellence through a diverse workforce and inclusive culture that encourages all people to reach their full potential. Michigan State University Extension programs and materials are open to all without regard to race, color, national origin, gender, gender identity, religion, age, height, weight, disability, political beliefs, sexual orientation, marital status, family status or veteran status. Issued in furtherance of MSU Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Thomas G. Coon, Director, MSU Extension, East Lansing, MI 48824. This information is for educational purposes only. Reference to commercial products or trade names does not imply endorsement by MSU Extension or bias against those not mentioned.

2015 Participating Seed Companies:

CHANNEL BIOSEED

Monsanto Company
800 N. Lindbergh Blvd.
St. Louis, MO 63167
www.channel.com

GOLDEN HARVEST NK BRAND

Syngenta
11055 Wayzata Blvd
Minnetonka, MN 55305
www.syngentaseeds.com

NU TECH/G2 GENETICS

NuTech Seed, LLC
2321 North Loop Drive
Ames, IA 50010
www.nutechseed.com

CROPLAN

Croplan Genetics
P.O. Box 64281
St. Paul, MN 55164-5324
www.croplangenetics.com

GREAT LAKES

Great Lakes Hybrids
9915 West M-21
Ovid, MI 48866
www.greatlakeshybrids.com

RUPP

Rupp Seeds, Inc.
17919 Co. Rd. B
Wauseon, OH 43567
www.ruppseeds.com

D.F. SEEDS

D.F. Seeds, Inc.
905 S. Jackson St.
Dansville, MI 48819
www.dfseeds.com

HURON COMMODITIES, INC.

75 Wellington St.
Clinton, ON NOM 1LO,
Canada
<http://www.huron.com>

STEYER SEEDS

6154 North C.R. 33
Tiffin, Ohio 44883
www.steyerseeds.com

DAIRYLAND

Dairyland Seed Company
P.O. Box 958
West Bend, WI 53095
www.dairylandseed.com

LEGACY SEEDS

290 Depot St
Scandinavia, WI 54977
www.legacyseeds.com

STINE

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

DYNA-GRO

Crop Production Services
443 Allenby Drive
Marysville, OH 43040
www.dyna-groseed.com

MYCOGEN

Mycogen Seeds
9330 Zionsville Road
Indianapolis, IN 46268
www.mycogen.com

ZF SELECT

Zeeland Farm Services, Inc.
2525 84th Avenue
Zeeland, MI 49464
www.zfsinc.com

**The 2015 TARE Trials were made
successful by the generous support
of the following organizations:**

Corn Marketing Program of Michigan

Crop Production Services

Great Lakes Hybrids

Indian Summer Compost

Michigan Agriculture Commodities

Michigan Crop Improvement Association

Michigan Soybean Promotion Committee

Michigan Wheat Program

North Central S.A.R.E.

P and C Ag Solutions

Sanilac County Corn Growers

Syngenta

Thumb Drone Works

T N T Equipment Inc.

Yale Steel