

2016 Northwest Minnesota County Variety Research Trials



Variety Plot Trial Booklet
Funded by MSRPC
and the Soybean Checkoff



Variety Trial Organizers & Participants:

- Polk County Soybean-Corn Growers
- Pennington/Red Lake County Soybean-Corn Growers
- Marshall County Soybean-Corn Growers

Special Thanks to:

- Bill Craig, Ag Service Director, Marshall & Pennington Cnty, Project Lead
- Russ Severson, Crookston, MN, Project Support
- Nathan Johnson, U of M Extension, Project Support
- Jim Stordahl, U of M Extension, Project Support
- Howard Person, Thief River Falls, Project Support
- Dr. Grant Mehring, NDSU Assistant Professor, Statistical Analysis

Coordinated by the following Soybean Counties

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Cooperator/Location:

Tony Johnson Farm, Alvarado, MN

Planting Date: May 6, 2016

Harvest Date: October 3, 2016

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Cooperator/Location:

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Planting Date: May 6, 2016

Harvest Date: September 30, 2016

Polk County:

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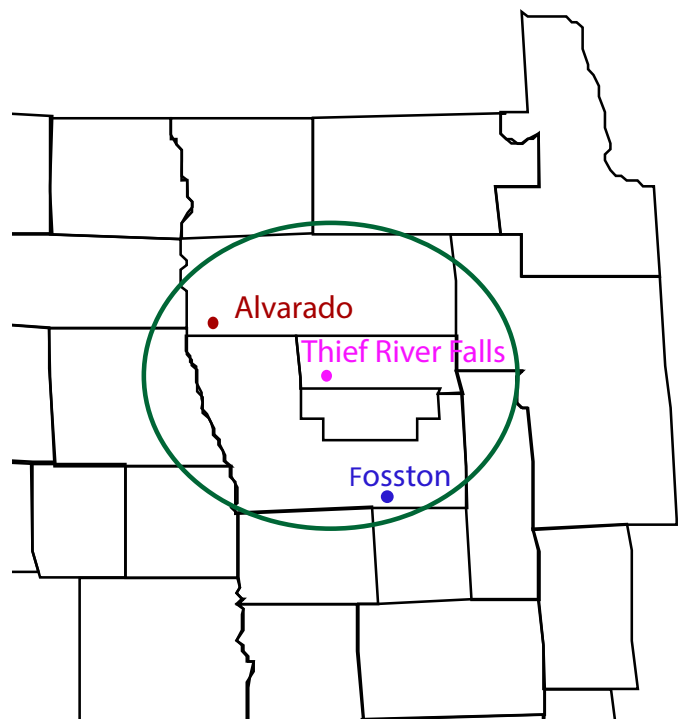
Cooperator/Location:

Ellsworth Danielson Farm, Fosston, MN

Planting Date: May 5 2016

Harvest Date: September 20, 2016

County Soybean Variety Trial Locations



Coordinated County Variety Trials and Research Trials:

The data presented here is part of a coordinated effort by Minnesota County Soybean Growers to expand the amount of research information that soybean growers have access to in northwest Minnesota. These trials are funded by entry fees paid by the seed companies.

There were three MN soybean counties across northern MN that participated in this coordinated effort. The results of these trials will be disseminated in the On-Farm Cropping Trials Booklet which will be available at the Prairie Grains Conference, December 8, 2016 and at future county meetings.

About This Variety Plot Trial:

The County Soybean Variety Plots are randomized small plot trials. They utilized three replicated blocks in each location. The soybean plots were planted with a Haldrup small plot cone planter and harvested with a small plot Zurn combine. For weed control, the plots were sprayed with glyphosate by the farmer-cooperator using commercial size equipment, utilizing driving lanes through the plots.

Data Interpretation:

Statistics are a mathematical tool used to summarize and interpret groups of numbers. In these tables we used a LSD (least significant difference) test to determine if differences in yield are due to genetic differences between varieties or due to other causes such as variability in soil type or fertility, or other environmental factors.

If the difference between two varieties exceeds the LSD value, with 95 percent probability, the higher yielding variety is significantly different in yield. If the difference between two varieties is less than the LSD value, then the variety yields are considered the same. The LSD number is also a measure of variability within a trial; and a large number indicates there is more variability in a location compared to a location with a small LSD number.

Coefficient of Variation (CV) is an indicator of how much variability there was within the soybean trial location (uneven seeding rate, emergence, insect damage, disease, soil type etc.) that was not due to any effect of the varieties. A CV of less than 15 indicates a very uniform trial site; therefore, differences in soybean yields are the result of varieties rather than other external factors.

Relative Maturity:

Relative maturity ratings are provided for each entry. These ratings consist of a number for the maturity group designations (000, 00, 0, 1, 2) followed by a decimal and another number, ranging from 0-9, which indicates a ranking within each maturity group. For example the entry MN0101 indicates a 0.1, making it an early group 0, while MN0901, with a 0.9 rating, is the latest group 0.

County Variety Trials and Plot Tours:

In 2016 county soybean varietal trials were conducted in Marshall, Pennington/Red Lake, and Polk counties. The plots are conducted as random, replicated trials. The trial results are published in booklet and online form for all soybean growers and seed companies to use to provide selection information to improve soybean production within each county. The county data, along with university plot data, can provide useful yield information for purchasing top yielding varieties that improve soybean production and profitability within the region. County plot tours, sponsored by the University of Minnesota Extension and Minnesota Soybean Research & Promotion Council, were held in August. The plot tours allowed growers to view the plots and learn about soybean varieties from seed company representatives. Production updates were also presented by the University of Minnesota Extension researchers. Note: Varieties containing an X are Roundup Ready2Xtend soybeans containing Dicamba and Glyphosate tolerant genetics.

County Collaborators:

Bill Craig, Ag Services Director, Marshall & Pennington Counties & Russ Severson, Polk County Soybean Growers, Associate Director

Characteristics of Soybean Varieties and Variety Placement Across Zones

PHYTOPHTHORA ROOT ROT is a destructive soil borne disease that can cause soybean stand loss and reduced plant productivity. The primary means of managing this disease is to plant varieties that are resistant to the pathogen. This is a bit of a 'cat and mouse' game since there are over 55 races of this disease and approximately 8 single resistance genes, designated as *Rps* genes that are used in soybean that offer different spectrums of control. Each *Rps* gene offers control of several races of phytophthora but no gene offers control of all races. The key to managing this disease is to know which *Rps* gene is used in each soybean field you plant and make an annual evaluation of how well it is performing. For example, if the soybean variety you have chosen has a *Rps* 1k gene and you plant it in two fields and you notice phytophthora is very low in field A but is pretty noticeable in spots in field B, you want to make field notes to avoid using the *Rps* 1K gene in field B in future soybean variety selections.

SOYBEAN CYST NEMATODE (SCN) is a highly damaging pest of soybean. Surveys indicate this pest is expanding its range in NW Minnesota and you should be testing your soil to determine if it is present. Crop rotation and planting SCN resistant varieties are the primary means for managing this microscopic roundworm.

SEED TREATMENTS: 1-16: Fungicides / 17-19: Insecticides / 20: Inoculants / 21: Other					
Ref #:	Treatment	Ref #:	Treatment	Ref #:	Treatment
1	Azoxystrobin	8	Mefenoxam	15	Trichoderma harzianum Rifai
2	Bacillus pumilus	9	Metalaxyl	16	Trifloxystrobin
3	Bacillus subtilis	10	Pyraclostrobin	17	Clothianidin
4	Captan	11	Streptomyces griseoviridis	18	Imidacloprid
5	Fludioxonil	12	Streptomyces lydicus	19	Thiamethoxam
6	Ipconazole	13	Thiabendazole	20	Bradyrhizobium japonicum
7	Mancozeb	14	Thiram	21	Other

In the Seed Treatment column on the form: List each of the seed treatments present on the variety. (I.e. If the variety is treated with CruiserMaxx Plus (mefenoxam, fludioxonil, thiamethoxam) you would put 8,5,19 in the box. If the seed treatment list does not include one of the compounds use the number 21.)

Phytophthora	
Ref #:	Gene:
1	Rps 1a
2	Rps 1b
3	Rps 1c
4	Rps 1k
5	Rps 3
6	Rps 4
7	Rps 6

SCN Trait:	
Ref #:	Trait
1	PI88788
2	Peking
3	Other

Early Soybean Varieties - 00.8 and Earlier

Company	Variety	Relative Maturity	SCN Trait	Phytophthora Gene ng = No Gene	Seed Treatment (See chart above for reference)
Channel	00806R2	00.8	-	3	9, 10, 21
Dyna-Gro	S005RY87	00.5	-	3	5, 8, 19, 21
Dyna-Gro	S007XT27	00.7	1	3	9, 10, 18, 21
Integra	20097	00.9	-	-	8, 5, 19
Legacy	LS-00835	00.8	1	5	8, 5, 19
Legend	LS-007R653	00.7	-	ng	8, 5, 19
Legend	LS-004R752	00.4	-	5	8, 5, 19
Northstar	NS-0080R2	00.6	-	3	19, 9, 5, 21
Northstar	NS-0072R2	00.7	-	3	19, 9, 5, 21
Northstar	NS-0081NR2	00.8	1	5, 3	19, 9, 5, 21
NuTech	6008 R2	00.8	-	-	8, 5, 19
Peterson	16R008N	00.8	-	5, 3	16
Proseed	50-08	00.8	1	3	19
Proseed	XT6007	00.7	1	3	19
REA	R00727	00.7	-	-	9, 10, 21
Syngenta	S007-Y4	00.5	-	3	8, 5, 19
Wensman	W30065NR2	0.06	1	5, 3	5, 8, 19, 21

Medium Soybean Varieties - 00.9 - 0.3

Company	Variety	Relative Maturity	SCN Trait	Phytophthora Gene ng = No Gene	Seed Treatment (See chart above for reference)
Channel	0209R2	0.2	-	3	9, 10, 21
Channel	0205R2	0.2	-	3	9, 10, 21
Dairyland	DSR-0225/R2Y	0.2	-	3	5, 8, 19, 20
Dairyland	DSR-0305/R2Y	0.3	-	4	5, 8, 19, 20
Dairyland	DSR-C918/R2Y	00.9	-	4	5, 8, 19, 20
Dyna-Gro	S03RY36	0.3	-	3	5, 8, 19, 21
Dyna-Gro	S01RY86	0.1	-	3	5, 8, 19, 21
Integra	20126	00.9	-	-	8, 9, 19
Integra	20087	0.1	-	-	8, 5, 19
Legacy	LS-0334 RR2	0.3	-	4	8, 5, 19
Legacy	LS-0214 RR2	0.2	-	-	8, 5, 19
Legacy	LS-0135 RR2	0.1	-	3	8, 5, 19
Legend	03R650	0.3	-	5	8, 5, 19
Legend	01R656	0.1	-	3	8, 5, 19
Northstar	0111R2	0.1	-	3	19, 9, 5, 21
NuTech	6021	0.2	-	-	8, 5, 19
Partners Brand	PB00961	00.9	1	4	8, 5, 19
Partners Brand	PB0361	0.3	-	-	8, 5, 19
Partners Brand	PB0251	0.2	-	5	8, 5, 19
Peterson Farms	16R01	0.1	-	3	16
Peterson Farms	17R008N	00.9	-	3	16
Pioneer	P02T54R	0.2	-	4	-
Prairie Brand	PB-0397R2	0.3	-	-	5, 8, 19, 21
Prairie Brand	PB-0146R2	0.1	1	3	5, 8, 19, 21
Prairie Brand	PB-00856R2	00.9	1	3, 5	5, 8, 19, 21
REA	R0216	0.2	-	3	9, 10, 21
Syngenta	S02-B4	0.2	-	4	8, 5, 19
Wensman	W1037RX	0.3	-	3	5, 8, 19, 21
Wensman	W3018R2	0.1	-	3	5, 8, 19, 21

Late Soybean Varieties - 0.4 and later

Company	Variety	Relative Maturity	SCN Trait	Phytophthora Gene ng = No Gene	Seed Treatment (See chart above for reference)
Channel	0507R2	0.5	1	3	9, 10, 21
Dairyland	DSR-0619/R2Y	0.6	1	5	5, 8, 19, 20
Latham	0685	0.6	1	5	5, 8
Latham	0485	0.4	1	5	5, 8
NuTech	6048	0.4	-	4	8, 5, 19
Pioneer	P06T28R	0.6	-	4	-
Proseed	XT 607	0.7	1	3	-
REA	R0815	0.8	1	3	9, 10, 21
REA	64G94	0.4	1	-	9, 10, 21
Syngenta	S06-Q9	0.6	1	-	8, 5, 19
Wensman	W1048NRX	0.4	1	5	5, 8, 19, 21

EARLY MATURITY

Variety trial results for two* NW Minnesota counties and the combined analysis for soybean yield, 2016.

Brand	Variety	Relative Maturity	Polk (bu/ac)	Pennington/Red Lake (bu/ac)	Combined (bu/ac)
Proseed	50-08	00.8	60.2	69.6	64.9
Legacy	LS-00835	00.8	56.5	70.7	63.6
Peterson	16R008N	00.8	56.8	70.2	63.5
Integra	20097	00.9	55.4	70.7	63.0
Northstar	NS-0081NR2	00.8	55.4	67.3	61.4
Legend	LS-004R752	00.4	51.1	71.0	61.1
Dyna-Gro	S005RY87	00.5	52.3	68.5	60.4
Channel	00806R2	00.8	47.3	71.6	59.4
Legend	LS-007R653	00.7	50.0	65.4	57.6
Northstar	NS-0072R2	00.7	54.3	60.6	57.4
Proseed	XT6007	00.7	46.6	68.0	57.3
NuTech	6008 R2	00.8	48.0	65.7	56.8
REA	R00727	00.7	48.0	64.3	56.1
Northstar	NS-0080R2	00.6	46.0	65.1	55.6
Syngenta	S007-Y4	00.5	43.7	67.6	55.6
Wensman	W30065NR2	00.6	42.1	65.4	53.8
Dyna-Gro	S007XT27	00.7	42.1	63.6	52.9
Average			50.3	67.4	58.8
CV			8.8	7.5	8.1
LSD (0.05)			7.4	8.7	7.8
Top Third			54.4-60.2	68.0-71.6	61.0-64.9
Mid Third			48.3-54.3	64.3-67.9	57.0-60.9
Bottom Third			42.1-48.2	60.6-64.2	52.9-56.9

Variety trial results for three NW Minnesota counties and the combined analysis for soybean yield, 2016.

Brand	Variety	Relative Maturity	Polk (bu/ac)	Pennington/Red Lake (bu/ac)	Marshall (bu/ac)	Combined (bu/ac)
Legacy	LS-0334 RR2	0.3	61.5	70.8	59.3	63.9
Dairyland	DSR-0225/R2Y	0.2	55.7	67.1	64.6	62.5
Northstar	0111R2	0.1	60.8	71.4	54.6	62.3
Prairie Brand	PB-0397R2	0.3	60.3	68.2	57.2	61.9
Legend	03R650	0.3	57.6	66.0	61.7	61.8
Wensman	W1037RX	0.3	54.7	59.8	70.0	61.5
Prairie Brand	PB-0146R2	0.1	54.7	65.3	62.9	60.9
Dyna-Gro	S03RY36	0.3	54.5	68.7	58.9	60.7
Peterson Farms	16R01	0.1	55.7	67.8	58.7	60.7
Wensman	W3018R2	0.1	55.2	69.6	55.1	60.0
REA	R0216	0.2	49.3	71.2	58.0	59.5
Dairyland	DSR-0305/R2Y	0.3	60.8	66.3	51.2	59.5
Legend	01R656	0.1	51.3	68.8	56.8	59.0
Channel	0209R2	0.2	49.5	68.9	57.8	58.7
Dyna-Gro	S01RY86	0.1	52.9	65.6	57.0	58.5
Channel	0205R2	0.2	49.4	66.8	59.3	58.5
Partners Brand	PB0361	0.3	60.3	58.1	54.5	57.6
Partners Brand	PB0251	0.2	57.2	64.5	50.7	57.4
Legacy	LS-0135 RR2	0.1	55.1	75.8	38.0	56.6
Legacy	LS-0214 RR2	0.2	52.3	67.9	46.5	55.5
Integra	20126	00.9	53.7	61.9	48.5	54.7
Dairyland	DSR-C918/R2Y	00.9	53.6	60.6	44.7	53.0
Peterson Farms	17R008N	00.9	50.6	59.2	46.8	52.2
Partners Brand	PB00961	00.9	48.7	63.1	41.0	50.9
Syngenta	S02-B4	0.2	46.4	60.2	44.7	50.4
Prairie Brand	PB-00856R2	00.9	48.3	68.9	29.4	48.9
Integra	20087	0.1	45.9	60.8	37.1	47.9
NuTech	6021	0.2	48.9	56.4	34.5	46.6
Pioneer	P02154R	0.2	46.9	58.4	14.3	39.9
Average			53.5	65.5	50.8	56.6
CV			9.7	8.9	10.2	9.5
LSD (0.05)			8.5	9.3	8.6	10.8
Top Third			56.5-61.5	69.4-75.8	51.5-70.0	56.0-63.9
Mid Third			51.2-56.4	62.9-69.3	32.9-51.4	47.9-55.9
Bottom Third			45.9-51.1	56.4-62.8	14.3-32.8	39.9-47.8

MEDIUM MATURITY

Variety trial results for three NW Minnesota counties and the combined analysis for soybean yield, 2016.

Brand	Variety	Relative Maturity	Polk (bu/ac)	Pennington/Red Lake (bu/ac)	Marshall (bu/ac)	Combined (bu/ac)
REA	R0815	0.8	57.4	62.5	71.7	63.5
Proseed	XT 607	0.7	54.0	66.2	67.5	62.9
Dairyland	DSR-0619/R2Y	0.6	51.1	63.1	60.7	59.8
	Check		57.7	57.7	62.1	59.3
Syngenta	S06-Q9	0.6	55.3	63.9	61.1	58.8
Latham	685	0.6	52.4	61.6	57.3	57.7
Pioneer	P06T28R	0.6	52.5	60.8	57.1	57.2
Latham	485	0.4	50.9	59.7	58.7	56.9
Wensman	W1048NRX	0.4	51.2	62.6	55.7	55.9
REA	64G94	0.4	51.3	60.2	52.9	55.5
NuTech	6048	0.4	51.5	60.6	52.4	54.3
Channel	0507R2	0.5	53.3	65.8	47.4	54.1
	Average		53.2	62.0	58.7	58.0
	CV		5.4	6.3	8.6	7.8
	LSD (0.05)		5.8	NS	8.3	6.5
	Top Third		55.5-57.7	63.5-66.2	63.8-71.7	60.5-63.5
	Mid Third		53.2-55.4	60.6-63.4	55.6-63.7	57.3-60.4
	Bottom Third		50.9-53.1	57.7-60.5	47.4-55.5	54.1-57.2

Soybean Production Research - MN Soybean Research & Promotion Council

Mission: To help farmers turn discoveries from science into higher crop yields and enhance profit potential in the field.

Why it matters:

Unbiased production research information is vital to farmers across Minnesota. Because fewer public dollars are spent on agricultural research and extension, projects supported by the Production action team make valuable management information and new soybean cultivars available to farmers across the state.

Research Funding:

In 2016, the Production action team recommended 21 projects for funding. Checkoff dollars are leading the way to increasing soybean yield and enhancing environmental stewardship. Funded projects included developing genetic resistance to SCN, Soybean Aphid and Sudden Death Syndrome, development of biological control for soybean cyst nematode, enhancing soybean aphid management, optimizing soybean plant nutrition management and continued technology transfer program support for control of herbicide resistant weeds, optimizing soybean pest (insect and disease) management and improving soil health.

U of M Soybean Breeding Position:

Farmer leaders and Minnesota Soybean production staff participated in the process with the Department of Agronomy and Plant Genetics at the University of Minnesota to identify and hire a new soybean breeder for Minnesota. Dr. Aaron Lorenz began in March 2015. He worked closely with Dr. Jim Orf to transfer duties as Orf moves toward retirement after more than 30 years of service to Minnesota soybean farmers in the development of new cultivars and germplasm in 2016.

Conservation Tillage Conference and Soil Health Field Day:

The Production action team co-sponsored the University of Minnesota Conservation Tillage Conference and the Soil Health Field Day, which demonstrated the impacts of conservation tillage, soil salinity and other agronomic practices on Soil Health. Farmers could see actual compaction following various tillage practices via soil pits excavated in the field. Agronomic practices were evaluated for crop and soil health responses. Several different equipment manufacturers demonstrated equipment to minimize tillage effects and provide in-furrow cover crop planting methods.

Production Breakout:

Projects	Subject
8	Agronomic research and technology transfer
3	Disease and Pest Management
2	Insect Management
8	Soybean breeding, molecular genetics and functional genomics