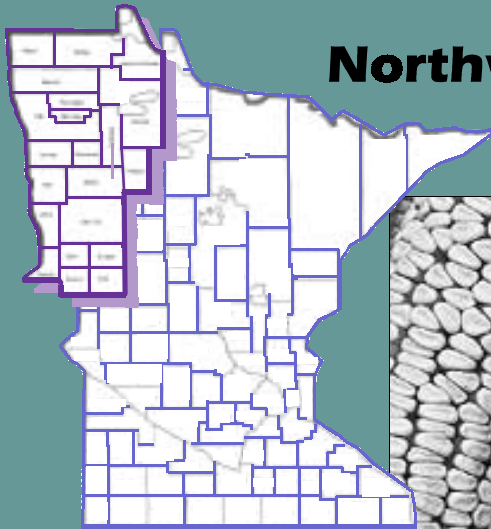


January 2000

On-Farm Cropping Trials

Northwest and West Central Minnesota



UNIVERSITY OF MINNESOTA
Extension
SERVICE



1999 On-Farm Cropping Trials For Northwest and West Central Minnesota

The U of M Extension Service Crops team is pleased to provide you with the results of the 1999 on-farm field cropping trials conducted in NW and WC Minnesota.

This is a new publication for Minnesota. It was developed to increase the awareness and impact of the many on-farm cropping projects conducted in Minnesota. The booklet contains summary information for projects on a wide range of management issues for corn, soybeans, small grains, and other crops. We hope this year's publication will serve as a prototype for future years and additional regions in the state.

These projects were made possible thanks to the hard work of many people. This includes the farmers, Extension Educators, and specialists who conducted these trials and names are listed with the results. Also, thank you to our graphic designer Theresa Hébert and the task force. Other contributors include the University of Minnesota Extension Service, Natural Resource Conservation Service (NRCS), North Central Region Sustainable Agricultural Research and Education Program (NCRSARE), Minnesota Wheat Research and Promotion Council, and the Minnesota Soybean Research and Promotion Council.

The studies included in this booklet are listed as either a research/demonstration or a demonstration plot. Included is a description of the difference between the two. Whenever possible, research plot data were analyzed using statistics.

For more information about any of the projects included in this report, please contact the Extension Educator or specialist listed. We invite your input on priorities you believe are important for Minnesota crop producers and have included an evaluation for you to complete and mail to the address printed on the back of the evaluation form.

Sincerely,

Jodi DeJong

Task Force Chair
Extension Educator - Environmental Stewardship
West Central Research and Outreach Center
State Hwy 329, PO Box 471
Morris, MN 56267

Neil Hansen

Soil and Water Quality Specialist
West Central Research and Outreach Center
State Hwy 329, PO Box 471
Morris, MN 56267

Bill Wilcke

Extension Engineer
Biosystems and Ag Engineering
204 Bio Ag Engineering
1390 Eckles Ave
St. Paul, MN 55108

Jochum Wiersma

Small Grain Specialist
Northwest Research and Outreach Center
108 Ag Research Center
2900 University Ave
Crookston, MN 56716

Jim Stordahl

Extension Educator - Crop Systems
919 8th Avenue SW
PO Box 280
Moorhead, MN 56561-0280

Erv Oelke

Extension Agronomist - Crops
411 Borlaug Hall
1991 Upper Buford Circle
St. Paul, MN 55108

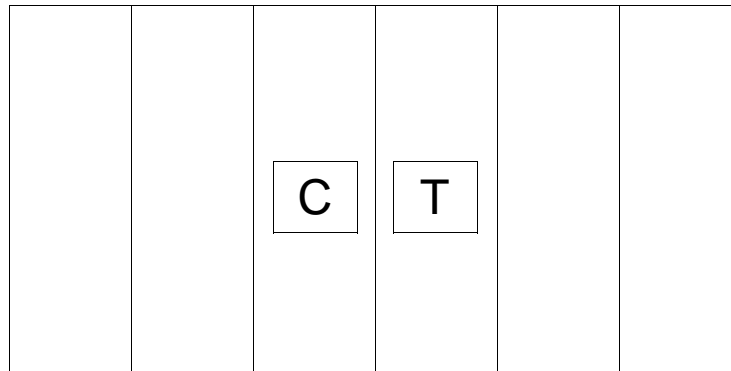
Demonstration Plots

The purpose of demonstration plots is to allow visual observation of differences between two or more treatments. However, demonstration plots, such as strip tests, may have a serious problem with field variability, which can make the results misleading. A statistical approach is a more meaningful way to compare treatments.

Replication is a key part of statistical methods because it addresses variability within a treatment due to other factors. However farmers may not be willing to replicate treatments in a strip plot trial. Another way this may be achieved is to include a number of farms in the strip plot trial, with the same treatments applied to all farms. Thus, each farm is a replicate.

A second concern in the validity of demonstration plots is biasing results by placing a favorite treatment on a preferred block of land. This can be avoided by randomly allocating treatment positions in the field by some independent means (e.g. drawing numbers from a hat). Randomization of treatments within a field is an extremely important factor contributing to the final reliability of the results.

Example of a demonstration plot:



C = Check Plot
T = Treated Plot

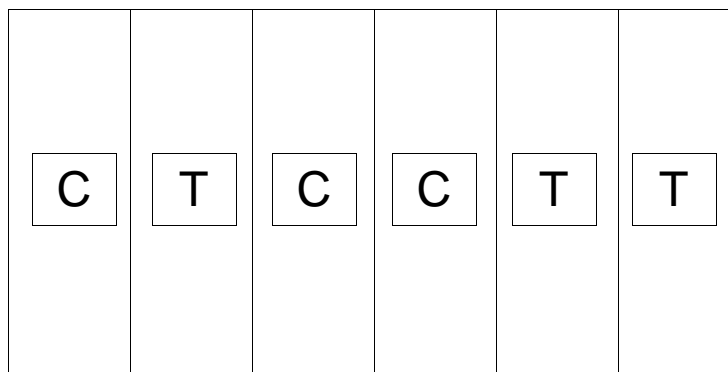
Research Plots

Research plots are randomized and replicated in the field or across geographic locations. Replication is used to increase precision in identifying treatment differences. It allows a statistical analysis of field variation. This analysis will help determine whether detected differences are real or due to random chance. Trials are generally replicated in space, time, or both. Randomization prevents one treatment from being favored in any way. A randomized trial mixes the order and placement of replicated plots.

Some comparisons of treatments may result in little or no statistically significant differences. When this occurs, it is not appropriate to conclude which treatment is superior. A difference of one or two bushels per acre between treatments may or may not represent a true yield advantage. If the small yield advantage continues for several years or over several locations within a single year, more confidence can be placed on that treatment. A minimum difference between means, called the least significant difference (LSD) is required for the observed difference to be attributed to the treatment.

It is critical that final conclusions about a new practice be made only after being evaluated over several years and/or at several locations.

Example of a research plot – randomized, replicated control and treated plots:



C = Check Plot
T = Treated Plot

Table of Contents

Title	County	Pg.
Red River Barley Variety Trial	Northwest District	7
White Mold Control & Nitrogen Management in Edible Beans	Hubbard, Otter Tail East, & Wadena Counties	8
Canola Rotation Study	Red Lake County	9
Canola Seed Treatment Comparisons	Northwest District	10
Corn Population & Row Width Study	Hubbard County	11
Corn Silage Variety Trial	Becker County	12
Corn Variety Trial	Clay & Norman Counties	13
Corn Variety Trial	Red Lake County	14
Corn Yield for Varying Poultry Litter Rates	Hubbard County	15
Field Pea as an Alternative Crop	Red Lake County	16
Soybean Inoculation & Nitrogen Treatment Trial	Kittson County	17
Soybean Inoculation & Nitrogen Treatment Trial	Polk West County	20
Soybean Inoculation for Reducing Iron Chlorosis	Grant, Stevens, & Traverse Counties	21
Soybean Iron Treatment Study	Norman County	22
Soybean Phosphorus Fertilizer Trial	Grant, Otter Tail West, & Wilkin Counties	23
Soybean Plant Population Trial	Grant, Otter Tail West, & Wilkin Counties	24
Soybean Seed Treatment Effects on Disease	Polk West County	25
Soybean Variety Trial	Mahnomen & Norman Counties	26
Soybean Variety Trial	Mahnomen County	27
Soybean Variety Trial	Norman County	28
Soybean Variety Trial & Iron Chlorosis Rating	Norman County	29
Soybean Variety & Iron Treatment Trial	Polk West County	30
Sugarbeet Root Rot Trial	Clay County	31
Hairy Vetch Interseeding in Sunflower	Red Lake County	32
Red River Wheat Variety Trial	Northwest District	33
Alternative Crops for Northwest Minnesota	Red Lake County	34
Pasture Renovation with Aeration	Lake of the Woods County	35

On-Farm Cropping Trials Booklet Evaluation Form

We want to know what you think about this booklet. Please take a few minutes to fill out this evaluation form and mail it to the address on the back of this sheet. Your comments will help shape the future On-Farm Cropping Trials Booklets.

1.) Where did you receive a copy of this booklet? (Check all that apply)

- In the mail
- An Extension Educator
- The local Coop
- At crop production meetings or field days
- Other _____

2.) In general, how will you use the On-Farm booklet?

- Read at least some
- Skim
- Save for future reference
- Pass on to a friend
- Recycle or discard without using
- Other _____

3.) How would you rate the On-Farm booklet in terms of:

	Excellent				Poor
Design	1	2	3	4	5
Communicating information on our projects	1	2	3	4	5
Clarity and readability	1	2	3	4	5
Interest to you	1	2	3	4	5

4.) How would you describe your profession? (Check all that apply)

- Farmer/rancher
- University researcher
- Extension Educator
- Seed/equipment dealer
- Nonprofit organization
- State/Federal employee
- Crop consultant
- Other _____

5.) I typically get my information about production practices from: (Check all that apply)

- Other farmers/ranchers
- Books
- Farm journals and newsletters
- Extension or other agency personnel
- The Internet
- Other _____

6.) Which information in the booklet was most useful to you in your work?

7.) What research topics would you like to see covered in future booklets?

8.a) Do you plan to make any changes in your agricultural practices as a result of information provided in this booklet?

8.b) What do you feel would be the economic impact of changing these practices?

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 52 MORRIS, MN

POSTAGE WILL BE PAID BY ADDRESSEE

UNIVERSITY OF MINNESOTA
WEST CENTRAL RESEARCH AND OUTREACH CENTER
STATE HWY 329
PO BOX 471
MORRIS, MN 56267

FOLD

FOLD

Red River Barley Variety Trial – Demonstration/Research

Northwest District

Cooperator:
 Dave Hasbargen
 Wayne Zimmerman
 Brian Hest
 Ray Swenson
 J. Wendell Sands
 Marv Hemrick
 Jim Kukowski
 Ron Anderson

Nearest Town:
 Foxhome, MN
 Ulen, MN
 Perley, MN
 Brooks, MN
 Alvarado, MN
 St. Hilaire, MN
 Strathcona, MN
 Hallock, MN

Purpose of the Study:

Evaluation of released cultivars for grain yield and grain quality in northwest Minnesota.

Funding: Minnesota Barley Council
Soil Type: Ranging from sandy loam to loam
Tillage: Field cultivator
Previous Crop: Wheat, Sugarbeets, Canola or Soybeans
Planting Date: 4/22/99 – 5/28/99
Row Width: 7”
Fertilizer: Applied by Cooperator
Herbicide: Buctril, Hoelon, Puma
Harvest Date: 7/29/99 – 8/20/99
Exp. Design: Randomized complete block, 2 replications

Company	Variety	Actual Yield (bu/a)		Yield Relative to % of Mean		Test Weight (lb/bu)	Grain Protein (%)	Plump (%)
		1 year	3 year	1 year	3 year			
NDSU	Foster *	120.9	93.1	105.2	101.0	42.3	12.1	89.0
U of M	Stander *	119.3	91.3	103.8	99.4	43.8	12.4	91.1
U of M	MnBrite	117.0	94.4	101.8	102.4	45.4	13.9	89.7
U of M	Robust *	114.4	88.3	99.6	95.8	44.7	13.1	90.0
Ag Canada	AC Oxbow	95.5	—	83.1	—	41.2	13.0	97.7
LSD (0.05)				6.4	4.2	1.0	0.2	1.1

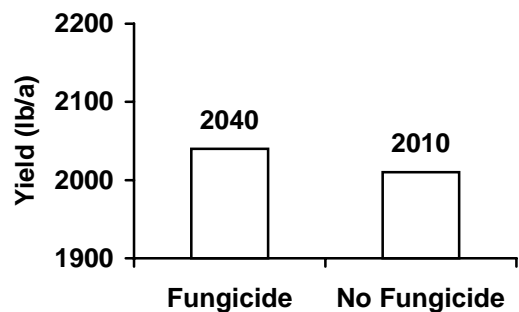
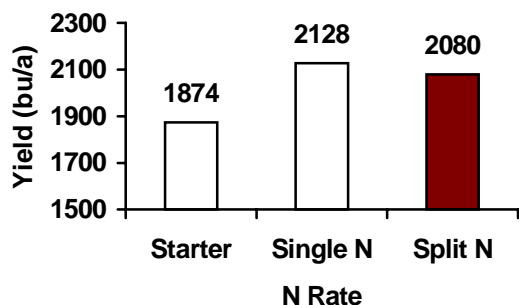
* AMBA approved malting barley cultivars.

For additional information about this trial contact:
 Jochum Wiersma
 2900 University Avenue
 Crookston, MN 56716
 Phone: 218-281-8629
 wiers002@tc.umn.edu

Purpose of the Study:

To measure the effect of three nitrogen management systems with and without the use of fungicide on yield of dry edible beans.

Cooperator: Mike Beelner, Mark Reistenberg, Jerry Breid, Clarence Horsager
Partnerships: U of M researchers and Extension Service, NRCS, SWCD
Funding: EQIP Grant
Nearest Town: Hubbard, Perham, Wadena, Minnesota
Soil Type: Irrigated sandy soil
Tillage: Disk-chisel
Previous Crop: Corn
Hybrid/Variety: Montcalm
Planting Date: 5/23/99
Row Width: 36"
Fertilizer: See table
Herbicide: 1 ½ pts. Sonalan, 1 pt. Basagran, 3 oz. Raptor, & Benlate
Insecticide: 6 oz. Asana (for leaf hoppers)
Harvest Date: 9/1/99
Exp. Design: Randomized complete block, 2-4 replications



N Management	Yield (lbs/a)					
	Site	1	2	3	4	Average
Starter Only		2226	1064	1872	2334	1874
Single N		2499	1843	2231	2438	2128
Split N		2315	1209	2197	2600	2080

Results:

Although statistical analysis of the data is not complete, it appears that the use of nitrogen fertilizer increased yield at all locations. At these sites, highest yield appears to be associated with the single application of nitrogen. The split application (2 applications of 60 lb. N/acre each) did not produce additional yield. It appears that the use of fungicide for white mold control had no effect on yield. This observation is a consequence of the absence of white mold in the region during the 1999 growing season.

For additional information about this trial contact:

Will R. Yliniemi
301 Court Avenue
Park Rapids, MN 56470
Phone: 218-732-3391
wyliniemi@extension.umn.edu

Bill Saumer
118 N. Main; PO Box 250
New York Mills, MN 56567
Phone: 218-385-3000
wsaumer@extension.umn.edu

Tom Hovde
415 S. Jefferson Street
Wadena, MN 56482
Phone: 218-631-7623
thovde@extension.umn.edu

Canola Rotation Study – Demonstration

Red Lake County

Cooperator: Raymond C. Swenson
Funding: Minnesota Canola Council
Nearest Town: Oklee, Minnesota
Soil Type: Sandy loam
Tillage: Chisel plow-fall, cultivator-spring
Previous Crop: Canola
Planting Date: Corn: 5/26, Wheat: 5/27, Barley: 5/28
Row Width: Corn: 30", Wheat & Barley: 6"
Fertilizer: Corn: 63-55-60, Wheat & Barley: 63-32-41
Herbicide: 2.4-D
Harvest Pop.: Corn: 28,500, Wheat: 932,000, Barley: 887,000 (plants/acre)
Harvest Date: Corn: 11/15, Wheat: 9/18, Barley: 9/18
Exp. Design: Randomized complete block, 2 replications

Purpose of the Study:

This study was designed to compare the economic return of three different crops grown following canola.

Crop	Crop Price * (\$/bu)	Yield ** (bu/a)	Return # (\$/a)
Corn	1.71	45.6	4.77
Wheat	2.74	31.9	28.85
Barley	1.41	29.4	13.51

* Loan rates were used for crop prices.

** Yields were low due to excessive rainfall that delayed planting of all crops and harvesting of wheat and barley.

Results:

Producers want to know what crop will give the greatest economic return following canola. In this study, wheat gave the greatest return. However, long term comparisons are needed due to the variable climatic conditions.

For additional information about this trial contact:

Zachary Fore
2600 Wheat Drive
Red Lake Falls, MN 56750
Phone: 218-253-4401
zfore@extension.umn.edu

Canola Seed Treatment Comparisons – Demonstration/Research

Northwest District

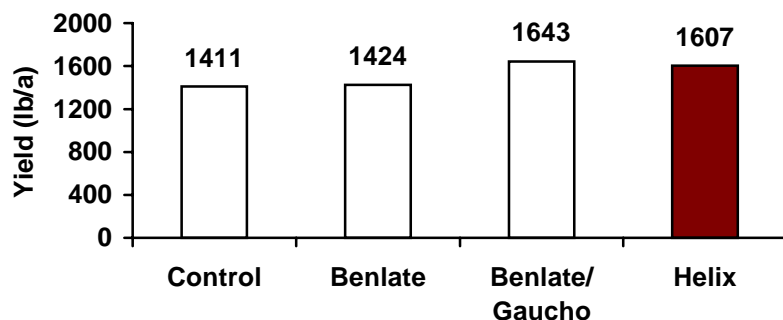
Purpose of the Study:

Evaluate the performance of untreated seed to seed treated with either a fungicide or fungicide(s) in combination with an insecticide.

Counties: Kittson Roseau Red Lake Polk
Cooperator: Rob & Tim Rynning/Richard Magnusson Monte Casavan Ron Landsverk
Nearest Town: Kennedy Roseau Dorothy Fosston
Soil Type: Northcote clay Zippel loamy fine sand Clearwater clay Fram loam
Planting Date: 4/29/99 6/18/99 5/26/99 5/29/99
Partnerships: U of M Extension Service, U of M Ag Experiment Station, Novartis Crop Protection
Tillage: Fall: range from moldboard to chisel, spring: cultivated
Previous Crop: Small grains
Hybrid/Variety: Hyola 401
Row Width: 6”
Fertilizer: Based on soil test at each location
Herbicide: Pre-plant Treflan, Poast if needed
Harvest Date: Swath at physiological maturity at all locations
Exp. Design: Randomized complete block, 4 replications

Seed Treatment	Brand Name	Location (County)				Avg
		Kittson (lb/a)	Roseau (lb/a)	Red Lake (lb/a)	Polk (lb/a)	
Control		2110	1402	1176	954	1411
Fungicide	Benlate	2063	1448	1199	987	1424
Fungicide & Insecticide	Benlate/Gaucho	2294	1771	1307	1201	1643
Fungicides & Insecticide	Helix *	2273	1770	1215	1170	1607
LSD (0.05)		164	277	NS	231	91

* Trade name of product that contains the insecticide Adage and fungicide Apron XL, Dividend, and



Results:

Even though few, if any, flea beetles were present at any of the locations, adding an insecticide to the seed treatment resulted in yield increases compared to untreated and fungicide treated seed.

For additional information about this trial contact:

Erv Oelke
 411 Borlaug Hall; 1991 Upper Buford Circle
 St. Paul, MN 55108
 Phone: 612-625-1211
 eoelke@extnsion.umn.edu

Corn Population and Row Width Study – Demonstration/Research

Hubbard County

Cooperator: Prairie Sky Farm
Partnerships: U of M researchers and Extension Service
Funding: U of M Central Regional Partnership Grant
Nearest Town: Park Rapids, Minnesota
Soil Type: Verndale
Tillage: Field cultivator
Previous Crop: Edible beans
Hybrid/Variety: Wensman 5018 BT (80 day)
Planting Date: 4/27/99
Row Width: 18", 24", 30"
Fertilizer: Starter 185 lbs. (15-5-36)/acre, nitrogen sidedress
Herbicide: Lasso/Atrazine
Harvest Date: 9/28/99
Exp. Design: Randomized complete block

Purpose of the Study:

To determine the effect of row width and plant populations on irrigated corn yield.

Row Spacing (inches)	Yield (bu/a)
18	146
24	144
30	149

Plant Population * (plants/a)	Yield (bu/a)
24,000	130
30,000	138
36,000	160

* Wensman recommends a planting population of 35,000 for irrigated corn.



Results:

Increasing plant population from 24,000 to 30,000 plants/a increased corn yield by 30 bu/a which is consistent with University of Minnesota recommendations.
 Increasing row size from 18" to 30" did not change the corn yield.

For additional information about this trial contact:

Dale Hicks
 411 Bortlaug Hall; 1991 Upper Buford Circle
 St. Paul, MN 55108
 Phone: 612-625-1796
 dhicks@extension.umn.edu

Will R. Yliniemi
 301 Court Avenue
 Park Rapids, MN 56470
 Phone: 218-732-3391
 wyliniemi@extension.umn.edu

Corn Silage Variety Trial – Demonstration

Becker County

Purpose of the Study:

Compare yield, nutrient content, and milk production potential of 14 corn hybrids.

Cooperator: Tony and Gloria Beck
Partnerships: U of M Extension Service, Corn seed companies
Funding: Corn seed companies
Nearest Town: Menahga, Minnesota
Soil Type: Sandy loam
Tillage: Chisel plowed, disked twice, cultivated once
Previous Crop: Corn
Hybrid/Variety: See table
Planting Date: 5/19/99
Row Width: 36" (4 rows)
Fertilizer: 6000 gallons of cow manure/acre, plus 130 lbs. (18-9-18-9S)/acre
Herbicide: Basis Gold, Bactril
Harvest Pop.: Average 26,611 plants
Harvest Date: 9/30/99
Exp. Design: Strip trial

Variety	Relative Maturity	Tons/Acre at 70% Moisture	DM Crude Protein	DM ADF (%)	DM NDF (%)	Net Energy Lactation	Milk (lbs./a)	Milk * (\$/a)
Cargill F227	90	20.5	6.88	22.03	42.47	0.72	9,448	\$1,134
Cargill F377	100	18.1	7.03	23.69	45.38	0.71	8,315	\$998
Croplan 345	—	27.4	6.66	22.95	42.24	0.72	12,662	\$1,519
Croplan 357	—	20.6	7.23	22.77	42.19	0.72	9,488	\$1,139
Hyland 2240	90	19.4	7.09	24.18	43.95	0.71	8,961	\$1,075
Hyland 2505	98	28.5	7.21	26.61	48.46	0.70	13,156	\$1,579
Hyland 2507	—	27.0	6.98	21.95	41.65	0.72	12,469	\$1,496
Mycogen 2404 Bt	94	29.1	7.55	24.92	45.09	0.71	13,432	\$1,612
Mycogen 2662 Bt	102	23.7	6.61	25.94	48.83	0.70	10,946	\$1,314
Mycogen TMF94	94	24.6	7.00	25.49	46.61	0.71	11,142	\$1,337
Novartis NX4687	—	17.8	6.93	27.59	50.30	0.72	8,206	\$985
Pioneer 37R71 Bt	99	25.0	7.18	21.05	40.83	0.72	11,541	\$1,385
Pioneer 38P05	94	22.4	6.99	24.05	43.97	0.71	10,355	\$1,243
Pioneer 39D81	85	21.1	7.24	21.45	40.74	0.72	9,711	\$1,165

* Assumptions: 1.3 lbs. DM = 1lb. Of Milk, Milk price \$12 cwt.

For additional information about this trial contact:

Harouna Maiga
 809 8th Street SE
 Detroit Lakes, MN 56501
 Phone: 218-847-3141
 hmaiga@extensin.umn.edu

Corn Variety Trial – Demonstration/Research

Clay County Norman County

Cooperator: Bryan Hest
Partnerships: U of M Extension Service, Wensman Seeds, Midwest Seed Genetics, AgriPro Seeds
Funding: Corn seed companies
Nearest Town: Perley, Minnesota
Soil Type: Fargo silty clay
Tillage: Chisel plowed
Previous Crop: Spring wheat
Hybrid/Variety: See table
Planting Date: 5/3/99
Row Width: 22"
Fertilizer: 250 lbs. (46-0-0)/acre, 10 gal. (10-34-0)/a
Herbicide: Clarity and Accent at half recommended rate
Planting Pop.: 29,500
Harvest Date: 10/22/99
Exp. Design: Randomized complete block, 4 replications
Comments: Heavy rain and crusting caused stand count differences

Purpose of the Study:

To compare agronomic characteristics of several corn hybrids.

85 Day Relative Maturity

Company	Variety	Yield (bu/a)	Stand (plants/a)	Moisture (%)
Dekalb	DK 355	149	24.6	17.4
Wensman	W5088 BT	139	23.9	20.8
Thunder	9782	130	19.5	19.0
AgriPro	AP9090	128	23.0	21.4
Pioneer	39D81	128	18.1	18.7
Croplan	D 5866 BT	126	19.3	21.9
Midwest Seed	6844	116	21.3	22.5
Legend	6985	113	22.9	19.7
Novartis	N 17-C5 BT	105	20.3	19.3
Mycogen	2242	103	17.9	18.5
Hyland	HLB270	100	16.5	25.9
Golden Harvest	H-6229	85	16.6	18.3
LSD (0.05)		19	3.8	1.3

80 Day Relative Maturity

Company	Variety	Yield (bu/a)	Stand (plants/a)	Moisture (%)
Wensman	W5018 BT	137	24.6	19.0
Legend	6781	135	23.9	20.3
Dekalb	DK 334 BT	135	26.0	19.1
Thunder	9780	132	23.1	18.8
Novartis	NX2127 BT	129	25.8	20.9
Hyland	HL2262	115	25.9	19.1
Midwest Seed	6817	115	17.6	19.2
Mycogen	2141 BT	102	21.5	17.7
Mycogen	2110	100	21.3	17.9
Cargill	1877	98	23.0	18.7
Croplan	154	98	23.1	19.3
Pioneer	39A26	89	22.6	18.7
AgriPro	9055	81	19.6	26.3
LSD (0.05)		14	3.7	2.9

90 Day Relative Maturity

Company	Variety	Yield (bu/a)	Stand (plants/a)	Moisture (%)
Cargill	2777	140	22.0	20.2
Golden Harvest	2265	137	23.9	20.1
Legend	6987	135	24.8	20.5
Midwest Seeds	6914	130	25.8	21.7
AgriPro	AP-9156	125	22.4	22.6
Hyland	HL2240	119	20.6	21.6
Croplan	N 24-B9	107	20.4	22.4
Pioneer	38K06	103	21.5	21.8
Dekalb	DK-389 BT	102	21.3	19.6
Novartis	N 2555 BT	99	20.6	21.6
Wensman	MAX 007	88	14.0	20.6
Mycogen	2250	67	16.0	21.6
Wensman	W-4123	63	8.8	19.8
LSD (0.05)		20	3.6	1.8

For additional information about this trial contact:

Jim Stordahl
 919 8th Avenue N.
 Moorhead, MN 56560
 Phone: 218-299-5020
 jstordahl@extension.umn.edu

Kenneth Pazdernik
 101 W. 3rd Avenue
 Ada, MN 56510
 Phone: 218-784-7183
 kpazdernik@extension.umn.edu

Corn Variety Trial – Demonstration

Red Lake County

Purpose of the Study:

Compare different commercially available corn hybrids in three maturity ranges for yield and stand counts.

Cooperator: Gary Purath
Partnerships: Red Lake County Crop Improvement Association, Cenex, and corn seed companies
Funding: Corn seed companies
Nearest Town: Red Lake Falls, Minnesota
Soil Type: Silt loam
Tillage: Two cultivations
Previous Crop: Soybeans
Hybrid/Variety: See table
Planting Date: 5/26/99
Row Width: 30”
Fertilizer: 110-52-50 - 2 Cu/acre
Herbicide: Celebrity, 5 gal. APM 28/100 gal.
Insecticide: Pounce was applied 8/16/99, corn borer in NW Minnesota reached threshold levels and warranted spraying.
Harvest Date: 10/15/99
Exp. Design: Strip trial

80 Day Maturity			
Company	Hybrid	Stand (plants/a)	Yield * (bu/a)
Prairie Gold	PG1313	30,500	103.2
Novartis	NX 2127	31,500	98
Croplan	197	31,000	98.4
Pioneer	39A26	27,500	102.2
Hyland	2262	32,000	93.1
Mycogen	2141 BT	30,500	94.7
Gold Country	19780	29,000	90.9
Pioneer	3941	31,300	118.2
Wensman	W5018 BT	30,000	99.5

* Yields adjusted to 15% moisture.

75 Day Maturity			
Company	Hybrid	Stand (plants/a)	Yield * (bu/a)
Novartis	NX1107	32,000	104.6
Pioneer	39J69	27,500	113.4
Prairie Gold	PG 1202	28,500	101.7
Croplan	172	25,000	116.4
Mycogen	2051	31,500	106.7
Hyland	2093	31,000	105.6

* Yields adjusted to 15% moisture.

85 Day Maturity			
Company	Hybrid	Stand (plants/a)	Yield * (bu/a)
Wensman	W5048 BT	30,500	105.5
Croplan	212	26,500	107.5
Hyland	HLB270	30,500	119.6
Pioneer	39D81	30,500	117.6
Prairie Gold	1345	29,000	91.8
Novartis	N17-C5	30,500	109.6

* Yields adjusted to 15% moisture.

For additional information about this trial contact:

Hans Kandel
 PO Box 279
 Red Lake Falls, MN 56750
 Phone: 218-253-2897 1-800-770-1244
 kande001@umn.edu

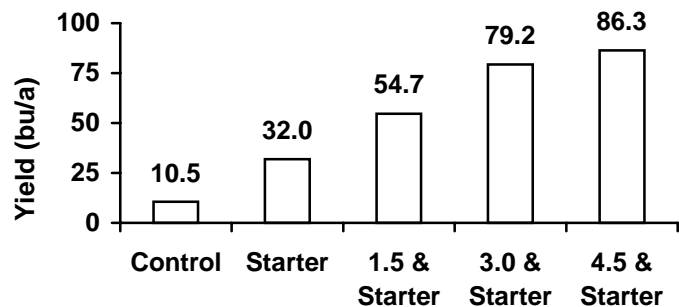
Corn Yield for Varying Poultry Litter Rates – Demonstration

Hubbard County

Cooperator: Don Hemingway
Partnerships: U of M Extension Service, MDA, SWCD
Funding: Feedlot Manure Management Initiative, MDA
Nearest Town: Hubbard, Minnesota
Soil Type: Hubbard loamy sand
Tillage: Chisel plowed
Previous Crop: Corn
Hybrid/Variety: Pioneer 3963
Planting Date: 5/29/99
Row Width: 36"
Fertilizer: Starter: 100 lbs. (25-0-36)/acre
Soil Test: P Bray – 78 ppm
 K – 93 ppm
 pH – 6.0
Herbicide: 1 lb. Atrazine, Banvel
Harvest Pop.: ~21,000
Harvest Date: 10/25/99
Exp. Design: Strip trial

Purpose of the Study:

Comparison of several rates of turkey litter to assess nitrogen needs of dry land corn in sandy soil.



Manure Treatment * (T/a)	Total Available N (lb/a)	Yield (bu/a)
Control	0	10.5
1.5 and starter	57	54.7
3.0 and starter	94	79.2
4.5 and starter	127	86.3
Starter Only	24	32.0

* Turkey manure was mixed with sunflower hull bedding,

Results:

Corn responded to manure and fertilizer addition, but yields were low for all treatments due to crop being grown on non-irrigated sandy soils.

For additional information about this trial contact:

Phil Nesse, Don Sirucek
 Co. Road 2 & Airport Road
 Staples, MN 56479
 Phone: 218-894-3075
 pnesse@extension.umn.edu

Will R. Yliniemi
 301 Court Avenue
 Park Rapids, MN 56470
 Phone: 218-732-3391
 wyliniemi@extension.umn.edu

**Field Pea as an Alternative Crop –
Demonstration/Research**

Red Lake County

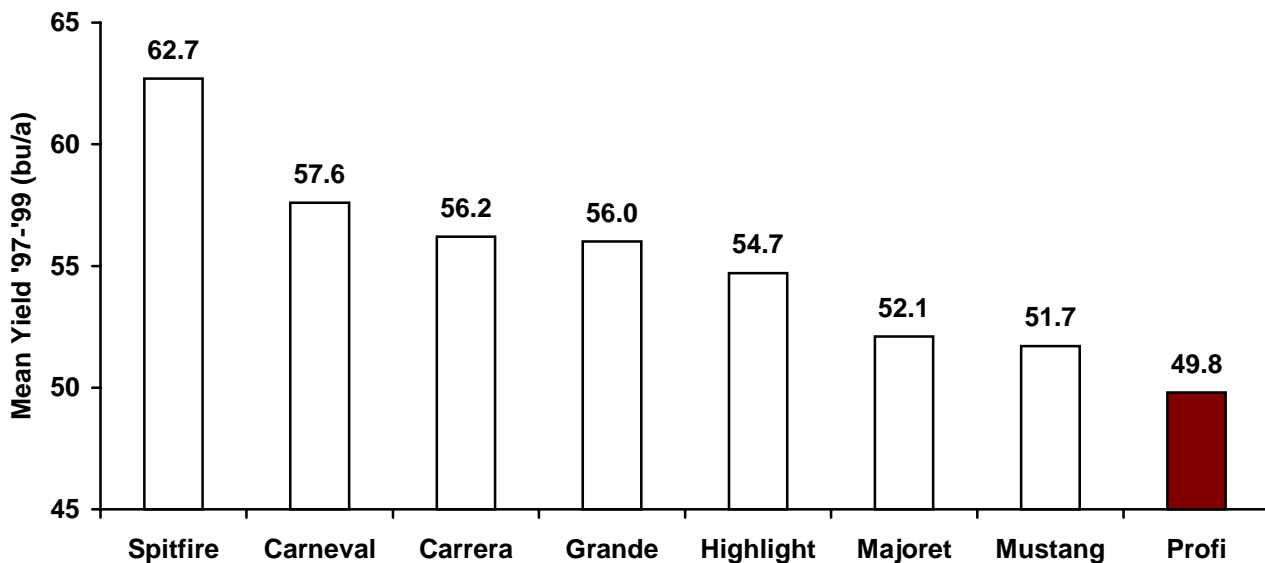
Purpose of the Study:

To determine the yield of field pea varieties.

Cooperator: Rob and Tim Rynning
Partnerships: Red Lake County Crop Improvement Association, U of M Center of Alternative Plant and Animal Products
Funding: Red Lake County Crop Improvement Association, LCMR Grant
Nearest Town: Kennedy, Minnesota
Soil Type: Northcote clay
Tillage: Fall chisel 2x, spring cultivation 2x
Previous Crop: Spring wheat
Hybrid/Variety: See table
Planting Date: 4/30/99
Row Width: 6"
Fertilizer: None
Herbicide: 1 ½ pts. Treflan
Harvest Date: 8/19/99
Exp. Design: Randomized complete block, 4 replications

Pea Variety	Yield 1999 (bu/a)	Mean Yield for 1997-1999 * (bu/a)
Spitfire	56.0	62.7
Carneval	53.7	57.6
Carrera	65.5	56.2
Grande	49.7	56.0
Highlight	49.6	54.7
Majoret	52.8	52.1
Mustang	48.3	51.7
Profi	51.9	49.8
Integra	68.2	—
Astuce	63.5	—
LSD (0.10)	7	5.6

* Mean of Red Lake Falls, Fosston, Oklee and Kennedy 1997, Lake of the Woods, Red Lake Falls and Fosston 1998, and Kennedy 1999. Each site had four replicates.



For additional information about this trial contact:

Hans Kandel
 PO Box 279
 Red Lake Falls, MN 56750
 Phone: 218-253-2897 1-800-770-1244
 kande001@umn.edu

Soybean Inoculation and Nitrogen Treatment Trial – Demonstration/Research

Kittson County

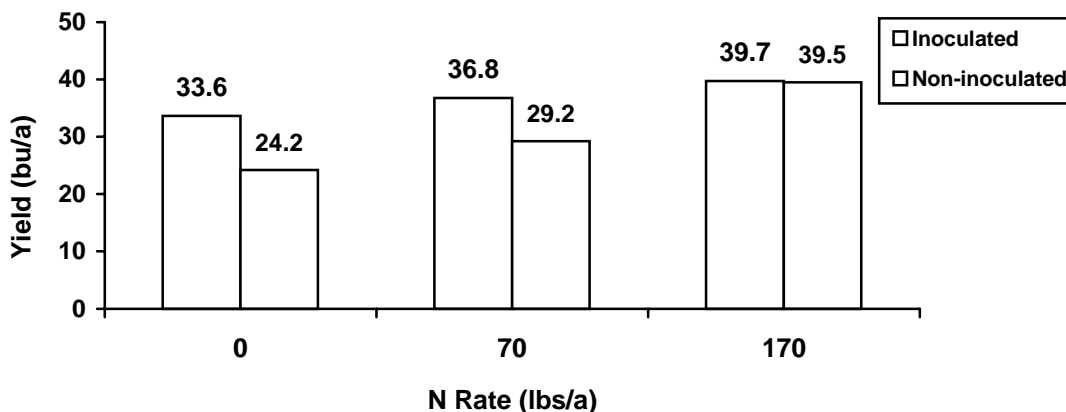
Cooperator: Klein Farms
Partnerships: Cenex//Land O'Lakes, Minnesota Soybean Research and Promotion Council
Funding: Minnesota Soybean Research and Promotion Council
Nearest Town: Hallock, Minnesota
Soil Type: Northcote clay
Tillage: Plowed and disked in fall, multi weeder in spring
Previous Crop: Wheat
Hybrid/Variety: Mycogen S34
Planting Date: 5/25/99
Row Width: 6", solid seeded
Herbicide: Raptor
Harvest Date: 10/15/99
Exp. Design: 2 replications

Purpose of the Study:

Study the effects of seed inoculation and timing of various levels of nitrogen application during the growing season.

Nitrogen Fertilizer (lbs/a)	Inoculated Avg. Yield (bu/a)	Non-inoculated Avg. Yield (bu/a)
0	33.6	24.2
70 *	36.8	29.2
170 **	39.7	39.5
LSD (0.20)	5.0	

* 35 lbs. at v2 & r2



Results:

Seed inoculated significantly improved soybean yields at 0 and 70 lbs of N/a. However, there was no yield advantage at high soil N rates.

For additional information about this trial contact:

Nathan Johnson
PO Box 369
Hallock, MN 56728
Phone: 218-843-3674
njohnson@extension.umn.edu

Northwest Research and Outreach Center Crookston, Minnesota



The mission of the Northwest Research and Outreach Center is to contribute, within the framework of the Minnesota Agricultural Experiment Station and the College of Agricultural, Food and Environmental Sciences, to the acquisition, interpretation and dissemination of research results to the people of Minnesota, with application to the knowledge base of the United States and World. Within this framework, major emphasis is placed on research and education that is relevant to the needs of northwest Minnesota, and which includes projects initiated by Center scientists, other MAES scientists and state or federal agencies.

Faculty:

- Jason Brantner, Research Fellow, Plant Pathology
- Bobby Holder, Associate Professor, Water Management & Pesticides
- Carlyle Holen, Associate Professor, IPM Specialist
- Ian Macrae, Assistant Professor, Entomology
- George Marx, Professor, Dairy
- Albert Sims, Assistant Professor, Soil, Water & Climate
- Larry Smith, Head & Agronomy-Sugarbeets
- Dan Svedarsky, Professor, Natural Resources
- Galen Thompson, Research Fellow, Agronomy
- Jochum Wiersma, Assistant Professor, Small Grains Specialist
- John Wiersma, Associate Professor, Agronomy
- Carol Windels, Professor, Plant Pathology

NWROC research and education priorities emphasize interdisciplinary projects including:

- Agronomy
- Dairy
- Entomology
- Feedlot Beef
- Natural Resources
- Plant Pathology
- Potatoes
- Small Grains Extension
- Soil & Water Quality
- Sugarbeets

UNIVERSITY OF MINNESOTA

Northwest Research & Outreach Center
Ag Research Center, 2900 University Avenue
Crookston, MN 56716
218-281-8604 Fax: 218-281-8603
nwroc.coafes.umn.edu

University of Minnesota
North Dakota State University
Industry
DNR

Cooperating Partnerships:

South Dakota State University
University of Manitoba
Montana State University
USDA-ARS

West Central Research and Outreach Center Morris, Minnesota



The WCROC Mission is to provide leadership in the generation and dissemination of research-based knowledge that addresses agricultural and rural issues. WCROC research and education priorities emphasize interdisciplinary projects, with partners that range from producers to consumers of agricultural products, through citizen - guided programs.

Faculty:

- Greg Cuomo, Associate Professor, Agronomy/Plant Genetics
- Jodi DeJong, Extension Educator-Environmental Stewardship
- Neil Hansen, Assistant Professor, Soil, Water & Climate
- Bill Head, Assistant Professor, Animal Science
- Dennis Johnson, Professor, Animal Science
- Lee Johnston, Professor, Animal Science; Extension-Animal Scientist-Swine
- John Moncrief, Professor, Soil, Water & Climate; Extension-Soil Scientist-Tillage
- Dorothy Rosemeier, Extension Educator-Community Organizer
- Margot Rudstrom, Assistant Professor, Applied Economics, Extension-Economics-Farm Profitability
- Jerry Wright, Associate Professor-Extension Engineer-Biosystems & Agricultural Engineering
- Wynne Wright, Research Associate, Sociology
- Jim VanDerPol, School of Agriculture Endowed Chair in Agricultural Systems
- Steve Poppe, Research Plot Coordinator-Horticulture
- George Nelson, Crop Scientist

WCROC research and education priorities emphasize interdisciplinary projects, with partners that range from producers to consumers of agricultural products, through citizen-guided programs including:

- Crops
- Environmental Horticulture
- Dairy
- Farm Profitability
- Forage Management/Ecology
- Sheep
- Soils & Water Quality
- Swine
- Irrigation/Drainage
- Sociology
- Community Leadership
- Environmental quality of agricultural management systems
- Forage based livestock systems
- Swine Production Systems

Cooperating Partnerships:

University of Minnesota
University of Minnesota-Morris
USDA-ARS
Industry

AURI
DNR

UNIVERSITY OF MINNESOTA
West Central Research & Outreach Center
State Highway 329; PO Box 471; Morris, MN 56267
320-589-1711 Fax: 320-589-4870
wcroc.coafes.umn.edu

Soybean Inoculation and Nitrogen Treatment Trial – Demonstration/Research

Polk West County

Purpose of the Study:

To determine if seed inoculation or applying nitrogen to soybeans at different stages of growth affects yield.

Cooperator: H. D. Ross
Partnerships: U of M Extension Service
Funding: Minnesota Soybean Research and Promotion Council
Nearest Town: Crookston, Minnesota
Soil Type: Beardon-Coldin complex, silt loam
Tillage: Disk, cultivator
Previous Crop: Sugarbeets
Hybrid/Variety: U of M Agassiz
Planting Date: 5/25/99
Row Width: 22”
Fertilizer: Residual N (40 lbs.), residual N plus 35 lbs. N pre-plant, and residual N plus 35 lbs. N at stage R-1.
Herbicide: Prowl
Planting Pop.: 190,000
Harvest Date: 9/29/99
Exp. Design: Split plot design, 4 replications

Treatment	Yield (bu/a)
Residual N only	34.0
75 lbs. N at planting	33.3
75 lbs. N at R-1	35.3
LSD (0.05)	NS

Treatment	Yield (bu/a)
Non-inoculated	35.1
Inoculated	33.3
LSD (0.05)	NS

Results:

There was no statistical difference found in grain yield for different nitrogen application rates or timing.

Results:

Grain yield was not statistically different between the inoculated and non-inoculated soybean seed.

For additional information about this trial contact:

Joe Schafer
 PO Box 556
 Crookston, MN 56716
 Phone: 218-281-8696
 jschafer1@extension.umn.edu

Russ Severson
 2900 University Avenue
 Crookston, MN 56716
 Phone: 218-281-8685
 rseverson@extension.umn.edu

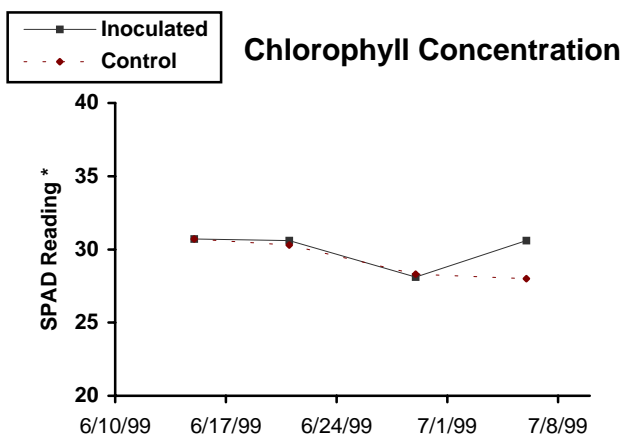
Soybean Inoculation for Reducing Iron Chlorosis – Demonstration/Research

**Grant County
Stevens County
Traverse County**

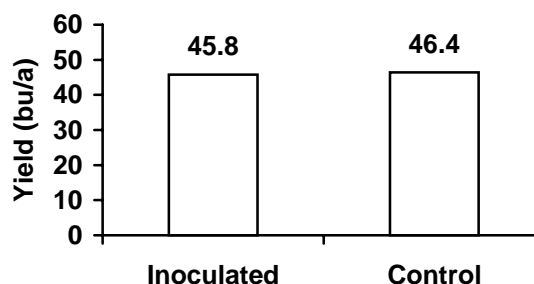
Counties: Grant, Stevens, Traverse
Partnerships: U of M researchers and Extension Service, Minnesota Ag Experiment Station
Funding: Red River Marketing, Minnesota Ag Experiment Station
Soil Type: 16 sites. Soils ranged from Lacustrine Red River Valley soils (loam) to glacial till soils (clay loams)
Tillage: Fall chisel or moldboard plow depending on site
Previous Crop: Wheat, Corn, or Soybean
Hybrid/Variety: Pioneer 90B72 (most common variety, others represented)
Planting Date: Range
Row Width: Range from narrow rows to 30" rows
Fertilizer: At most sites there was no fertilization.
Herbicide: Round-up (most common, others represented)
Harvest Pop.: Range 130,000 – 300,000/acre
Harvest Date: Range
Exp. Design: Split-planter approach used for field scale comparisons

Purpose of the Study:

Evaluate the interaction of inoculating soybean seed on the development and impact of iron-deficiency induced chlorosis. Also compare yield effect of inoculation.



	Yield (bu/a)	Stand (plants/a)	Test Weight (lb/bu)
Inoculated	45.8	200,000	56.4
Control	46.4	190,000	56.4
LSD (0.05)	NS	NS	NS



* SPAD refers to the portable chlorophyll meter (Minolta SPAD-502). Chlorophyll content is represented by a relative scale. A decrease in the SPAD reading corresponds to an increase in chlorosis severity.

Results:

Chlorophyll concentration was measured with a hand-held meter to assess chlorosis severity over time. Soybeans were chlorotic at all sites, regardless of treatment. The inoculated soybeans re-greened earlier than the control, but resulted in no difference in yields or test weight. All tested fields had recent history of soybean production. In this situation, there was no apparent benefit to inoculation.

For additional information about this trial contact:

Neil Hansen
 State Hwy 329; PO Box 471
 Morris, MN 56267
 Phone: 320-589-1711
 hansennc@mrs.umn.edu

Purpose of the Study:

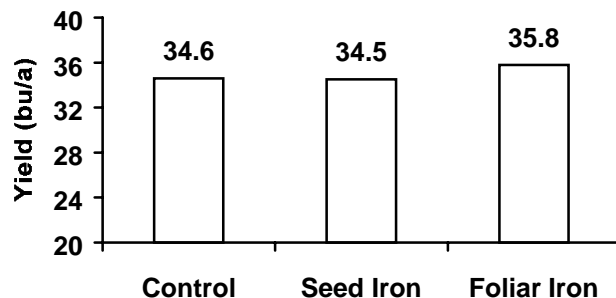
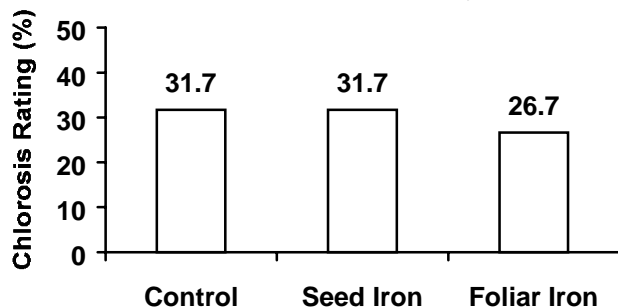
To compare three different iron treatments on two varieties of soybean for iron chlorosis rating and yield.

Cooperator: Fred Jamison
Partnerships: U of M Ag Experiment Station, and Extension Service
Funding: Minnesota Soybean Research and Promotion Council
Nearest Town: Ada, Minnesota
Soil Type: Fargo silty clay loam
Tillage: Chisel plowed
Previous Crop: Spring wheat
Hybrid/Variety: U of M Agassiz and NK Solano
Planting Date: 5/28/99
Row Width: 7", solid seeded
Herbicide: 2 ½ pts. Prowl, 4 oz. Raptor, 3 oz. Cobra, 1¼ pts. Quad 7
Populations: 180,000
Harvest Date: 10/15/99
Exp. Design: Randomized complete block, 4 replications
Iron Treatments: 6% sequestered 138 – Iron chelate at .06 lb/acre

Treatment	Chlorosis Rating * # (%)	Yield (bu/a)	Test Weight (lb/bu)
Control	31.7 a	34.6	56.2
Seed Iron	31.7 a	34.5	56.6
Foliar Iron	26.7 b	35.8	56.4
LSD (0.05)	4.8	NS	NS

* 0% is no damage and 100% is severe chlorosis and necrosis.

Values followed by a different letter are significantly different.



Data for the two varieties are averaged in the table and graphs.

Results:

Statistically, there was a lower chlorosis rating for foliar iron treatment than for the control and seed iron treatments. Although chlorosis ratings were different, there were no significant differences in test weight and yields among all treatments.

For additional information about this trial contact:

Kenneth Pazdernik
 101 W. 3rd Avenue
 Ada, MN 56510
 Phone: 218-784-7183
 pazde002@umn.edu

Joe Schafer
 PO Box 556
 Crookston, MN 56716
 Phone: 218-281-8696
 jschafer1@extension.umn.edu

**Soybean Phosphorus Fertilizer Trial –
Demonstration**

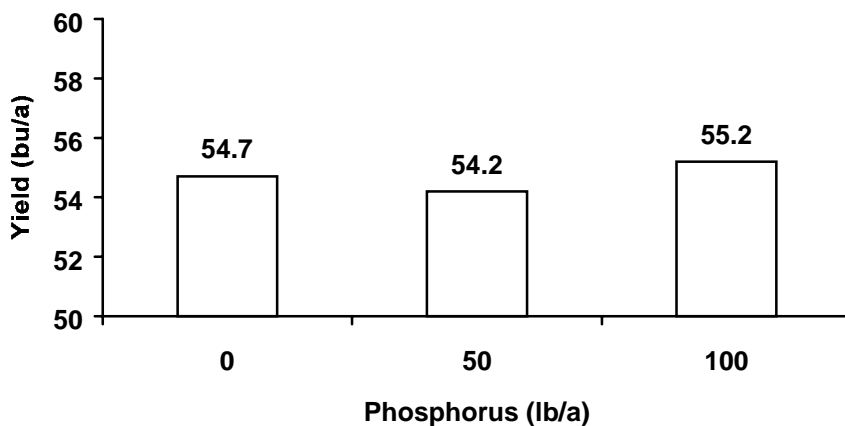
**Grant County
Otter Tail West County
Wilkin County**

Cooperator: Don Viger
Partnerships: U of M Extension Service, Otter Tail Corn & Soybean Growers Association, Centrol Crop Consultants, Crop and Soil Association
Funding: Minnesota Soybean Research and Promotion Council
Nearest Town: Fergus Falls, Minnesota
Soil Type: Clay loam
Tillage: Disk in fall, cultivate in spring, and 2 soil finisher passes with herbicide applications
Previous Crop: Corn
Hybrid/Variety: Wensman 2098 RR
Planting Date: 5/19/99
Row Width: 10"
Fertilizer: 0, 50, 100 lbs. P₂O₅ (18-46-0)/acre
Soil Test Data: Sampled – 5/13/99
P Bray – 5.2 ppm
K – 151 ppm
pH – 7.7
OM – 4.4%
Harvest Date: 9/30/99
Exp. Design: Strip trial

Purpose of the Study:

To determine if using phosphorus fertilizer before planting soybeans results in higher yields.

Phosphorus Study	
P Fertilizer (lb/a)	Yield (bu/a)
0	54.7
50	54.2
100	55.2



Results:

Soil tests indicated that P levels were low and that additional P fertilizer was needed. However, no response to additional P was observed.

For additional information about this trial contact:

Gary Mikulecky 421 Nebraska Avenue Breckenridge, MN 56520 Phone: 218-643-1434 gmikulecky@extension.umn.edu	Bob Stommes 130 Minnesota Avenue E. Glenwood, MN 56334 Phone: 320-634-5735 rstommes@extension.umn.edu	Bret Oelke 411 1st Street SE; PO Box 1099 Elbow Lake, MN 56531 Phone: 218-685-4820 boelke@extension.umn.edu
--	---	---

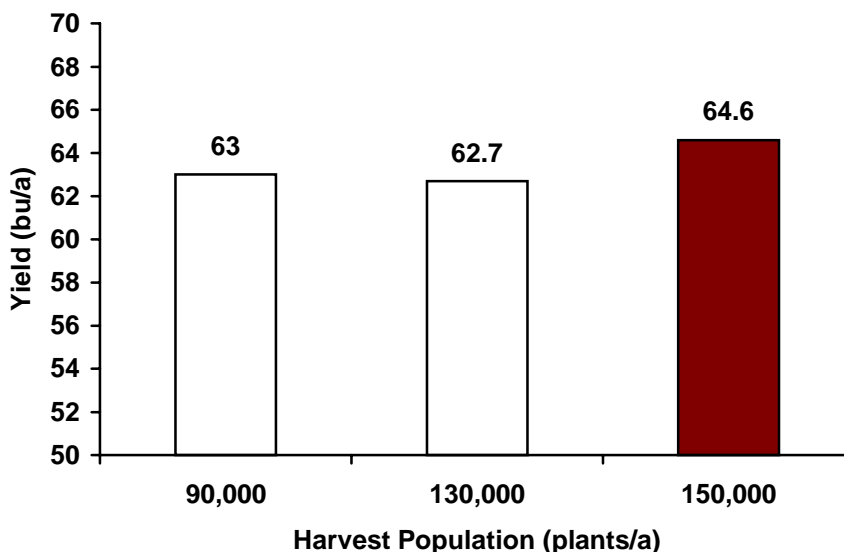
Purpose of the Study:

To determine the effect of plant population on soybean yield.

Cooperator: Don Viger
Partnerships: U of M Extension Service, Otter Tail Corn & Soybean Growers Association, Central Crop Consultants, Crop and Soil Association
Funding: Minnesota Soybean Research and Promotion Council
Nearest Town: Fergus Falls, Minnesota
Soil Type: Clay loam
Tillage: Disk in fall, cultivate in spring, 2 soil finisher passes for herbicide applications.
Previous Crop: Corn
Hybrid/Variety: Wensman 2098 RR
Planting Date: 5/19/99
Row Width: 10”
Fertilizer: none
Herbicide: 1 qt. Roundup Ultra, 1 ½ pts. later
Harvest Pop.: 90,000, 130,000, 150,000
Harvest Date: 9/30/99
Exp. Design: Strip trial

Population Study *	
Harvest Population (plants/a)	Yield (bu/a)
90,000	63.0
130,000	62.7
150,000	64.6

* Wensman recommends a planting rate of 200,000 seeds/acre.



Results:

Treatments were not replicated, but there was little yield difference between populations. This may be due to soybean’s ability to compensate for lower planting rates.

For additional information about this trial contact:

Bob Stommes
 130 Minnesota Avenue E.
 Glenwood, MN 56334
 Phone: 320-634-5735
 rstommes@extension.mn.edu

Bret Oelke
 411 1st Street SE; PO Box 1099
 Elbow Lake, MN 56531
 Phone: 218-685-4820
 boelke@extension.umn.edu

Gary Mikulecky
 421 Nebraska Avenue
 Breckenridge, MN 56520
 Phone: 218-643-1434
 gmikulecky@extension.umn.edu

Soybean Seed Treatment Effects on Disease – Demonstration/Research

Polk West County

Cooperator: H. D. Ross
Partnerships: U of M researchers and Extension Service
Funding: Minnesota Soybean Research and Promotion Council
Nearest Town: Crookston, Minnesota
Soil Type: Beardon-Coldin complex, silt loam
Tillage: Disk, cultivator
Previous Crop: Sugarbeets
Hybrid/Variety: U of M Agassiz
Planting Date: 5/25/99
Row Width: 22"
Fertilizer: None
Herbicide: Prowl
Harvest Pop.: 115,000, 175,000, 235,000
Harvest Date: 9/29/99
Exp. Design: Randomized complete block, 4 replications

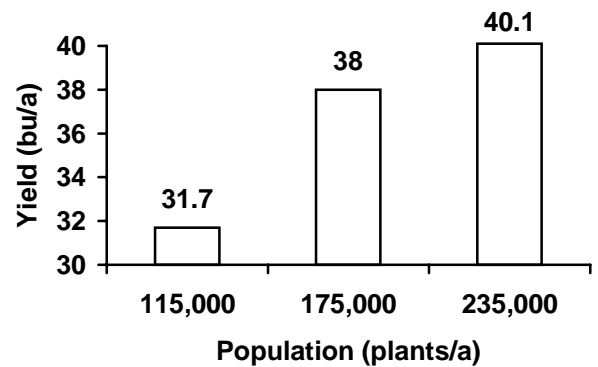
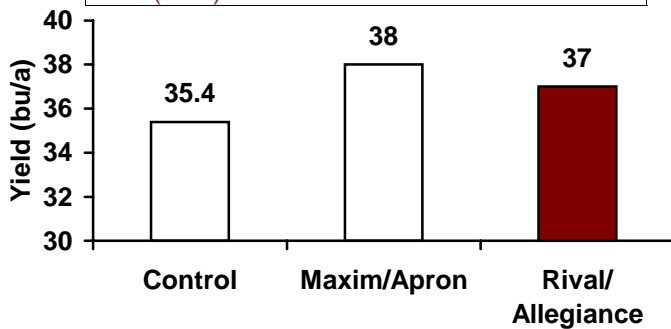
Purpose of the Study:

To determine effects of two seed treatment mixtures and three plant populations on yield.

Population (plants/a)	Yield * (bu/a)
115,000	31.7 c
175,000 #	38.0 b
235,000	40.8 a
LSD (0 .05)	2.6

* Values followed by a different letter are significantly different.

Fungicide	Yield (bu/a)
Control	35.4
Maxim/Apron	38.0
Rival/Allegiance	37.0
LSD (0.05)	NS



Results:

On average, the fungicide treatments had a 2 bu/a increase in yield, however, there was no statistical difference between the treatments.

Results:

The population treatment showed a statistical difference in yield. The average yield difference between the low to mid population level was 6.3 bu/a, while the difference between the mid and high levels was 2.9 bu/a. There was a yield increase of 9.2 bu/a from the low to the high population.

For additional information about this trial contact:

Joe Schafer
 PO Box 556
 Crookston, MN 56716
 Phone: 218-281-8696
jschafer1@extension.umn.edu

Purpose of the Study:

To compare soybean varieties for yield, maturity, and moisture content.

Cooperator: Pazdernik Brothers Farms
Partnerships: Soybean seed companies, Heartland Seeds
Funding: Soybean seed companies
Nearest Town: Waubun, Minnesota
Soil Type: Barnes loam
Tillage: Conventional
Previous Crop: Wheat
Hybrid/Variety: See table
Planting Date: 6/1/99
Row Width: 6", solid seeded
Fertilizer: 100 lbs. (10-26-26-2 zinc)/acre
Herbicide: 4 oz. Raptor, 2 oz. Cobra, 1 qt/100 gal Activator Plus, 2 ½ lb. Ammonium Sulfate
Harvest Date: 10/28/99
Exp. Design: Randomized strip plot, 3 replications

All varieties were treated with this herbicide program including Roundup Ready soybeans. This is not the recommended herbicide treatment for Roundup Ready soybeans.

Company	Variety	Yield * (bu/a)	Moisture (%)	Maturity
Legend	LS-0009	49.3	10.0	00.9
Pioneer	90B21	47.3	10.0	0.2
Pioneer	90B43	44.7	10.2	0.4
Mycogen	013	43.0	10.0	0.1
AgriPro	0577 RR	42.7	10.1	0.5
Mycogen	5072	41.7	9.9	0.7
NDSU	Council	41.7	10.0	0.6
Thunder	0598	40.7	10.1	0.5
U of M	MN0301	40.3	10.0	0.3
Croplan	L-0083	40.0	10.0	00.8
NDSU	Daksoy	40.0	10.0	00.6
Novartis	S05-D5	39.6	10.0	0.5
U of M	Agassiz	39.0	9.9	0.3
Croplan	9RT04	38.7	10.2	0.4
NDSU	Jim	38.7	10.0	00.7
NDSU	Traill	38.3	9.9	0.0
Hyland	Rugged RR	38.3	10.1	0.2
Hyland	Enterprise	37.7	10.3	0.7
Wensman	W3036	37.7	10.1	0.3
AgriPro	AP 0550	37.3	10.0	0.7
Croplan	L-0727	36.7	10.1	0.7
Croplan	L-0332	36.7	10.0	0.3
Hyland	Corona	36.7	10.0	00.2
Golden Harvest	GH-097 RR	36.7	10.2	0.9
Croplan	RT0566 RR	35.3	10.1	0.5
Wensman	W2058 RR	35.0	10.0	0.5
Novartis	S00-66	35.0	9.9	00.6
LSD (0.05)		6.10	0.14	

* Yields adjusted to 13% moisture.

For additional information about this trial contact:

Ken Pazdernik
101 W. 2nd Avenue
Ada, MN 56510
Phone: 218-784-7183
pazde002@umn.edu

Ray Bisek
311 Main; PO Box 477
Mahnomen, MN 56557
Phone: 218-935-2226
rbisek@extension.umn.edu

Soybean Variety Trial – Demonstration

Mahnomen County

Company	Variety	Yield (bu/a)	Test Wt (lbs/bu)	Maturity
AgriPro	0550	34.2	58.2	0.7
AgriPro	0527 RR	38.9	57.5	0.5
Croplan	L0083	45.4	56.0	00.8
Croplan	9RT04	33.5	54.8	0.4
Croplan	L0332	46.3	55.8	0.3
Croplan	L0727	33.8	58.2	0.7
Croplan	RT0566	42.0	57.5	0.5
Dekalb	CX007	53.6	56.4	00.7
Dekalb	CX025	44.0	54.1	0.2
Golden Harvest	GH097 RR	36.3	56.8	0.9
Hyland	Enterprise	49.7	54.7	0.7
Hyland	Corona	40.3	57.5	00.2
Hyland	Rugged RR	39.1	57.1	0.2
Legend	LS-009	48.6	55.5	00.9
Mycogen	013	33.7	56.0	0.1
Mycogen	5007	43.8	56.2	00.7
Mycogen	5072	44.0	57.2	0.7
NDSU	Council	38.9	57.7	0.6
NDSU	Daksoy	46.1	56.5	00.6
NDSU	Jim	39.9	56.5	00.7
NDSU	Traill	43.9	56.4	0.0
Novartis	S0066	39.3	55.4	00.6
Novartis	S05D5	38.6	58.8	0.5
Pioneer	90B21	45.1	56.4	0.2
Pioneer	90E43	48.7	57.0	0.4
Thunder	0598	42.6	57.1	0.5
U of M	MN0301	44.7	55.3	0.3
U of M	Agassiz	34.3	55.4	0.3
Wensman	W2058 RR	36.0	54.6	0.5
Wensman	W3036	44.3	54.4	0.3

Purpose of the Study:

To compare soybean varieties for differences in yield, maturity, and test weight.

Cooperator: Terry & Trent McCollum
Partnerships: Soybean seed companies
Nearest Town: Bejou, Minnesota
Soil Type: Hammerly/Vallers
Tillage: Plowed, disked, cultivated
Previous Crop: Alfalfa
Hybrid/Variety: See table
Planting Date: 6/3/99
Row Width: 6"
Fertilizer: None
Herbicide: 1 pt. Basagran, 5 oz. Fusion on 6/24 and 5 oz. Fusion on 7/10
Harvest Date: 10/28/99
Exp. Design: Strip Trial

All varieties were treated with this herbicide program including Roundup Ready soybeans. This is not the recommended herbicide treatment for Roundup Ready soybeans.

For additional information about this trial contact:

Ray Bisek
 311 Main; PO Box 477
 Mahnomen, MN 56557
 Phone: 218-935-2226
 rbisek@extension.umn.edu

Soybean Variety Trial – Demonstration

Norman County

Purpose of the Study:

To compare soybean varieties for yield, maturity and moisture content.

Cooperator: Fred Jamison
Partnerships: Soybean seed companies, Wensman Seed, Cropland
Funding: Soybean seed companies
Nearest Town: Ada, Minnesota
Soil Type: Fargo Silty Clay loam
Tillage: Chisel plowed
Previous Crop: Spring wheat
Hybrid/Variety: See table
Planting Date: 5/30/99
Row Width: 6", solid seeded
Herbicide: 4 oz. Raptor, 1 qt. 28%, 1¼ pt. COC
Populations: 185,000
Harvest Date: 10/13/99
Exp. Design: Strip trial

All varieties were treated with this herbicide program including Roundup Ready soybeans. This is not the recommended herbicide treatment for Roundup Ready soybeans.

Company	Variety	Yield * (bu/a)	Moisture (%)	Relative Maturity
AgriPro	AP0550	30.8	14.9	0.7
AgriPro	AP0577 RR	14.5	19.6	0.5
Croplan	9RT04	17.5	16.8	0.4
Croplan	L0083	29.2	10.9	00.8
Croplan	L0332	35.7	12.6	0.3
Croplan	L0727	36.0	14.1	0.7
Croplan	RT0566	12.1	19.9	0.5
Golden Harvest	H-097	13.6	16.9	0.7
Hyland	Corona	27.5	10.6	00.2
Hyland	Enterprise	21.0	16.8	0.7
Hyland	Rugged	10.7	15.4	0.2
Legend	LS0009	32.5	12.1	00.9
Mycogen	013	35.3	11.1	0.1
Mycogen	5072	25.5	14.5	0.7
NDSU	Council	30.1	14.7	0.6
NDSU	Daksoy	32.8	10.8	00.6
NDSU	Jim	28.0	12.4	00.7
NDSU	Traill	24.0	16.2	0.0
Novartis	S00-66	23.9	12.6	00.6
Novartis	S05-D5	27.6	13.1	0.5
Pioneer	90B21	13.5	13.1	0.2
Pioneer	90B43	36.3	11.1	0.4
Thunder	0598	37.1	12.5	0.5
U of M	Agassiz	35.8	11	0.0
U of M	MN0301	34.7	11.9	0.3
Wensman	W2058 RR	13.8	19.7	0.5
Wensman	W3036	28.1	13.1	0.3

* Yields may have been lower due to environmental conditions, iron chlorosis, and herbicide interaction.

For additional information about this trial contact:

Kenneth Pazdernik
 101 W. 3rd Avenue
 Ada, MN 56510
 Phone: 218-784-7183
 pazde002@umn.edu

Soybean Variety Trial And Iron Chlorosis Rating – Demonstration/Research

Norman County

Cooperator: Fred Jamison
Funding: Minnesota Soybean Research
and Promotion Council
Nearest Town: Ada, Minnesota
Soil Type: Fargo silty clay loam
Tillage: Chisel plowed
Previous Crop: Spring wheat
Hybrid/Variety: NK Solano and U of M Agassiz
Planting Date: 5/28/99
Row Width: 6", solid seeded
Herbicide: 4 oz. Raptor, 3 oz. Cobra, 1¼ pts. Quad 7
Harvest Pop.: 180,000
Harvest Date: 10/15/99
Exp. Design: Randomized complete block, 4 replications

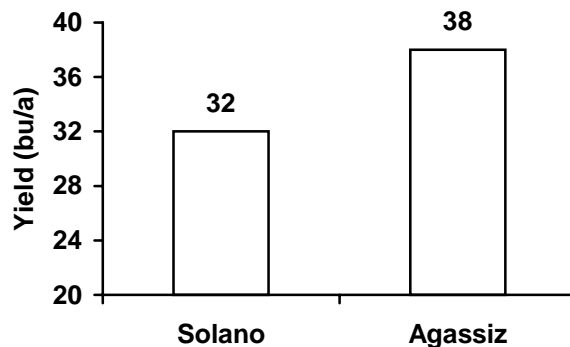
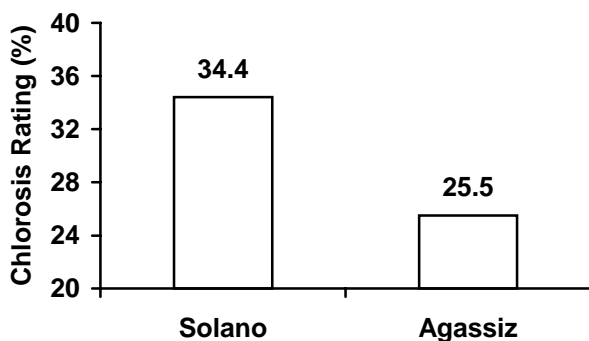
Purpose of the Study:

To compare soybean
varieties for yield and iron
chlorosis rating.

Variety	Chlorosis Rating * (%)	Yield # (bu/a)	Test Weight # (lb/bu)
Solano	34.4	32.0 b	57.9 a
Agassiz	25.5	38.0 a	54.8 b
LSD (0.05)	NS	1.8	2.2

* 0% is no damage and 100% is severe chlorosis and necrosis.

Values followed by a different letter are significantly different.



Results:

Chlorosis ratings were not statistically different between varieties. These two varieties did not show a difference in iron chlorosis rating as shown in past research, perhaps due to environmental conditions and herbicide interaction. There was a significant yield difference between varieties with Agassiz out-yielding Solano by 6 bu/a.

For additional information about this trial contact:

Kenneth Pazdernik
101 W. 3rd Avenue
Ada, MN 56510
Phone: 218-784-7183
pazde002@umn.edu

Purpose of the Study:

To determine effects of variety and seed or foliar iron treatments on soybean yield.

Cooperator: H. D. Ross
Funding: Minnesota Soybean Research and Promotion Council
Nearest Town: Crookston, MN
Soil Type: Beardon-Coldin complex, silt loam
Tillage: Disk, cultivator
Previous Crop: Sugarbeets
Hybrid/Variety: U of M Agassiz and NK Solano
Planting Date: 5/25/99
Row Width: 22"
Herbicide: Prowl
Planting Pop.: 190,000
Harvest Date: 9/29/99
Exp. Design: Split plot arrangement of a randomized complete block, 4 replications

Treatment	Yield (bu/a)
Control, no iron	35.3
Seed iron	35.7
Foliar iron	35.9
LSD (0.05)	NS

Variety	Yield (bu/a)
Agassiz	38.0
Solano	33.9
LSD (0.05)	NS

Results:

There was no statistical difference in grain yield for the iron treatments. This may be due to the absence of iron chlorosis in the field.

Results:

There was no statistical difference in grain yield for the two varieties.

For additional information about this trial contact:

Joe Schafer
 PO Box 556
 Crookston, MN 56716
 Phone: 218-281-8696
 jschafer1@extension.umn.edu

Sugarbeet Root Rot Trial – Demonstration/Research

Clay County

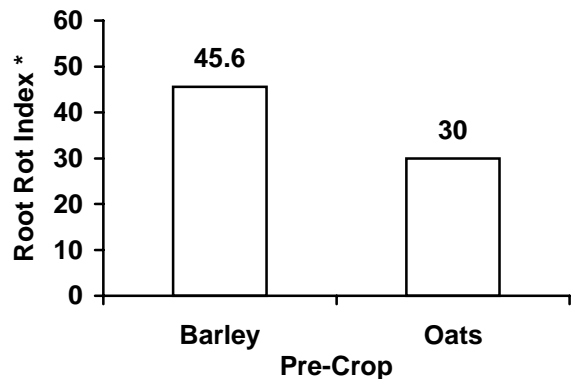
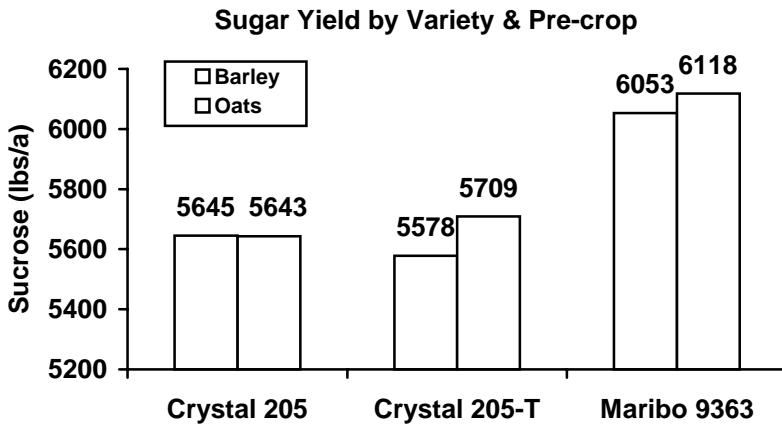
Cooperator: Craig and Karla Hurner
Partnerships: American Crystal Sugar
Funding: U of M Extension Service and American Crystal Sugar
Nearest Town: Moorhead, Minnesota
Soil Type: Bearden loam
Tillage: Chisel plow, cultivation
Previous Crop: Fallow
Hybrid/Variety: See table
Planting Date: 5/26/99 & 5/27/99
Row Width: 22”
Fertilizer: 226 lbs. (18-46-0)/acre
Herbicide: Upbeet, Select, MSO, Stinger, and Betamix tank mix
Harvest Pop.: Varies with treatment
Harvest Date: Late September
Exp. Design: Split block, 3 replications (yield), 6 replications (sugar quality)

Purpose of the Study:

To evaluate sugarbeet yield, quality, and Aphanomyces infection levels as affected by variety, fungicide, and pre-crop influence.

		Sugar Quality			Yield	
Pre-crop	Variety	Tare (%)	Sugar (%)	LOM #	Tons (T/a)	Sucrose (lbs/a)
Barley	Crystal 205	5.3	16.8	1.3	16.8	5645
	Crystal 205-T *	3.0	16.7	1.2	16.7	5578
	Maribo 9363	2.4	17.1	1.4	17.7	6053
Oats	Crystal 205	3.5	16.5	1.3	17.1	5643
	Crystal 205-T *	3.7	16.5	1.3	17.3	5709
	Maribo 9363	3.1	16.9	1.5	18.1	6118
LSD (0.05)		1.3	NS	0.13	NS	NS

* Crystal 205-T: Seed impregnated with the fungicide Tachigarin.
 # LOM: Loss to molasses.



* The Root Rot Index is a bioassay to determine disease potential of a field. (RRI values greater than 50 are cause for serious concern).

Results:

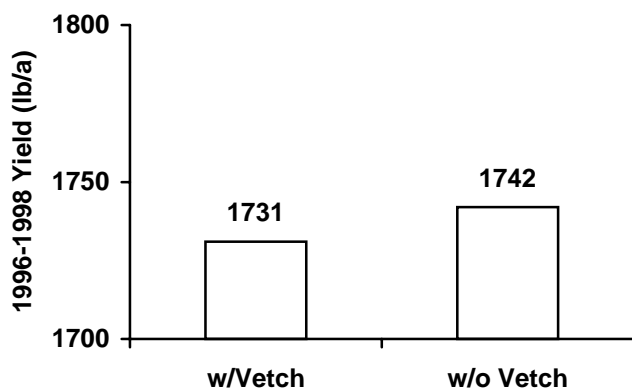
The Root Rot Index was significantly reduced by the presence of an oat pre-crop; however, for reasons that are unclear, Aphanomyces root rot did not develop, in discernable amounts, in any treatments. Sugar yield, sugar quality, and plant population were unaffected by pre-crop or the seed treatment, Tachigaren. Although sugar concentration and yield were unaffected, there were significant varietal differences in tare and LOM concentrations.

For additional information about this trial contact:

Jim Stordahl
 919 8th Avenue N.
 Moorhead, MN 56560
 Phone: 218-299-5020
 jstordahl@extension.umn.edu

Purpose of the Study:
 To compare sunflower yield when intercropped with hairy vetch.

Cooperator: See table
Funding: MN Department of Agricultural Energy and Sustainable Agriculture Program
Exp. Design: Strip trial
Planting: Hairy vetch was broadcasted and worked in by cultivation when sunflowers reached the V4 stage.



Year Cooperator	Sunflower w/Vetch Yield (lb/a)	Sunflower w/o Vetch Yield (lb/a)	Hairy Vetch Yield (lb/a)
1996			
Anderson	2040	2002	449 *
Swanson	703	599	449 *
Swenson	1266	1472	447 *
Schindler	1877	1609	134 *
Average	1472	1421	370 *
1997			
Vatthauer	1412	1847	152
Demarais	1892	2129	856
Swanson	1023	853	1528
Anderson	2232	2169	205
Swenson	1065	967	1129
Stenberg	1057	845	2102
Average	1447	1468	995
1998			
Swenson	1822	1910	1506
Amundson, A	2398	2637	1184
Amundson, B	2813	2803	960
Schafer	2634	2544	2099
Average	2417	2474	1437
Mean 96-98	1731	1742	943

* Hairy vetch yield was decreased due to late planting.

Results:

Sunflower yields with and without hairy vetch were not significantly different over 3 years. An average of 943 lb. hairy vetch dry matter production per acre was added to the cropping system without losing sunflower yield. Dense canopies of sunflower reduced the growth of hairy vetch. The system can work if there is sufficient light reaching the soil surface.

Red River Wheat Variety Trial – Demonstration/Research

Northwest District

Cooperator:
 Dave Hasbargen
 Wayne Zimmerman
 Brian Hest
 Ray Swenson
 J. Wendell Sands
 Marv Hemrick
 Jim Kukowski
 Ron Anderson

Nearest Town:
 Foxhome, MN
 Ulen, MN
 Perley, MN
 Brooks, MN
 Alvarado, MN
 St. Hilaire, MN
 Strathcona, MN
 Hallock, MN

Purpose of the Study:

Evaluation of
 released cultivars for grain
 yield and grain quality in
 northwest Minnesota.

Funding: Minnesota Wheat Research and Promotion Council
Soil Type: Ranging from sandy loam to loam
Previous Crop: Wheat, Sugarbeets, Canola or Soybeans
Planting Date: 4/22/99 – 5/28/99
Row Width: 7”
Fertilizer: Applied by Cooperator
Herbicide: Buctril, Hoelon, Puma
Harvest Date: 7/29/99 to 9/16/99
Exp. Design: Randomized complete block, 2 replications

Company	Variety	Actual Yield (bu/a)		Yield Relative to % of Mean		Plant Height (inches)	Lodging (1-9) #	Test Weight (lbs/bu)	Protein (%)
		1 year	3 years	1 year	3 years				
AgriPro	Lars	59.9	60.6	124.8	110.2	29.0	3.1	53.9	13.7
AgriPro	Ivan **	59.9	—	124.7	—	30.9	1.3	56.3	13.1
SDSU	Oxen	58.4	62.6	121.7	113.8	32.3	3.1	55.6	14.6
SDSU	Russ	57.1	62.9	118.9	114.4	35.3	3.3	55.8	14.3
NDSU	Reeder **	52.1	—	108.6	—	33.2	1.8	55.2	14.8
Pioneer	P2375	51.3	58.5	106.8	106.4	33.0	3.9	56.8	14.2
U of M	McVey **	51.9	—	108.2	—	32.8	2.6	53.4	13.4
U of M	Verde	51.2	59.9	106.6	108.9	32.6	2.9	55.9	13.8
SDSU	Ingot *	50.2	60.3	104.6	109.6	36.3	2.3	60.9	14.6
NDSU	Parshall **	49.1	—	102.2	—	35.0	2.2	58.5	14.4
U of M	HJ 98 *	48.7	59.4	101.4	108.0	32.7	2.0	56.7	14.0
SDSU	Forge *	47.9	56.8	99.7	103.2	34.4	1.8	58.1	13.8
AgriPro	Nora	45.7	49.7	95.2	90.3	28.5	3.2	54.4	15.5
W Plant Breeders	Sharpshooter	45.0	50.9	93.7	92.5	34.7	3.6	57.7	14.2
U of M	Marshall	44.0	53.5	91.6	97.3	31.7	3.1	54.2	13.9
NDSU	Argent **	43.8	—	91.2	—	33.6	2.1	56.5	15.3
SDSU	Ember **	43.0	—	89.5	—	32.8	2.4	56.6	13.2
NDSU	Keene **	42.9	—	89.3	—	33.3	1.9	54.1	14.9
U of M	Bacup	42.6	45.2	88.7	82.1	34.0	4.4	59.0	16.4
AgriPro	Hagar *	42.4	53.3	88.3	96.9	32.9	1.8	54.7	14.5
AgriPro	Gunner	36.0	53.0	75.0	96.3	35.3	3.2	57.4	15.5
Agriculture Canada	AC Barie *	33.3	43.6	69.3	79.3	37.8	2.8	56.4	15.2
LSD (0.05)		5.8	2.9	9.7	5.2			2.2	0.7

* Second year entries (1998 & 1999 data only).

** First year entries (1999 data only).

1 fully upright and 9 flat to the ground.

For additional information about this trial contact:

Jochum Wiersma
 2900 University Avenue
 Crookston, MN 56716
 Phone: 218-281-8629
 wiers002@tc.umn.edu

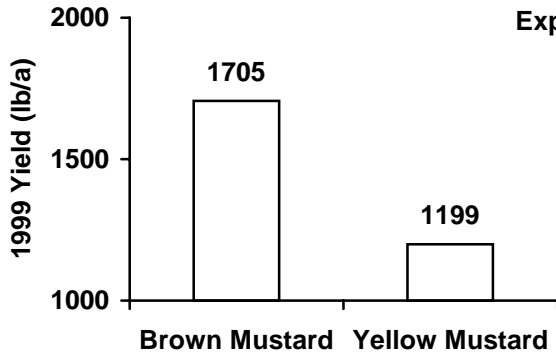
**Alternative Crops for Northwest Minnesota –
Demonstration/Research**

Red Lake County

Purpose of the Study:

Production information for alternative crops that have potential in northwest Minnesota.

Cooperator: Rob and Tim Rynning
Partnerships: Red Lake County Crop Improvement Association, U of M Center of Alternative Plant and Animal Products
Funding: Red Lake County Crop Improvement Association and LCMR Grant
Nearest Town: Kennedy, Minnesota
Soil Type: Northcote clay
Tillage: Fall Chiseled 2x, Spring: Cultivated 1x
Previous Crop: Wheat
Planting Date: 4/30/99
Row Width: 6"
Fertilizer: 80-0-0-15 plus 3-15-0 at planting
Herbicide: 8 lbs. Treflan in fall; 1 1/2 pts. Poast
Harvest Date: 8/11 & 8/19/99
Exp. Design: Randomized complete block, 2 and 4 replications



Alternative Crop	1999 Yield * (lb/a)	1998-1999 Yield # (lb/a)
Brown Mustard	1705a	1663
Yellow Mustard	1199b	1565

* Values in the column followed by the same letter are not significantly different.

The mean from Red Lake Falls 1998, Kennedy & Red Lake

Alternative Crop	1999 Yield (lb/a)	1998-1999 Yield # (lb/a)
Crambe Meyer Ca	1266	1134
Crambe Meyer Fa	1175	1112
Crambe BelAnn	1062	1092

The mean from Red Lake Falls 1998, Kennedy & Red

Alternative Crop	1999 Yield (lb/a)	1998-1999 Yield # (lb/a)
Fenugreek Wa	811	979
Fenugreek Mi	679	943

The mean from Red Lake Falls 1998, Kennedy & Red Lake

Results:

Over 2 years, Brown Mustard yielded 100 lb/a more than yellow mustard. The Crambe varieties had similar yields as well as the two varieties of Fenugreek.

For additional information about this trial contact:

Hans Kandel
 PO Box 279
 Red Lake Falls, MN 56750
 Phone: 218-253-2897 1-800-770-1244
 kande001@umn.edu

Pasture Renovation with Aeration – Demonstration

Lake of the Woods County

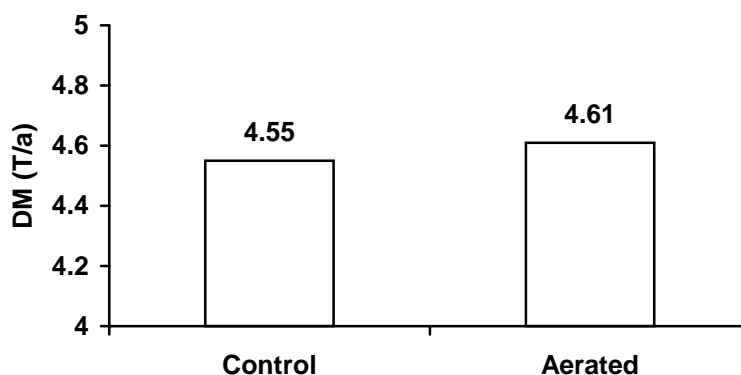
Cooperator: Olson Stock Farm
Nearest Town: Williams, Minnesota
Soil Type: Loam and sandy loam
Tillage: Aerator
Previous Crop: Predominately grass (timothy) with some alfalfa
Treatment Date: Aeration performed in 5/98
Harvest Date: 6/15/99
Exp. Design: Demonstration plot

Purpose of the Study:

Compare benefits of pasture aeration as measured by dry matter production.

Dry Matter * (T/a)						
Site	1	2	3	4	5	Average
Control	4.4	4.8	4.3	4.7	4.6	4.55
Aerated	4.3	5.0	4.4	4.5	4.9	4.61

* Forage was sampled before full maturity due to grazing demands.



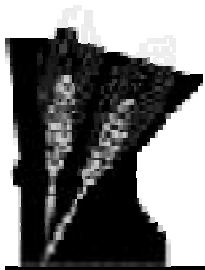
Results:

There were no apparent differences in dry matter produced. Pasture species appeared to have been improved, however, difference was not measured.

For additional information about this trial contact:

Gene Krause
206 8th Avenue SE; PO Box 598
Baudette, MN 56623
Phone: 218-634-1511
gkrause@extension.umn.edu

Printing was made possible with support from the following organizations.....



The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation. The University of Minnesota is an equal opportunity educator and employer.