

## Screening Soybean Varieties for Resistance to Iron Chlorosis, 2003

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Field studies were set out at five locations in 2003, to compare the chlorosis resistance of about 170 soybean entries to iron chlorosis. The sites were located near Amenia, Arthur, Ayr, and Galesburg, ND. Two sites were lost to hail, but one was replanted. The sites ranged in pH from 7.8 to 8.0, salinity (EC) from 0.6 to 1.8 mmho/cm, and % CaCO<sub>3</sub> ranging from 7 to 12 %. Thirty seeds were planted in short (5') rows on 30-inch centers. The experimental design was a randomized complete block with four replications.

Three ratings were made, at the 2-3 trifoliolate stage, the 5-6 trifoliolate stage, and two weeks after the 5-6 trifoliolate stage. The scale was a 1-5 scale, with 1=representing no chlorosis and 5= the most severe chlorosis. The third rating was not taken at the replanted site, because of the need to finish the study in time to prepare this report for the NDSC Field Days, and the third rating was not taken at another site, as recovery from chlorosis was uneven across the plot.

Nine "standard" varieties are entered, to help in the interpretation of the results. The varieties, listed in expected order from the most resistant to most susceptible, were Iowa State ISU A11> Seeds 2000 2070RR > Traill > Council = Asgrow 0801 > Peterson PFS 0202RR = Glacier > Mycogen 5072 = Stine 0480 = NuTech 0505RR. The variety ISU A11 represents the highest level of chlorosis resistance available in current breeding lines. An early selection of A11 ("A11-early") was also tested. All standards were entered twice, to show the degree of variation in our ratings. Some entries were breeding lines, and the data are not reported here.

The summary of the chlorosis scores, averaged across site and the three ratings, are shown in Table 1. Each chlorosis rating in Table 1 represents the average of 36 observations. It was a challenging year, with excessive moisture early, and no rainfall later. Our standards separated themselves as expected with a few exceptions. Council performed a little better than expected, PFS 0202RR performed a little better than expected, and Stine 0480 performed a little better than expected, but generally, the standards separated themselves as expected.

If a field produces moderate or temporary chlorosis, we generally recommend that varieties have a chlorosis resistance as good or better than Council or Asgrow 0801 for these soils. On fields with severe chlorosis problems, only varieties with the highest levels of resistance should be planted. Any yield advantage of a less-resistant variety is lost if the crop turns yellow, even if there is recovery later in the growing season.

This report can also be found on our web site:

[www.soilsci.ndsu.nodak.edu/yellowsoybeans/](http://www.soilsci.ndsu.nodak.edu/yellowsoybeans/)

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Table 1. Average chlorosis scores at four sites in North Dakota, 2003. 1=no chlorosis, 5=most severe chlorosis.

Company	Variety name	Average
<b>"Standard"</b>	<b>ISU A11</b>	<b>1.4</b>
<b>"Standard"</b>	<b>ISU A11</b>	<b>1.6</b>
Gold Co Seed	6009 RR	1.8
Brushvale	BS 0315	1.8
<b>"Standard"</b>	<b>S2000 2070 RR</b>	<b>1.8</b>
<b>"Standard"</b>	<b>S2000 2070 RR</b>	<b>1.8</b>
<b>"Standard"</b>	<b>A11-Early</b>	<b>1.8</b>
<b>"Standard"</b>	<b>A11-Early</b>	<b>1.8</b>
DeKalb	DKB 009-51	2.0
Garst	0601 RR	2.0
Brushvale	BS 2108	2.0
UAP Dyna-Gro	DG 38D05	2.0
Wensman	W 2054 RR	2.0
Pioneer	90 M90 (RR)	2.1
Stine	S 0536-4	2.1
NuTech	NT 0555+ RR	2.1
Hyland	HX 329	2.1
Pioneer	PHI 03-16 (RR)	2.1
AgSource	90093 RR	2.1
Kaystar	K-0520 RR	2.2
Bio Gene	BG 050 RR	2.2
Prairie Brand	PB-0643 RR	2.2
AgSource	9051 RR	2.2
NuTech	NT 0403A RR	2.2
Prairie Brand	PB-0232 RR	2.2
<b>"Standard"</b>	<b>Council</b>	<b>2.2</b>
<b>"Standard"</b>	<b>Trail</b>	<b>2.2</b>
Northstar	NS 0217 RR	2.2
<b>"Standard"</b>	<b>Council</b>	<b>2.2</b>
Peterson Farm Seeds	PFS 0406 RR	2.2
Pioneer	90B51 RR	2.2
Proseed	RR 30-51	2.2
Stine	S 0136-4	2.2
U of MN	MN 0201	2.2
Northstar	NS 0056 RR	2.2
U of MN	M97-304097	2.2
Wensman	W 2051 RR	2.2
Peterson Farm Seeds	PFS 04007 RR	2.3
Mycogen	X53052 RR	2.3
NuTech	NT 0121 RR	2.3
Peterson Farm Seeds	PFS 0407 RR	2.3

Company	Variety name	Average
Quality Seed Genetics	0888 RR	2.3
AgSource	9023 RR	2.3
Garst	0095 RR	2.3
Top Farm	6072 RR SB	2.3
U of MN	M97-304112	2.3
Gold Country Seed	2502 RR	2.3
Mustang	M-054 RR	2.3
Wensman	W 20091 RR	2.3
Quality Seed Genetics	0081 RR	2.3
Asgrow	AG 0301	2.4
Legend Seeds	LS 0911 RR	2.4
Thunder	605 RR	2.4
U of MN	MN 0304	2.4
Gold Country Seed	3403 RR	2.4
Hyland	HX 327	2.4
<b>"Standard"</b>	<b>Trail</b>	<b>2.4</b>
Hyland	HX 268	2.4
UAP Dyna-Gro	DG 30D09	2.4
<b>"Standard"</b>	<b>Asgrow 0801 RR</b>	<b>2.4</b>
Bio Gene	BG 0203 RR	2.4
Kaystar	K-0710 RR	2.4
Mycogen	Atlas Brand 5B008 RR	2.4
Peterson Farm Seeds	PFS 04009 RR	2.4
U of MN	M97-304052	2.4
Bio Gene	BG 091 RR	2.5
Dairyland	DSR-007/RR	2.5
Kaystar	K-0091 RR	2.5
Proseed	RR 2011	2.5
Hyland	HX 326	2.5
Prairie Brand	PB-0072 RR	2.5
Stine	S 0086-4	2.5
Dyna Gro	DG 34G02	2.5
Stine	S 0076-4	2.5
Top Farm	6102 RR	2.5
Wensman	W 20073 RR	2.5
Pioneer	PHI 03-18 (RR)	2.5
Prairie Brand	PB-0094 RR	2.5
UAP Dyna-Gro	DG 32Y09	2.5
AgSource	9092 RR	2.5
Sabre	133 RR CN	2.5
NuTech	NT 0089 RR	2.6
Gold Co Seed	1300 RR	2.6
Northstar	NS 0018 RR	2.6
Ziller	BT 7090R	2.6
Prairie Brand	PB-1063 RR	2.6

Company	Variety name	Average
UAP Dyna-Gro	DG 39P03	2.6
Mustang	M-094 RR	2.6
Proseed	RR 2080	2.6
Garst	1490 N	2.6
Wensman	W 2034 RR	2.6
Seeds 2000	0071 RR	2.6
Proseed	RR 2007	2.7
Ziller	BT 7084R	2.7
<b>"Standard"</b>	<b>Asgrow 0801 RR</b>	<b>2.7</b>
<b>"Standard"</b>	<b>PFS 0202 RR</b>	<b>2.7</b>
Bio Gene	BG 0050 RR	2.7
Seeds 2000	0051 RR	2.7
<b>"Standard"</b>	<b>PFS 0202 RR</b>	<b>2.7</b>
NDSU	Walsh	2.7
Quality Seed Genetics	0939 RR	2.7
Ziller	Exp. 62339R	2.7
NDSU	Jim	2.7
Garst	XR 13N33	2.7
Kaystar	K-0965 RR	2.7
NuTech	NT 0323 RR	2.8
Dairyland	DSR-050/RR	2.8
Qual Seed Gen.	1313 RR/SW	2.8
Thunder	2409 RR	2.8
NK Brand	S06-L6	2.8
Garst	XR 15Y04	2.8
Gold Country Seed	725 RR	2.8
NK Brand	CL 431203	2.8
Sabre	EX 05	2.8
Seeds 2000	2021 RR	2.8
Ziller	BT 7133NR	2.8
AgSource	9053 RR	2.8
Dairyland	DST-0604/RR	2.9
Northstar	NS 0808 RR	2.9
Garst	XR 03Y43	2.9
Mycogen	X53080 RR	2.9
U of MN	MN 0071	2.9
<b>"Standard"</b>	<b>Glacier</b>	<b>2.9</b>
Legend Seeds	LS 0092 RR	2.9
Garst	XY 12Y20	2.9
NK Brand	X 302 R	2.9
Legend Seeds	LS 0082 RR	3.0
NK Brand	X 309 R	3.0
Hyland	HX 331	3.0

Company	Variety name	Average
Seeds 2000	2100 RR	3.0
Ziller	Exp. 42310R	3.0
DeKalb	DKB 07-52	3.0
Prograin	PR 0117	3.0
<b>"Standard"</b>	<b>Stine 0480</b>	<b>3.0</b>
<b>"Standard"</b>	<b>Glacier</b>	<b>3.1</b>
Brushvale	BS 0303	3.1
Brushvale	BS 135-10	3.1
Bio Gene	BG 0080 RR	3.1
Seeds 2000	2050 RR	3.1
Pioneer	PHI 03-14 (RR)	3.1
Prograin	Venus	3.1
Dairyland	DSR-040/RR	3.1
Legend Seeds	LS 0091 RR	3.2
Peterson Farm Seeds	PFS 0403 RR	3.2
<b>"Standard"</b>	<b>Mycogen 5072</b>	<b>3.2</b>
Mycogen	X53022 RR	3.2
Thunder	2406 RR	3.2
Prograin	PR 32102 RR	3.2
Brushvale	BS 0305	3.3
NDSU	Barnes	3.3
Quality Seed Genetics	0221 RR	3.3
<b>"Standard"</b>	<b>Stine 0480</b>	<b>3.3</b>
Thunder	24004 RR	3.3
Dairyland	DSR-009/RR	3.3
Hyland	HX 330	3.3
Prograin	PR 3404 RR	3.3
NDSU	Proto	3.4
NDSU	Sargent	3.4
<b>"Standard"</b>	<b>Mycogen 5072</b>	<b>3.4</b>
Asgrow	AG 0101	3.4
NK Brand	MT 107519	3.6
<b>"Standard"</b>	<b>NuTech 0505 RR</b>	<b>3.6</b>
Asgrow	AG 0601	3.7
Prograin	PR 0203 RR	3.7
Top Farm	6042 RR	3.7
<b>"Standard"</b>	<b>NuTech 0505 RR</b>	<b>3.8</b>
Prograin	PR 249.137 natto	4.2
Mycogen	X53061 RR	4.3