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Evaluation of Soybean Varieties Resistant to Soybean Cyst Nematode in Iowa—2019

View of the northwest Iowa location.

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Summary

- Nine experiments were conducted in 2019, three across northern, three across central, and three across southern Iowa.
- The same varieties were studied in all three experiments across northern, central, or southern Iowa, but varieties varied from north to central to south.
- There were 69 SCN-resistant soybean varieties and 3 susceptible varieties in each experiment. Overall, the resistant varieties were of 18 different brands.
- Most varieties contained SCN resistance from PI 88788. Four varieties in the northern experiments, six in the central experiments, and two in the southern experiments had Peking SCN resistance.
- Initial SCN numbers ranged from 254 eggs per 100 cm^3 of soil near Ames (central) to 4,687 eggs per 100 cm^3 of soil near Fruitland (southeast).
- The SCN populations in all fields in which experiments were conducted had greater than 10% reproduction on PI 88788 (HG Type 2). The SCN population in the field near Fruitland was extremely virulent, having 71% reproduction on PI 88788. Two locations also had reproduction on Peking that was greater than or equal to 10 %, making them an HG Type 1.2; Laurens (10%) and Ames (20%).
- Maximum yields of individual SCN-resistant varieties ranged from 51 bushels per acre near Laurens (northwest) to 81 bushels per acre near Glenwood (southwest).
- The two varieties with Peking SCN resistance in the experiment near Fruitland yielded 71 bushels per acre. The top-yielding variety with PI 88788 resistance in the experiment produced 58.7 bushels per acre. Also, SCN numbers decreased by 80% in plots with varieties with Peking resistance but SCN numbers increased up to 9-fold on individual varieties with PI 88788 resistance in this experiment.
- The largest overall season-long increases in SCN numbers were in experiments near Ames (central), Oelwein (northeast), and Fruitland (southeast).
- SCN numbers decreased throughout the season on all SCN-resistant varieties in the experiment near Moorhead, in west central Iowa. This was the second-highest yielding experiment.
- Results indicate a range of yield performance of SCN-resistant varieties and high yields of some varieties with Peking SCN resistance.
- Farmers should grow soybean varieties with Peking SCN resistance alternating with high-yielding PI 88788 SCN-resistant varieties that allow low SCN reproduction.

Introduction

Use of resistant soybean varieties is a very effective strategy for managing soybean cyst nematode (SCN), and numerous SCN-resistant soybean varieties are available for Iowa soybean farmers. Each year, SCN-resistant soybean varieties are evaluated in SCN-infested fields throughout Iowa by Iowa State University personnel. The research described in this report was performed to assess the agronomic performance of maturity group (MG) I, II, and III SCN-resistant soybean varieties and to determine the effects of the varieties on SCN numbers or population densities.

Materials and Methods

SCN-resistant soybeans were studied in northern, central, and southern Iowa based upon maturity group. The northern trials were located near Laurens (northwest Iowa), Manly (north central Iowa) and Oelwein (northeast Iowa). The central trials were located near Moorhead (west central Iowa), Ames (central Iowa), and Urbana (east central Iowa). The southern trials were located near Glenwood (southwest Iowa), Oskaloosa (south central Iowa), and Fruitland (southeast Iowa).

Location-specific details.

Location	Initial SCN Population (eggs / 100 cc soil)	HG Type[1]	Planting Date	Harvest Date
Laurens (NW)	2,902	1.2-	June 4th	October 27th
Manly (NC)	417	2-	May 7th	October 28th
Oelwein (NE)	642	2-	May 13th	October 17th
Moorhead (WC)	2,742	2-	May 17th	October 15th
Ames (C)	254	1.2-	June 3rd	November 1st
Urbana (EC)	1,305	2-	June 10th	November 7th
Glenwood (SW)	4,011	2-	May 15th	October 18th
Oskaloosa (SC)	1,748	2-	May 16th	October 25th
Fruitland (SE)	4,687	2-	May 10th	October 14th

[1] In the SCN HG type test results, "1" indicates ≥10% reproduction on Peking (PI 548402), and "2" indicates ≥10% reproduction on PI 88788. "-" indicates an incomplete HG type test; populations were tested only on Peking, PI 88788, PI 90763, and PI 437654.

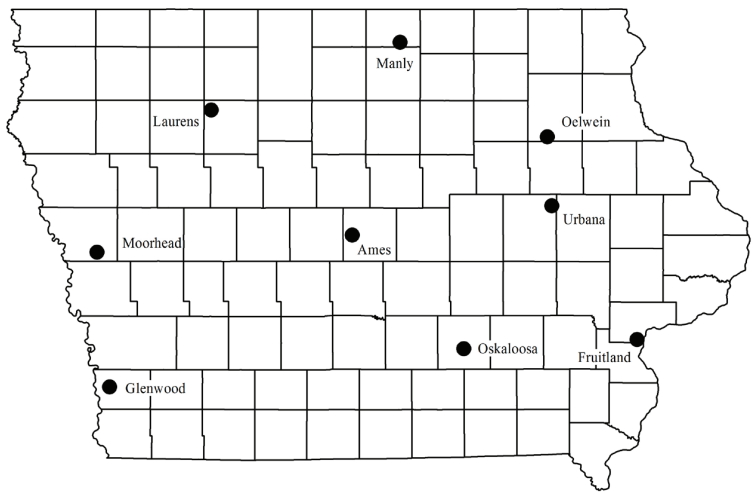
SCN-susceptible varieties also were planted in the experiments for comparison purposes. All plots were four 17-foot-long rows spaced 30 inches apart and were planted at 8 seeds per foot (140,000 seeds per acre), with four replications per variety. Seed companies were encouraged to treat their seed with fungicide and insecticide. Seeds that were received untreated were treated with CruiserMaxx® Vibrance® by Iowa State University personnel. A complete list of the seed treatments used on the varieties tested is included at the end of the report. Pre-plant herbicides Authority® Supreme and Pendimethalin were applied to each location. All locations were sprayed with Flexstar®, FirstRate®, Warrant® and Select Max® to control weeds during the growing season. The Laurens and Moorhead locations were planted using "no-till" methods, and the Oelwein location was planted into a terminated rye grass cover crop. At all other locations, the seed bed was tilled prior to planting.

At growth stage R6 all locations were scouted for foliar symptoms of sudden death syndrome (SDS), with no significant symptoms observed. All plots were end trimmed to a length of 14 feet during September. For each location, the center two rows of each four-row plot were harvested with a plot combine, total seed weight per plot and seed moisture were determined, and total plot seed weights subsequently were converted to bushels per acre. Resistant varieties and susceptible check varieties are grouped separately and are listed in the report in decreasing order of yield. Eleven varieties were dropped from the Oskaloosa location due to plot damage caused by excessive rainfall.

At the beginning of the growing season, plots were sampled for the presence of SCN. Soil samples, consisting of 10 one-inch-diameter, six- to eight-inch-deep soil cores were collected from the center 14 feet

of the center two rows of each plot immediately after planting. SCN cysts were extracted from each soil sample, and SCN eggs were extracted from the cysts and counted. SCN egg population densities were also determined for each plot at the end of the growing season in an identical manner.

Because of the consistent relationship between higher soil pH and high SCN population densities, all varieties were also field tested for tolerance to iron deficiency chlorosis (IDC). Each variety was planted in a hill plot consisting of five seeds per hill, with four replications per variety, at two high pH field locations. Notes were taken for IDC symptoms at each location approximately four weeks after planting. Varieties were rated on a scale of "1" to "5" with a "1" indicating no symptoms of IDC present and a "5" indicating plant death due to IDC. Data from one location was discarded due to the lack of IDC symptoms. One variety highly resistant to IDC and one variety susceptible to IDC also were included in the experiments as checks. The highly resistant variety scored an average of 1.2 and the susceptible variety scored an average of 3.2. The scores from these IDC field tests are listed in each location table in the report for reference.



Data Presentation

In the report, soybean yield and SCN reproduction are displayed graphically in addition to numerically in the tables. Yield is represented by the length of the green bars. SCN reproduction is represented by the length of the blue bars. SCN reproduction was determined by calculating the reproductive factor (RF) for each variety. RF is calculated by dividing the average final SCN population density by the average initial SCN population density for each variety. If a variety has a RF value of 5.0, the SCN population density for those plots was 5 times greater at harvest than it was at planting. A RF value of 0.5 means the SCN population density for those plots at harvest was one half the population density at planting. The RF value is location specific and may vary substantially under different environmental conditions, soil types, and nematode populations.

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Table 1. Laurens (NW Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Pioneer	P21A28X	2.1	Peking	RR2X	1.9	600	0.2	51.2
Pioneer	P19A14X	1.9	Peking	RR2X	3.0	725	0.4	50.7
Federal Hybrids	F2290N	2.2	Peking	RR2X	2.3	1,800	0.5	50.2
Beck's	2710E3	2.7	PI 88788	E3	1.9	5,125	1.3	48.2
FS HiSOY	HS 26X90	2.6	Peking	RR2X	2.5	1,800	1.0	47.9
Cornelius	1920E	2.0	PI 88788	E3	1.9	2,300	0.8	45.5
LATHAM	L 2295 R2X	2.2	PI 88788	RR2X	2.1	7,350	2.7	44.8
Beck's	2559X2	2.5	PI 88788	RR2X	2.3	5,400	2.9	44.4
Nutech	17N01L	1.7	PI 88788	LL	1.3	5,850	1.6	43.9
Kruger	K2X-2172	2.1	PI 88788	RR2X	2.0	4,050	2.6	43.8
Kruger	K2X-1862	1.8	PI 88788	RR2X	2.0	5,625	1.6	43.4
Stine	19GA02	1.9	PI 88788	LLGT27	2.7	3,700	1.5	43.4
LG Seeds	LGS1776RX	1.7	PI 88788	RR2X	1.8	6,550	3.2	43.3
Mycogen	MY210L5	2.1	PI 88788	LL	2.8	7,575	2.9	43.1
Cornelius	CB20X22	2.0	PI 88788	RR2X	3.0	6,375	2.4	43.1
Beck's	2310E3	2.3	PI 88788	E3	2.6	9,900	3.4	42.8
FS HiSOY	HS 21X90	2.1	PI 88788	RR2X	3.3	11,250	4.6	42.6
Stine	25GA62	2.5	PI 88788	LLGT27	2.0	5,925	1.6	42.6
Merschman	Ute 2022 LLGT27	2.2	PI 88788	LLGT27	1.8	8,375	3.2	42.5
FS HiSOY	HS 19X90	1.9	PI 88788	RR2X	1.8	9,750	3.2	42.4
Mycogen	MY220R2X	2.2	PI 88788	RR2X	2.0	8,600	2.6	42.3
NK	S20-J5X	2.0	PI 88788	RR2X	1.9	3,600	1.2	42.0
Beck's	2088FP	2.0	PI 88788	LLGT27	2.1	6,575	3.8	41.8
Merschman	Mars 1919 E	1.9	PI 88788	E3	1.5	2,100	0.6	41.5
FS HiSOY	HS 22X90	2.2	PI 88788	RR2X	1.9	8,300	2.0	41.4
ASGROW	AG22X9	2.2	PI 88788	RR2X	1.4	8,650	3.2	41.4
Merschman	Navaho 2020 LLGT27	2.0	PI 88788	LLGT27	1.9	5,775	2.5	41.4
ASGROW	AG21X9	2.1	PI 88788	RR2X	1.9	7,350	3.7	41.3
LATHAM	L 1883 L	1.8	PI 88788	LL	3.0	6,900	2.8	41.1
Pioneer	P23A15X	2.3	PI 88788	RR2X	2.3	14,750	6.4	40.8
Kruger	K2X-2073	2.0	PI 88788	RR2X	1.8	7,175	2.4	40.7
Kruger	K2X-1773	1.7	PI 88788	RR2X	2.4	9,425	2.1	40.7
Kruger	K2X-2283	2.2	PI 88788	RR2X	2.3	5,800	1.5	40.5
Hoegemeyer HPT	LL1710 N	1.7	PI 88788	LL	2.3	6,775	2.7	40.5
NK	S21-W8X	2.1	PI 88788	RR2X	1.4	9,525	2.9	40.5
LATHAM	L 2159 R2X	2.1	PI 88788	RR2X	3.0	8,450	2.4	40.3
FS HiSOY	HS 24X80	2.4	PI 88788	RR2X	2.7	5,400	1.7	40.1
Pioneer	P18A98X	1.8	PI 88788	RR2X	1.6	6,825	1.9	40.0
Federal Hybrids	F2090N	2.0	PI 88788	RR2X	1.8	7,700	2.7	40.0
ASGROW	AG27X0	2.7	PI 88788	RR2X	2.6	7,950	2.8	39.6
Hoegemeyer HPT	LL2221 N	2.2	PI 88788	LL	2.5	7,825	3.0	39.4
Kruger	K2X-2052	2.0	PI 88788	RR2X	2.1	6,725	1.5	39.2
Dyna-Gro	S21XT49	2.1	PI 88788	RR2X	1.9	6,950	3.6	39.2
ASGROW	AG19X0	1.9	PI 88788	RR2X	1.5	7,300	2.4	38.5
LG Seeds	LGS2007RX	2.0	PI 88788	RR2X	2.0	4,700	1.2	38.2
Dyna-Gro	S23XT90	2.3	PI 88788	RR2X	2.0	8,650	3.3	38.2
ASGROW	AG25X0	2.5	PI 88788	RR2X	2.9	10,625	4.1	38.0
Merschman	Mohegan 2023E	2.3	PI 88788	E3	2.3	5,250	1.3	37.7
LEGACY SEEDS	LS-1838N RR2X	1.8	PI 88788	RR2X	1.4	4,350	2.1	37.6
Hoegemeyer HPT	2202 NX	2.2	PI 88788	RR2X	2.1	6,525	1.5	37.6
Dyna-Gro	S21EN70	2.1	PI 88788	E3	2.6	5,450	1.4	37.6

Table 1. Laurens (NW Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Nutech	20N03E	2.0	PI 88788	E3	2.0	4,650	1.2	37.5
Dyna-Gro	S24XT08	2.4	PI 88788	RR2X	3.0	8,625	2.0	37.5
LATHAM	L 2549 R2X	2.5	PI 88788	RR2X	3.0	11,625	7.6	37.4
Cornelius	CB18X80	1.8	PI 88788	RR2X	1.8	5,350	2.3	37.3
Federal Hybrids	F2280N	2.2	PI 88788	RR2X	2.3	10,225	4.3	37.2
FS HiSOY	HS 27X90	2.7	PI 88788	RR2X	2.5	9,525	3.3	37.0
ASGROW	AG23X8	2.3	PI 88788	RR2X	2.1	9,175	4.2	36.9
NK	S18-H3X	1.8	PI 88788	RR2X	1.6	6,675	2.5	36.7
Stine	21LH02	2.1	PI 88788	LL	2.5	5,575	1.5	36.5
Beck's	2777X2	2.7	PI 88788	RR2X	2.8	15,300	5.2	36.3
ASGROW	AG18X0	1.8	PI 88788	RR2X	1.6	4,125	1.4	36.2
Merschman	Cheyenne 1920E	2.0	PI 88788	E3	2.6	5,075	1.8	36.1
LATHAM	L 1769 R2X	1.7	PI 88788	RR2X	2.9	5,175	2.9	35.7
Federal Hybrids	F2190N	2.1	PI 88788	RR2X	1.9	7,900	2.1	35.3
LEGACY SEEDS	LS-2139N RR2X	2.1	PI 88788	RR2X	2.1	5,825	2.2	34.9
Hoegemeyer HPT	1910 E	1.9	PI 88788	E3	2.3	7,875	2.7	34.9
Cornelius	CB21X55	2.1	PI 88788	RR2X	2.2	4,950	2.2	34.9
Stine	17GA02	1.7	PI 88788	LLGT27	1.5	5,425	2.4	34.8
	Mean	2.1	-	-	2.2	6,740	2.5	40.5
	LSD[4] (P = 0.10)	-	-	-	-	3,927	-	4.8
Stine	*20GA00*	*2.0*	*None*	*LLGT27*	*1.8*	*10,625*	*4.1*	*39.2*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*9,300*	*2.2*	*32.6*
University of Nebraska	*U14-103015*	*1.8*	*None*	*None*	*2.5*	*12,150*	*3.1*	*27.1*
	Mean	*2.2*	-	-	*2.3*	*10,692*	*3.1*	*32.9*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 2,902 eggs per 100 cc soil; HG type 1.2- (63% on PI 88788, 10% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 2. Manly (NC Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
ASGROW	AG22X9	2.2	PI 88788	RR2X	1.4	400	1.5	72.0
Hoegemeyer HPT	LL2221 N	2.2	PI 88788	LL	2.5	650	1.7	70.9
Hoegemeyer HPT	2202 NX	2.2	PI 88788	RR2X	2.1	525	1.1	69.7
Pioneer	P21A28X	2.1	Peking	RR2X	1.9	150	0.2	69.5
NK	S21-W8X	2.1	PI 88788	RR2X	1.4	425	2.1	69.5
LATHAM	L 2295 R2X	2.2	PI 88788	RR2X	2.1	350	0.7	68.8
Kruger	K2X-2073	2.0	PI 88788	RR2X	1.8	675	3.9	68.7
Stine	25GA62	2.5	PI 88788	LLGT27	2.0	625	1.7	68.6
FS HiSOY	HS 27X90	2.7	PI 88788	RR2X	2.5	850	2.0	68.4
Cornelius	CB18X80	1.8	PI 88788	RR2X	1.8	600	2.0	68.4
Kruger	K2X-2172	2.1	PI 88788	RR2X	2.0	825	0.9	68.3
Dyna-Gro	S21EN70	2.1	PI 88788	E3	2.6	800	0.9	68.1
Pioneer	P19A14X	1.9	Peking	RR2X	3.0	200	0.6	68.0
Hoegemeyer HPT	LL1710 N	1.7	PI 88788	LL	2.3	1,275	3.4	68.0
LG Seeds	LGS2007RX	2.0	PI 88788	RR2X	2.0	450	1.1	67.8
Pioneer	P18A98X	1.8	PI 88788	RR2X	1.6	825	1.6	67.6
Kruger	K2X-1862	1.8	PI 88788	RR2X	2.0	775	1.6	67.5
ASGROW	AG27X0	2.7	PI 88788	RR2X	2.6	800	0.9	67.4
Mycogen	MY210L5	2.1	PI 88788	LL	2.8	1,100	1.9	67.3
FS HiSOY	HS 24X80	2.4	PI 88788	RR2X	2.7	850	2.6	66.9
LG Seeds	LGS1776RX	1.7	PI 88788	RR2X	1.8	550	1.4	66.8
Mycogen	MY220R2X	2.2	PI 88788	RR2X	2.0	500	1.3	66.8
Beck's	2777X2	2.7	PI 88788	RR2X	2.8	800	1.4	66.6
Federal Hybrids	F2190N	2.1	PI 88788	RR2X	1.9	425	0.5	66.6
Nutech	17N01L	1.7	PI 88788	LL	1.3	600	1.6	66.5
Stine	17GA02	1.7	PI 88788	LLGT27	1.5	550	1.2	66.4
LATHAM	L 2549 R2X	2.5	PI 88788	RR2X	3.0	475	1.5	66.4
Kruger	K2X-1773	1.7	PI 88788	RR2X	2.4	400	0.9	66.3
Pioneer	P23A15X	2.3	PI 88788	RR2X	2.3	675	4.5	66.1
Hoegemeyer HPT	1910 E	1.9	PI 88788	E3	2.3	850	2.3	66.0
LEGACY SEEDS	LS-2139N RR2X	2.1	PI 88788	RR2X	2.1	775	2.6	65.8
Merschman	Ute 2022 LLGT27	2.2	PI 88788	LLGT27	1.8	725	4.1	65.8
Federal Hybrids	F2090N	2.0	PI 88788	RR2X	1.8	575	1.2	65.6
Federal Hybrids	F2290N	2.2	Peking	RR2X	2.3	225	0.4	65.4
NK	S20-J5X	2.0	PI 88788	RR2X	1.9	175	0.8	65.4
Merschman	Mohegan 2023E	2.3	PI 88788	E3	2.3	825	1.5	65.0
LATHAM	L 2159 R2X	2.1	PI 88788	RR2X	3.0	875	5.8	65.0
Beck's	2088FP	2.0	PI 88788	LLGT27	2.1	175	0.8	64.8
Cornelius	CB20X22	2.0	PI 88788	RR2X	3.0	800	1.6	64.8
Kruger	K2X-2283	2.2	PI 88788	RR2X	2.3	475	0.7	64.7
ASGROW	AG21X9	2.1	PI 88788	RR2X	1.9	425	1.1	64.7
Merschman	Cheyenne 1920E	2.0	PI 88788	E3	2.6	550	2.2	64.6
Cornelius	1920E	2.0	PI 88788	E3	1.9	700	1.2	64.6
Cornelius	CB21X55	2.1	PI 88788	RR2X	2.2	425	0.8	64.2
ASGROW	AG23X8	2.3	PI 88788	RR2X	2.1	625	1.7	64.1
FS HiSOY	HS 21X90	2.1	PI 88788	RR2X	3.3	450	1.8	64.0
ASGROW	AG19X0	1.9	PI 88788	RR2X	1.5	700	1.2	63.6
FS HiSOY	HS 26X90	2.6	Peking	RR2X	2.5	650	1.4	63.5
Beck's	2710E3	2.7	PI 88788	E3	1.9	450	1.0	63.5
Merschman	Navaho 2020 LLGT27	2.0	PI 88788	LLGT27	1.9	525	1.4	63.5
FS HiSOY	HS 19X90	1.9	PI 88788	RR2X	1.8	425	0.9	63.1

Table 2. Manly (NC Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Stine	21LH02	2.1	PI 88788	LL	2.5	925	2.6	63.1
Beck's	2559X2	2.5	PI 88788	RR2X	2.3	325	2.6	63.1
Federal Hybrids	F2280N	2.2	PI 88788	RR2X	2.3	775	5.2	63.1
Dyna-Gro	S24XT08	2.4	PI 88788	RR2X	3.0	400	2.7	63.1
Merschman	Mars 1919 E	1.9	PI 88788	E3	1.5	225	0.6	62.9
Dyna-Gro	S21XT49	2.1	PI 88788	RR2X	1.9	175	2.3	62.8
ASGROW	AG18X0	1.8	PI 88788	RR2X	1.6	300	0.6	62.7
Kruger	K2X-2052	2.0	PI 88788	RR2X	2.1	875	2.2	62.3
NK	S18-H3X	1.8	PI 88788	RR2X	1.6	375	0.7	62.1
ASGROW	AG25X0	2.5	PI 88788	RR2X	2.9	525	1.9	62.0
Beck's	2310E3	2.3	PI 88788	E3	2.6	525	1.9	62.0
Nutech	20N03E	2.0	PI 88788	E3	2.0	250	0.6	62.0
LEGACY SEEDS	LS-1838N RR2X	1.8	PI 88788	RR2X	1.4	275	0.9	61.9
LATHAM	L 1883 L	1.8	PI 88788	LL	3.0	650	2.2	61.8
Dyna-Gro	S23XT90	2.3	PI 88788	RR2X	2.0	575	1.3	61.4
LATHAM	L 1769 R2X	1.7	PI 88788	RR2X	2.9	900	1.5	61.2
Stine	19GA02	1.9	PI 88788	LLGT27	2.7	275	0.8	61.0
FS HiSOY	HS 22X90	2.2	PI 88788	RR2X	1.9	500	0.6	60.3
	Mean	2.1	-	-	2.2	570	1.7	65.4
	LSD[4] (P = 0.10)	-	-	-	-	NS	-	4.0
Stine	*20GA00*	*2.0*	*None*	*LLGT27*	*1.8*	*1,600*	*2.6*	*60.2*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*4,250*	*5.5*	*53.9*
University of Nebraska	*U14-103015*	*1.8*	*None*	*None*	*2.5*	*2,675*	*5.6*	*53.1*
	Mean	*2.2*	-	-	*2.3*	*2,842*	*4.6*	*59.6*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 417 eggs per 100 cc soil; HG type 2- (26% on PI 88788, 0% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 3. Oelwein (NE Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Beck's	2777X2	2.7	PI 88788	RR2X	2.8	3,850	11.0	63.9
Pioneer	P21A28X	2.1	Peking	RR2X	1.9	200	0.3	63.3
Federal Hybrids	F2090N	2.0	PI 88788	RR2X	1.8	1,200	2.8	63.1
Federal Hybrids	F2290N	2.2	Peking	RR2X	2.3	100	0.6	62.9
Hoegemeyer HPT	2202 NX	2.2	PI 88788	RR2X	2.1	1,200	2.7	62.8
Kruger	K2X-2073	2.0	PI 88788	RR2X	1.8	1,775	3.7	62.5
LEGACY SEEDS	LS-2139N RR2X	2.1	PI 88788	RR2X	2.1	2,650	5.9	62.3
Cornelius	CB18X80	1.8	PI 88788	RR2X	1.8	2,250	3.8	62.3
Dyna-Gro	S24XT08	2.4	PI 88788	RR2X	3.0	2,375	3.3	62.2
Stine	25GA62	2.5	PI 88788	LLGT27	2.0	3,025	4.0	62.1
Pioneer	P23A15X	2.3	PI 88788	RR2X	2.3	2,025	9.0	62.0
ASGROW	AG27X0	2.7	PI 88788	RR2X	2.6	975	3.5	61.8
LG Seeds	LGS2007RX	2.0	PI 88788	RR2X	2.0	2,250	6.9	61.7
Cornelius	CB21X55	2.1	PI 88788	RR2X	2.2	4,275	5.7	61.7
Mycogen	MY210L5	2.1	PI 88788	LL	2.8	3,000	3.6	60.8
Hoegemeyer HPT	LL2221 N	2.2	PI 88788	LL	2.5	2,425	3.6	60.8
Beck's	2088FP	2.0	PI 88788	LLGT27	2.1	1,475	3.5	60.3
LEGACY SEEDS	LS-1838N RR2X	1.8	PI 88788	RR2X	1.4	1,850	4.4	60.0
Stine	19GA02	1.9	PI 88788	LLGT27	2.7	1,150	1.4	59.9
Kruger	K2X-1773	1.7	PI 88788	RR2X	2.4	2,550	2.9	59.7
Merschman	Navaho 2020 LLGT27	2.0	PI 88788	LLGT27	1.9	1,400	1.7	59.6
Merschman	Cheyenne 1920E	2.0	PI 88788	E3	2.6	2,625	7.5	59.5
Mycogen	MY220R2X	2.2	PI 88788	RR2X	2.0	2,475	9.9	59.4
NK	S21-W8X	2.1	PI 88788	RR2X	1.4	2,925	3.5	59.4
Pioneer	P19A14X	1.9	Peking	RR2X	3.0	425	0.8	59.3
Dyna-Gro	S21EN70	2.1	PI 88788	E3	2.6	1,275	1.8	59.3
Beck's	2559X2	2.5	PI 88788	RR2X	2.3	1,850	3.4	59.2
Cornelius	CB20X22	2.0	PI 88788	RR2X	3.0	1,275	2.7	59.1
FS HiSOY	HS 27X90	2.7	PI 88788	RR2X	2.5	3,625	6.3	59.0
FS HiSOY	HS 26X90	2.6	Peking	RR2X	2.5	550	0.9	58.8
ASGROW	AG22X9	2.2	PI 88788	RR2X	1.4	1,200	1.2	58.4
LATHAM	L 2159 R2X	2.1	PI 88788	RR2X	3.0	2,400	7.4	58.4
FS HiSOY	HS 24X80	2.4	PI 88788	RR2X	2.7	2,325	3.1	58.0
ASGROW	AG25X0	2.5	PI 88788	RR2X	2.9	3,550	3.5	58.0
ASGROW	AG21X9	2.1	PI 88788	RR2X	1.9	2,350	2.7	58.0
Kruger	K2X-2052	2.0	PI 88788	RR2X	2.1	2,050	4.6	57.9
Beck's	2710E3	2.7	PI 88788	E3	1.9	2,700	3.6	57.8
Hoegemeyer HPT	LL1710 N	1.7	PI 88788	LL	2.3	1,975	6.1	57.6
LG Seeds	LGS1776RX	1.7	PI 88788	RR2X	1.8	4,500	8.6	57.4
LATHAM	L 1883 L	1.8	PI 88788	LL	3.0	1,275	3.2	57.3
ASGROW	AG23X8	2.3	PI 88788	RR2X	2.1	3,150	7.9	57.2
Kruger	K2X-2172	2.1	PI 88788	RR2X	2.0	2,725	4.0	57.1
ASGROW	AG19X0	1.9	PI 88788	RR2X	1.5	1,900	2.3	57.0
Merschman	Mohegan 2023E	2.3	PI 88788	E3	2.3	2,500	11.1	56.9
LATHAM	L 2549 R2X	2.5	PI 88788	RR2X	3.0	2,475	4.0	56.9
Federal Hybrids	F2280N	2.2	PI 88788	RR2X	2.3	4,800	12.0	56.5
LATHAM	L 2295 R2X	2.2	PI 88788	RR2X	2.1	1,300	1.9	56.2
Nutech	17N01L	1.7	PI 88788	LL	1.3	1,350	3.9	56.2
Federal Hybrids	F2190N	2.1	PI 88788	RR2X	1.9	1,325	1.3	55.9
Pioneer	P18A98X	1.8	PI 88788	RR2X	1.6	3,025	8.1	55.6
NK	S20-J5X	2.0	PI 88788	RR2X	1.9	2,175	2.1	55.2

Table 3. Oelwein (NE Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Beck's	2310E3	2.3	PI 88788	E3	2.6	2,650	3.9	55.0
Merschman	Mars 1919 E	1.9	PI 88788	E3	1.5	1,125	1.7	55.0
FS HiSOY	HS 21X90	2.1	PI 88788	RR2X	3.3	3,725	4.4	54.9
Merschman	Ute 2022 LLGT27	2.2	PI 88788	LLGT27	1.8	1,750	1.2	54.9
Dyna-Gro	S21XT49	2.1	PI 88788	RR2X	1.9	1,950	2.2	54.8
Kruger	K2X-1862	1.8	PI 88788	RR2X	2.0	3,075	3.0	54.7
ASGROW	AG18X0	1.8	PI 88788	RR2X	1.6	2,550	3.2	54.5
NK	S18-H3X	1.8	PI 88788	RR2X	1.6	2,300	4.6	54.1
Dyna-Gro	S23XT90	2.3	PI 88788	RR2X	2.0	2,925	2.5	54.0
FS HiSOY	HS 19X90	1.9	PI 88788	RR2X	1.8	3,075	4.9	53.8
Hoegemeyer HPT	1910 E	1.9	PI 88788	E3	2.3	1,525	3.1	53.6
FS HiSOY	HS 22X90	2.2	PI 88788	RR2X	1.9	3,150	9.0	53.5
Stine	21LH02	2.1	PI 88788	LL	2.5	1,600	2.8	52.8
Kruger	K2X-2283	2.2	PI 88788	RR2X	2.3	5,275	7.8	52.7
Nutech	20N03E	2.0	PI 88788	E3	2.0	2,900	3.0	52.3
LATHAM	L 1769 R2X	1.7	PI 88788	RR2X	2.9	2,175	1.7	51.0
Cornelius	1920E	2.0	PI 88788	E3	1.9	875	1.3	50.6
Stine	17GA02	1.7	PI 88788	LLGT27	1.5	2,200	2.0	50.0
	Mean	2.1	-	-	2.2	2,245	4.1	57.8
	LSD[4] (P = 0.10)	-	-	-	-	1,786	-	4.5
Stine	*20GA00*	*2.0*	*None*	*LLGT27*	*1.8*	*1,175*	*1.5*	*54.6*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*3,775*	*9.4*	*53.8*
University of Nebraska	*U14-103015*	*1.8*	*None*	*None*	*2.5*	*2,750*	*1.8*	*48.6*
	Mean	*2.2*	-	-	*2.3*	*2,567*	*4.3*	*52.3*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 642 eggs per 100 cc soil; HG type 2- (30% on PI 88788, 0% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 4. Moorhead (WC Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
NK	S30-M9X	3.0	PI 88788	RR2X	1.8	550	0.3	75.7
Pioneer	P27A17X	2.7	Peking	RR2X	2.2	275	0.1	75.0
FS HiSOY	HS 29X80	2.9	PI 88788	RR2X	2.4	1,200	0.5	73.9
Hoegemeyer HPT	LL2641 N	2.6	Peking	LL	1.9	450	0.1	73.3
Beck's	2899X2	2.8	PI 88788	RR2X	2.3	1,475	0.7	73.1
FS HiSOY	HS 28X70	2.8	PI 88788	RR2X	3.1	400	0.1	72.7
ASGROW	AG29X9	2.9	PI 88788	RR2X	3.0	650	0.2	72.4
LG Seeds	LGS3297RX	3.2	PI 88788	RR2X	2.5	1,075	0.4	72.3
LATHAM	L 2839 LLGT27	2.8	PI 88788	LLGT27	2.3	1,375	0.3	72.3
Hoegemeyer HPT	2590 NR	2.5	Peking	GT	2.5	450	0.2	72.2
FS HiSOY	HS 31X60	3.1	PI 88788	RR2X	2.5	975	0.4	72.1
Kruger	K2X-2971	2.9	PI 88788	RR2X	1.9	400	0.3	72.0
FS HiSOY	HS 33X80	3.3	PI 88788	RR2X	3.0	1,075	0.3	71.9
Merschman	Mohawk 1928E	2.8	PI 88788	E3	2.6	650	0.3	71.9
Pioneer	P29A25X	2.9	PI 88788	RR2X	1.6	950	0.4	71.9
Dyna-Gro	S28XT58	2.8	PI 88788	RR2X	2.9	1,050	0.5	71.8
Beck's	2777X2	2.7	PI 88788	RR2X	2.8	1,350	0.5	71.7
ASGROW	AG27X0	2.7	PI 88788	RR2X	2.6	450	0.2	71.2
Beck's	3546FP	3.5	PI 88788	LLGT27	2.5	775	0.4	71.2
LATHAM	L 2887 R2X	2.8	PI 88788	RR2X	2.8	775	0.2	71.1
Dyna-Gro	S32EN60	3.2	PI 88788	E3	3.4	875	0.4	71.1
LG Seeds	C2888RX	2.8	PI 88788	RR2X	2.3	975	0.4	70.9
Mycogen	MY311L5	3.1	PI 88788	LL	2.5	1,550	0.4	70.8
Beck's	3559X2	3.5	PI 88788	RR2X	3.2	500	0.2	70.7
ASGROW	AG27X9	2.7	Peking	RR2X	2.3	550	0.2	70.6
LATHAM	L 2949 E3	2.9	PI 88788	E3	2.8	1,150	0.5	70.6
Nutech	30N05E	3.0	PI 88788	E3	2.1	675	0.2	70.5
ASGROW	AG26X0	2.6	PI 88788	RR2X	2.8	1,275	0.6	70.4
Cornelius	CB27X81	2.7	PI 88788	RR2X	3.4	475	0.2	70.4
LG Seeds	LGS2989RX	2.9	PI 88788	RR2X	2.1	725	0.3	70.3
Merschman	Apache 1926E	2.6	PI 88788	E3	2.6	875	0.5	70.2
Hoegemeyer HPT	2781 NX	2.7	PI 88788	RR2X	2.3	1,100	0.5	70.2
Nutech	3281L	2.8	PI 88788	LL	1.5	550	0.2	70.0
Kruger	K2X-2673	2.6	PI 88788	RR2X	3.3	1,150	0.7	69.8
Merschman	Harrison 2030E	3.0	PI 88788	E3	1.8	575	0.2	69.8
Pioneer	P24A80X	2.4	PI 88788	RR2X	2.0	1,375	0.4	69.7
Mycogen	MY280R2X	2.8	PI 88788	RR2X	3.6	825	0.3	69.7
Beck's	3082FP	3.0	PI 88788	LLGT27	1.9	1,925	0.5	69.5
Kruger	K2X-2863	2.8	PI 88788	RR2X	3.5	1,300	0.7	69.1
Merschman	Chickasaw 2025 LLGT27	2.5	PI 88788	LLGT27	2.8	750	0.3	69.1
Nutech	30N02E	3.0	PI 88788	E3	2.7	1,450	0.6	69.1
Cornelius	CB24X64	2.4	PI 88788	RR2X	3.0	1,025	0.4	69.0
Federal Hybrids	F2880N	2.8	PI 88788	RR2X	3.0	625	0.2	68.9
Federal Hybrids	F2590N	2.5	PI 88788	RR2X	2.3	725	0.3	68.8
Stine	25GA62	2.5	PI 88788	LLGT27	2.0	1,500	0.8	68.7
Pioneer	P25A27X	2.5	PI 88788	RR2X	2.1	900	0.2	68.7
Kruger	K2X-2573	2.5	PI 88788	RR2X	2.7	1,225	0.5	68.6
ASGROW	AG28X9	2.8	PI 88788	RR2X	3.0	2,225	0.5	68.5
Kruger	K2X-2652	2.6	PI 88788	RR2X	2.4	1,275	0.5	68.3
Hoegemeyer HPT	2820 E	2.8	PI 88788	E3	2.6	1,325	0.7	68.3
Nutech	28N02E	2.8	PI 88788	E3	2.4	850	0.3	68.3

Table 4. Moorhead (WC Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Mycogen	MY290L5	2.9	PI 88788	LL	2.3	850	0.3	68.2
NK	S25-V8X	2.5	PI 88788	RR2X	1.9	750	0.3	68.1
Stine	25LK62	2.5	PI 88788	LL	1.5	2,025	0.7	67.8
Stine	25LH62	2.5	PI 88788	LL	1.9	1,400	0.5	67.2
NK	S27-M8X	2.7	PI 88788	RR2X	2.8	975	0.4	67.0
Dyna-Gro	S27EN89	2.7	PI 88788	E3	1.8	975	0.5	66.8
Merschman	Osage 2025E	2.5	Peking	E3	1.5	650	0.2	66.7
Hoegemeyer HPT	2540 E	2.5	PI 88788	E3	2.8	625	0.3	66.7
Stine	24LJ20	2.4	PI 88788	LL	2.4	1,175	0.4	66.6
Cornelius	1924E	2.4	PI 88788	E3	2.5	675	0.2	66.5
Federal Hybrids	F2380N	2.3	PI 88788	RR2X	1.6	925	0.3	66.2
LG Seeds	LGS2444RX	2.4	PI 88788	RR2X	2.9	1,300	0.4	66.1
LATHAM	L 2597 E3	2.5	Peking	E3	1.6	450	0.2	64.9
Nutech	25N03E	2.5	PI 88788	E3	2.3	800	0.2	64.5
LATHAM	L 2429 E3	2.4	PI 88788	E3	2.1	1,200	0.4	64.1
ASGROW	AG25X0	2.5	PI 88788	RR2X	2.9	1,325	0.7	64.0
Cornelius	2023E	2.3	PI 88788	E3	2.9	1,775	0.6	63.5
Stine	24GA22	2.4	PI 88788	LLGT27	1.9	475	0.2	62.5
	Mean	2.7	-	-	2.5	971	0.4	69.5
	LSD[4] (P = 0.10)	-	-	-	-	740	-	3.8
Stine	*31GA13*	*3.1*	*None*	*LLGT27*	*3.5*	*1,100*	*0.4*	*75.9*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*17,750*	*9.2*	*62.8*
University of Nebraska	*U11-920017*	*2.8*	*None*	*None*	*1.3*	*11,025*	*3.7*	*56.8*
	Mean	*2.9*	-	-	*2.4*	*9,958*	*4.4*	*65.2*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 2,742 eggs per 100 cc soil; HG type 2- (10% on PI 88788, 0% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 5. Ames (C Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Kruger	K2X-2971	2.9	PI 88788	RR2X	1.9	850	8.5	67.1
Cornelius	CB27X81	2.7	PI 88788	RR2X	3.4	1,075	6.1	66.7
Dyna-Gro	S28XT58	2.8	PI 88788	RR2X	2.9	2,300	23.0	66.3
Merschman	Apache 1926E	2.6	PI 88788	E3	2.6	425	3.4	66.1
LG Seeds	LGS2989RX	2.9	PI 88788	RR2X	2.1	1,700	8.5	65.9
FS HiSOY	HS 28X70	2.8	PI 88788	RR2X	3.1	950	3.8	65.4
Beck's	2777X2	2.7	PI 88788	RR2X	2.8	3,100	15.5	65.1
Mycogen	MY311L5	3.1	PI 88788	LL	2.5	2,350	7.8	65.1
ASGROW	AG27X0	2.7	PI 88788	RR2X	2.6	2,800	14.0	64.9
ASGROW	AG29X9	2.9	PI 88788	RR2X	3.0	1,850	3.4	64.8
LG Seeds	LGS3297RX	3.2	PI 88788	RR2X	2.5	1,350	7.7	64.6
Pioneer	P24A80X	2.4	PI 88788	RR2X	2.0	2,050	11.7	64.1
Hoegemeyer HPT	LL2641 N	2.6	Peking	LL	1.9	850	2.8	64.1
Nutech	25N03E	2.5	PI 88788	E3	2.3	1,800	12.0	64.1
Nutech	3281L	2.8	PI 88788	LL	1.5	650	4.3	64.1
LATHAM	L 2887 R2X	2.8	PI 88788	RR2X	2.8	525	2.3	63.9
Kruger	K2X-2673	2.6	PI 88788	RR2X	3.3	2,450	8.2	63.8
ASGROW	AG26X0	2.6	PI 88788	RR2X	2.8	2,450	5.4	63.8
LG Seeds	LGS2444RX	2.4	PI 88788	RR2X	2.9	2,775	18.5	63.8
Mycogen	MY290L5	2.9	PI 88788	LL	2.3	1,875	7.5	63.7
Beck's	2899X2	2.8	PI 88788	RR2X	2.3	1,975	8.8	63.5
NK	S30-M9X	3.0	PI 88788	RR2X	1.8	2,450	19.6	63.5
Beck's	3559X2	3.5	PI 88788	RR2X	3.2	1,300	7.4	63.4
Merschman	Osage 2025E	2.5	Peking	E3	1.5	725	2.6	63.3
LATHAM	L 2949 E3	2.9	PI 88788	E3	2.8	2,400	8.7	63.2
FS HiSOY	HS 29X80	2.9	PI 88788	RR2X	2.4	3,475	13.9	63.1
Beck's	3546FP	3.5	PI 88788	LLGT27	2.5	1,925	38.5	63.1
ASGROW	AG25X0	2.5	PI 88788	RR2X	2.9	2,325	9.3	63.0
Hoegemeyer HPT	2781 NX	2.7	PI 88788	RR2X	2.3	1,425	6.3	63.0
Hoegemeyer HPT	2820 E	2.8	PI 88788	E3	2.6	1,875	9.4	62.9
FS HiSOY	HS 33X80	3.3	PI 88788	RR2X	3.0	1,450	6.4	62.6
ASGROW	AG27X9	2.7	Peking	RR2X	2.3	125	2.5	62.6
Merschman	Harrison 2030E	3.0	PI 88788	E3	1.8	850	5.7	62.4
Nutech	28N02E	2.8	PI 88788	E3	2.4	4,400	44.0	62.4
Kruger	K2X-2573	2.5	PI 88788	RR2X	2.7	1,150	15.3	62.2
Pioneer	P27A17X	2.7	Peking	RR2X	2.2	2,375	7.3	62.1
LG Seeds	C2888RX	2.8	PI 88788	RR2X	2.3	3,800	16.9	61.7
LATHAM	L 2839 LLGT27	2.8	PI 88788	LLGT27	2.3	1,625	21.7	61.7
Hoegemeyer HPT	2590 NR	2.5	Peking	GT	2.5	1,100	5.5	61.4
Cornelius	CB24X64	2.4	PI 88788	RR2X	3.0	2,000	2.0	61.3
Merschman	Mohawk 1928E	2.8	PI 88788	E3	2.6	3,925	19.6	61.1
Nutech	30N05E	3.0	PI 88788	E3	2.1	1,075	10.8	61.1
Federal Hybrids	F2880N	2.8	PI 88788	RR2X	3.0	3,500	10.8	61.1
ASGROW	AG28X9	2.8	PI 88788	RR2X	3.0	1,625	13.0	61.0
Cornelius	1924E	2.4	PI 88788	E3	2.5	1,350	2.8	61.0
NK	S25-V8X	2.5	PI 88788	RR2X	1.9	3,900	13.0	60.5
FS HiSOY	HS 31X60	3.1	PI 88788	RR2X	2.5	6,825	27.3	60.4
Stine	24LJ20	2.4	PI 88788	LL	2.4	825	8.3	60.2
Federal Hybrids	F2380N	2.3	PI 88788	RR2X	1.6	1,250	5.0	60.1
Beck's	3082FP	3.0	PI 88788	LLGT27	1.9	2,625	8.8	60.0
Pioneer	P29A25X	2.9	PI 88788	RR2X	1.6	2,475	5.5	59.9

Table 5. Ames (C Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Dyna-Gro	S32EN60	3.2	PI 88788	E3	3.4	2,600	52.0	59.5
Stine	25LH62	2.5	PI 88788	LL	1.9	3,000	10.9	59.2
Mycogen	MY280R2X	2.8	PI 88788	RR2X	3.6	3,275	9.4	59.2
Merschman	Chickasaw 2025 LLGT27	2.5	PI 88788	LLGT27	2.8	2,275	4.8	58.8
Kruger	K2X-2652	2.6	PI 88788	RR2X	2.4	3,475	15.4	58.6
Kruger	K2X-2863	2.8	PI 88788	RR2X	3.5	4,150	8.7	58.4
NK	S27-M8X	2.7	PI 88788	RR2X	2.8	1,675	13.4	58.2
Stine	25GA62	2.5	PI 88788	LLGT27	2.0	3,925	11.2	57.8
Pioneer	P25A27X	2.5	PI 88788	RR2X	2.1	4,925	13.1	57.7
LATHAM	L 2429 E3	2.4	PI 88788	E3	2.1	2,225	6.4	57.5
Dyna-Gro	S27EN89	2.7	PI 88788	E3	1.8	2,825	6.6	57.5
LATHAM	L 2597 E3	2.5	Peking	E3	1.6	1,225	1.7	57.4
Hoegemeyer HPT	2540 E	2.5	PI 88788	E3	2.8	2,225	22.3	57.1
Federal Hybrids	F2590N	2.5	PI 88788	RR2X	2.3	1,975	7.2	56.8
Nutech	30N02E	3.0	PI 88788	E3	2.7	1,650	11.0	56.7
Stine	25LK62	2.5	PI 88788	LL	1.5	5,725	17.6	56.6
Cornelius	2023E	2.3	PI 88788	E3	2.9	1,775	8.9	56.1
Stine	24GA22	2.4	PI 88788	LLGT27	1.9	2,450	6.1	53.5
	Mean	2.7	-	-	2.5	2,227	11.3	61.6
	LSD[4] (P = 0.10)	-	-	-	-	2,545	-	3.9
Stine	*31GA13*	*3.1*	*None*	*LLGT27*	*3.5*	*2,675*	*4.1*	*63.3*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*2,575*	*25.8*	*61.9*
University of Nebraska	*U11-920017*	*2.8*	*None*	*None*	*1.3*	*1,900*	*4.8*	*58.4*
	Mean	*2.9*	-	-	*2.4*	*2,383*	*11.5*	*61.2*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 254 eggs per 100 cc soil; HG type 1.2- (67% on PI 88788, 20% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 6. Urbana (EC Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Mycogen	MY290L5	2.9	PI 88788	LL	2.3	2,475	1.2	60.1
Pioneer	P27A17X	2.7	Peking	RR2X	2.2	1,225	1.2	59.8
Nutech	28N02E	2.8	PI 88788	E3	2.4	3,050	3.3	59.2
NK	S25-V8X	2.5	PI 88788	RR2X	1.9	1,875	1.5	59.0
Merschman	Mohawk 1928E	2.8	PI 88788	E3	2.6	4,650	2.8	58.6
Nutech	3281L	2.8	PI 88788	LL	1.5	3,600	1.6	58.0
Cornelius	CB27X81	2.7	PI 88788	RR2X	3.4	3,050	2.5	57.3
Stine	25GA62	2.5	PI 88788	LLGT27	2.0	2,375	1.9	57.1
Hoegemeyer HPT	2820 E	2.8	PI 88788	E3	2.6	2,725	3.2	57.1
Nutech	25N03E	2.5	PI 88788	E3	2.3	2,000	3.5	56.9
Kruger	K2X-2863	2.8	PI 88788	RR2X	3.5	5,050	4.0	56.6
Merschman	Chickasaw 2025 LLGT27	2.5	PI 88788	LLGT27	2.8	1,850	2.2	56.6
LG Seeds	C2888RX	2.8	PI 88788	RR2X	2.3	2,475	1.9	56.5
LG Seeds	LGS3297RX	3.2	PI 88788	RR2X	2.5	1,950	2.4	56.5
Nutech	30N02E	3.0	PI 88788	E3	2.7	1,900	3.0	56.0
FS HiSOY	HS 29X80	2.9	PI 88788	RR2X	2.4	2,225	4.0	55.8
LG Seeds	LGS2989RX	2.9	PI 88788	RR2X	2.1	4,025	3.8	55.7
LATHAM	L 2949 E3	2.9	PI 88788	E3	2.8	4,600	3.8	55.6
Hoegemeyer HPT	LL2641 N	2.6	Peking	LL	1.9	2,000	2.8	55.5
ASGROW	AG27X0	2.7	PI 88788	RR2X	2.6	2,500	1.6	55.4
ASGROW	AG27X9	2.7	Peking	RR2X	2.3	1,850	0.9	55.1
Federal Hybrids	F2880N	2.8	PI 88788	RR2X	3.0	2,550	2.0	55.1
LATHAM	L 2887 R2X	2.8	PI 88788	RR2X	2.8	2,450	2.2	55.0
Merschman	Apache 1926E	2.6	PI 88788	E3	2.6	3,775	4.2	54.9
Merschman	Harrison 2030E	3.0	PI 88788	E3	1.8	3,400	3.3	54.9
NK	S30-M9X	3.0	PI 88788	RR2X	1.8	3,075	1.6	54.9
Cornelius	1924E	2.4	PI 88788	E3	2.5	3,650	2.4	54.8
Federal Hybrids	F2590N	2.5	PI 88788	RR2X	2.3	2,225	4.2	54.7
Kruger	K2X-2573	2.5	PI 88788	RR2X	2.7	3,125	4.6	54.6
Beck's	3546FP	3.5	PI 88788	LLGT27	2.5	5,025	3.0	54.5
Mycogen	MY311L5	3.1	PI 88788	LL	2.5	8,250	4.6	54.5
Dyna-Gro	S28XT58	2.8	PI 88788	RR2X	2.9	2,775	1.7	54.3
Hoegemeyer HPT	2590 NR	2.5	Peking	GT	2.5	1,325	1.7	53.9
Dyna-Gro	S32EN60	3.2	PI 88788	E3	3.4	2,625	3.0	53.8
Beck's	2777X2	2.7	PI 88788	RR2X	2.8	5,500	5.0	53.7
Nutech	30N05E	3.0	PI 88788	E3	2.1	2,650	1.5	53.7
Beck's	2899X2	2.8	PI 88788	RR2X	2.3	2,850	3.4	53.6
Hoegemeyer HPT	2781 NX	2.7	PI 88788	RR2X	2.3	4,000	4.6	53.6
ASGROW	AG26X0	2.6	PI 88788	RR2X	2.8	5,250	7.0	53.5
Cornelius	CB24X64	2.4	PI 88788	RR2X	3.0	1,450	1.0	53.4
Beck's	3559X2	3.5	PI 88788	RR2X	3.2	3,125	2.1	53.3
Mycogen	MY280R2X	2.8	PI 88788	RR2X	3.6	1,800	1.6	53.2
FS HiSOY	HS 28X70	2.8	PI 88788	RR2X	3.1	5,950	2.3	53.0
Stine	25LH62	2.5	PI 88788	LL	1.9	3,900	3.7	53.0
ASGROW	AG29X9	2.9	PI 88788	RR2X	3.0	2,050	1.5	52.8
ASGROW	AG28X9	2.8	PI 88788	RR2X	3.0	3,900	1.8	52.8
Pioneer	P25A27X	2.5	PI 88788	RR2X	2.1	2,150	1.5	52.8
Pioneer	P24A80X	2.4	PI 88788	RR2X	2.0	2,125	2.7	52.7
FS HiSOY	HS 31X60	3.1	PI 88788	RR2X	2.5	5,075	3.5	52.6
Stine	25LK62	2.5	PI 88788	LL	1.5	3,225	3.5	52.5
Merschman	Osage 2025E	2.5	Peking	E3	1.5	3,175	1.5	52.5

Table 6. Urbana (EC Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
FS HiSOY	HS 33X80	3.3	PI 88788	RR2X	3.0	3,150	1.9	52.2
Pioneer	P29A25X	2.9	PI 88788	RR2X	1.6	4,600	2.7	52.2
NK	S27-M8X	2.7	PI 88788	RR2X	2.8	3,900	2.7	52.0
LG Seeds	LGS2444RX	2.4	PI 88788	RR2X	2.9	4,375	1.9	51.8
LATHAM	L 2839 LLGT27	2.8	PI 88788	LLGT27	2.3	2,575	2.8	51.8
LATHAM	L 2597 E3	2.5	Peking	E3	1.6	1,550	1.5	51.5
Kruger	K2X-2673	2.6	PI 88788	RR2X	3.3	3,750	4.8	50.9
Dyna-Gro	S27EN89	2.7	PI 88788	E3	1.8	5,200	3.9	50.9
Cornelius	2023E	2.3	PI 88788	E3	2.9	4,425	4.1	50.8
Beck's	3082FP	3.0	PI 88788	LLGT27	1.9	4,175	4.5	50.5
Kruger	K2X-2971	2.9	PI 88788	RR2X	1.9	2,975	2.4	49.7
Stine	24LJ20	2.4	PI 88788	LL	2.4	4,275	2.0	49.6
Hoegemeyer HPT	2540 E	2.5	PI 88788	E3	2.8	1,975	0.9	49.6
Kruger	K2X-2652	2.6	PI 88788	RR2X	2.4	2,375	2.1	49.5
ASGROW	AG25X0	2.5	PI 88788	RR2X	2.9	3,750	2.3	48.2
LATHAM	L 2429 E3	2.4	PI 88788	E3	2.1	4,125	2.6	47.4
Federal Hybrids	F2380N	2.3	PI 88788	RR2X	1.6	2,900	1.6	46.6
Stine	24GA22	2.4	PI 88788	LLGT27	1.9	3,400	3.2	44.0
	Mean	2.7	-	-	2.5	3,297	2.7	53.8
	LSD[4] (P = 0.10)	-	-	-	-	2,582	-	3.9
Stine	*31GA13*	*3.1*	*None*	*LLGT27*	*3.5*	*750*	*2.0*	*56.9*
University of Nebraska	*U11-920017*	*2.8*	*None*	*None*	*1.3*	*10,500*	*6.9*	*44.5*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*7,675*	*3.7*	*41.9*
	Mean	*2.9*	-	-	*2.4*	*6,308*	*4.2*	*47.8*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 1,305 eggs per 100 cc soil; HG type 2- (24% on PI 88788, 4% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 7. Glenwood (SW Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Hoegemeyer HPT	LL3220 N	3.2	Peking	LL	2.5	400	0.1	81.4
Merschman	Kennedy 1936E	3.6	PI 88788	E3	3.0	8,975	3.1	79.6
Cornelius	CB33G44	3.3	PI 88788	LLGT27	2.0	5,950	1.4	79.5
FS HiSOY	HS 38X70	3.8	PI 88788	RR2X	2.9	3,425	0.6	79.1
Cornelius	1928E	2.8	PI 88788	E3	1.6	7,675	1.5	78.5
Merschman	Monroe 2037E	3.7	PI 88788	E3	2.3	7,400	1.9	78.0
Nutech	32N02L	3.2	Peking	LL	2.3	625	0.2	77.9
Beck's	3789X2	3.7	PI 88788	RR2X	3.4	5,575	1.6	77.8
Mycogen	MY372L5	3.7	PI 88788	LL	2.4	3,250	0.6	77.3
Kruger	K2X-3662	3.6	PI 88788	RR2X	3.1	5,075	1.6	76.9
FS HiSOY	HS 32X90	3.2	PI 88788	RR2X	3.1	5,675	0.9	76.8
Beck's	3546FP	3.5	PI 88788	LLGT27	2.5	14,775	3.5	76.5
Stine	32GA22	3.2	PI 88788	LLGT27	2.1	2,575	0.5	76.0
Dyna-Gro	S35EN99	3.5	PI 88788	E3	2.4	10,875	4.7	76.0
Hoegemeyer HPT	3491 NX	3.4	PI 88788	RR2X	3.6	6,525	2.1	75.5
Beck's	3559X2	3.5	PI 88788	RR2X	3.2	4,825	1.6	75.4
Kruger	K2X-3552	3.5	PI 88788	RR2X	2.4	4,825	1.4	75.2
LG Seeds	LGS3600RX	3.6	PI 88788	RR2X	3.5	2,250	0.6	75.2
LG Seeds	LGS3777RX	3.7	PI 88788	RR2X	3.9	7,000	2.2	75.0
Dyna-Gro	S37EN39	3.7	PI 88788	E3	3.5	4,725	1.2	75.0
Pioneer	P33A53X	3.3	PI 88788	RR2X	2.3	5,000	1.1	74.7
Merschman	Adams 2034 LLGT27	3.4	PI 88788	LLGT27	2.8	5,350	2.5	74.3
MorSoy	MS LL 3728	3.7	PI 88788	LL	2.6	6,650	1.7	74.1
LATHAM	L 3394 R2X	3.3	PI 88788	RR2X	2.9	6,900	1.0	74.1
Stine	29GA02	2.9	PI 88788	LLGT27	3.6	1,975	0.5	74.0
LATHAM	L 3382 LLGT27	3.3	PI 88788	LLGT27	1.9	6,975	2.0	74.0
Hoegemeyer HPT	3030 E	3.0	PI 88788	E3	2.3	4,050	0.8	73.5
Cornelius	CB33X17	3.3	PI 88788	RR2X	3.9	5,350	1.0	73.4
NK	S34-T2X	3.4	PI 88788	RR2X	2.1	8,175	1.6	73.3
Stine	31GA23	3.1	PI 88788	LLGT27	1.5	9,900	4.0	72.8
ASGROW	AG37X0	3.7	PI 88788	RR2X	3.1	11,625	4.0	72.1
MorSoy	MS 3747 RXT	3.7	PI 88788	RR2X	2.1	4,400	1.6	71.9
Federal Hybrids	F3200N	3.2	PI 88788	RR2X	3.0	8,900	1.5	71.8
ASGROW	AG32X0	3.2	PI 88788	RR2X	1.8	4,225	0.7	71.7
Hoegemeyer HPT	3166 NX	3.1	PI 88788	RR2X	3.1	3,625	1.3	71.7
LG Seeds	LGS3060RX	3.0	PI 88788	RR2X	2.1	7,850	1.9	71.6
Nutech	33N03E	3.3	PI 88788	E3	3.0	6,450	1.1	71.5
ASGROW	AG30X9	3.0	PI 88788	RR2X	2.3	1,875	0.6	71.3
Nutech	30N02E	3.0	PI 88788	E3	2.7	5,825	1.6	71.3
MorSoy	MS 3907 RXT	3.9	PI 88788	RR2X	3.6	4,225	1.2	71.1
Kruger	K2X-3852	3.8	PI 88788	RR2X	3.8	4,925	1.7	71.1
ASGROW	AG33X0	3.3	PI 88788	RR2X	3.4	4,925	2.0	71.0
Kruger	K2X-3384	3.3	PI 88788	RR2X	3.5	10,725	4.0	70.9
Stine	31GA02	3.1	PI 88788	LLGT27	2.5	4,850	1.2	70.8
ASGROW	AG35X0	3.5	PI 88788	RR2X	2.5	4,400	1.5	70.8
LG Seeds	LGS2989RX	2.9	PI 88788	RR2X	2.1	2,300	0.7	70.8
LG Seeds	C2888RX	2.8	PI 88788	RR2X	2.3	3,825	0.8	70.7
Nutech	28N02E	2.8	PI 88788	E3	2.4	4,700	0.9	70.5
FS HiSOY	HS 35X90	3.5	PI 88788	RR2X	3.0	7,900	1.2	70.4
ASGROW	AG28X9	2.8	PI 88788	RR2X	3.0	8,575	3.0	70.4
Pioneer	P35A33X	3.5	PI 88788	RR2X	3.5	6,675	1.1	70.4

Table 7. Glenwood (SW Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Pioneer	P31A22X	3.1	PI 88788	RR2X	2.3	3,325	1.2	70.2
Nutech	31N02E	3.1	PI 88788	E3	2.8	4,675	1.4	70.2
ASGROW	AG29X9	2.9	PI 88788	RR2X	3.0	3,175	0.7	69.9
Pioneer	P37A27X	3.7	PI 88788	RR2X	2.4	6,125	1.7	69.7
FS HiSOY	HS 39X70	3.9	PI 88788	RR2X	4.0	4,500	1.8	69.5
Federal Hybrids	F2880N	2.8	PI 88788	RR2X	3.0	9,075	3.6	69.4
Mycogen	MY390R2X	3.9	PI 88788	RR2X	2.5	3,625	0.7	69.3
Kruger	K2X-3353	3.3	PI 88788	RR2X	2.9	3,075	1.2	69.1
Kruger	K2X-3271	3.2	PI 88788	RR2X	2.4	5,125	1.6	68.4
Stine	27GA12	2.7	PI 88788	LLGT27	1.8	4,625	1.1	68.4
Cornelius	CB29X90	2.9	PI 88788	RR2X	1.8	6,225	1.9	68.2
Dyna-Gro	S34XT69	3.4	PI 88788	RR2X	3.0	4,350	1.1	67.7
ASGROW	AG31X0	3.1	PI 88788	RR2X	2.1	6,725	1.3	67.6
Mycogen	MY311L5	3.1	PI 88788	LL	2.5	8,375	1.3	67.6
Dyna-Gro	S33XT79	3.3	PI 88788	RR2X	2.3	4,900	1.3	67.5
FS HiSOY	HS 37X70	3.7	PI 88788	RR2X	2.8	5,975	1.3	67.3
NK	S37-A4X	3.7	PI 88788	RR2X	2.8	9,225	2.0	66.5
LATHAM	L 3179 LLGT27	3.1	PI 88788	LLGT27	1.6	3,325	1.2	66.2
	Mean	3.3	-	-	2.7	5,680	1.6	72.6
	LSD[4] (P = 0.10)	-	-	-	-	5,421	-	4.3
Stine	*34LK13*	*3.4*	*None*	*LL*	*3.3*	*5,225*	*0.9*	*71.6*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*10,000*	*3.3*	*66.3*
Iowa State University	*IA3024*	*3.2*	*None*	*None*	*2.0*	*8,075*	*3.8*	*61.3*
	Mean	*3.1*	-	-	*2.6*	*7,767*	*2.7*	*66.4*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 4,011 eggs per 100 cc soil; HG type 2- (53% on PI 88788, 5% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 8. Oskaloosa (SC Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
NK	S37-A4X	3.7	PI 88788	RR2X	2.8	3,400	1.9	69.9
FS HiSOY	HS 38X70	3.8	PI 88788	RR2X	2.9	2,925	1.6	68.0
FS HiSOY	HS 35X90	3.5	PI 88788	RR2X	3.0	3,800	2.1	67.1
Hoegemeyer HPT	3491 NX	3.4	PI 88788	RR2X	3.6	5,967	3.0	66.9
FS HiSOY	HS 32X90	3.2	PI 88788	RR2X	3.1	2,500	1.1	66.7
Kruger	K2X-3852	3.8	PI 88788	RR2X	3.8	2,425	1.5	66.6
Pioneer	P35A33X	3.5	PI 88788	RR2X	3.5	4,367	2.5	66.4
Nutech	32N02L	3.2	Peking	LL	2.3	467	0.4	65.8
Hoegemeyer HPT	LL3220 N	3.2	Peking	LL	2.5	625	0.3	65.3
Cornelius	CB33G44	3.3	PI 88788	LLGT27	2.0	2,750	1.7	65.1
Mycogen	MY311L5	3.1	PI 88788	LL	2.5	2,633	2.3	65.0
Merschman	Monroe 2037E	3.7	PI 88788	E3	2.3	3,600	2.7	64.8
FS HiSOY	HS 39X70	3.9	PI 88788	RR2X	4.0	4,000	3.6	64.5
Kruger	K2X-3552	3.5	PI 88788	RR2X	2.4	3,175	2.8	64.5
ASGROW	AG33X0	3.3	PI 88788	RR2X	3.4	3,600	1.8	64.0
Mycogen	MY372L5	3.7	PI 88788	LL	2.4	3,050	2.0	63.9
Merschman	Adams 2034 LLGT27	3.4	PI 88788	LLGT27	2.8	1,850	1.9	63.7
Cornelius	CB33X17	3.3	PI 88788	RR2X	3.9	3,025	1.8	63.5
Merschman	Kennedy 1936E	3.6	PI 88788	E3	3.0	3,433	1.5	63.4
Beck's	3789X2	3.7	PI 88788	RR2X	3.4	4,150	2.0	63.3
LATHAM	L 3394 R2X	3.3	PI 88788	RR2X	2.9	2,850	2.0	63.3
Hoegemeyer HPT	3030 E	3.0	PI 88788	E3	2.3	3,800	2.6	63.2
Federal Hybrids	F3200N	3.2	PI 88788	RR2X	3.0	3,350	1.4	62.9
Mycogen	MY390R2X	3.9	PI 88788	RR2X	2.5	2,200	1.3	62.1
LATHAM	L 3382 LLGT27	3.3	PI 88788	LLGT27	1.9	2,400	1.6	61.6
ASGROW	AG32X0	3.2	PI 88788	RR2X	1.8	2,175	1.6	61.2
LG Seeds	LGS3600RX	3.6	PI 88788	RR2X	3.5	2,950	3.0	61.2
LG Seeds	LGS3060RX	3.0	PI 88788	RR2X	2.1	4,125	3.5	61.0
Dyna-Gro	S35EN99	3.5	PI 88788	E3	2.4	3,075	1.9	61.0
FS HiSOY	HS 37X70	3.7	PI 88788	RR2X	2.8	2,500	1.2	60.8
LATHAM	L 3179 LLGT27	3.1	PI 88788	LLGT27	1.6	1,325	1.0	60.7
Pioneer	P33A53X	3.3	PI 88788	RR2X	2.3	3,200	2.8	60.6
ASGROW	AG30X9	3.0	PI 88788	RR2X	2.3	3,567	1.6	60.3
Dyna-Gro	S34XT69	3.4	PI 88788	RR2X	3.0	3,100	2.9	60.3
Nutech	28N02E	2.8	PI 88788	E3	2.4	3,233	2.9	59.8
Beck's	3546FP	3.5	PI 88788	LLGT27	2.5	3,700	3.2	59.6
Pioneer	P31A22X	3.1	PI 88788	RR2X	2.3	2,050	1.6	59.6
Beck's	3559X2	3.5	PI 88788	RR2X	3.2	5,125	2.6	59.5
ASGROW	AG31X0	3.1	PI 88788	RR2X	2.1	2,567	1.9	59.2
Cornelius	CB29X90	2.9	PI 88788	RR2X	1.8	2,800	1.8	59.2
Nutech	31N02E	3.1	PI 88788	E3	2.8	3,200	1.4	58.9
LG Seeds	LGS2989RX	2.9	PI 88788	RR2X	2.1	3,075	2.3	58.6
LG Seeds	C2888RX	2.8	PI 88788	RR2X	2.3	2,775	1.9	58.1
Cornelius	1928E	2.8	PI 88788	E3	1.6	3,500	1.2	58.1
NK	S34-T2X	3.4	PI 88788	RR2X	2.1	3,067	3.1	58.0
Stine	32GA22	3.2	PI 88788	LLGT27	2.1	2,667	1.7	57.9
ASGROW	AG28X9	2.8	PI 88788	RR2X	3.0	3,725	1.6	57.8
MorSoy	MS LL 3728	3.7	PI 88788	LL	2.6	3,400	1.3	57.3
Nutech	33N03E	3.3	PI 88788	E3	3.0	1,133	0.4	57.2
Nutech	30N02E	3.0	PI 88788	E3	2.7	2,775	2.1	57.1
MorSoy	MS 3747 RXT	3.7	PI 88788	RR2X	2.1	3,766	1.8	57.0

Table 8. Oskaloosa (SC Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Stine	27GA12	2.7	PI 88788	LLGT27	1.8	2,100	0.6	56.8
Hoegemeyer HPT	3166 NX	3.1	PI 88788	RR2X	3.1	2,133	0.8	56.4
Kruger	K2X-3353	3.3	PI 88788	RR2X	2.9	3,567	1.5	56.3
Kruger	K2X-3271	3.2	PI 88788	RR2X	2.4	3,500	1.8	56.2
Stine	31GA23	3.1	PI 88788	LLGT27	1.5	1,850	0.7	55.2
Stine	29GA02	2.9	PI 88788	LLGT27	3.6	2,600	1.3	53.8
ASGROW	AG29X9	2.9	PI 88788	RR2X	3.0	2,300	1.2	53.1
Stine	31GA02	3.1	PI 88788	LLGT27	2.5	1,825	0.6	47.9
	Mean	3.3	-	-	2.6	2,936	1.8	61.0
	LSD[4] (P = 0.10)	-	-	-	-	NS	-	5.5
Stine	*34LK13*	*3.4*	*None*	*LL*	*3.3*	*5,500*	*4.6*	*54.9*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*4,400*	*3.8*	*50.4*
Iowa State University	*IA3024*	*3.2*	*None*	*None*	*2.0*	*4,300*	*2.0*	*33.8*
	Mean	*3.1*	-	-	*2.6*	*4,763*	*3.5*	*46.0*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

Some plots were discarded due to poor emergence. Varieties with more than one discarded replication are not shown.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 1,748 eggs per 100 cc soil; HG type 2- (56% on PI 88788, 4% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 9. Fruitland (SE Iowa).

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
Nutech	32N02L	3.2	Peking	LL	2.3	700	0.2	73.5
Hoegemeyer HPT	LL3220 N	3.2	Peking	LL	2.5	725	0.2	71.3
Merschman	Adams 2034 LLGT27	3.4	PI 88788	LLGT27	2.8	10,100	2.3	58.7
Cornelius	CB33G44	3.3	PI 88788	LLGT27	2.0	14,025	2.2	57.2
Nutech	33N03E	3.3	PI 88788	E3	3.0	8,625	1.5	56.9
Pioneer	P31A22X	3.1	PI 88788	RR2X	2.3	10,825	3.9	56.6
Beck's	3559X2	3.5	PI 88788	RR2X	3.2	7,825	2.7	56.4
Kruger	K2X-3852	3.8	PI 88788	RR2X	3.8	11,950	2.0	56.3
MorSoy	MS LL 3728	3.7	PI 88788	LL	2.6	7,375	2.2	56.2
Dyna-Gro	S35EN99	3.5	PI 88788	E3	2.4	12,800	3.0	56.1
Stine	32GA22	3.2	PI 88788	LLGT27	2.1	8,775	2.0	55.7
LG Seeds	LGS3600RX	3.6	PI 88788	RR2X	3.5	9,475	2.1	55.4
ASGROW	AG30X9	3.0	PI 88788	RR2X	2.3	10,650	1.9	55.1
Kruger	K2X-3662	3.6	PI 88788	RR2X	3.1	17,400	3.0	54.9
Mycogen	MY311L5	3.1	PI 88788	LL	2.5	14,975	2.9	54.9
ASGROW	AG31X0	3.1	PI 88788	RR2X	2.1	11,825	3.8	54.6
FS HiSOY	HS 38X70	3.8	PI 88788	RR2X	2.9	16,150	3.0	54.1
Nutech	28N02E	2.8	PI 88788	E3	2.4	8,925	1.8	54.0
Kruger	K2X-3552	3.5	PI 88788	RR2X	2.4	11,575	2.4	53.8
FS HiSOY	HS 32X90	3.2	PI 88788	RR2X	3.1	20,150	3.5	53.7
ASGROW	AG33X0	3.3	PI 88788	RR2X	3.4	14,825	2.3	53.7
Pioneer	P35A33X	3.5	PI 88788	RR2X	3.5	13,850	2.2	53.5
ASGROW	AG32X0	3.2	PI 88788	RR2X	1.8	9,125	2.5	53.3
Federal Hybrids	F3200N	3.2	PI 88788	RR2X	3.0	16,225	5.1	53.2
NK	S34-T2X	3.4	PI 88788	RR2X	2.1	18,625	3.5	53.2
NK	S37-A4X	3.7	PI 88788	RR2X	2.8	17,025	4.1	53.1
LG Seeds	LGS3777RX	3.7	PI 88788	RR2X	3.9	15,400	3.2	53.0
Cornelius	1928E	2.8	PI 88788	E3	1.6	9,975	2.9	52.9
LATHAM	L 3382 LLGT27	3.3	PI 88788	LLGT27	1.9	10,900	2.1	52.8
Dyna-Gro	S34XT69	3.4	PI 88788	RR2X	3.0	17,800	2.8	52.8
Mycogen	MY372L5	3.7	PI 88788	LL	2.4	16,650	3.4	52.7
Beck's	3789X2	3.7	PI 88788	RR2X	3.4	9,250	2.6	52.5
Beck's	3546FP	3.5	PI 88788	LLGT27	2.5	10,775	3.0	52.2
LG Seeds	C2888RX	2.8	PI 88788	RR2X	2.3	9,675	1.6	52.2
Nutech	31N02E	3.1	PI 88788	E3	2.8	13,350	2.9	51.9
Pioneer	P33A53X	3.3	PI 88788	RR2X	2.3	10,150	2.6	51.3
Cornelius	CB33X17	3.3	PI 88788	RR2X	3.9	10,525	2.1	51.2
Stine	29GA02	2.9	PI 88788	LLGT27	3.6	9,650	1.6	51.0
LATHAM	L 3394 R2X	3.3	PI 88788	RR2X	2.9	9,725	1.3	50.8
Kruger	K2X-3271	3.2	PI 88788	RR2X	2.4	19,525	3.9	50.7
Dyna-Gro	S37EN39	3.7	PI 88788	E3	3.5	17,125	4.6	50.5
Pioneer	P37A27X	3.7	PI 88788	RR2X	2.4	15,150	3.3	50.4
Stine	27GA12	2.7	PI 88788	LLGT27	1.8	5,225	1.3	50.3
Kruger	K2X-3353	3.3	PI 88788	RR2X	2.9	14,700	3.0	50.1
ASGROW	AG37X0	3.7	PI 88788	RR2X	3.1	17,900	4.9	49.9
FS HiSOY	HS 39X70	3.9	PI 88788	RR2X	4.0	23,750	6.2	49.8
Hoegemeyer HPT	3491 NX	3.4	PI 88788	RR2X	3.6	24,100	6.6	49.6
Nutech	30N02E	3.0	PI 88788	E3	2.7	13,825	3.4	49.2
FS HiSOY	HS 37X70	3.7	PI 88788	RR2X	2.8	26,900	3.6	49.1
Stine	31GA23	3.1	PI 88788	LLGT27	1.5	18,075	3.3	49.0
Dyna-Gro	S33XT79	3.3	PI 88788	RR2X	2.3	15,150	3.0	48.7

Table 9. Fruitland (SE Iowa) continued.

Brand	Variety	Relative Maturity	Resistance	Herbicide Technology[1]	IDC	SCN # (eggs/100cc)[2]	SCN RF[3]	Yield (bu/acre)
MorSoy	MS 3907 RXT	3.9	PI 88788	RR2X	3.6	16,750	5.9	48.6
Kruger	K2X-3384	3.3	PI 88788	RR2X	3.5	17,650	2.6	48.6
Merschman	Kennedy 1936E	3.6	PI 88788	E3	3.0	19,650	3.7	48.6
Hoegemeyer HPT	3030 E	3.0	PI 88788	E3	2.3	12,750	2.8	48.5
Hoegemeyer HPT	3166 NX	3.1	PI 88788	RR2X	3.1	11,300	3.3	48.4
Federal Hybrids	F2880N	2.8	PI 88788	RR2X	3.0	13,400	3.1	48.3
ASGROW	AG35X0	3.5	PI 88788	RR2X	2.5	16,800	3.4	48.0
FS HiSOY	HS 35X90	3.5	PI 88788	RR2X	3.0	15,200	3.4	47.9
ASGROW	AG28X9	2.8	PI 88788	RR2X	3.0	13,925	2.2	47.6
Mycogen	MY390R2X	3.9	PI 88788	RR2X	2.5	19,025	4.7	47.3
MorSoy	MS 3747 RXT	3.7	PI 88788	RR2X	2.1	34,400	9.4	46.7
Cornelius	CB29X90	2.9	PI 88788	RR2X	1.8	14,125	2.7	46.2
LATHAM	L 3179 LLGT27	3.1	PI 88788	LLGT27	1.6	14,525	4.6	46.0
ASGROW	AG29X9	2.9	PI 88788	RR2X	3.0	12,025	2.4	44.7
Merschman	Monroe 2037E	3.7	PI 88788	E3	2.3	15,525	4.2	43.8
Stine	31GA02	3.1	PI 88788	LLGT27	2.5	14,450	2.4	43.3
LG Seeds	LGS3060RX	3.0	PI 88788	RR2X	2.1	20,475	3.8	42.0
LG Seeds	LGS2989RX	2.9	PI 88788	RR2X	2.1	16,600	4.5	41.0
	Mean	3.3	-	-	2.7	14,034	3.1	51.8
	LSD[4] (P = 0.10)	-	-	-	-	7,508	-	5.5
Stine	*34LK13*	*3.4*	*None*	*LL*	*3.3*	*12,025*	*2.8*	*54.3*
ASGROW	*AG27X8*	*2.7*	*None*	*RR2X*	*2.5*	*15,250*	*4.0*	*38.1*
Iowa State University	*IA3024*	*3.2*	*None*	*None*	*2.0*	*13,525*	*2.6*	*32.9*
	Mean	*3.1*	-	-	*2.6*	*13,600*	*3.1*	*41.8*

Values presented in tables are means. Entries are listed in decreasing order of yield.

Italicized entries are widely available SCN-susceptible varieties entered by Iowa State University for comparison purposes.

[1] GT = glyphosate tolerant, RR2Y = Roundup Ready 2 Yield®, RR2X = Roundup Ready 2 Xtend®, LL = LibertyLink®, LLGT27 = Liberty Link® GT27™, E3 = Enlist E3™. May not reflect all herbicide tolerances. Consult product literature or seed dealer for more complete information.

[2] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; initial SCN population 4,687 eggs per 100 cc soil; HG type 2- (71% on PI 88788, 0% on Peking).

[3] Reproductive factor (RF) = average final SCN egg population density / average initial SCN egg population density; RF 1.0 = no change in SCN population density over growing season.

[4] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 10. Seed treatments used on varieties evaluated in 2019.

Brand	Seed Treatment	Brand	Seed Treatment	Brand	Seed Treatment
ASGROW	Acceleron® FI Nemastrike™	Hoegemeyer HPT	LumiGEN™ ILeVO®	MorSoy	CruiserMaxx® Vibrance®
Beck's*	Escalate® SDS, Nemasect™ ILeVO®	Kruger	Acceleron® Elite FI, B-200 SAT, NemaStrike™, ILeVO®	Mycogen	Lumisena™ ILeVO®
Cornelius	CruiserMaxx® Vibrance® ILeVO®	LATHAM*	SoyShield Plus™	NK	Clariva® Complete Mertect®
Dyna-Gro	Equity® VIP Clariva®	LEGACY SEEDS	L-Coat Total	Nutech	Lumisena™ ILeVO®
Federal Hybrids*	Maximum ArmourGuard™ ILeVO®	LG Seeds	AgriShield® MAX ILeVO®	Pioneer	Lumisena™, Gaucho® EverGol™ Energy
FS HiSOY*	Acceleron® FI ILeVO®	Merschman	Bonus Coated +™ ILeVO®	Stine*	CruiserMaxx® Vibrance®

* Following are exceptions to the seed treatment information listed above:

- Beck's varieties 2899X2, 3082FP, 3546FP and 3789X2 did not include ILeVO®
- Federal Hybrids varieties F2190N, F2290N, F2590N, F2880N and F3200N did not include ILeVO®
- FS HiSOY varieties HS 19X90 and HS 22X90 treated with Clariva® Complete and Mertect®
- LATHAM varieties L 1883 L, L 2159 R2X, L 2429 E3, L 2597 E3, L 2839 LLGT27, L 2949 E3, L 3179 LLGT27, L 3382 LLGT27, and L 3394 R2X treated with CruiserMaxx® Vibrance®
- Stine variety 25GA62 treated with Thiabendazole and variety 25LH62 treated with Stine XP Complete
- SCN susceptible check varieties all treated with CruiserMaxx® Vibrance®

Table 11. Contact information for companies represented in 2019 variety trials.

Bayer (ASGROW)
phone: 319-290-9008
website: www.Asgrow.com

Beck's Hybrids
phone: 515-318-8272
website: www.beckshybrids.com

Cornelius Seed
phone: 563-672-3463
website: www.corneliusseed.com

Federal Hybrids
phone: 712-830-9742
website: www.federalhybrids.com

GROWMARK, Inc. (FS HiSOY)
phone: 309-557-6399
website: www.fsseeds.com

Hoegemeyer Hybrids
phone: 800-245-4631
website: www.therightseed.com

Kruger Seeds
phone: 515-238-4572
website: www.Krugerseed.com

Latham Hi-Tech Seeds
phone: 877-465-2842
website: www.lathamseeds.com

LEGACY SEEDS
phone: 715-538-3238
website: www.legacyseeds.com

LG Seeds
phone: 402-443-6288
website: www.lgseeds.com

Merschman Seeds
phone: 319-837-6111
website: www.merschmanseeds.com

MFA Incorporated (MorSoy)
phone: 573-719-7127
website: www.mfaseed.com

Mycogen Seeds
phone: 515-851-5144
website: www.mycogen.com

NuTech Seed
phone: 515-681-9092
website: www.nutechseed.com

Nutrien Ag Solutions (Dyna-Gro)
phone: 402-340-9153
website: www.dynagroseed.com

Pioneer Hi-Bred
phone: 515-535-3200
website: www.pioneer.com

Stine Seed Company
phone: 515-677-2605
website: www.stineseed.com

Syngenta (NK)
phone: 712-253-4913
website: www.syngenta-us.com/soybeans/nk