Evaluation of Soybean Varieties Resistant to Soybean Cyst Nematode in Iowa

2002

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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 growers. Each year, public and private 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

In northern Iowa, 15 conventional (non-Roundup Ready®) and 32 Roundup Ready®, SCN-resistant soybean varieties were evaluated in SCN-infested fields near Kanawha in north central Iowa and near Mason City in northeast Iowa. Six conventional and four Roundup Ready®, SCN-susceptible varieties also were planted in the experiments. Plots were four, 17-foot-long rows spaced 30 inches apart and were planted at a rate of 10 seeds per foot, with four replications per variety. Preplant herbicide was applied to each location. Conventional post-emergent herbicides were applied to the conventional varieties and Roundup® herbicide was applied to the Roundup Ready® varieties.

In central Iowa, eight conventional and 41 Roundup Ready®, SCN-resistant soybean varieties were evaluated in SCN-infested fields near Churdan in west central Iowa and near Cambridge in central Iowa. Five conventional and three Roundup Ready®, SCN-susceptible varieties also were planted in the experiments. Plots were four, 17-foot-long rows spaced 30 inches apart and were planted at a rate of 10 seeds per foot, with four replications per variety. Preplant herbicide was applied to each location. Conventional post-emergent herbicides were applied to the conventional varieties and Roundup® herbicide was applied to the Roundup Ready® varieties.

In southern Iowa, one conventional and 34 Roundup Ready®, SCN-resistant soybean varieties were evaluated in SCN-infested fields near Lenox in southwest Iowa and near Crawfordsville in southeast Iowa. Three Roundup Ready®, SCN-susceptible varieties also were planted in the experiments. Plots were four, 17-foot-long rows spaced 30 inches apart and were planted at a rate of 10 seeds per foot, with four replications per variety. Preplant herbicide and Roundup® herbicide were applied to each location. The one conventional variety was covered when Roundup® herbicide was applied.

Plant stand (number of plants per foot) was assessed in each plot 35 to 40 days after planting. Maturity notes were taken at one location in each region. A variety was considered mature when 95 percent of the pods had turned brown. Just prior to harvest, average plant height and lodging (1=all plants fully erect, 5=all plants flat) were assessed in each plot. For all locations, total seed weight per plot and seed moisture were determined, and total plot seed weights subsequently were converted to bushels per acre. Varieties are listed in the report in order of ascending maturity and then by descending yield.

At the beginning of the growing season, plots were sampled for the presence of SCN. Soil samples, consisting of ten 1-inch-diameter, 6- to 8-inch-deep soil cores, were collected from the center 14 feet of the center two rows of each plot either immediately after planting or within a week after planting. SCN cysts were extracted from each soil sample, and SCN eggs were extracted from the cysts and counted.

SCN egg population densities also were determined for each plot at the end of the growing season in an identical manner.

Conventional varieties and Roundup Ready® varieties were grouped and results were analyzed separately, except in southern Iowa where only one conventional variety was tested. This conventional variety was grouped and analyzed with the Roundup Ready® varieties.

All varieties also were field tested for tolerance to iron deficiency chlorosis (IDC). Each variety was planted in hill plots consisting of five seeds per hill, with two replications per variety, in two fields with a history of iron chlorosis. One field was located at the Iowa State University Woodruff Farm and the other was located at the Iowa State University Kelly Farm, both near Ames in central Iowa. The plots at the Woodruff Farm were planted on May 22 and the plots at the Kelly Farm were planted on June 3. Notes were taken for IDC symptoms at each location approximately four weeks after planting and again at five 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. Only the second sets of scores were used from each location as the symptoms dramatically increased between weeks four and five. The second set of scores from each location then were averaged together and an overall rating was assigned to each variety.

Summary

The results of the experiments described in this report were consistent and dramatic. The data convincingly illustrate the benefits of utilizing SCN-resistant soybean varieties for management of this important soybean pest. Throughout the experiments, most of the soybean varieties with SCN resistance had greater yields than susceptible varieties, although some resistant varieties had greater yields than others. End-of-season SCN population densities were significantly greater in plots where susceptible varieties were grown relative to plots planted with resistant varieties. Nematode control is an extremely important aspect of growing SCN-resistant soybean varieties that must be considered when selecting soybean varieties. **Growing soybean varieties in SCN-infested fields in an attempt to maximize soybean yields in the short term without any consideration of the effect of the varieties on SCN population densities will seriously reduce the long-term soybean productivity of the land**.

The results of these experiments illustrate that SCN-resistant varieties can suppress SCN reproduction and provide increased soybean yields relative to using susceptible varieties, however most of the resistant varieties also suffer some yield loss. Consequently, resistant varieties must be used in an integrated management program, along with the use of non-host crops and scouting for early detection of SCN, to maximize yields and minimize reproduction of the pest on a long-term basis.

The data presented in this report are from a limited number of locations and should be used only as a beginning point for developing a SCN management program for any specific field. Performance of individual SCN-resistant soybean varieties in SCN-infested fields will vary among locations and years. **Growers are encouraged to evaluate several SCN-resistant soybean varieties at their own locations to determine the best varieties for their local conditions**.

Acknowledgments

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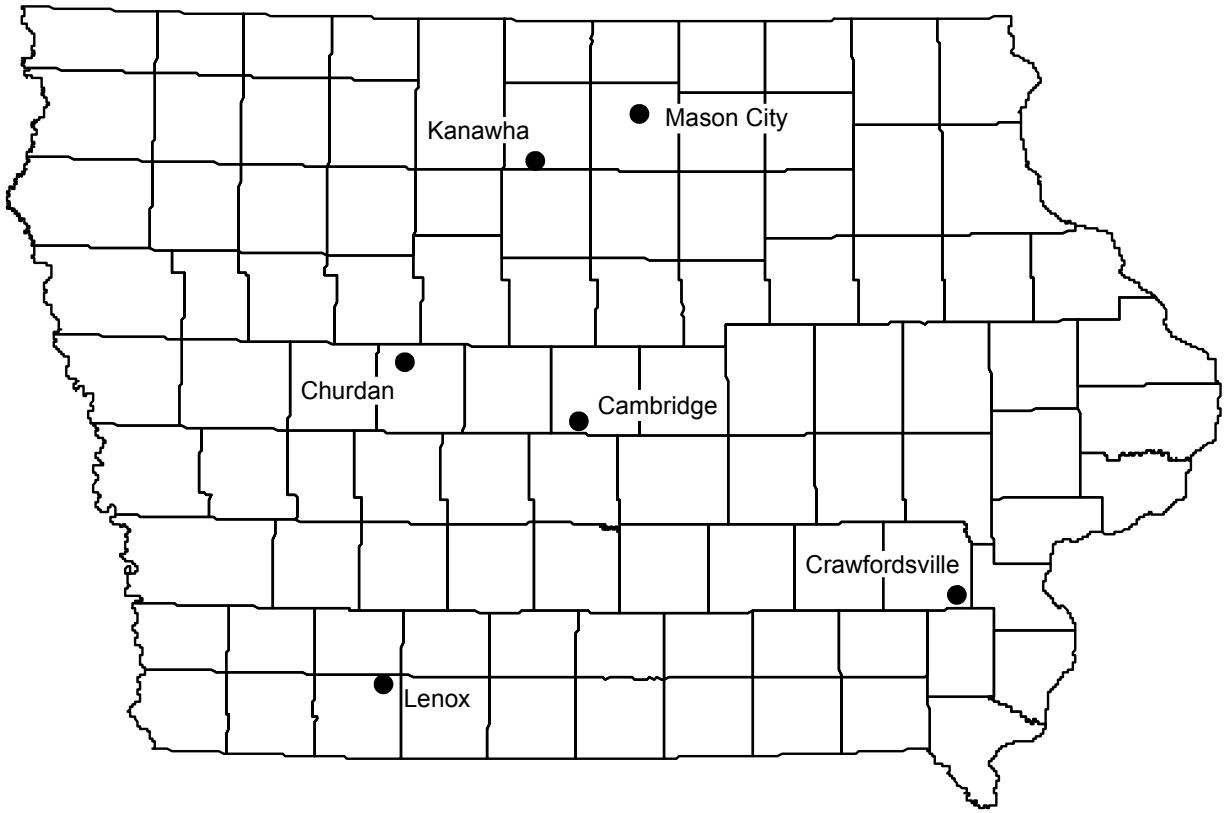
Map of 2002 Locations



Additional Information about SCN

There are several Iowa State University Extension publications available containing information about SCN. The biology, life cycle, and recommended management of SCN are described in publication PM 879, Soybean Cyst Nematode. Publication PM 1649, Soybean Cyst Nematode-Resistant Soybean Varieties for Iowa, lists soybean varieties with resistance to SCN. Publication IPM 47s, Scouting for Soybean Cyst Nematode, illustrates the recommended procedures for scouting for SCN. Finally, publication PD 32, Plant Nematode Sample Submission Form, is the form that should be submitted with soil samples to the Iowa State University Plant Disease Clinic for testing for SCN. All of these publications should be available at your county extension office or can be ordered by telephone from the office of Extension Distribution Center (515) 294-5247.

Table 1. 2002 Location Summary.

Location	Soil Type	Planting Date	Harvest Date	Herbicide Treatment	Yield (bushels per acre) resistant	Yield (bushels per acre) susceptible	Yield LSD[1]	Final SCN Density (eggs per 100 cc soil) resistant	Final SCN Density (eggs per 100 cc soil) susceptible	Final SCN Density LSD[1]
North central (Kanawha)	Clarion loam	16 May 2002	9 October 2002	Conventional	47.0	45.5	NS	2,361	1,917	NS
				Roundup®	51.6	50.8	NS	1,306	1,572	NS
Northeast (Mason City)	Wapsie loam	4 May 2002	10 October 2002	Conventional	49.8	50.3	NS	1,270	2,525	639
				Roundup®	53.9	56.0	1.6	1,207	2,859	469
West central (Churdan)	Clarion-Nicollet-Webster	9 May 2002	14 October 2002	Conventional	52.2	47.4	NS	1,198	8,205	3,091
				Roundup®	56.4	53.2	NS	2,938	7,621	2,195
Central (Cambridge)	Colo silty clay loam	7 May 2002	7 October 2002	Conventional	49.8	38.4	2.5	2,656	16,570	4,117
				Roundup®	50.3	42.1	2.1	3,077	17,417	3,479
Southwest (Lenox)	Winterset silty clay loam	15 May 2002	15 October 2002	Roundup®	39.2	26.2	3.8	11,471	34,933	8,660
Southeast (Crawfordsville)	Mahaska silty clay loam	21 May 2002	8 October 2002	Roundup®	54.2	46.3	3.1	4,313	8,458	2,587

[1]Least significant difference: values are from Fisher's least-significant-difference test (P = 0.05), NS = no significant differences between resistant and susceptible.

Table 2. Soybean cyst nematode (SCN) reproduction and agronomic performance of conventional (non-Roundup Ready®) soybean varieties in north central Iowa (Kanawha) in an SCN-infested field (average population at planting of 4,213 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Thompson	T-3204CN	2.0	---	5.7	31.3	2.0	46.4	10	1,850
Gold Country Seed	Gold Country X6219CYST	1.9	---	3.9	31.5	2.0	45.2	14	2,125
Pioneer	92B05 (S)[2]	2.0	---	6.2	31.8	1.8	46.0	11	2,125
Public	Bell	1.9	---	6.1	32.8	2.0	45.0	15	1,875
Public	Freeborn	1.7	---	5.0	36.3	2.0	45.5	13	2,725
Public	BSR 101 (S)[2]	1.9	---	4.7	35.3	1.8	41.7	19	3,225
Dennis Ewing Farm Seed	D-2220+ SCN	2.2	---	6.0	31.3	2.0	50.5	3	4,075
Dennis Ewing Farm Seed	D-2323 SCN	2.3	---	6.0	33.0	2.0	49.4	6	2,213
Public	IA 1008	1.9	---	5.9	39.3	2.0	47.8	8	1,575
Public	IA 2021 (S)[2]	2.5	---	5.2	32.8	2.3	43.8	17	1,213
Pioneer	9234[3]	2.3	---	5.1	35.5	2.0	43.5	18	2,313
Public	IA 1009	1.8	---	5.8	36.8	2.3	50.0	4	2,575
Public	Turner	2.3	---	5.4	40.0	2.8	49.0	7	2,588
Pioneer	9233 (S)[2]	2.3	---	4.6	36.0	2.0	47.6	9	1,925
Public	Kenwood 94 (S)[2]	2.5	---	3.7	35.8	2.8	40.2	21	1,013
Monsanto	ASGROW A2553 (S)[2]	2.5	---	6.1	32.0	2.0	54.1	1	2,000
Garst Seed Company	Garst/AgriPro D259N	2.5	---	4.9	35.5	2.3	49.9	5	2,025
Latham Seed Company	Latham EX-552CN[4,5]	2.3	---	6.0	41.3	3.0	44.7	16	1,775
Sand Seed Service	SOI 247N	2.4	---	5.7	37.8	2.0	51.9	2	2,450
ProfiSeed	PS 2310 CN	2.3	---	5.8	39.3	2.8	41.1	20	2,850
Public	Jack	2.9	---	5.1	47.5	3.0	45.9	12	2,400
	LSD[6]	---	---	NS	3.2	0.4	4.7	---	NS

Values presented in table are means. Plots were planted on 16 May 2002 and harvested on 9 October 2002. Entries are listed in order of maturity date in the northeast location, then by decreasing order of yield. Unless otherwise noted, source of resistance is PI 88788.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 4,213 eggs per 100 cc soil; field infested with HG Type 2.5.7 (race 5) SCN.

[2]Susceptible check variety.

[3]PI 548402 (Peking) source of resistance.

[4]Experimental variety.

[5]PI 437654 (Hartwig) and PI 88788 sources of resistance.

[6]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 3. Soybean cyst nematode (SCN) reproduction and agronomic performance of Roundup Ready® soybean varieties in north central Iowa (Kanawha) in an SCN-infested field (average population at planting of 3,357 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Pioneer	92B05 (S)[2]	2.0	---	7.9	34.0	2.0	47.5	35	1,413
Wilson Seeds Inc.	1981 RR[3]	1.9	---	6.4	39.0	2.0	47.9	34	1,275
Syngenta Seeds	S18-U9	1.8	---	6.4	35.8	1.8	44.9	36	1,675
Monsanto	ASGROW AG1902	1.9	---	4.7	32.5	2.0	48.1	33	2,438
JC Robinson/Golden Harvest	X 2276RR[4]	2.2	---	7.2	35.0	2.0	52.5	9	1,625
Gold Country Seed Inc.	Gold Country 2121NRR	2.1	---	7.0	35.8	2.0	53.6	5	875
Wilson Seeds Inc.	2350 RR (S)[2]	2.3	---	5.5	36.0	2.3	51.5	21	1,500
JC Robinson/Golden Harvest	X 1969RR[4]	1.9	---	6.9	34.3	2.0	51.0	24	1,513
Latham Seed Co.	Latham 388RRN	1.9	---	6.7	35.5	2.0	50.7	25	1,238
Kruger Seed Company	K-221 RR/SCN[5]	2.2	---	5.7	35.8	1.8	53.4	6	1,913
Stine Seed Company	Stine S1962-4	1.9	---	6.5	37.0	1.8	52.8	8	1,288
Merschman Seeds, Inc.	Merschman Venus RR	1.9	---	5.6	35.3	2.0	51.7	18	825
Garst Seed Company	Garst/AgriPro 2013RR/N[5]	2.0	---	5.6	35.5	1.8	50.5	28	1,063
Kruger Seed Company	K-242 RR/SCN	2.3	---	6.2	33.3	2.0	50.0	31	988
Sand Seed Service	SOI 2042NRR	2.0	---	6.0	35.5	2.0	53.0	7	1,225
ProfiSeed	PS 4225 CN	2.2	---	6.9	36.3	2.0	52.0	14	1,300
Gold Country Seed Inc.	Gold Country 3221NRR	2.1	---	6.3	36.8	1.8	51.8	16	1,475
Kruger Seed Company	K-202 RR/SCN	2.0	---	7.3	35.0	2.0	51.5	21	1,088
United Agri Products	Dyna-Gro 3199 NRR	1.9	---	6.9	34.8	2.0	50.6	27	1,400
Prairie Brand Seed Co.	PB-1992NRR	2.0	---	6.1	35.3	2.0	50.5	28	1,150
Garst Seed Company	Garst/AgriPro 2112RR/N	2.1	---	6.9	33.5	2.0	50.2	30	1,250
Albert Lea Seed House	Viking 2108 CNRR[6]	2.1	---	5.0	37.5	2.0	53.9	3	1,200
Monsanto	DEKALB DKB24-51	2.4	---	6.7	35.5	2.0	52.2	12	1,188
Prairie Brand Seed Co.	PB-2092NRR[5]	2.0	---	6.2	37.0	2.0	51.8	16	1,988
Crow's Hybrid	CRX231N[4]	2.3	---	5.3	37.0	2.0	51.7	18	750
Pioneer	92B36 (S)[2]	2.3	---	6.6	33.8	2.0	51.7	18	1,150
Royster-Clark, Inc.	Vigoro V20N3RR	2.0	---	6.9	37.5	2.0	51.3	23	1,950
Prairie Brand Seed Co.	PB-2392NRR	2.3	---	7.5	36.3	2.0	50.7	25	1,563
Ottilie RO Seed	Ottilie 8232 RRN	2.3	---	6.8	35.5	2.0	52.3	11	1,650
Stine Seed Company	Stine S2342-4	2.2	---	6.3	36.0	2.0	52.0	14	850
Dennis Ewing Farm Seed	D-277 RR/SCN	2.5	---	7.4	36.8	2.0	57.1	1	1,075
Four Star Seed Company	3252RR	2.5	---	5.2	32.5	2.0	53.8	4	1,750
Pioneer	92B74 (S)[2]	2.7	---	6.7	34.5	2.0	52.5	9	2,225
Garst Seed Company	Garst/AgriPro 2612RR/N	2.6	---	6.6	34.0	2.0	49.5	32	800
Dairyland Seed Co., Inc.	DSR-255/RR	2.5	---	6.6	38.8	2.0	55.1	2	613
Dairyland Seed Co., Inc.	DSR-274/RR	2.7	---	7.2	36.5	3.0	52.1	13	825
	LSD[7]	---	---	NS	2.7	0.3	3.5	---	NS

Values presented in table are means. Plots were planted on 16 May 2002 and harvested on 9 October 2002. Entries are listed in order of maturity date in the northeast location, then by decreasing order of yield. Unless otherwise noted, source of resistance is PI 88788.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 3,357 eggs per 100 cc soil; field infested with HG Type 2.5.7 (race 5) SCN.

[2]Susceptible check variety.

[3]PI 548402 (Peking) source of resistance.

[4]Experimental variety.

[5]PI 437654 (Hartwig) and PI 88788 sources of resistance.

[6]PI 437654 (Hartwig) source of resistance.

[7]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 5. Soybean cyst nematode (SCN) reproduction and agronomic performance of Roundup Ready® soybean varieties in northeast Iowa (Mason City) in an SCN-infested field (average population at planting of 2,306 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Pioneer	92B05 (S)[2]	2.0	9/17	7.6	33.5	1.3	55.6	10	2,413
Syngenta Seeds	S18-U9	1.8	9/18	8.4	33.3	2.3	52.5	26	1,300
Wilson Seeds Inc.	1981 RR[3]	1.9	9/18	7.8	41.0	2.0	52.5	26	588
Monsanto	ASGROW AG1902	1.9	9/19	7.8	34.5	1.8	55.0	11	2,667
JC Robinson/Golden Harvest	X 2276RR[4]	2.2	9/23	6.6	37.0	2.0	51.9	30	1,438
JC Robinson/Golden Harvest	X 1969RR[4]	1.9	9/24	8.0	38.3	1.8	54.5	13	1,300
Wilson Seeds Inc.	2350 RR (S)[2]	2.3	9/24	6.9	37.0	1.8	54.2	15	2,725
Gold Country Seed Inc.	Gold Country 2121NRR	2.1	9/24	7.5	38.3	2.0	54.1	16	1,038
Latham Seed Co.	Latham 388RRN	1.9	9/24	8.1	39.0	1.5	53.1	23	1,488
Kruger Seed Company	K-221 RR/SCN[5]	2.2	9/25	6.9	38.5	1.8	57.5	3	1,213
Kruger Seed Company	K-242 RR/SCN	2.3	9/25	8.5	35.8	1.0	56.1	7	2,525
Garst Seed Company	Garst/AgriPro 2013RR/N[5]	2.0	9/25	6.8	38.8	1.8	56.0	8	1,525
Merschman Seeds, Inc.	Merschman Venus RR	1.9	9/25	6.6	38.5	2.0	52.6	25	875
Stine Seed Company	Stine S1962-4	1.9	9/25	6.5	38.3	1.5	51.8	31	1,075
Gold Country Seed Inc.	Gold Country 3221NRR	2.1	9/26	7.9	36.8	2.0	54.7	12	1,013
Kruger Seed Company	K-202 RR/SCN	2.0	9/26	7.5	38.0	1.8	53.8	17	1,400
United Agri Products	Dyna-Gro 3199 NRR	1.9	9/26	8.5	41.0	2.0	53.7	19	975
ProfiSeed	PS 4225 CN	2.2	9/26	8.0	39.0	1.5	53.6	20	1,163
Garst Seed Company	Garst/AgriPro 2112RR/N	2.1	9/26	7.8	35.5	2.0	53.2	22	663
Prairie Brand Seed Co.	PB-1992NRR	2.0	9/26	8.6	38.3	1.3	51.5	35	1,600
Sand Seed Service	SOI 2042NRR	2.0	9/26	6.7	38.8	1.5	51.5	35	1,125
Prairie Brand Seed Co.	PB-2092NRR[5]	2.0	9/27	7.7	41.8	2.3	57.4	5	613
Albert Lea Seed House	Viking 2108 CNRR[6]	2.1	9/27	6.5	39.3	2.0	56.5	6	1,088
Pioneer	92B36 (S)[2]	2.3	9/27	7.3	36.8	1.8	55.7	9	3,100
Royster-Clark, Inc.	Vigoro V20N3RR	2.0	9/27	7.1	41.0	1.5	53.8	17	1,100
Crow's Hybrid	CRX231N[4]	2.3	9/27	7.3	39.3	2.0	52.5	26	875
Stine Seed Company	Stine S2342-4	2.2	9/27	7.8	37.5	2.0	52.1	29	1,075
Monsanto	DEKALB DKB24-51	2.4	9/27	6.2	37.0	1.8	51.7	32	1,063
Prairie Brand Seed Co.	PB-2392NRR	2.3	9/27	6.5	38.5	2.0	51.7	32	1,500
Ottilie RO Seed	Ottilie 8232 RRN	2.3	9/28	8.1	37.5	2.0	52.8	24	1,288
Dennis Ewing Farm Seed	D-277 RR/SCN	2.5	9/29	7.8	37.8	1.8	61.0	1	1,325
Pioneer	92B74 (S)[2]	2.7	9/29	7.6	37.0	2.0	58.5	2	3,200
Four Star Seed Company	3252RR	2.5	9/29	6.9	35.8	2.0	57.5	3	775
Garst Seed Company	Garst/AgriPro 2612RR/N	2.6	9/29	7.7	38.5	2.0	51.7	32	825
Dairyland Seed Co., Inc.	DSR-255/RR	2.5	9/30	7.0	41.8	2.0	54.5	13	750
Dairyland Seed Co., Inc.	DSR-274/RR	2.7	10/1	6.8	39.5	2.5	53.6	20	1,750
	LSD[7]	---	2	NS	3.1	0.6	3.3	---	1,269

Values presented in table are means. Plots were planted on 4 May 2002 and harvested on 10 October 2002. Entries are listed in order of maturity date, then by decreasing order of yield. Unless otherwise noted, source of resistance is PI 88788.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 2,306 eggs per 100 cc soil; field infested with HG Type 7 (race 3) SCN.

[2]Susceptible check variety.

[3]PI 548402 (Peking) source of resistance.

[4]Experimental variety.

[5]PI 437654 (Hartwig) and PI 88788 sources of resistance.

[6]PI 437654 (Hartwig) source of resistance.

[7]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 6. Soybean cyst nematode (SCN) reproduction and agronomic performance of conventional (non-Roundup Ready®) soybean varieties in west central Iowa (Churdan) in an SCN-infested field (average population at planting of 5,407 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Public	Turner	2.3	---	6.3	33.8	2.0	47.5	10	1,300
Pioneer	9234[2]	2.3	---	6.6	31.3	2.0	52.0	6	1,100
Monsanto	ASGROW A2553 (S)[3]	2.5	---	8.3	31.0	1.8	54.1	4	10,475
Public	IA 2021 (S)[3]	2.5	---	5.0	26.3	1.8	44.0	12	9,900
Public	Loda	2.1	---	5.9	33.0	1.8	54.7	3	763
Public	Kenwood 94 (S)[3]	2.5	---	3.8	28.3	1.5	37.2	13	5,663
Pioneer	92B74 (S)[3]	2.7	---	8.1	25.0	1.5	48.7	9	3,738
Monsanto	ASGROW AG2703 (S)[3]	2.7	---	7.0	32.3	1.0	53.1	5	11,250
Public	IA 3014	3.0	---	6.4	36.5	1.8	50.9	7	1,463
Public	Dwight	2.9	---	6.8	27.5	1.8	49.6	8	2,125
KSC/Challenger	K-2990 SCN	2.9	---	7.5	36.3	1.8	62.7	1	563
KSC/Challenger	K-3030 SCN	3.0	---	7.3	33.0	2.0	55.1	2	713
Public	Jack	2.9	---	5.0	40.3	3.5	45.5	11	1,563
	LSD[4]	---	---	2.2	6.1	0.6	14.4	---	8,221

Values presented in table are means. Plots were planted on 9 May 2002 and harvested on 14 October 2002. Entries are listed in order of maturity date in the central location, then by decreasing order of yield. Unless otherwise noted, source of resistance is PI 88788.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 5,407 eggs per 100 cc soil; field infested with HG Type 7 (race 3) SCN.

[2]PI 548402 (Peking) source of resistance.

[3]Susceptible check variety.

[4]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 7. Soybean cyst nematode (SCN) reproduction and agronomic performance of Roundup Ready® soybean varieties in west central Iowa (Churdan) in an SCN-infested field (average population at planting of 2,652 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Monsanto	DEKALB DKB24-51	2.4	---	6.7	33.3	1.8	53.3	34	1,125
Syngenta Seeds	S26-H2	2.6	---	7.0	34.0	1.8	49.6	43	4,625
Midwest Seed Genetics	GR2631	2.6	---	6.8	34.0	1.0	55.7	27	1,113
Kruger Seed Company	K-272 RR/SCN[2]	2.7	---	7.6	29.5	1.5	50.9	39	2,838
Garst Seed Co.	Garst/AgriPro 2612RR/N	2.6	---	6.6	30.0	1.0	50.0	42	7,125
Dairyland Seed Co. Inc.	DSR-255/RR	2.5	---	7.9	31.0	2.0	56.8	20	1,913
Pioneer	92B74 (S)[3]	2.7	---	7.4	29.5	1.8	56.2	24	7,650
Latham Seed Co.	Latham EX-758RRN[2,4]	2.6	---	7.0	29.3	1.3	46.0	44	3,100
Monsanto	DEKALB DKB26-52	2.7	---	6.9	39.8	2.0	55.3	28	2,613
Monsanto	DEKALB DKB27-51	2.7	---	7.3	30.8	1.0	53.3	34	1,638
Monsanto	ASGROW AG2703 (S)[3]	2.7	---	7.3	35.0	1.5	52.6	36	7,338
Prairie Brand Seed Co.	PB-2606NRR	2.6	---	6.6	34.8	2.0	50.8	41	3,225
Sand Seed Service	SOI 2642NRR	2.6	---	6.2	42.5	2.3	57.5	16	1,488
Ottilie RO Seed	Ottilie 8266 RRN	2.6	---	6.6	33.8	1.0	57.4	17	500
Prairie Brand Seed Co.	PB-2520NRR	2.5	---	6.7	32.0	2.0	62.3	3	588
United Agri Products	Dyna-Gro X429 RR	2.7	---	8.6	33.5	1.8	58.9	10	3,950
ProfiSeed	PS 4261 CN	2.6	---	6.0	32.3	1.3	58.4	12	2,225
Dennis Ewing Farm Seeds	D-277 RR/SCN	2.5	---	8.0	31.5	1.8	57.4	17	2,700
Syngenta Seeds	X228R[4]	2.8	---	6.5	36.5	2.5	54.4	31	3,588
Kruger Seed Company	K-288 RR/SCN	2.8	---	6.2	34.5	2.0	59.5	9	1,400
JC Robinson/Golden Harvest	X 2698RR[4]	2.6	---	8.3	34.5	1.8	55.9	25	4,700
Syngenta Seeds	X229R[4]	2.9	---	6.5	33.5	1.8	54.9	30	2,063
Dennis Ewing Farm Seeds	D-272+ RR/SCN	2.6	---	6.7	31.5	1.3	54.3	33	5,588
Pioneer	93B01 (S)[3]	3.0	---	7.4	28.3	2.0	50.9	39	7,875
Prairie Brand Seed Co.	PB-2801NRR	2.8	---	6.4	33.5	1.8	57.7	15	2,938
Latham Seed Co.	Latham 828RRN	2.7	---	6.9	36.8	2.0	61.4	5	3,050
Dennis Ewing Farm Seeds	D-288+ RR/SCN	2.8	---	7.1	32.5	1.5	60.2	7	2,725
Garst Seed Co.	Garst/AgriPro 3212RR/N	3.2	---	6.7	36.8	1.8	57.8	14	563
Thompson	T-7291 CR	2.9	---	6.8	34.0	1.5	61.3	6	3,013
Stine Seed Company	Stine S2842-4	2.8	---	6.4	32.5	1.3	57.2	19	1,400
Dairyland Seed Co. Inc.	DSR-274/RR	2.7	---	7.3	31.5	2.0	56.4	23	1,588
Wilson Seeds Inc.	3348 RR[5]	3.3	---	6.6	35.3	2.0	55.8	26	3,325
ProfiSeed	PS X427 CN	2.7	---	7.3	31.3	1.8	55.2	29	3,388
Ottilie RO Seed	Ottilie 8282 RRN	2.8	---	7.6	32.5	1.3	51.2	38	4,600
JC Robinson/Golden Harvest	H-2991RR[4]	2.9	---	6.8	29.0	1.5	58.1	13	2,225
KSC/Challenger	K-323 RR/SCN	3.1	---	7.5	34.8	1.5	54.4	31	7,363
ProfiSeed	PS 4291 CN	2.9	---	8.1	31.8	1.5	52.1	37	3,313
Merschman Seeds, Inc.	Merschman Cherokee XRR	2.9	---	6.8	35.3	2.0	64.4	1	1,663
Kruger Seed Company	K-303 RR/SCN	2.9	---	6.8	35.0	1.8	62.5	2	2,113
Midwest Seed Genetics	GR2931	2.9	---	7.8	34.8	2.0	56.8	20	8,250
United Agri Products	Dyna-Gro 3292 NRR	2.9	---	6.7	32.3	1.8	56.6	22	4,938
Four Star Seed Company	3289RR	2.8	---	6.3	34.3	2.0	61.8	4	1,475
Stine Seed Company	Stine S2802-4	2.8	---	5.5	33.8	1.8	60.2	7	3,713
Sand Seed Service	SOI 2900NRR	2.9	---	7.1	33.5	1.8	58.6	11	725
	LSD[6]	---	---	NS	4.7	0.6	8.9	---	5,264

Values presented in table are means. Plots were planted on 9 May 2002 and harvested on 14 October 2002. Entries are listed in order of maturity date in the central location, then by decreasing order of yield. Unless otherwise noted, source of resistance is PI 88788.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 2,652 eggs per 100 cc soil; field infested with HG Type 7 (race 3) SCN.

[2]PI 437654 (Hartwig) and PI 88788 sources of resistance.

[3]Susceptible check variety.

[4]Experimental variety.

[5]PI 548402 (Peking) source of resistance.

[6]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 8. Soybean cyst nematode (SCN) reproduction and agronomic performance of conventional (non-Roundup Ready®) soybean varieties in central Iowa (Cambridge) in an SCN-infested field (average population at planting of 3,979 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Public	Turner	2.3	9/16	7.4	34.3	3.0	44.1	8	2,413
Pioneer	9234[2]	2.3	9/17	6.2	30.3	2.0	45.9	7	2,725
Public	IA 2021 (S)[3]	2.5	9/18	6.4	25.5	1.8	35.7	12	15,075
Monsanto	ASGROW A2553 (S)[3]	2.5	9/18	7.5	27.3	1.5	40.0	10	16,950
Public	Kenwood 94 (S)[3]	2.5	9/20	4.9	28.3	1.5	34.5	13	8,625
Public	Loda	2.1	9/20	6.5	32.3	2.0	50.5	5	1,663
Pioneer	92B74 (S)[3]	2.7	9/21	6.4	26.0	1.5	39.1	11	21,900
Monsanto	ASGROW AG2703 (S)[3]	2.7	9/23	7.0	32.3	1.3	42.6	9	20,300
Public	IA 3014	3.0	9/25	6.9	37.3	2.3	48.1	6	2,400
Public	Dwight	2.9	9/25	6.1	30.8	1.8	50.6	4	5,075
KSC/Challenger	K-2990 SCN	2.9	9/26	6.7	35.5	2.5	55.5	1	1,600
KSC/Challenger	K-3030 SCN	3.0	9/27	7.4	33.3	2.0	53.0	2	2,950
Public	Jack	2.9	9/28	6.0	45.0	2.8	51.0	3	2,425
	LSD[4]	---	3	1.5	3.1	0.7	4.6	---	10,577

Values presented in table are means. Plots were planted on 7 May 2002 and harvested on 7 October 2002. Entries are listed in order of maturity date, then by decreasing order of yield. Unless otherwise noted, source of resistance is PI 88788.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 3,979 eggs per 100 cc soil; field infested with HG Type 2.5.7 (race 1) SCN.

[2]PI 548402 (Peking) source of resistance.

[3]Susceptible check variety.

[4]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 9. Soybean cyst nematode (SCN) reproduction and agronomic performance of Roundup Ready® soybean varieties in central Iowa (Cambridge) in an SCN-infested field (average population at planting of 3,252 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Monsanto	DEKALB DKB24-51	2.4	9/17	7.9	30.8	2.0	46.7	35	1,475
Syngenta Seeds	S26-H2	2.6	9/17	7.8	36.3	1.8	46.5	36	1,350
Garst Seed Co.	Garst/AgriPro 2612RR/N	2.6	9/18	8.2	28.5	1.0	50.0	24	1,750
Midwest Seed Genetics	GR2631	2.6	9/18	6.9	31.8	1.0	46.0	39	1,950
Kruger Seed Company	K-272 RR/SCN[2]	2.7	9/18	7.2	29.5	1.8	45.1	41	988
Latham Seed Co.	Latham EX-758RRN[2,3]	2.6	9/20	7.1	32.0	2.0	49.1	27	1,350
Dairyland Seed Co. Inc.	DSR-255/RR	2.5	9/20	6.7	32.8	1.5	47.7	33	2,425
Pioneer	92B74 (S)[4]	2.7	9/20	8.1	25.0	1.3	39.6	44	17,275
Prairie Brand Seed Co.	PB-2606NRR	2.6	9/21	7.0	39.3	2.0	53.7	5	1,138
Monsanto	DEKALB DKB27-51	2.7	9/21	7.4	30.5	1.5	49.0	28	1,850
Monsanto	DEKALB DKB26-52	2.7	9/21	7.5	36.8	2.0	48.9	29	2,900
Monsanto	ASGROW AG2703 (S)[4]	2.7	9/21	6.7	32.0	1.5	43.9	42	17,800
Sand Seed Service	SOI 2642NRR	2.6	9/22	7.3	38.3	2.0	51.6	15	1,675
Ottilie RO Seed	Ottilie 8266 RRN	2.6	9/22	8.1	31.8	1.8	50.8	22	4,388
Syngenta Seeds	X228R[3]	2.8	9/23	8.2	34.8	2.0	52.2	11	1,325
United Agri Products	Dyna-Gro X429 RR	2.7	9/23	6.3	33.0	1.8	51.5	18	2,525
Dennis Ewing Farm Seeds	D-277 RR/SCN	2.5	9/23	8.4	29.5	1.3	49.3	26	1,975
Prairie Brand Seed Co.	PB-2520NRR	2.5	9/23	7.3	27.5	1.5	48.0	31	1,500
ProfiSeed	PS 4261 CN	2.6	9/23	8.4	31.8	1.5	47.8	32	1,000
Kruger Seed Company	K-288 RR/SCN	2.8	9/24	7.3	32.5	1.5	53.7	5	2,100
JC Robinson/Golden Harvest	X 2698RR[3]	2.6	9/24	8.2	32.5	2.0	51.3	19	4,600
Dennis Ewing Farm Seeds	D-272+ RR/SCN	2.6	9/24	7.4	31.8	1.3	50.9	21	2,500
Syngenta Seeds	X229R[3]	2.9	9/24	8.0	35.3	1.5	49.5	25	3,550
Pioneer	93B01 (S)[4]	3.0	9/24	7.4	30.8	1.3	42.8	43	17,175
Prairie Brand Seed Co.	PB-2801NRR	2.8	9/25	8.5	33.3	2.0	54.3	2	1,613
Dennis Ewing Farm Seeds	D-288+ RR/SCN	2.8	9/26	7.6	33.8	1.8	52.6	8	1,813
Garst Seed Co.	Garst/AgriPro 3212RR/N	3.2	9/26	8.3	34.5	1.8	52.1	12	1,125
Latham Seed Co.	Latham 828RRN	2.7	9/26	7.9	32.8	2.0	46.3	38	18,250
ProfiSeed	PS X427 CN	2.7	9/27	7.5	32.8	2.0	55.6	1	1,625
Wilson Seeds Inc.	3348 RR[5]	3.3	9/27	7.1	35.3	1.5	52.1	12	1,550
Stine Seed Company	Stine S2842-4	2.8	9/27	6.2	32.5	1.5	51.7	14	1,850
Ottilie RO Seed	Ottilie 8282 RRN	2.8	9/27	7.7	31.3	1.3	50.3	23	2,375
Thompson	T-7291 CR	2.9	9/27	7.9	30.3	1.3	48.6	30	2,325
Dairyland Seed Co. Inc.	DSR-274/RR	2.7	9/27	8.3	32.3	2.0	46.5	36	8,550
JC Robinson/Golden Harvest	H-2991RR[3]	2.9	9/28	6.9	30.8	1.5	54.3	2	3,200
ProfiSeed	PS 4291 CN	2.9	9/28	7.4	30.8	1.3	51.6	15	1,475
KSC/Challenger	K-323 RR/SCN	3.1	9/28	8.8	32.3	1.5	46.0	39	17,150
Merschman Seeds, Inc.	Merschman Cherokee XRR	2.9	9/29	7.7	31.5	1.8	54.2	4	2,350
United Agri Products	Dyna-Gro 3292 NRR	2.9	9/29	6.2	32.3	1.8	52.4	10	2,950
Midwest Seed Genetics	GR2931	2.9	9/29	8.4	30.0	1.5	51.6	15	1,475
Kruger Seed Company	K-303 RR/SCN	2.9	9/29	7.8	31.3	1.3	51.1	20	2,275
Stine Seed Company	Stine S2802-4	2.8	9/30	5.9	31.3	1.8	53.2	7	6,425
Four Star Seed Company	3289RR	2.8	9/30	7.6	30.5	2.0	52.6	8	1,750
Sand Seed Service	SOI 2900NRR	2.9	9/30	7.5	29.5	1.3	47.6	34	1,700
	LSD[6]	---	2.0	NS	2.5	0.6	3.8	---	7,594

Values presented in table are means. Plots were planted on 7 May 2002 and harvested on 7 October 2002. Entries are listed in order of maturity date, then by decreasing order of yield. Unless otherwise noted, source of resistance is PI 88788.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 3,252 eggs per 100 cc soil; field infested with HG Type 2.5.7 (race 1) SCN.

[2]PI 437654 (Hartwig) and PI 88788 sources of resistance.

[3]Experimental variety.

[4]Susceptible check variety.

[5]PI 548402 (Peking) source of resistance.

[6]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 10. Soybean cyst nematode (SCN) reproduction and agronomic performance of Roundup Ready® soybean varieties in southwest Iowa (Lenox) in an SCN-infested field (average population at planting of 5,598 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Pioneer	93B01 (S)[2]	3.0	---	7.5	21.5	1.5	27.9	35	31,875
Prairie Brand Seed Co.	PB-2920NRR	2.9	---	7.1	23.3	1.3	41.6	13	4,825
Midwest Seed Genetics	GR2931	2.9	---	8.3	21.5	2.0	40.3	19	3,875
JC Robinson/Golden Harvest	H-2991RR[3]	2.9	---	7.7	22.5	1.8	36.1	29	4,050
Pioneer	93B53 (S)[2]	3.5	---	7.6	22.3	1.8	25.2	37	42,975
Garst Seed Co.	Garst/AgriPro 3212RR/N	3.2	---	6.0	26.0	2.0	40.0	20	3,400
Pioneer	93B35 (S)[2]	3.3	---	7.8	21.5	1.5	25.6	36	29,950
Dennis Ewing Farm Seeds	D-340 RR/SCN	3.3	---	7.5	22.8	2.0	41.1	15	4,800
Stine Seed Company	Stine S2802-4	2.8	---	6.5	21.8	1.8	37.8	26	7,650
Ottilie RO Seed	Ottilie 8333 RRN	3.3	---	7.4	21.3	1.3	22.7	38	43,200
Monsanto	ASGROW AG3201	3.2	---	8.2	26.0	1.8	44.0	6	5,088
Kruger Seed Company	K-303 RR/SCN	2.9	---	7.0	22.0	2.0	39.2	21	5,213
Prairie Brand Seed Co.	PB-3292NRR	3.2	---	7.0	25.8	1.5	34.5	32	11,825
Syngenta Seeds	X233R[3]	3.3	---	8.1	29.0	2.0	45.5	4	2,025
Public	MPV 331 NRR	3.3	---	6.7	25.8	2.0	42.1	12	4,000
United Agri Products	Dyna-Grow 3321 NRR	3.2	---	6.4	26.0	2.0	41.4	14	3,600
Latham Seed Co.	Latham 1138RRN	3.2	---	7.4	26.5	1.3	32.6	33	11,700
Kruger Seed Company	K-344 RR/SCN	3.2	---	8.9	26.0	1.3	34.7	31	14,300
Syngenta Seeds	X235R[3]	3.5	---	7.8	29.8	1.5	43.1	10	4,400
Stine Seed Company	Stine S3402-4	3.4	---	7.2	23.5	2.0	42.6	11	5,175
Merschman Seeds, Inc.	Merschman Hoover VRR	3.4	---	7.3	21.5	1.8	38.8	23	5,600
Prairie Brand Seed Co.	PB-3592NRR	3.5	---	6.5	22.0	2.0	38.8	23	5,800
Dennis Ewing Farm Seeds	D-388 RR/SCN	3.8	---	7.5	25.8	2.0	46.4	1	6,800
Wilson Seeds Inc.	3790 NRR[4]	3.7	---	7.6	26.0	2.0	45.6	3	12,200
Monsanto	ASGROW AG3703	3.7	---	7.6	26.0	1.3	43.4	9	4,600
Merschman Seeds, Inc.	Merschman Truman RR	3.5	---	7.3	29.5	2.0	40.7	18	3,050
Stine Seed Company	Stine S3842-4	3.8	---	7.8	25.0	2.0	39.2	21	6,400
Public	MPV 350 NRR	3.5	---	8.4	28.8	2.0	38.0	25	5,475
Public	MPV 381 NRR	3.8	---	8.5	24.0	1.3	31.4	34	35,555
Midwest Seed Genetics	GR3931	3.9	---	7.3	24.3	1.8	46.0	2	5,400
Kruger Seed Company	K-389 RR/SCN	3.7	---	9.0	27.5	2.0	45.4	5	9,175
Sand Seed Service	SOI 340N (conventional)[5]	3.4	---	6.9	25.8	1.8	41.0	17	4,675
Syngenta Seeds	S37-N4[6]	3.7	---	8.0	31.3	2.0	43.6	7	4,350
Dennis Ewing Farm Seeds	D-401 RR/SCN[7]	3.9	---	6.6	23.0	1.0	43.5	8	4,450
United Agri Products	Dyna-Grow 3362 NRR	3.6	---	7.8	23.8	1.8	41.1	15	26,000
Garst Seed Co.	Garst/AgriPro 3712RR/N	3.7	---	7.5	23.0	1.5	36.4	28	47,975
Sand Seed Service	SOI 3632NRR	3.6	---	8.0	22.3	2.0	37.7	27	42,350
Merschman Seeds, Inc.	Merschman Kennedy VIRR	3.8	---	7.8	22.0	1.8	35.3	30	29,275
	LSD[8]	---	---	NS	2.8	0.5	6.2	---	12,555

Values presented in table are means. Plots were planted on 15 May 2002 and harvested on 15 October 2002. Entries are listed in order of maturity date in the southeast location, then by decreasing order of yield. Unless otherwise noted, source of resistance is PI 88788 and the variety is Roundup Ready ®.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 5,598 eggs per 100 cc soil; field infested with HG Type 7 (race 3) SCN.

[2]Susceptible check variety.

[3]Experimental variety.

[4]PI 548402 (Peking) source of resistance.

[5]Conventional (non-Roundup Ready®) variety.

[6]Variety formerly X139R.

[7]Variety formerly D-393 RR/SCN.

[8]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 11. Soybean cyst nematode (SCN) reproduction and agronomic performance of Roundup Ready® soybean varieties in southeast Iowa (Crawfordsville) in an SCN-infested field (average population at planting of 2,090 eggs per 100cc soil) in 2002.

Brand	Variety	Relative Maturity	Maturity Date	Stand (plants/ft)	Height (inches)	Lodging (1-5)	Yield (bu/acre)	Yield Rank	SCN # [1] (100 cc)
Pioneer	93B01 (S)[2]	3.0	9/16	8.9	31.0	1.8	43.1	38	8,000
Prairie Brand Seed Co.	PB-2920NRR	2.9	9/19	8.8	31.0	1.8	53.1	25	1,850
JC Robinson/Golden Harvest	H-2991RR[3]	2.9	9/20	7.8	31.8	1.8	54.4	16	2,625
Midwest Seed Genetics	GR2931	2.9	9/20	7.4	32.3	1.0	53.1	25	1,000
Pioneer	93B53 (S)[2]	3.5	9/20	7.2	33.8	1.8	47.7	36	8,900
Garst Seed Co.	Garst/AgriPro 3212RR/N	3.2	9/21	7.2	35.8	2.3	51.6	29	2,300
Pioneer	93B35 (S)[2]	3.3	9/21	7.2	30.3	1.3	48.2	35	8,475
Dennis Ewing Farm Seeds	D-340 RR/SCN	3.3	9/22	8.1	32.0	2.0	54.1	18	1,500
Stine Seed Company	Stine S2802-4	2.8	9/22	7.9	32.5	1.5	52.1	27	2,975
Ottilie RO Seed	Ottilie 8333 RRN	3.3	9/22	8.8	33.3	1.8	43.6	37	7,975
Monsanto	ASGROW AG3201	3.2	9/23	7.9	34.8	1.3	57.3	6	1,625
Kruger Seed Company	K-303 RR/SCN	2.9	9/23	7.6	31.8	1.8	54.0	19	2,500
Prairie Brand Seed Co.	PB-3292NRR	3.2	9/23	7.5	37.3	1.8	50.7	31	8,000
United Agri Products	Dyna-Grow 3321 NRR	3.2	9/24	7.9	36.5	2.0	57.2	7	1,825
Latham Seed Co.	Latham 1138RRN	3.2	9/24	7.7	35.5	1.8	55.2	12	3,925
Public	MPV 331 NRR	3.3	9/24	8.3	34.5	2.3	53.3	22	1,400
Syngenta Seeds	X233R[3]	3.3	9/24	9.3	36.3	2.3	50.4	33	2,025
Kruger Seed Company	K-344 RR/SCN	3.2	9/25	9.0	37.0	1.8	53.3	22	5,450
Prairie Brand Seed Co.	PB-3592NRR	3.5	9/26	6.5	34.0	1.0	55.8	10	2,600
Merschman Seeds, Inc.	Merschman Hoover VRR	3.4	9/26	7.7	34.3	2.0	55.7	11	2,350
Stine Seed Company	Stine S3402-4	3.4	9/26	8.2	34.0	1.5	55.2	12	3,025
Syngenta Seeds	X235R[3]	3.5	9/26	9.0	38.5	1.8	50.7	31	2,225
Wilson Seeds Inc.	3790 NRR[4]	3.7	9/27	8.2	34.8	2.0	58.6	4	4,800
Merschman Seeds, Inc.	Merschman Truman RR	3.5	9/27	9.1	37.5	2.0	56.4	9	2,650
Public	MPV 381 NRR	3.8	9/27	9.3	35.3	2.0	54.6	14	8,600
Public	MPV 350 NRR	3.5	9/27	9.4	36.3	2.0	54.4	16	1,950
Monsanto	ASGROW AG3703	3.7	9/27	8.4	38.0	2.0	53.8	20	2,075
Dennis Ewing Farm Seeds	D-388 RR/SCN	3.8	9/27	8.6	33.5	2.3	51.4	30	5,375
Stine Seed Company	Stine S3842-4	3.8	9/27	7.7	35.0	1.8	49.3	34	7,000
Midwest Seed Genetics	GR3931	3.9	9/28	8.5	36.8	1.8	59.4	1	1,875
Kruger Seed Company	K-389 RR/SCN	3.7	9/28	9.0	34.3	1.8	58.4	5	4,400
Sand Seed Service	SOI 340N (conventional)[5]	3.4	9/28	10.4	33.3	2.0	53.2	24	2,275
Dennis Ewing Farm Seeds	D-401 RR/SCN[6]	3.9	9/29	8.3	37.0	1.0	59.4	1	2,000
Garst Seed Co.	Garst/AgriPro 3712RR/N	3.7	9/29	9.3	31.3	1.5	54.5	15	17,350
Syngenta Seeds	S37-N4[7]	3.7	9/29	8.4	41.0	2.0	53.8	20	2,475
United Agri Products	Dyna-Grow 3362 NRR	3.6	9/29	8.3	31.0	1.5	52.1	27	8,425
Sand Seed Service	SOI 3632NRR	3.6	9/30	8.8	33.3	1.5	58.9	3	10,275
Merschman Seeds, Inc.	Merschman Kennedy VIRR	3.8	9/30	9.1	33.0	1.5	56.8	8	12,250
	LSD[8]	---	3.0	NS	2.9	0.6	6.8	---	4,169

Values presented in table are means. Plots were planted on 21 May 2002 and harvested on 8 October 2002. Entries are listed in order of maturity date, then by decreasing order of yield.
Unless otherwise noted, source of resistance is PI 88788 and the variety is Roundup Ready ®.

[1]Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities; average initial SCN population 2,090 eggs per 100 cc soil; field infested with HG Type 0 (race 3) SCN.

[2]Susceptible check variety.

[3]Experimental variety.

[4]PI 548402 (Peking) source of resistance.

[5]Conventional (non-Roundup Ready®) variety.

[6]Variety formerly D-393 RR/SCN

[7]Variety formerly X139R.

[8]Least significant difference: values are from Fisher's least-significant-difference test (P= 0.05), NS = no significant differences among the varieties.

Table 12. Iron deficiency chlorosis (IDC) field screening scores from two fields in central Iowa (Ames).

Brand	Variety	Roundup Ready®	Score (1-5)	Region		
				North	Central	South
	Resistant Check		1.0			
	Susceptible Check		2.9			
Dennis Ewing Farm Seed	D-2220+ SCN		1.5	x		
Dennis Ewing Farm Seed	D-2323 SCN		1.3	x		
Garst Seed Company	Garst/AgriPro D259N		1.0	x		
Gold Country Seed	Gold Country X6219CYST		1.3	x		
KSC/Challenger	K-2990 SCN		2.0		x	
KSC/Challenger	K-3030 SCN		2.8		x	
Latham Seed Company	Latham EX-552CN		2.3	x		
Monsanto	ASGROW A2553		1.5	x	x	
Pioneer	9233		2.0	x		
Pioneer	9234		1.0	x	x	
ProfiSeed	PS 2310 CN		2.8	x		
Public	Bell		2.3	x		
Public	BSR 101		1.0	x		
Public	Dwight		1.8		x	
Public	Freeborn		1.8	x		
Public	IA 1008		1.5	x		
Public	IA 1009		1.5	x		
Public	IA 2021		1.3	x	x	
Public	IA 3014		1.8		x	
Public	Jack		2.0	x	x	
Public	Kenwood 94		2.3	x	x	
Public	Loda		2.0		x	
Public	Turner		1.3	x	x	
Sand Seed Service	SOI 247N		1.8	x		
Sand Seed Service	SOI 340N		2.8			x
Thompson Seeds	T-3204CN		1.0	x		
Albert Lea Seed House	Viking 2108 CNRR	x	2.0	x		
Crow's Hybrid	CRX231N	x	2.8	x		
Dairyland Seed Co., Inc.	DSR-255/RR	x	2.3	x	x	
Dairyland Seed Co., Inc.	DSR-274/RR	x	1.5	x	x	
Dennis Ewing Farm Seed	D-272+ RR/SCN	x	2.8		x	
Dennis Ewing Farm Seed	D-277 RR/SCN	x	1.8	x	x	
Dennis Ewing Farm Seed	D-288+ RR/SCN	x	1.8		x	
Dennis Ewing Farm Seeds	D-340 RR/SCN	x	2.3			x
Dennis Ewing Farm Seeds	D-388 RR/SCN	x	3.8			x
Dennis Ewing Farm Seeds	D-401 RR/SCN	x	2.5			x
Four Star Seed Company	3252RR	x	1.8	x		
Four Star Seed Company	3289RR	x	3.0		x	
Garst Seed Co.	Garst/AgriPro 3212RR/N	x	2.0		x	x
Garst Seed Co.	Garst/AgriPro 3712RR/N	x	1.8			x
Garst Seed Company	Garst/AgriPro 2013RR/N	x	2.0	x		
Garst Seed Company	Garst/AgriPro 2112RR/N	x	1.5	x		
Garst Seed Company	Garst/AgriPro 2612RR/N	x	1.3	x	x	
Gold Country Seed Inc.	Gold Country 2121NRR	x	4.0	x		
Gold Country Seed Inc.	Gold Country 3221NRR	x	3.0	x		
JC Robinson/Golden Harvest	H-2991RR	x	2.3		x	x
JC Robinson/Golden Harvest	X 1969RR	x	2.5	x		
JC Robinson/Golden Harvest	X 2276RR	x	2.8	x		
JC Robinson/Golden Harvest	X 2698RR	x	2.0		x	
Kruger Seed Company	K-202 RR/SCN	x	2.5	x		
Kruger Seed Company	K-221 RR/SCN	x	1.8	x		
Kruger Seed Company	K-242 RR/SCN	x	2.5	x		
Kruger Seed Company	K-272 RR/SCN	x	3.5		x	
Kruger Seed Company	K-288 RR/SCN	x	2.0		x	
Kruger Seed Company	K-303 RR/SCN	x	2.0		x	x
Kruger Seed Company	K-344 RR/SCN	x	2.5			x
Kruger Seed Company	K-389 RR/SCN	x	1.8			x
KSC/Challenger	K-323 RR/SCN	x	1.8		x	
Latham Seed Co.	Latham 1138RRN	x	2.3			x

Table 12. Continued.

Brand	Variety	Roundup Ready®	Score (1-5)	Region		
				North	Central	South
Latham Seed Co.	Latham 388RRN	x	2.0	x		
Latham Seed Co.	Latham 828RRN	x	1.8		x	
Latham Seed Co.	Latham EX-758RRN	x	3.0		x	
Merschman Seeds, Inc.	Merschman Cherokee XRR	x	2.5		x	
Merschman Seeds, Inc.	Merschman Hoover VRR	x	2.0			x
Merschman Seeds, Inc.	Merschman Kennedy VIRR	x	2.0			x
Merschman Seeds, Inc.	Merschman Truman RR	x	2.5			x
Merschman Seeds, Inc.	Merschman Venus RR	x	2.0	x		
Midwest Seed Genetics	GR2631	x	3.3		x	
Midwest Seed Genetics	GR2931	x	2.0		x	x
Midwest Seed Genetics	GR3931	x	2.8			x
Monsanto	ASGROW AG1902	x	2.0	x		
Monsanto	ASGROW AG2703	x	1.3		x	
Monsanto	ASGROW AG3201	x	2.3			x
Monsanto	ASGROW AG3703	x	1.5			x
Monsanto	DEKALB DKB24-51	x	2.5	x	x	
Monsanto	DEKALB DKB26-52	x	1.8		x	
Monsanto	DEKALB DKB27-51	x	2.8		x	
Ottilie RO Seed	Ottilie 8232 RRN	x	2.5	x		
Ottilie RO Seed	Ottilie 8266 RRN	x	2.3		x	
Ottilie RO Seed	Ottilie 8282 RRN	x	2.3		x	
Ottilie RO Seed	Ottilie 8333 RRN	x	2.3			x
Pioneer	92B05	x	2.5	x		
Pioneer	92B36	x	2.8	x		
Pioneer	92B74	x	2.0	x	x	
Pioneer	93B01	x	1.3		x	x
Pioneer	93B35	x	2.5			x
Pioneer	93B53	x	1.3			x
Prairie Brand Seed Co.	PB-1992NRR	x	2.3	x		
Prairie Brand Seed Co.	PB-2092NRR	x	2.0	x		
Prairie Brand Seed Co.	PB-2392NRR	x	2.5	x		
Prairie Brand Seed Co.	PB-2520NRR	x	2.0		x	
Prairie Brand Seed Co.	PB-2606NRR	x	1.8		x	
Prairie Brand Seed Co.	PB-2801NRR	x	1.3		x	
Prairie Brand Seed Co.	PB-2920NRR	x	2.8			x
Prairie Brand Seed Co.	PB-3292NRR	x	1.8			x
Prairie Brand Seed Co.	PB-3592NRR	x	3.3			x
ProfiSeed	PS 4225 CN	x	2.3	x		
ProfiSeed	PS 4261 CN	x	2.8		x	
ProfiSeed	PS 4291 CN	x	3.3		x	
ProfiSeed	PS X427 CN	x	1.5		x	
Public	MPV 331 NRR	x	1.3			x
Public	MPV 350 NRR	x	2.8			x
Public	MPV 381 NRR	x	2.3			x
Royster-Clark, Inc.	Vigoro V20N3RR	x	2.5	x		
Sand Seed Service	SOI 2042NRR	x	2.0	x		
Sand Seed Service	SOI 2642NRR	x	2.0		x	
Sand Seed Service	SOI 2900NRR	x	2.8		x	
Sand Seed Service	SOI 3632NRR	x	2.0			x
Stine Seed Company	Stine S1962-4	x	2.5	x		
Stine Seed Company	Stine S2342-4	x	2.8	x		
Stine Seed Company	Stine S2802-4	x	2.0		x	x
Stine Seed Company	Stine S2842-4	x	1.3		x	
Stine Seed Company	Stine S3402-4	x	3.5			x
Stine Seed Company	Stine S3842-4	x	3.0			x
Syngenta Seeds	S18-U9	x	2.5	x		
Syngenta Seeds	S26-H2	x	2.8		x	
Syngenta Seeds	S37-N4	x	2.3			x
Syngenta Seeds	X228R	x	2.8		x	
Syngenta Seeds	X229R	x	1.5		x	
Syngenta Seeds	X233R	x	1.8			x
Syngenta Seeds	X235R	x	2.3			x
Thompson Seeds	T-7291 CR	x	2.5		x	