Evaluation of Soybean Varieties Resistant to Soybean Cyst Nematode in Iowa

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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 and noninfested 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

Eight MG I and 14 MG II SCN-resistant soybean varieties were evaluated in a SCN-infested (race 3) and a nearby noninfested field at the Iowa State University Northern Research and Demonstration Farm in Kanawha, Iowa. Two MG I and four MG II SCN-susceptible varieties also were planted in the experiments. Plots were four 12-foot-long rows spaced 27 inches apart and were planted at a rate of 10 seeds per foot on 12 May 1997.

In central Iowa, 3 MG I, 20 MG II, and 8 MG III SCN-resistant soybean varieties were evaluated in a SCN-infested (Race 3) and a nearby noninfested field at the Iowa State University Agronomy Farm. One MG I, 2 MG II, and 4 MG III SCN-susceptible varieties also were planted in the experiments. Plots were four 12-foot-long rows spaced 27 inches apart and were planted at a rate of 10 seeds per foot. The infested plots were planted 6 May 1997 and the noninfested plots were planted 8 May 1997.

Four MG II and 17 MG III SCN-resistant soybean varieties were evaluated in a noninfested field at the Iowa State University Southeast Research and Demonstration Farm and a nearby SCN-infested (race 3) field near Crawfordsville, Iowa. Three MG III 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 on 15 May 1997. An additional experiment was planted in a SCN-infested field near the Iowa State University Muscatine Island Research Farm in Fruitland, Iowa. All details of this study were identical to the experiments carried out at Crawfordsville.

Plant stand (number of plants per foot) was assessed in each plot 35 to 40 days after planting. Just prior to harvest, average plant height and lodging (1=all plants fully erect, 5=all plants flat) were assessed in each plot. Maturity date, when 95 percent of the pods in a plot turned brown, also was recorded at Kanawha and Ames. Plots were mechanically harvested at Kanawha on 2 October 1997. Plots in the Ames noninfested and infested fields were harvested on 3 October and 7 October 1997, respectively. Crawfordsville and Muscatine plots were harvested on 17 October 1997. 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.

At the beginning of the growing season, plots in both infested and noninfested fields 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 12 feet of the center two rows of each plot either immediately prior to 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. Plots in both fields were sampled again immediately prior to harvest or within a week after harvest.

Data collected from plots planted with MG I, II, and III varieties were sorted and analyzed separately.

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 in fields infested with SCN, although some resistant varieties had greater yields than others. In noninfested fields, the average yields of the resistant varieties evaluated were within a few bushels per acre of the susceptible varieties evaluated. Furthermore, several SCN-resistant varieties actually had greater yields than the best-yielding susceptible varieties in noninfested fields. End-of-season SCN population densities were significantly greater in plots where susceptible varieties were grown relative to plots planted with resistant varieties.

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, comparison of the yields of SCN-resistant varieties in infested fields and in nearby noninfested fields at each of the three paired experimental locations in 1997 revealed that most of the resistant varieties also suffered some yield loss. Consequently, resistant varieties must be used in an integrated management program, along with the use of nonhost crops and scouting for early detection of SCN, to maximize yields and minimize reproduction of the pest on a long-term basis.

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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, Disease-resistant Soybean Varieties for Iowa, lists soybean varieties with resistance or tolerance to four major Iowa soybean diseases, including SCN. Publication IPM-47-s, 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 Publications Distribution (515) 294-5247.

Table 1. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group I soybean varieties in an SCN-infested field and a noninfested field in north central Iowa (Kanawha) in 1997.

		SCN-Infested Field							Noninfested Field					
Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank
Stine	1882	6.4	29.3	9/20	1.1	49.1	1	788	7.5	38.3	9/22	1.5	69.5	1
Pioneer	9182	5.8	27.5	9/16	1.1	46.3	3	500	8.5	34.8	9/16	1.3	59.1	7
Public	Alpha	5.8	31.0	9/18	1.2	39.8	7	725	8.9	33.8	9/18	1.7	58.9	8
Public	Archer (S)[2]	5.8	29.3	9/18	1.1	37.1	8	2,300	7.8	35.8	9/17	1.4	54.8	10
Public	Bell	7.0	29.5	9/20	1.2	47.1	2	600	7.8	34.5	9/22	1.5	61.9	2
Latham	EX-342CN	5.0	26.3	9/21	1.1	43.6	5	2,100	9.3	36.0	9/21	1.2	61.8	3
Public	Faribault	5.8	24.5	9/13	1.2	36.6	9	888	8.6	30.8	9/16	1.4	60.4	5
Public	Freeborn	6.0	26.8	9/17	1.1	40.8	6	688	8.3	31.3	9/17	1.3	59.7	6
Public	Parker (S)[2]	6.7	29.3	9/17	1.1	36.5	10	6,150	8.1	36.3	9/18	1.9	58.5	9
Novartis	S-18-11	7.1	28.8	9/18	1.1	43.7	4	738	7.9	33.5	9/19	1.3	61.2	4
LSD[3]		1.2	2.5	1.1	0.1	2.7	---	1,195	1.4	3.7	1.6	0.2	12.7	---

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots in both fields were planted on 12 May 1997 and harvested on 2 October 1997. Varieties are listed in ascending numerical, then alphabetical, order of variety name, regardless of brand name.

[1] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities.

[2] Susceptible check variety.

[3] Least significant difference: values are from Fisher's least-significant-difference test.

Table 2. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group II soybean varieties in an SCN-infested field and a noninfested field in north central Iowa (Kanawha) in 1997.

		SCN-Infested Field							Noninfested Field					
Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank
Latham	522CN	7.2	28.8	9/21	1.2	45.3	9	788	8.6	33.8	9/20	1.3	60.2	10
Latham	722CN	5.8	30.0	9/24	1.1	46.6	5	2,138	8.3	36.8	9/25	1.4	59.6	12
Pioneer	9234	5.4	26.3	9/20	1.3	46.1	7	763	7.7	32.5	9/22	1.2	59.1	13
Mark Seed	95CN27	6.0	30.5	10/1	1.2	44.0	11	688	8.3	37.3	10/2	1.3	56.4	15
Mark Seed	97CN22	6.2	31.0	9/21	1.1	47.3	4	1,350	8.3	37.3	9/23	1.4	61.8	6
AgriPro	AP2101 SCN	7.5	24.5	9/19	1.1	38.7	17	1,163	7.8	30.5	9/20	1.2	62.8	5
AgriPro	AP2601 SCN	5.7	25.0	9/29	1.2	47.7	1	550	7.9	30.3	9/29	1.1	66.6	1
DeKalb	CX235c	6.1	28.0	9/23	1.1	45.7	8	563	7.5	33.5	9/26	1.2	59.9	11
Public	IA1006 (S)[2]	5.3	26.8	9/18	1.2	40.9	15	5,600	8.0	36.5	9/19	1.4	53.7	16
Public	IA2021 (S)[2]	6.0	26.0	9/24	1.2	42.2	12	6,975	7.8	30.3	9/24	1.3	64.2	2
Public	IA2036	7.1	32.8	9/22	1.4	47.7	1	650	9.1	40.3	9/25	2.0	57.9	14
Jacobsen	J770CN	6.3	30.8	9/21	1.2	46.5	6	588	9.4	38.3	9/24	1.6	61.4	8
Public	Kenwood 94	6.0	28.3	9/25	1.3	44.3	10	5,925	9.3	32.5	9/26	1.3	61.1	9
Cenex	L2102CN	5.4	26.3	9/21	1.1	41.3	13	1,338	8.8	35.5	9/21	1.2	63.2	4
Public	Newton	6.1	35.3	9/21	1.5	39.3	16	575	8.1	41.5	9/27	1.7	48.7	18
Prairie	PB-210N	6.3	24.8	9/19	1.3	41.1	14	563	9.8	32.5	9/21	1.4	63.8	3
Prairie	PB-215N	5.7	31.0	9/21	1.2	47.6	3	1,163	7.8	36.5	9/24	1.3	61.7	7
Public	Sturdy (S)[2]	6.9	29.0	9/15	1.1	38.4	18	5,750	8.1	34.0	9/18	1.2	53.3	17
LSD[3]		1.4	2.8	1.6	0.1	3.6	---	2,293	1.8	2.7	1.8	0.2	12.7	---

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots in both fields were planted on 12 May 1997 and harvested on 2 October 1997. Varieties are listed in ascending numerical, then alphabetical, order of variety name, regardless of brand name.

[1] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities.

[2] Susceptible check variety.

[3] Least significant difference: values are from Fisher's least-significant-difference test.

Table 3. Average soybean cyst nematode (SCN) reproduction and agronomic performance of SCN-resistant and susceptible maturity group I and II soybean varieties in an SCN-infested field and a noninfested field in north central Iowa (Kanawha) in 1997.

	---------- Yield - SCN-infested Field ---------- (bu/A)			------ Final SCN Population Densities ------ (eggs per 100 cc soil)			---------- Yield - Noninfested Field ---------- (bu/A)		
	Resistant Varieties	Susceptible Varieties	LSD[1]	Resistant Varieties	Susceptible Varieties	LSD[1]	Resistant Varieties	Susceptible Varieties	LSD[1]
Maturity Group I	43.0	36.8	3.2	833	4,225	964	61.6	56.7	NS
Maturity Group II	45.0	41.1	2.2	947	6,063	836	60.2	58.1	NS

Plots in both fields were planted on 12 May 1997 and harvested on 2 October 1997.

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

Table 4. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group I soybean varieties in an SCN-infested field and a noninfested field in central Iowa (Ames) in 1997.

		---------- SCN-Infested Field ----------							---------- Noninfested Field ----------					
Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank
Pioneer	9182	8.5	34.5	9/8	2.5	59.3	2	1,200	6.3	34.0	9/8	2.0	57.5	4
Public	Archer (S)[2]	8.1	36.3	9/9	2.3	42.3	4	8,125	7.2	35.5	9/10	2.0	62.7	2
Public	Bell	8.2	34.0	9/10	2.3	55.7	3	538	7.5	34.8	9/11	2.0	57.6	3
Latham	EX-352CN	8.2	37.0	9/11	2.5	62.3	1	1,263	7.9	38.5	9/11	2.0	68.9	1
LSD[3]		NS	NS	1.1	NS	8.9	---	4,584	NS	1.9	2.4	NS	4.4	---

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots in infested field were planted on 6 May 1997 and harvested on 7 October 1997; plots in noninfested field were planted on 8 May 1997 and harvested on 3 October 1997. Varieties are listed in ascending numerical, then alphabetical order of variety name, regardless of brand name.

[1] Final SCN egg population density (eggs per 100 cc soil), there were no significant differences among initial SCN population densities.

[2] Susceptible check variety.

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

Table 5. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group II soybean varieties in an SCN-infested field and a noninfested field in central Iowa (Ames) in 1997.

		SCN-Infested Field							Noninfested Field					
Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank
Stine	2472	8.0	35.8	9/9	2.3	64.6	3	1,575	6.0	33.8	9/9	2.5	66.6	10
Stine	2972	8.2	35.3	9/19	2.3	64.1	6	2,925	6.2	37.3	9/20	1.0	70.2	4
Latham	522CN	7.7	33.3	9/10	2.5	60.0	17	1,025	6.9	34.0	9/10	2.5	55.9	22
Latham	722CN	8.6	37.3	9/12	1.8	63.4	9	1,025	8.1	36.3	9/13	2.0	64.5	13
Pioneer	9234	7.3	35.0	9/10	1.5	61.4	14	1,438	6.6	32.5	9/10	2.0	64.1	15
Pioneer	92B91	8.7	41.5	9/17	2.3	68.2	1	400	6.7	40.8	9/18	2.3	69.3	6
Mark Seed	95CN27	8.4	37.5	9/21	2.3	61.7	12	1,263	7.3	37.3	9/22	1.8	65.5	11
Asgrow	A2869	8.4	41.5	9/19	2.8	67.0	2	163	7.1	41.3	9/20	2.0	72.8	1
AgriPro	AP2601 SCN	8.3	31.0	9/16	2.3	63.6	8	1,188	5.5	28.3	9/15	1.3	64.2	14
AgriPro	AP2901 SCN	7.1	40.0	9/22	2.3	54.5	19	850	4.4	41.5	9/23	2.0	62.1	19
Merschma	Cherokee VIII	8.2	38.0	9/19	1.5	62.0	11	1,125	6.7	36.5	9/21	1.3	71.9	2
DeKalb	CX235c	6.9	33.3	9/13	2.0	63.8	7	1,788	5.8	36.0	9/14	1.5	68.8	8
DeKalb	CX260c	8.7	37.5	9/18	2.8	63.4	9	1,563	4.5	40.0	9/20	2.0	71.5	3
DeKalb	CX292c	8.8	36.0	9/19	1.8	64.6	3	1,800	7.8	36.0	9/18	1.0	63.5	17
Public	IA2021 (S)[2]	7.6	34.0	9/10	2.0	46.9	21	6,475	5.8	31.8	9/10	1.5	65.5	11
Public	IA2036	8.4	40.0	9/12	2.5	60.0	17	663	7.2	40.5	9/13	3.0	62.3	18
Public	Kenwood 94	9.3	39.3	9/13	2.5	52.9	20	6,425	7.8	36.8	9/12	2.0	68.9	7
Public	Newton	8.9	40.5	9/11	2.8	45.5	22	1,700	7.3	41.3	9/16	2.8	59.8	20
Merschma	Osage III	6.4	36.5	9/11	2.3	60.8	16	1,725	3.9	35.0	9/12	2.8	59.6	21
Prairie	PB-210N	8.9	34.3	9/10	1.8	60.9	15	1,238	8.1	31.3	9/9	2.0	67.8	9
Prairie	PB-215N	8.7	39.3	9/11	2.8	61.6	13	1,563	6.3	41.8	9/12	2.3	69.4	5
Novartis	S29-11	9.1	39.8	9/19	1.5	64.5	5	713	6.7	37.5	9/20	1.8	63.9	16
LSD[3]		1.4	5.9	1.3	0.9	5.4	---	2,624	1.8	3.0	1.9	0.6	4.7	---

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots in infested field were planted on 6 May 1997 and harvested on 7 October 1997; plots in noninfested field were planted on 8 May 1997 and harvested on 3 October 1997. Varieties are listed in ascending numerical, then alphabetical, order of variety name, regardless of brand name.

[1] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities.

[2] Susceptible check variety.

[3] Least significant difference: values are from Fisher's least-significant-difference test.

Table 6. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group III soybean varieties in an SCN-infested field and a noninfested field in central Iowa (Ames) in 1997.

		SCN-Infested Field							Noninfested Field					
Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank
Wilson	3330 SCN	9.3	40.5	9/25	2.0	65.1	3	738	7.2	39.8	9/23	1.8	69.4	2
Mark	97CN33	8.5	41.0	9/26	2.3	62.1	6	900	6.9	41.3	9/24	1.8	66.0	8
Pioneer	93B11	8.4	39.8	9/17	2.0	66.3	1	2,200	7.1	37.5	9/19	1.5	68.3	5
Asgrow	A3134	8.8	40.8	9/26	2.3	65.7	2	900	6.0	36.3	9/21	1.0	64.5	11
Public	IA3005	8.3	33.5	9/22	1.8	62.4	4	2,975	8.0	40.5	9/24	2.3	69.1	3
Public	Iroquois (S)[2]	7.9	37.5	9/17	2.3	45.3	11	12,025	7.3	39.3	9/19	1.5	69.8	1
Public	Jack	7.7	41.0	9/20	2.5	62.4	4	1,625	6.9	43.3	9/20	3.0	65.3	10
Public	Linford	8.5	39.0	9/28	2.5	50.5	9	638	5.9	42.3	9/28	2.8	55.3	12
Public	Macon (S)[2]	7.7	37.8	9/26	1.8	49.3	10	9,175	6.0	37.8	9/26	1.8	68.5	4
Public	Probst (S)[2]	8.5	38.3	9/23	2.0	51.2	8	11,000	6.3	37.0	9/23	2.0	67.0	6
Public	Resnik (S)[2]	8.4	37.8	9/19	1.3	41.3	12	10,825	6.9	37.3	9/21	1.5	65.9	9
Novartis	X9733	8.1	43.3	9/26	2.0	61.1	7	1,238	7.3	43.0	9/25	1.5	66.3	7
LSD[3]		1.4	5.1	1.5	0.9	4.5	---	4,728	2.0	2.8	1.9	0.7	4.6	---

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots in infested field were planted on 6 May 1997 and harvested on 7 October 1997; plots in noninfested field were planted on 8 May 1997 and harvested on 3 October 1997. Varieties are listed in ascending numerical, then alphabetical, order of variety name, regardless of brand name.

[1] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities.

[2] Susceptible check variety.

[3] Least significant difference: values are from Fisher's least-significant-difference test.

Table 7. Average soybean cyst nematode (SCN) reproduction and agronomic performance of SCN-resistant and susceptible maturity group I, II, and III soybean varieties in an SCN-infested field and a noninfested field in central Iowa (Ames) in 1997.

	Yield - SCN-infested Field (bu/A)			Final SCN Population Densities (eggs per 100 cc soil)			Yield - Noninfested Field (bu/A)		
	Resistant Varieties	Susceptible Varieties	LSD[1]	Resistant Varieties	Susceptible Varieties	LSD[1]	Resistant Varieties	Susceptible Varieties	LSD[1]
Maturity Group I	59.1	42.3	7.3	1,000	8,125	3,323	61.3	62.7	NS
Maturity Group II	62.0	49.9	4.1	1,346	6,450	1,263	65.8	67.2	NS
Maturity Group III	61.9	46.8	3.3	1,402	10,756	1,864	65.5	67.8	NS

Plots in infested field were planted on 6 May 1997 and harvested on 7 October 1997; plots in noninfested field were planted on 8 May 1997 and harvested on 3 October 1997.

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

Table 8. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group II soybean varieties in an SCN-infested field and a noninfested field in south east Iowa (Crawfordsville) in 1997.

		SCN-Infested Field							Noninfested Field					
Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank
Latham	722CN	9.0	23.5	---	1.3	30.9	4	1,094	8.5	34.8	---	2.8	42.3	4
Pioneer	92B91	8.1	27.0	---	1.5	37.1	2	1,281	8.4	36.5	---	3.3	48.5	1
AgriPro	AP2901 SCN	7.5	27.3	---	1.5	34.3	3	1,550	7.6	38.3	---	2.8	46.8	3
DeKalb	CX292c	9.2	27.3	---	1.0	39.3	1	1,150	9.3	32.8	---	1.3	48.2	2
LSD[2]		1.3	NS	---	NS	6.3	---	NS	1.0	NS	---	0.8	6.0	---

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots in both fields were planted on 15 May 1997 and harvested on 17 October 1997. Varieties are listed in ascending numerical, then alphabetical, order of variety name, regardless of brand name.

[1] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities.

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

Table 9. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group III soybean varieties in an SCN-infested field and a noninfested field in south east Iowa (Crawfordsville) in 1997.

		SCN-Infested Field							Noninfested Field					
Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank
Stine	3272	9.3	20.0	---	1.0	23.3	17	6,563	8.9	33.5	---	1.0	54.0	1
Wilson	3330 SCN	8.6	27.3	---	1.0	34.2	13	1,300	8.9	34.3	---	2.0	46.5	14
Lewis	334	8.4	27.8	---	1.3	37.8	6	1,500	8.4	34.8	---	2.0	47.5	11
Novartis	3376	8.8	27.5	---	1.0	38.2	5	1,850	9.2	36.0	---	2.0	48.6	8
Lewis	391	8.9	27.3	---	1.0	36.3	9	1,250	8.9	35.5	---	1.5	48.0	9
Pioneer	93B11	8.3	22.5	---	1.0	32.8	15	863	8.8	33.5	---	2.3	46.9	13
Mark Seed	97CN33	8.5	26.5	---	1.5	35.2	12	2,150	7.8	35.0	---	2.0	48.8	7
Asgrow	A3134	8.7	25.3	---	1.0	41.0	2	1,375	9.1	31.8	---	2.0	50.8	3
Asgrow	A3559	8.7	26.5	---	1.0	40.9	3	1,144	9.0	33.8	---	1.5	50.8	3
AgriPro	AP3601 SCN	9.4	27.3	---	1.5	38.3	4	900	8.8	35.5	---	2.0	47.9	10
DeKalb	CX339c	9.3	30.5	---	1.3	41.4	1	1,313	8.4	36.0	---	1.5	46.3	15
DeKalb	CX394c	9.0	30.5	---	1.0	33.0	14	725	8.5	40.8	---	1.8	47.3	12
Public	IA3005	8.7	24.0	---	1.8	36.0	10	725	8.5	30.8	---	2.3	45.8	16
Public	Jack	9.0	30.3	---	2.5	36.6	7	1,038	8.7	37.3	---	3.3	42.9	17
Public	Linford	8.1	30.5	---	2.3	36.4	8	731	8.9	40.3	---	3.3	40.0	19
Public	Maverick	9.2	31.8	---	2.0	35.6	11	1,075	8.9	36.8	---	3.0	52.6	2
Public	Probst (S)[2]	8.2	21.5	---	1.5	19.8	19	12,763	8.8	34.8	---	2.8	49.3	6
Public	Resnik (S)[2]	8.3	21.8	---	1.0	17.3	20	13,475	9.7	34.5	---	2.0	49.7	5
Novartis	S39-11	7.7	25.3	---	1.5	26.9	16	3,688	8.4	40.5	---	2.0	40.0	19
Public	Williams 82	8.8	25.3	---	1.3	20.3	18	9,975	8.8	42.0	---	2.3	41.8	18
LSD[3]		1.2	3.9	---	0.5	4.7	---	5,927	1.1	3.2	---	0.6	6.1	---

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots in both fields were planted on 15 May 1997 and harvested on 17 October 1997. Varieties are listed in ascending numerical, then alphabetical, order of variety name, regardless of brand name.

[1] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities.

[2] Susceptible check variety.

[3] Least significant difference: values are from Fisher's least-significant-difference test.

Table 10. Average soybean cyst nematode (SCN) reproduction and agronomic performance of SCN-resistant and susceptible maturity group III soybean varieties in an SCN-infested field and a noninfested field in south east Iowa (Crawfordsville) in 1997.

	---------- Yield - SCN-infested Field ---------- (bu/A)			------ Final SCN Population Densities ------ (eggs per 100 cc soil)			---------- Yield - Noninfested Field ---------- (bu/A)		
	Resistant Varieties	Susceptible Varieties	LSD[1]	Resistant Varieties	Susceptible Varieties	LSD[1]	Resistant Varieties	Susceptible Varieties	LSD[1]
Maturity Group III	35.5	19.2	3.3	1,658	12,071	2,454	47.4	46.9	NS

Plots in both fields were planted on 15 May 1997 and harvested on 17 October 1997.

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

Table 11. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group II soybean varieties in an SCN-infested field in south east Iowa (Muscatine) in 1997.

Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)
Latham	722CN	7.4	27.5	---	2.3	41.3	3	6,450
Pioneer	92B91	8.2	24.0	---	2.3	41.9	2	2,075
AgriPro	AP2901 SCN	6.6	29.8	---	2.0	41.0	4	5,025
DeKalb	CX292c	7.3	27.8	---	1.0	45.3	1	4,163
LSD[3]		1.3	4.4	---	0.6	NS	---	4,066

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots in both fields were planted on 15 May 1997 and harvested on 17 October 1997. Varieties are listed in ascending numerical, then alphabetical, order of variety name, regardless of brand name.
[1] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities.
[2] Susceptible check variety.
[3] Least significant difference: values are from Fisher's least-significant-difference test, NS = no significant differences among the varieties.

Table 12. Soybean cyst nematode (SCN) reproduction and agronomic performance of maturity group III soybean varieties in an SCN-infested field in south east Iowa (Muscatine) in 1997.

Brand	Variety	Stand (plants/ft)	Height (inches)	Maturity (date)	Lodging (1-5)	Yield (bu/A)	Yield Rank	SCN #[1] (100 cc)
Stine	3272	8.2	20.5	---	1.0	28.4	17	26,050
Wilson	3330 SCN	7.2	30.7	---	1.0	35.6	14	9,750
Lewis	334	7.9	30.8	---	1.5	46.9	5	5,800
Novartis	3376	7.6	29.3	---	1.0	44.5	8	3,550
Lewis	391	6.4	31.3	---	1.5	41.6	13	10,450
Pioneer	93B11	7.5	26.5	---	1.0	35.2	15	9,750
Mark Seed	97CN33	6.8	30.8	---	1.5	49.2	1	6,750
Asgrow	A3134	7.9	25.0	---	1.0	41.7	12	6,675
Asgrow	A3559	7.3	27.0	---	1.0	45.0	7	7,875
AgriPro	AP3601 SCN	7.4	29.5	---	2.0	45.1	6	6,275
DeKalb	CX339c	8.4	31.0	---	2.0	48.6	3	2,600
DeKalb	CX394c	6.5	31.7	---	1.7	33.7	16	7,538
Public	IA3005	7.5	28.2	---	1.8	47.0	4	5,875
Public	Jack	7.9	33.8	---	3.0	43.8	9	3,050
Public	Linford	6.7	33.8	---	2.8	41.9	11	6,025
Public	Maverick	7.2	38.5	---	2.3	48.9	2	4,775
Public	Probst (S)[2]	7.3	22.5	---	1.5	26.2	20	54,400
Public	Resnik (S)[2]	7.2	24.8	---	1.0	27.2	18	31,875
Novartis	S39-11	6.5	33.3	---	2.0	43.0	10	9,500
Public	Williams 82	6.9	24.8	---	1.3	27.2	18	32,300
LSD[3]		1.3	4.6	---	1.7	13.2	---	10,709

Values presented in table are means; each variety was grown in four replicate plots in each field. Plots were planted on 15 May 1997 and harvested on 17 October 1997. Varieties are listed in ascending numerical, then alphabetical, order of variety name, regardless of brand name.
[1] Final SCN egg population density (eggs per 100 cc soil); there were no significant differences among initial SCN population densities.
[2] Susceptible check variety.
[3] Least significant difference: values are from Fisher's least-significant-difference test.