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Results of SCN-resistant soybean variety testing become available

Gregory L. Tylka
Iowa State University, gltylka@iastate.edu

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Results of SCN-resistant soybean variety testing become available

by Greg Tylka, Department of Plant Pathology

There are hundreds of resistant soybean varieties available for use in managing the soybean cyst nematode (SCN), a serious yield-limiting pest of soybeans. SCN-resistant soybean varieties are not immune; they can allow up to 10 percent SCN reproduction. Allowing 10 percent or less reproduction means the soybean varieties are providing 90 percent control.

The amount of SCN reproduction that occurs on any individual SCN-resistant soybean variety is determined by the genetics of the soybean plant and the genetics of the SCN population present in the field where the variety is being grown. The suppression of SCN reproduction afforded by most SCN-resistant soybean varieties allows for profitable management of SCN in the field.

The Iowa State University SCN-resistant Soybean Variety Trial Program evaluates for Iowa growers and their advisers the yield and SCN control provided by SCN-resistant soybean varieties. Not all SCN-resistant varieties are equal in yield or the nematode control that they provide. Soil samples are collected from each four-row, variety-trial plot (10 soil cores from the center two rows of each plot) at the time of planting and analyzed to verify the presence of SCN in every plot. At harvest, another soil sample is collected from each plot, and SCN population densities are determined to assess how well the SCN population reproduced on the soybean variety grown in each plot. Commonly grown SCN-susceptible varieties also are included in each of the variety trials.

Summary yield data for the SCN-resistant soybean varieties and the susceptible varieties from the 10 variety trial locations in 2007 are shown in the accompanying table. The end-of-season SCN population density data from all of the variety trial locations were not yet available at the time this article was written.

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Locations of the 2007 ISU SCN-resistant Soybean Variety Trial Program experiments.

In most of the locations in 2007, the SCN-resistant varieties, as a group, produced greater yields than the commonly grown, SCN-susceptible soybean varieties, as shown by the data in the table. The smallest positive yield difference between resistant and susceptible varieties in 2007 was at the Council Bluffs location, in southwest Iowa, where the initial SCN population density was 515 eggs per 100 cc (a little less than a half cup) of soil and the SCN-resistant varieties yielded 1.5 bushels per acre more than susceptible varieties. The greatest yield difference, 14.2 bushels per acre, occurred at the Vincent location, in north-central Iowa, where the initial SCN population density was 4,001 eggs per 100 cc of soil.

At two of the Iowa State University SCN-resistant Soybean Variety Trial Program locations in 2007, the SCN-susceptible varieties yielded greater than the SCN-resistant varieties as a group. This occurred at Manchester, in northeast Iowa, where the initial SCN population density was very low (301 eggs per 100 cc of soil) and at Crawfordsville, in southeast Iowa, where there was an initial SCN population density of 2,329 eggs per 100 cc of soil. At both locations, all four of the commonly grown SCN-susceptible varieties yielded greater than many of the SCN-resistant varieties. The reason for this result is not known but may be because of the low SCN population density at the Manchester location and perhaps because of other factors occurring at the Crawfordsville location (although no other pest problems were noticed).

It is no longer uncommon for Iowa SCN populations to have greater than 10 percent reproduction on PI 88788. The SCN populations at the Crawfordsville, Farnhamville, and Vincent locations of the Iowa State University SCN-resistant Soybean Variety Trial Program in 2007 had greater than 10 percent reproduction on PI 88788. And almost all of the SCN-resistant varieties evaluated in the Iowa State University SCN-resistant Soybean Variety Trial Program in 2007 had PI 887898 as the source of SCN resistance. But most of the SCN-resistant varieties yielded greater than the susceptible varieties at Crawfordsville, Farnhamville, and Vincent even though the SCN populations were capable of greater than 10 percent reproduction on PI 88788.

Complete yield and SCN population density data from the 2007 Iowa State University SCN-resistant Soybean Variety Trial Program experiments are available online at www.isuscntrials.info.

Locations, initial SCN population densities, and summary yield data for the 2007 Iowa State University SCN-resistant Soybean Variety Trial Program experiments.

		SCN-resistant Varieties		SCN-susceptible Varieties		
	Initial SCN Egg Density (100 cc)	Mean Yield (Bu/Acre)	Range of Yields (Bu/Acre)	Mean Yield (Bu/Acre)	Range of Yields (Bu/Acre)	Mean Yield Benefit of Resistance (Bu/Acre)
Northern Iowa District						
Albert City	3,353	63.0	56.3-67.5	51.8	49.0-55.6	11.2
Manchester	301	58.9	52.8-64.8	60.2	59.4-61.1	-1.3
Mason City	3,887	46.5	40.8-54.5	34.9	31.3-37.5	11.6
Vincent	4,001	45.4	38.3-55.3	31.2	24.9-34.7	14.2
Central Iowa District						
Cambridge	3,156	59.3	47.6-65.1	55.1	51.6-59.5	4.2
Farnhamville	5,461	54.8	46.1-62.2	48.0	41.3-51.9	6.8
Urbana	5,369	59.5	53.4-66.0	52.6	51.1-55.9	6.9
Southern Iowa District						
Council Bluffs	515	67.4	61.1-74.2	65.9	63.7-68.5	1.5
Crawfordsville	2,329	57.2	51.2-63.3	59.8	56.6-65.0	-2.6
Melrose	5,242	60.9	52.7-65.3	50.8	49.3-52.2	10.1

Greg Tylka is a professor of plant pathology with extension and research responsibilities in management of plant-parasitic nematodes.

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