Iowa State Research Farm Progress Reports

2010

Evaluation of Soybean Varieties in the Northern Uniform Soybean Test

Sylvia R. Cianzio
Iowa State University, scianzio@iastate.edu

Peter Lundeen
Iowa State University, plundeen@iastate.edu

Kyle Vander Molen
Iowa State University

Gregory D. Gebhart
Iowa State University, ggebhart@iastate.edu

Evaluation of Soybean Varieties in the Northern Uniform Soybean Test

Abstract

The Northern Uniform Soybean Test is used to evaluate soybean varieties produced by several public breeding programs in the Northern portion of the United States and Canada. In 2009, five public breeding programs participated in the Northern Uniform Soybean Test (Maturity Group I). Public breeders are allowed to enter varieties in the Uniform Test in exchange for growing locations for the test. Material entered in the Uniform Test is generally from advanced stages of a breeding program. The Uniform Soybean Test is an efficient method for soybean breeders to get multiple location data in comparison to each individual program growing their own locations. It also produces useful information by comparing soybean lines from multiple programs and identifies lines from other states that produce well in northern Iowa. Results from these tests are used by breeders to select varieties with superior yield and/or disease resistance to continue advancement to variety release. These results are also used to demonstrate positive characteristics to growers and other interested parties.

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Evaluation of Soybean Varieties in the Northern Uniform Soybean Test

RFR-A9109

Silvia Cianzio, professor
Peter Lundeen, research associate
Kyle Vander Molen, undergraduate student
Greg Gebhart, ag specialist
Department of Agronomy

Introduction

The Northern Uniform Soybean Test is used to evaluate soybean varieties produced by several public breeding programs in the Northern portion of the United States and Canada. In 2009, five public breeding programs participated in the Northern Uniform Soybean Test (Maturity Group I). Public breeders are allowed to enter varieties in the Uniform Test in exchange for growing locations for the test. Material entered in the Uniform Test is generally from advanced stages of a breeding program. The Uniform Soybean Test is an efficient method for soybean breeders to get multiple location data in comparison to each individual program growing their own locations. It also produces useful information by comparing soybean lines from multiple programs and identifies lines from other states that produce well in northern Iowa. Results from these tests are used by breeders to select varieties with superior yield and/or disease resistance to continue advancement to variety release. These results are also used to demonstrate positive characteristics to growers and other interested parties.

Preliminary Tests

Early generation testing of varieties have been planted at Kanawha since 2006. Tests ranging in size from 27 to 143 entries/year have been evaluated for agronomic traits. The two AR lines entered in the 2009 Northern Uniform Soybean Test came through early generation testing at Kanawha.

Materials and Methods

Plots were four 17-ft-long rows spaced 30 in. apart and were planted at a rate of 10 seeds/foot, with two replications per variety. A variety was considered mature when 95% of the pods had turned brown. For each location, the center two rows of each four-row plot were harvested with a plot combine; total seed weight/plot and seed moisture were determined, and total plot seed weights subsequently were converted to bushels/acre. Seed size was determined by weighing a 200-seed sample from each plot. Seed quality scores were determined by considering the amount and degree of wrinkling, defective seed coat, level of green seed coat, and moldy or other pigment imperfections. A seed quality score of 1 = very good and 5 = very poor. Protein and oil information was provided by the USDA-ARS National Center for Agricultural Utilization Research in Peoria, IL, and is based on analysis of a 25-gram sample from each plot.

Conclusions

The Kanawha location was one of 15 locations where the Uniform Test I was grown. Additional data should be used when making variety selections. The complete 2009 Northern Uniform Soybean Test report is available online at www.btny.purdue.edu/Pubs/USDA/2009UniformTestReport.pdf. The AR lines entered in this test are from Silvia Cianzio's Disease Resistant Soybean Breeding Program at Iowa State University.

Table 1. Agronomic performance and seed composition data for soybean varieties in the Northern Uniform Test I at Kanawha, IA in 2009.

Soybean line	Yield bu/acre	Yield rank	Maturity date	Seed Size (100 g)	Seed quality	Protein %	Oil %
MN1410 (I)	47.5	4	9/20	16.3	2.0	40.10	21.58
IA1022 (SCN)	46.3	6	9/19	15.5	2.0	36.44	22.73
Sheyenne (0)	46.4	5	9/11	16.2	3.0	38.79	20.73
A07-426040	49.5	3	9/22	17.3	2.0	40.05	20.39
AR06-165095	53.0	1	9/23	19.1	2.0	38.80	20.56
AR07-175064	52.1	2	9/23	19.5	2.0	39.22	19.59
SD05-240	47.5	4	9/21	16.3	1.0	38.68	20.66

Values presented in this table are means. The top three varieties are check varieties. Least significant difference: values are from Fisher's least significant difference test. Yield L.S.D. = 8.82.