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Evaluation of Soybean Varieties in the Northern Uniform Soybean Test—Uniform Test I

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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 2010, five public breeding programs participated in the Northern Uniform Soybean Test (Uniform Test I). Public breeders are allowed to enter varieties into the Uniform Test in exchange for growing locations for the test. Material entered into the Uniform Test is generally in advanced stages of a breeding program. The Uniform Soybean Test is an efficient method for soybean breeders to get multiple location data, in a very efficient manner 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 on a trek toward variety release. These results are also used to demonstrate positive characteristics to growers and other interested parties.

Keywords

RFR A1063, Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Evaluation of Soybean Varieties in the Northern Uniform Soybean Test—Uniform Test I

RFR-A1063

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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 2010, five public breeding programs participated in the Northern Uniform Soybean Test (Uniform Test I). Public breeders are allowed to enter varieties into the Uniform Test in exchange for growing locations for the test. Material entered into the Uniform Test is generally in advanced stages of a breeding program. The Uniform Soybean Test is an efficient method for soybean breeders to get multiple location data, in a very efficient manner 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 on a trek toward variety release. These results are also used to demonstrate positive characteristics to growers and other interested parties.

Materials and Methods

Plots were four 17-ft 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 percent 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 per 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.

Early Generation Testing

Early generation tests of varieties have been planted at Kanawha since 2006. Tests ranging in size from 27 to 143 entries per year have been evaluated for agronomic traits. The two AR lines entered in the 2010 Northern Uniform Soybean Test (Uniform Test I) came through early generation testing at Kanawha.

Results and Discussion

The Kanawha location was one of 14 locations where the Uniform Test I was grown. Additional data should be used when making variety selections. The complete 2010 Northern Uniform Soybean Test report is available online at <http://www.ag.purdue.edu/btny/extension/pages/extpubs.aspx> under the category USDA. The AR lines entered in this test are from Dr. Silvia Cianzio's Disease Resistant Soybean Breeding Program at Iowa State University.

Acknowledgements

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Table 1. Agronomic performance and seed composition data for soybean varieties in the Northern Uniform Test I at Kanawha, IA in 2010.

Soybean line	Yield bu/acre	Yield rank	Maturity date	Seed size (100 g)	Seed quality	Protein %	Oil %
MN1410 (I)	47.0	9	9/10	14.6	2.0	40.4	21.4
IA1022 (SCN)	53.6	2	5	13.4	1.0	38.0	22.1
Sheyenne (O)	39.4	18	-8	14.5	2.0	39.6	21.4
A07-427027	49.5	7	10	13.2	1.0	38.5	20.9
A08-151002	44.1	14	3	11.0	1.0	38.5	20.2
A08-151024	51.7	3	4	13.7	1.0	40.5	20.5
A08-151031	51.6	4	2	14.4	2.0	38.5	20.7
A08-151033	49.4	8	5	15.2	1.0	39.6	20.2
A08-152041	46.8	10	11	14.0	1.0	40.3	20.5
AR07-175064	49.9	6	4	16.5	1.0	40.7	21.1
AR08-186008	54.0	1	5	13.2	1.0	39.1	21.2
M02-385041	50.7	5	-2	13.6	2.0	39.8	20.8
M02-385091	45.3	13	-2	13.7	1.0	40.6	19.7
M03-165068	45.5	12	-1	12.2	2.0	37.5	21.7
M03-172059	41.5	16	-7	14.7	2.0	39.1	22.2
OAC 07-48C	43.6	15	4	14.8	2.0	37.6	21.7
SD05-240	46.5	11	4	13.8	1.0	39.2	21.0
SD06-535	41.4	17	0	13.7	2.0	39.6	20.8

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. = 12.9.