RELEASE OF 'ECLIPSE' BLACK BEAN

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ABSTRACT

Eclipse is an early maturing, high-yielding black bean, with very good size, shape and visual appearance (dull black seed coat). This cultivar has purple flowers and dark glossy green leaves. Growth habit is Type II upright with excellent lodging resistance. Eclipse is and early maturing cultivar with very good synchronous drydown prior to harvest (both plant and pods mature concurrently). The improved plant structure, combined with its synchronous drydown, suggests that these lines may be suitable for direct harvest, given appropriate equipment, field conditions, and operator care. Yield testing across more than 25 environments have shown that Eclipse is one of the best cultivars adapted to the Northern Great Plains. Over the last four to five years, it has almost replaced T-39, the most common black bean cultivar grown in the region.

PEDIGREE AND BREEDING HISTORY

Eclipse black bean (previously coded as ND 9902621-2) is a selection resulting from a hybridization series that started in 1996 and was released in 2004: 'Tacaragua'/ 'Nighthawk'// 'Navigator'. A modified pedigree was used as the main breeding method that allowed selecting this line. This is the first black bean variety to be released by the North Dakota Agricultural Experiment Station. It was an attempt to combine tolerance to white mold with early maturity and erect plant architecture. 'Tacaragua' is a black bean landrace from Venezuela with a Type IIIa growth habit which offers some resistance to white mold, posses the *I* gene and immune resistance to rust (Coyne et al., 1991; Fuller et al., 1984). In some field and green houses test, 'Tacaragua' expressed greater resistance to white mold than 'ICA-Bunsi'. 'Nighthawk' is an early maturing black bean cultivar from the University of Saskatchewan. 'Navigator' navy bean (Rogers® Brothers Seed Company) was used in this cross because it has excellent plant architecture, white mold avoidance, and BCMV resistance.

Eclipse is resistant to rust (*Ur-3* gene), BCMV (*I* gene), and shows white mold avoidance. The upright plant growth of Eclipse, together with excellent lodging resistance, early maturity and synchronous dry down of plant and pods at harvest, may provide a benefit in harvest efficiency for dry bean producers, given appropriate equipment, field conditions, and operator care. Black bean is the third most important class in North Dakota, accounting for 10% of the total dry bean production in the state (USDA-NASS, 2008). Over the last six years, Eclipse was tested at more than 30 locations environments across North Dakota (Kandel, 2009), as well as other states. Eclipse has showed excellent performance across most of the environments, with yields superior to other black bean commercial varieties (Table 1). Eclipse has exhibit a yield potential advantage over T-39 (the most popular black bean cultivar in the region) and also canned product appearance scores similar to T-39.

Additional information about Eclipse black bean can be obtained directly from the breeder. Breeder and Foundation seed of Eclipse will be maintained by the NDSU Foundation Seedstocks Program. Eclipse is protected under Title V of the Plant Variety Protection Act (Cert. # 200500293).

Small quantities of seed of Eclipse for research purposes are available from the corresponding author for the first five years. If Eclipse is used for research or contribute to germplasm enhancement or development of breeding line or cultivar, appropriate acknowledgment of the researchers and institutions responsible for development of Eclipse will be highly appreciated.

We would like to express our gratitude to the following persons and institutions: Robin Lamppa (NDSU – Plant Pathology) for inoculum preparation, James Kelly (MSU) for canning tests, Northarvest Bean Growers Assoc. for their long-term economic support, and Angela Linares (Ph.D. student from the NDSU breeding program), for compiling and editing information for this release note.

Table 1. Comparison of Eclipse with commercial check cultivars for agronomic and disease reactions summarized from several locations in North Dakota.

Trait	Eclipse	T-39	Raven	Jaguar
Yield (kg ha^{-1})[1]	2632	2297	-	2367
Maturity (d)	99	102	100	98
Seed Size (seeds/lb)	2,248	2,226	2,522	2,467
Growth Habit[2]	II	IIb	II	II
Plant Height (cm)	60	54	61	62
Lodging (0-9)[3]	2	7	1	2
Canning Score	3	2.7	2	4.5
Rust[4]	R	R	S	R
BCMV[4]	R	R	R	R
Anthracnose (7)[4]	R	R	R	R
(73)	S	S	S	R

[1]Average seed yield across 25 environments.
[2]Growth Habit = CIAT scale where I = determine bush; II = upright, shorth vine (IIb tendency toward floppines); III = prostate vine (IIIa will be erect in certain environmental conditions); IV = indeterminate climber.
[3]Lodging scores 0 = 100% erect, 9 = no erect plants
[4]Rust, BCMV and Anthracnose: R= Resistant, MR= Moderately Resistant, S=Susceptible

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