Phantom A New Black Bean for Michigan

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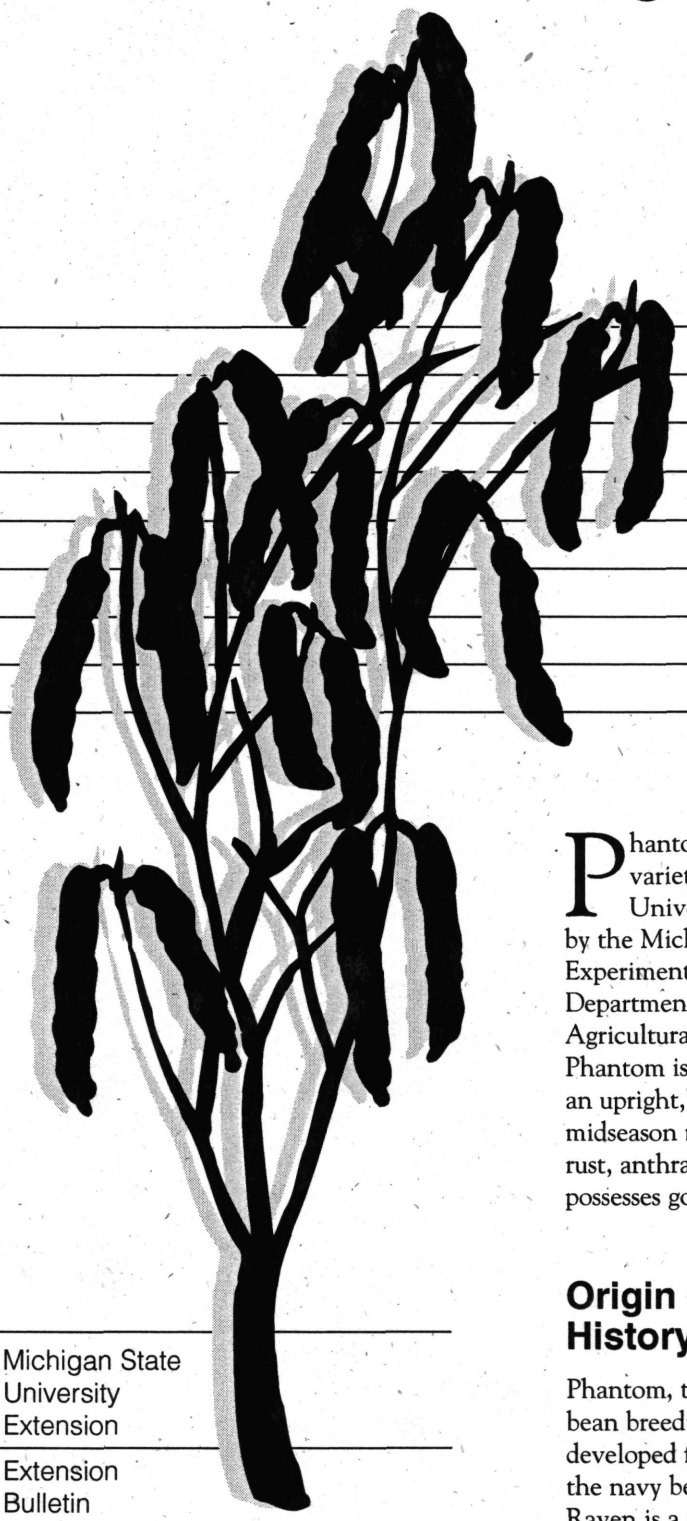
NEW from MSU

Phantom

A New Black Bean for Michigan



- Upright, short vine growth habit similar to that of Blackhawk.
- Taller and more lodging resistant than T-39.
- Two days later in maturity than T-39 and Black Jack.
- Has outyielded other commercial black bean varieties by 3 to 12 percent.
- Resistant to all anthracnose races present in mid-Michigan.
- Has improved canning quality and color retention after cooking.

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Phantom is a new black bean variety from Michigan State University. It was released jointly by the Michigan Agricultural Experiment Station and the U.S. Department of Agriculture's Agricultural Research Service. Phantom is a high-yielding variety with an upright, short vine growth habit and midseason maturity. It is resistant to rust, anthracnose and mosaic virus and possesses good canning quality.

Origin and Breeding History

Phantom, tested as the MSU black bean breeding line No. B95204, was developed from the cross of Raven with the navy bean breeding line N90618. Raven is a midseason, virus- and anthracnose-resistant black bean variety that has not demonstrated adequate yield potential nor acceptable tolerance to white mold. N90618 is a mid- to full-season, upright navy bean breeding line with tolerance to white mold. It is derived from the cross of Mayflower and Crestwood. The purpose of the cross was to improve the yield potential and combine anthracnose, virus and white mold resistance with good canning quality for future black bean varieties. The cross was made in 1992, advanced to the F_6 generation and entered into yield trials in 1995 with the code number B95204.

Yield Performance

Phantom was tested extensively for yield and agronomic traits for four seasons (1995-98) over 18 locations (Table 1). Over all locations Phantom yielded an average of 23 cwt/acre and outyielded all commercial black bean varieties except Midnight by 3 to 12 percent. In the absence of disease such as blight and

white mold, Phantom has produced yields in excess of 37 cwt/acre and has outyielded the Raven parent by 12 percent (2.8 cwt/acre) over eight locations.

Agronomic Features

Phantom exhibits an erect, short vine growth habit, averaging 21 inches in height with the pods positioned high in the plant canopy. It has excellent resistance to lodging compared with T-39 and Black Jack, with a score of 1.5 vs. 3 on a 1 to 5 scale where 1 is the most erect.

Phantom has purple flowers and blooms 55 days after planting. Phantom is a midseason variety, maturing an average of 95 days after planting with a range in maturity from 91 to 99 days, depending on season and location. It matures two days later than T-39 and Black Jack and five days earlier than Blackhawk. Phantom has demonstrated uniform maturity and excellent dry-down across a broad range of environments and fits a niche for an erect, high-yielding, midseason black bean variety in Michigan.

Disease Resistance

Phantom carries the single dominant hypersensitive I gene resistance to bean common mosaic virus (BCMV) but is sensitive to the temperature-insensitive necrosis-inducing strains of BCMV, which cause the black root reaction. It is resistant to the alpha race (race 17) of anthracnose, including the new alpha-brazil race (race 89), and races 7, 65 and 73 present in Michigan. No other black bean varieties have equivalent levels of resistance to anthracnose.

Phantom carries the *Ur-3* rust resistance gene, which conditions resistance to all local rust races prevalent in Michigan. Phantom has shown equivalent tolerance to white mold as T-39 and higher levels of tolerance than Raven, though chemical control is recommended when weather or growing conditions favor disease development. Phantom has a level of susceptibility to common blight similar to that of other commercial black bean varieties.

Quality Characteristics

Phantom typically has a small, opaque, black bean seed averaging 21 g/100 seeds with size ranges from 19 to 23 g/100 seeds. The seed is equivalent to that of T-39 in size, shape and color. Rated by a team of panelists as acceptable in canning quality, Phantom scored 4.4 (T-39 scored 3.9) on a visual rating scale of 1 to 7 where 4 is midscale (neither acceptable nor unacceptable). It showed better color retention than either Raven or Black Jack (17 vs. 19 and 18, respectively, on the L-color scale) and produced an acceptable canned product equivalent to T-39 in appearance.

Data on texture, hydration and drained weight ratios after cooking showed no differences between Phantom and other acceptable commercial black bean varieties. Within the commercial black bean class, Black Jack demonstrated the best overall canning quality.

Table 1: **Phantom Black Bean:** Comparison of Agronomic, Disease and Canning Characteristics with Five Other Black Bean Varieties.

Varieties	Phantom	T-39	Black-hawk	Black Jack	Raven	Midnight
Agronomic Traits						
Days to flower	50	48	50	47	47	50
Days to mature	95	93	100	93	95	99
Height	52	47	55	47	53	54
Lodging score	1.5	3.0	1.5	3.0	1.0	1.5
Selection index	5.5	3.5	5.0	4.0	5.0	5.0
100 Seed weight	21	22	25	22	20	21
Yield (percent)	100	97	97	94	88	102
Disease Resistance Traits						
BCMV	R	R	R	R	R	R
BCMNV	S	S	S	S	R	S
Anthracnose						
Races 65 & 73	R	S	S	S	R	S
& race 7	R	S	R	R	S	S
Rust race 53	R	R	R	S	R	R
Common blight	S	S	S	S	S	S
White mold	35	43	—	—	50	—
Canning quality traits						
Color L-scale	17	18	15	18	19	16
Wash drained ratio	1.2	1.2	1.3	1.3	1.2	1.3
Hydration ratio	2.0	2.0	2.0	1.9	2.0	2.0
Texture	66	69	68	56	60	68
Visual rating	4.4	3.9	3.7	6.0	2.4	3.8

Lodging: 1 = erect, 5 = prostrate; 100 seed weight - grams.
Selection index: 1 = worst, 5 = average, 9 = excellent; height - centimeters.
Diseases: BCMV = Bean Common Mosaic Virus; BCMNV = Bean Common Mosaic Necrotic Virus.
R = resistant, S = susceptible.
White mold: percent disease incidence (average of 90 plants grown under disease pressure).
Texture - KG/100G.
Visual rating: 1 = very undesirable, 4 = neither desirable nor undesirable, 7 = very desirable.

Release and Research Assessment

Phantom is released as a public, three-class, non-exclusive variety jointly by the Michigan Agricultural Experiment Station and the Agricultural Research Service. A research fee will be assessed on each unit (hundredweight) of either foundation or certified seed sold, and the fee will be collected by Michigan Crop Improvement Association.

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