Raven a New Black Bean for Michigan
Michigan State University Extension Service
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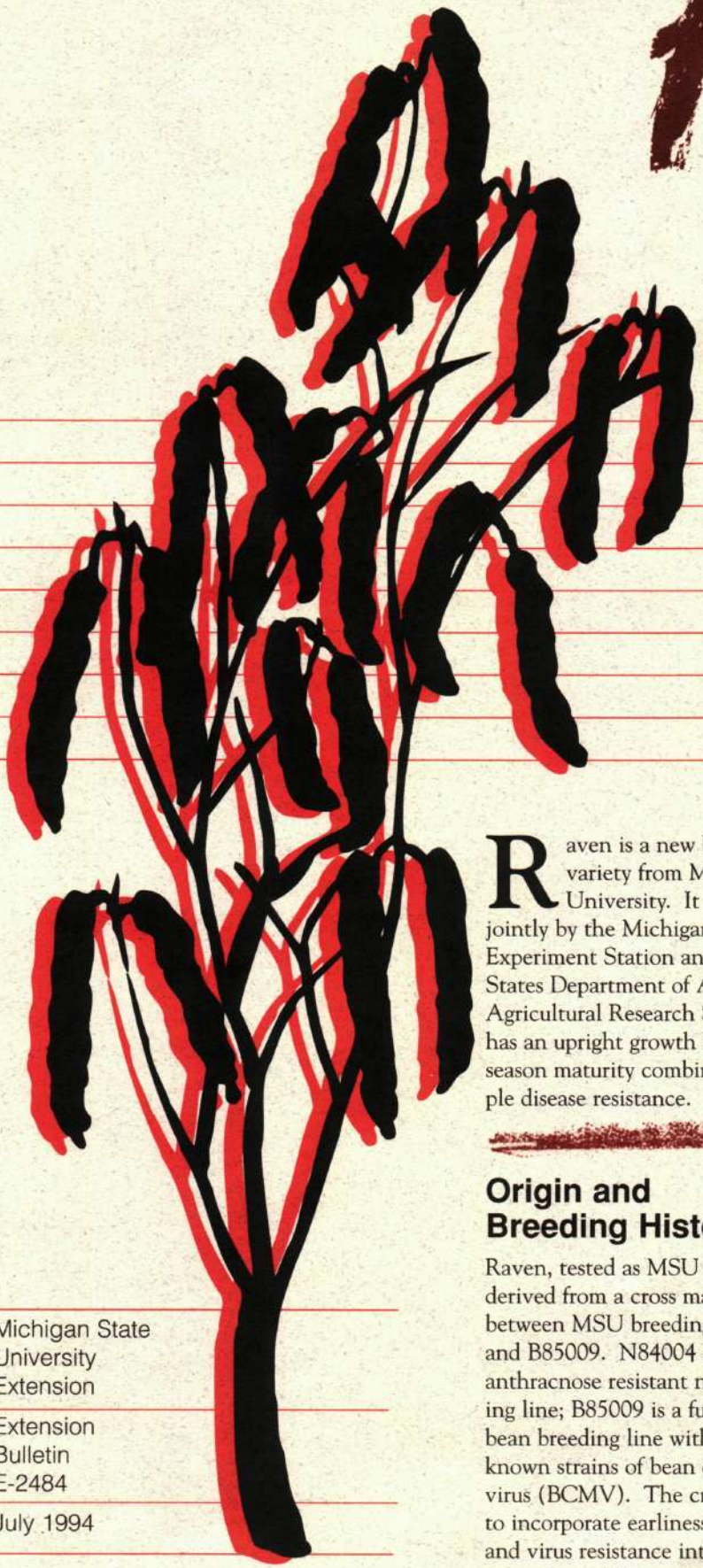
NEW from MSU

Raven

A New Black Bean for Michigan



- Upright growth habit
- Early- to mid-season maturity
- Multiple disease resistance
- Outyields early varieties
- Excellent lodging resistance
- Uniform maturity
- Excellent dry-down

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Raven is a new black bean variety from Michigan State University. It was released jointly by the Michigan Agricultural Experiment Station and the United States Department of Agriculture, Agricultural Research Service. Raven has an upright growth habit and mid-season maturity combined with multiple disease resistance.

Origin and Breeding History

Raven, tested as MSU No. B90222, was derived from a cross made in 1986 between MSU breeding lines N84004 and B85009. N84004 is a mid-season, anthracnose resistant navy bean breeding line; B85009 is a full season, black bean breeding line with resistance to all known strains of bean common mosaic virus (BCMV). The cross was designed to incorporate earliness, anthracnose and virus resistance into black bean germplasm. The cross was made in 1986 and advanced to the F8 generation over four years. A disease resistant breeding line entered yield trials in 1990 with the permanent code B90222.

Yield Performance

Raven was extensively tested for yield and agronomic traits for four seasons (1990-93) over 30 locations (Table 1). It averaged 23 cwt/acre and outyielded early season black bean varieties by 12 percent. However, it yielded from 6-19 percent less than full season varieties.

Agronomic Features

Raven exhibits the upright, type II indeterminate growth habit averaging 20 inches in height. It has excellent resistance to lodging, with a score of 1 on a 1 to 5 scale. Raven is an early- to mid-season bean, maturing 92 days after planting with a range in maturity from 87-98 days depending on season and

location. It matures a week earlier than the full season variety Midnight and five days earlier than T-39. Raven has demonstrated uniform maturity and excellent dry-down across a broad range of environments and fits a unique niche for a mid-season black bean variety in Michigan.

Disease Resistance

Raven carries the single dominant hypersensitive I gene resistance to BCMV combined with the recessive bc-3 gene. This gene combination provides complete protection to all known strains of BCMV including the temperature-insensitive necrosis- inducing strains NL 3 and NL 8 which cause the black root reaction in varieties with the unprotected I gene. Raven is the first bean variety to exhibit complete resistance to BCMV worldwide which will ensure no yield loss to necrotic strains of BCMV present in the western seed production states. Raven carries the A gene for resistance to alpha anthracnose which attacks all other black bean varieties except Blackhawk. It carries the Ur-3 rust resistance gene which conditions resistance to all local rust races prevalent in Michigan. Raven has shown little tolerance to white mold in spite of the avoidance afforded by its very erect plant architecture, so chemical control is recommended when weather conditions favor disease development.

Table 1. Raven Black Bean — Comparison of Agronomic, Disease, Yield Performance and Canning Characteristics.

Traits	Raven	Midnight	T-39	Black Magic	Blackhawk	UI-906
Agronomic Traits						
Days to flower	47	50	49	51	51	45
Days to maturity	92	98	96	99	98	86
Height (cm)	50	52	47	51	52	43
Lodging score (1-5)	1.0	2.0	3.5	2.5	1.5	1.5
Selection index (1-9)	6.0	5.0	3.5	4.5	5.5	4.0
100 seed weight (g)	16.5	19.8	20.4	20.3	23.1	15.7
Yield (percent)	100	119	117	115	106	88
Disease Resistance						
Bean common mosaic virus	R	R	R	R	R	R
Black root	R	S	S	S	S	S
Alpha anthracnose	R	S	S	S	R	S
Michigan rust races	R	R	R	R	R	R
Common blight	S	S	S	S	S	S
White mold (1-5)	4	3	3	2	2	3
Canning Quality						
Color L-scale	19	16	16	-	15	-
Hydration ratio	2.0	1.9	1.9	-	1.3	-
Washed drained ratio	1.2	1.2	1.3	-	1.8	-
Texture (kg/100 g)	70	79	63	-	67	-
Organoleptic rating (1-5)	2.8	2.8	2.8	2.1	2.6	4.1

Lodging: 1=erect, 5=prostrate
Selection index: 1=worst, 9=best
Diseases: R=resistant, S=susceptible
White mold: 1=resistant, 5=susceptible
Organoleptic rating: 1=worst, 5=best

Quality Characteristics

Raven has a small flat black seed averaging 16.5 g per 100 seeds and ranged from 16-20 g per 100 seeds. The seed is slightly smaller than that of other varieties but is equivalent in color and shape to other commercial black bean varieties. Canning quality is not a major selection criteria in black beans because this commodity is marketed overseas and not canned commercially. But in canning trials, Raven has been rated by a team of panelists as acceptable in canning quality. Raven scored 2.8 or equivalent to other commercial black bean varieties on a 5-point scale where 3 is average. Data on cooked color, texture hydration and drained weight ratios exhibited no differences between Raven and other commercial black bean varieties.

Release and Research Assessment

Raven is released as a public, nonexclusive variety by the Michigan Agricultural Experiment Station and the Agricultural Research Service. A research fee will be assessed on each unit (cwt) of certified seed sold.

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