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Condor, A New Black Bean for Michigan
Michigan State University Extension Service
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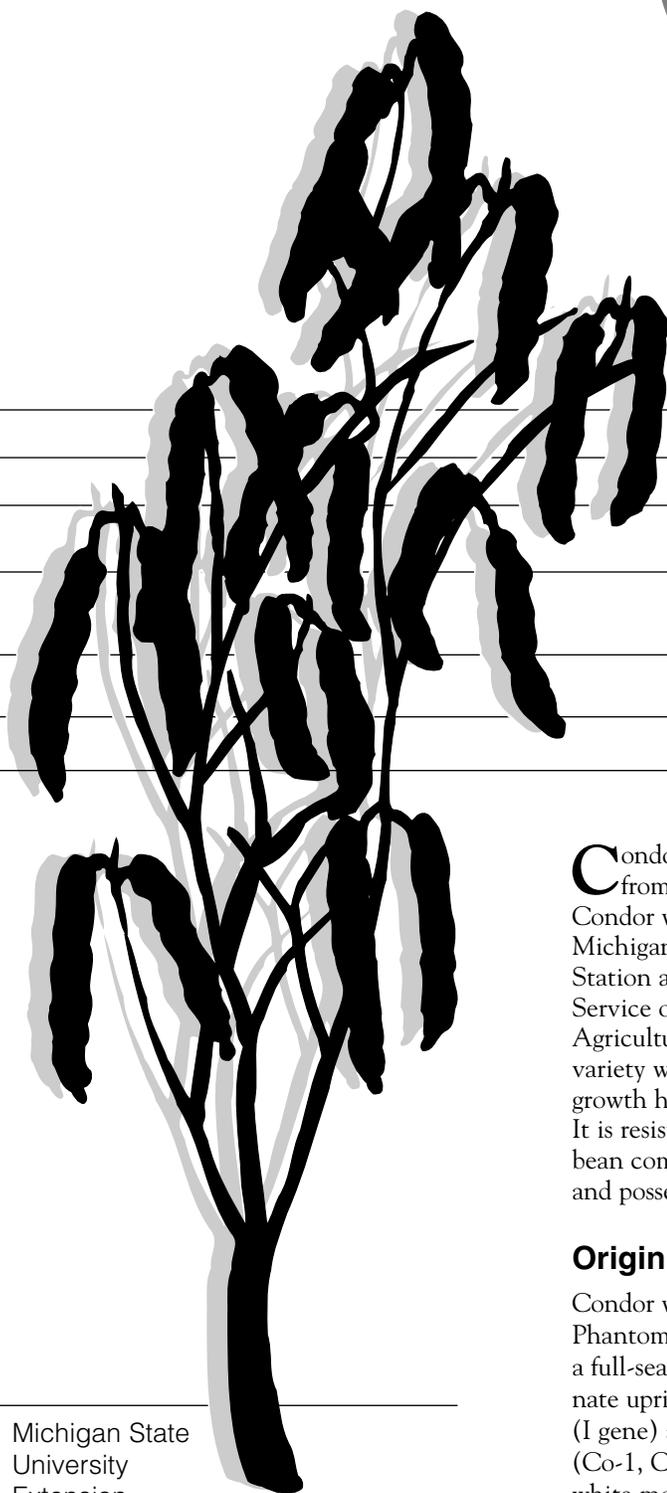
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**NEW from
MSU**

Condor

A NEW BLACK BEAN

for Michigan



- High-yielding, upright, short-vine growth habit.
- Taller and more resistant to lodging than T-39.
- Suitable for direct harvest.
- Similar in maturity to T-39 and 4 days earlier than Domino or Midnight.
- Resistant to all anthracnose races present in Michigan.
- Improved canning quality and color retention after cooking.

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

Origin and Background

Condor was developed from the Phantom/Black Jack cross. Phantom is a full-season, erect, Type-II indeterminate upright black bean line with virus (I gene) and anthracnose resistance (Co-1, Co-2 genes), and tolerance to white mold. Black Jack is a commercial black bean variety with good canning quality. The purpose of the cross was to combine erect plant habit and resistance to anthracnose, bean common mosaic virus and white mold with good

canning quality for future black bean varieties.

Yield Performance

Condor has been tested for six years (2000-2005) over 45 locations by MSU in cooperation with colleagues in Michigan, New York, North Dakota and Washington. The combined yield data are compared with three other black bean varieties in Table 1. Over 45 locations, Condor yielded 26.2 cwt/acre. The yield has ranged from a high of over 45 cwt/acre under irrigation in Montcalm County in 2001 and 2002 to a low of 13 cwt/acre under stress in Sanilac County in 2002. Over 44 locations, Condor significantly out-yielded the commercial varieties T-39 (by 5 percent) and Jaguar (by 4 percent) over 39 locations. Under narrow row (20-inch) testing combined with direct harvest at the Saginaw Valley Bean and Beet Research Farm, Condor yielded 29 to 33 cwt/acre in 2002, 2004, and 2005, and appears well suited to this increasingly popular management system.

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Agronomic Features

Condor exhibits the Type-II upright, short-vine (indeterminate) growth habit combined with resistance to lodging. Plants average 20 inches in height and exhibit an overall upright appearance similar to that of Phantom and more upright than Black Jack. Condor is intermediate in erectness between both parents. Condor is a mid-to full-season bean, maturing 95 days after planting. The range in maturity is from 91 to 98 days depending on season and location. It matures 1 day later than T-39, Jaguar and Black Jack, and 4 days earlier than Domino and Midnight. Condor has demonstrated the same uniform maturity and dry-down as Black Jack but has a higher agronomic acceptance rating because of its upright habit, resistance to lodging, excellent pod load and favorable high pod placement in

the plant canopy. Fertility and weed management practices used with other dry bean classes can be used for weed control in the production of Condor beans.

Disease Resistance

Condor possesses the combination of the single dominant hypersensitive I gene, which conditions resistance to seed-borne bean common mosaic virus (BCMV) but is sensitive to the temperature-insensitive-necrosis-inducing strains of BCMNV such as NL 3 and NL 8, which are known to occur in the Pacific Northwest. Condor possesses the Co-1 and Co-2 gene combination for resistance to anthracnose. This gene combination conditions resistance to races 7 and 73, present in Michigan. Condor possesses rust resistance and is essentially immune to the indigenous rust races prevalent in Michigan. Resistance has broken down after inoculation with a

mixture of races 38, 39, 40, 41, 43 and 53 in field testing in Maryland. Condor exhibits improved levels of tolerance to white mold compared with T-39 but has exhibited higher levels of susceptibility than Jaguar. Condor has a similar level of susceptibility to common bacterial blight as other commercial black bean varieties.

Quality Characteristics

Condor has a typical small, opaque black bean seed averaging 23 g/100 seeds; ranges from 19 to 23 g/100 seeds. The seed is equivalent to T-39 in size, shape and color. In canning trials, Condor has been subjectively rated by a team of panelists as being the best in cooking quality. Condor rated 4.7 (4.2 to 5.4) on a scale of 1 to 7, where 1 is the worst, 7 is the best and 4 is midscale (neither acceptable nor unacceptable). This evaluation is based upon whole bean integrity (no splitting or clumping); uniformity of size (uniform water uptake); color (no after-darkening); and clear brine (no starch extrusion into canning liquid). Data on cooked color, hydration and drained weight ratios exhibited no differences between Condor and other commercial black bean varieties. The texture of 56 kg/100 g is well within the acceptable range of 40 to 80 kg/100 g for processed black beans. Condor exhibited better color retention than most commercial black bean varieties and produced an excellent canned product equivalent to Black Jack in appearance.

Release and Research Fee

Condor was released by Michigan State University with the option that Condor be sold for seed by variety name only as a class of certified seed under the three-class system used in Michigan (breeder, foundation, certified). A royalty will be assessed on each hundredweight unit of either foundation seed or certified seed sold, depending on production location. The variety is licensed to the Michigan Crop Improvement Association, which will collect the royalty. Plant variety protection is pending.

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Table 1. Comparison of agronomic, disease and canning characteristics of Condor with three other black bean varieties: T-39, Jaguar and Midnight (2000-2005).

Varieties	Condor	T-39	Jaguar	Midnight
Agronomic Traits				
Days to Flower	49	48	48	50
Days to Maturity	95	94	94	99
Height (inches)	20	19	21	22
Lodging Score (1-5)	2.0	3.0	1.0	1.5
100 Seed Weight (g)	23	22	21	21
Yield (Percent)	100	95	96	102
Disease Resistance Traits				
BCMV	R	R	R	R
Anthracnose:				
Race 73	R	S	R	S
Race 7	R	S	R	S
Michigan Rust Races	R	R	R	R
White Mold (%)	35	49	21	—
Canning Quality Traits				
Color L-Scale	16	18	13	16
Washed Drained Ratio	1.2	1.2	1.2	1.3
Hydration Ratio	1.9	2.0	2.1	2.0
Texture (kg)	81	69	63	68
Visual Rating (1 - 7)	4.7	3.9	4.4	3.9

Lodging: 1 = erect, 5 = prostrate; 100 seed weight - grams

Diseases: BCMV- bean common mosaic virus, R = resistant, S = susceptible,

I = intermediate; White mold: percent disease incidence (average of 90 plants grown under disease pressure).

Canning: Color scale: The lower the value, the darker the cooked product; texture of canned beans is measured in kg/100g of force to shear cooked beans; visual rating: 1 = very undesirable, 4 = neither desirable nor undesirable, 7 = very desirable.