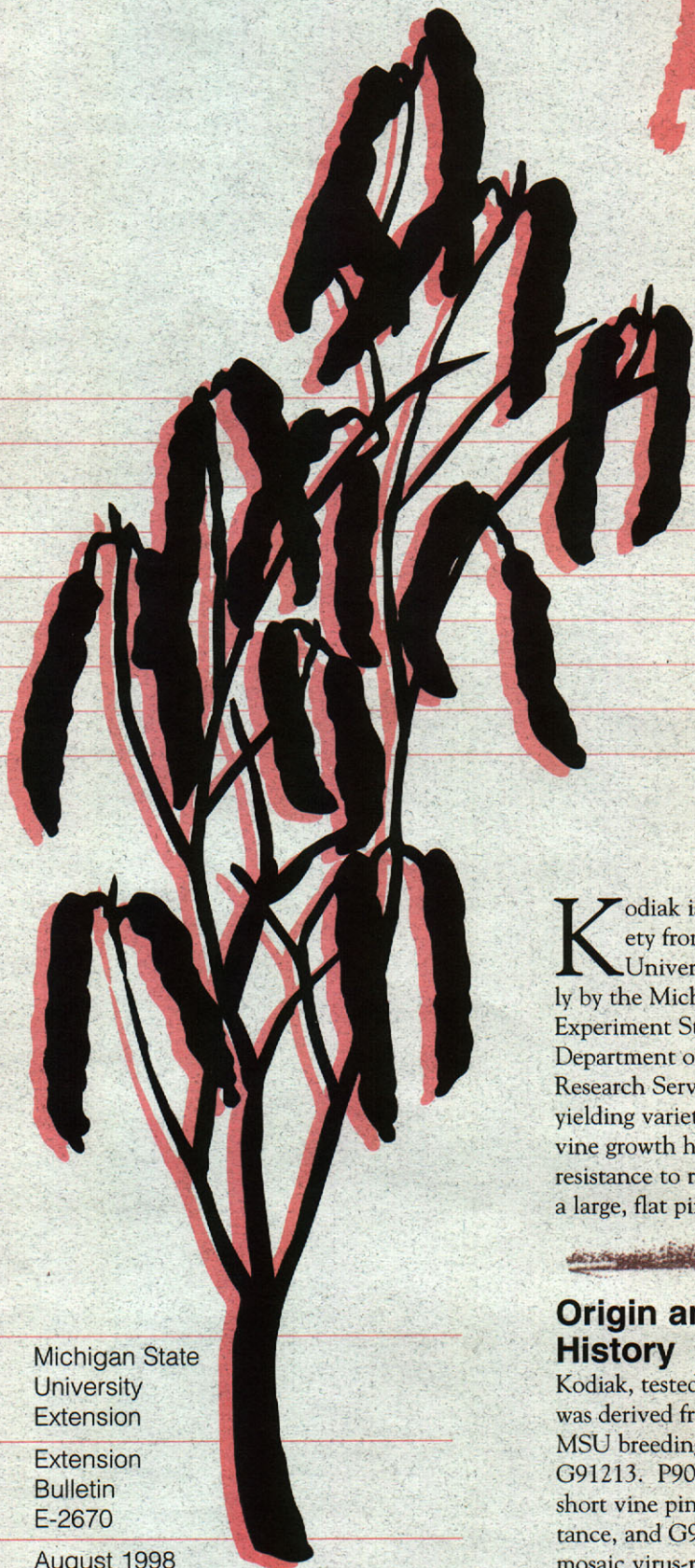


**NEW from
MSU**

Kodiak

A NEW PINTO BEAN

for Michigan



- Upright, short vine growth habit similar to Aztec.
- Less lodging resistant than Aztec.
- Two days later in maturity than Aztec.
- Outyielded Aztec by 11% over 18 locations in four years.
- Outyielded Othello by 10% over 21 locations in four years.
- Resistant to mosaic virus, rust and root rots.
- Large, flat pinto seed similar to Othello.
- Canning quality similar to Aztec.

Kodiak is a new pinto bean variety from Michigan State University. It was released jointly by the Michigan Agricultural Experiment Station and the U.S. Department of Agriculture Agricultural Research Service. Kodiak is a high-yielding variety with an upright, short vine growth habit, midseason maturity, resistance to rust and mosaic virus, and a large, flat pinto seed.

Origin and Breeding History

Kodiak, tested as MSU No. P94207, was derived from a cross between two MSU breeding lines: P90557 and G91213. P90557 is an indeterminate, short vine pinto bean with rust resistance, and G91213 is a midseason, mosaic virus-resistant great northern

bean breeding line. The cross was designed to combine rust and virus resistance into a high-yielding pinto bean variety. The cross was made in 1992 and advanced to the F₆ generation prior to entry in yield trials. A rust-resistant breeding line was entered into yield trials in 1994 with the code number P94207.

Yield Performance

Kodiak was tested extensively for yield and agronomic traits for four seasons (1994-97) over 26 locations (Table 1). It averaged 26 cwt/acre and outyielded all commercial pinto bean varieties by a margin of 5 to 11 percent. In the absence of disease such as blight and white mold, Kodiak has produced yields in excess of 36 cwt/acre and has outyielded Aztec by 11 percent (2.7 cwt/acre) over 18 locations. Kodiak has been com-

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petitive with vine-type varieties Chase and Othello, outyielding them by 5 and 10 percent, respectively, over 20 locations.

Agronomic Features

Kodiak exhibits an erect, short vine growth habit, averaging 19 inches in height with the pods positioned high in the plant canopy. It has moderate resistance to lodging compared with Aztec, with a score of 3 vs. 2 on a 1 to 5 scale where 1 is the most erect.

Kodiak is a midseason variety, maturing 94 days after planting, with a range in maturity from 86 to 98 days, depending on season and location. It matures two days later than Aztec and seven days later than

Othello. Kodiak has demonstrated uniform maturity and excellent dry-down across a broad range of environments and fits a niche for an erect, high-yielding, midseason pinto bean variety in Michigan.

Disease Resistance

Kodiak possesses the combination of the single dominant hypersensitive I gene and the recessive *bc-1²* gene, which in combination provide resistance to all strains of bean common mosaic virus (BCMV). This combination offers resistance to the temperature-insensitive necrosis-inducing strains of BCMV that cause the black root reaction. Kodiak carries the *Ur-3* and *Ur-6* rust resistance genes, which condition resistance to all local rust races preva-

lent in Michigan. Like Aztec, Kodiak has shown limited tolerance to white mold, so chemical control is recommended when weather or growing conditions favor disease development.

Quality Characteristics

Kodiak has a large, flat pinto bean seed averaging 42 g per 100 seeds and ranging from 39 to 45 g per 100 seeds. The seed is equivalent in size, shape and color to that of Othello. Kodiak has been rated by a team of panelists as acceptable in canning quality. Kodiak scored 2.3, Othello scored 4.0 and Aztec scored 2.1 on a 5-point scale where 3 is average. Data on cooked color, texture hydration and drained weight ratios showed no differences between Kodiak and other acceptable commercial pinto bean varieties.

Release and Research Assessment

Kodiak is released as a public, non-exclusive variety 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.

Table 1. Kodiak pinto bean — comparison of agronomic, disease, yield performance and canning characteristics.

Traits	Kodiak	Aztec	Othello	Chase	Sierra
Agronomic traits					
Days to flower	51	48	42	51	51
Days to mature	94	92	87	96	99
Height (cm)	48	50	35	40	53
Lodging score (1-5)	3.0	2.0	3.5	4.0	2.5
Selection index (1-9)	5.5	5.0	2.5	2.5	5.0
Seed size (g/100 seeds)	42	41	40	36	39
Yield (percent)	100	89	90	95	89
Disease resistance					
BCMV common strains	R	S	R	S	S
BCMV necrotic strains	R	S	R	S	S
Anthraxnose	S	S	S	S	S
Rust races 53 and 47	R	S	S	R	R
Common blight	S	S	S	T	S
White mold	S	S	S	S	T
Canning quality					
Color L-scale	30	31	30	31	31
Texture (kg/100 g)	91	109	79	118	141
Washed drained ratio	1.2	1.2	1.2	1.2	1.2
Hydration ratio	2.0	2.1	2.0	2.0	2.0
Organoleptic rating (1-5)	2.3	2.1	4.0	2.7	1.6

Lodging: 1 = erect, 5 = prostrate

Selection index: 1 = worst, 5 = average, 9 = best, based on adaption

Diseases: R = resistant, T = tolerant, S = susceptible

Organoleptic rating: 1 = worst, 5 = best on general cooked appearance

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