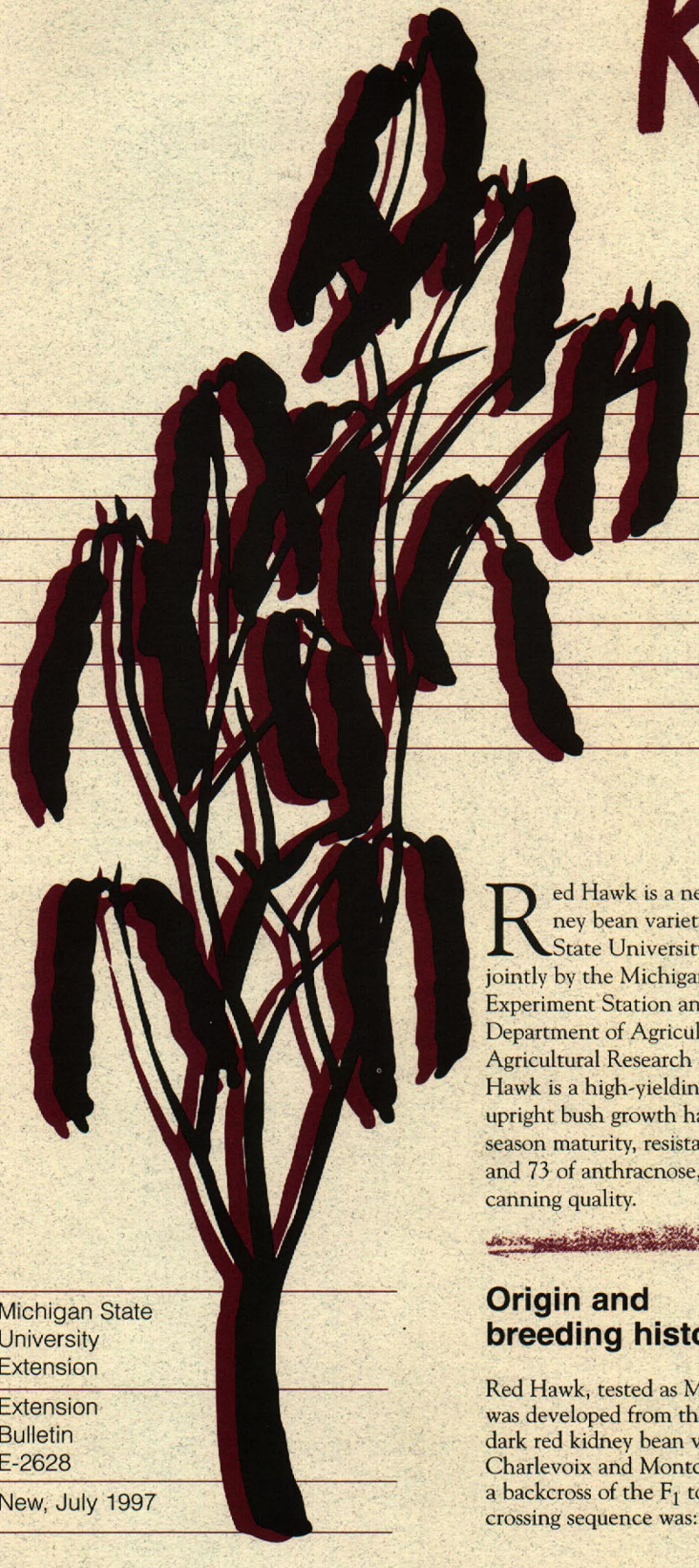
NEW from MSU

Red Hawk

A New Dark Red Kidney Bean for Michigan



- Erect bush habit similar to that of Sacramento light red kidney bean.
- Similar in height and flower color to Montcalm.
- More erect plant and better dry-down than Montcalm.
- Five days earlier in maturity than Montcalm.
- Outyielded Montcalm by 5 percent over 35 locations in seven years.
- Resistant to mosaic virus, rust and Races 7 and 73 of anthracnose.
- Equivalent to Isles in resistance to halo blight.
- Excellent canning quality similar to that of Montcalm.

Michigan State University Extension

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Red Hawk is a new dark red kidney 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. Red Hawk is a high-yielding variety with an upright bush growth habit, mid- to full-season maturity, resistance to Races 7 and 73 of anthracnose, and excellent canning quality.

Origin and breeding history

Red Hawk, tested as MSU No. K90101, was developed from the cross of the dark red kidney bean varieties Charlevoix and Montcalm, followed by a backcross of the F_1 to Montcalm. The crossing sequence was: Charlevoix/2*Montcalm. The objective of the cross was to combine the earliness and anthracnose resistance of Charlevoix with the superior canning quality and halo blight resistance of the Montcalm parent. One backcross to Montcalm was used to maintain the quality traits. The cross was made in 1988 and advanced to the F_6 generation when breeding line K90101 was entered into yield trials in 1990.

Yield performance

Red Hawk was tested extensively for yield and agronomic traits for seven seasons (1990-96) over 36 locations (Table 1). It averaged 22 cwt/acre and outyielded all commercial dark red kidney bean varieties by a margin of 2 to 11 percent. In the absence of disease such as blight and white mold, Red Hawk has produced yields in excess of 32 cwt/acre and has outyielded the

Montcalm parent by 5 percent (1 cwt/acre) over 35 locations. Red Hawk has been competitive with the full-season high-yielding variety Isles and outyielded the early-season variety Drake by 11 percent (2.5 cwt/acre) over 12 locations.

Agronomic features

Red Hawk exhibits an erect bush growth habit averaging 20 inches in height and has improved resistance to lodging compared with Montcalm, with a score of 2 vs 2.5 for Montcalm on a 1 to 5 scale where 1 is the most erect. It has a white flower similar to that of Montcalm with a faint pink blush on the wings of the blossom. Isles and Drake have pink flowers.

Red Hawk is a mid- to full-season variety, maturing 99 days after planting with a range in maturity from 95 to 102 days, depending on season and location. It matures five days earlier than Montcalm, one day earlier than Isles and three days later than Drake. Red Hawk has demonstrated uniform maturity and excellent dry-down across a broad range of environments and fits a niche for an erect, high-yielding, mid- to full-season dark red kidney bean variety in Michigan.

Disease resistance

Red Hawk 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. Red Hawk carries the combination of the Co-1 and Co-2 genes for resistance to all known races of anthracnose in North America, including Races 7 and 73, which are present in Michigan. Isles possesses similar levels of resistance to anthracnose, whereas Montcalm is susceptible to Race 7. Red Hawk is immune to the rust races prevalent in Michigan. Red Hawk has shown tolerance to halo blight and common blight equivalent to that of Isles but is susceptible to Michigan isolates of root rot (primarily *Fusarium*). All dark red kidney varieties show similar intermediate levels of tolerance to white mold.

Quality characteristics

Red Hawk has a typical dark red kidney bean seed averaging 62 g per 100 seeds and is equivalent in size, shape and color to Montcalm. In canning trials, Red Hawk scored 4.3 on a 5 point hedonic scale (where 5 is best). This evaluation is based on whole bean integrity (no splitting nor clumping), uniformity of size (uniform water uptake), color (no after-darkening) and clear brine (no starch extruded into canning liquid). After it is processed, Red Hawk is equivalent to Montcalm in cooking quality and does not differ significantly from other commercial dark red kidney bean cultivars for cooked color, texture, hydration and drained weight ratios.

Table 1. Red Hawk dark red kidney bean - comparison of agronomic, disease, performance and canning characteristics.

Traits	Red Hawk	Montcalm	Isles	Drake
Agronomic traits				
Days to flower	42	43	43	41
Days to mature	99	104	100	97
Height (cm)	51	52	51	49
Lodging score (1-5)	2.0	2.5	2.5	2.5
Selection index (1-9)	5.5	4.5	5.0	4.5
Seed size (g/100 seeds)	62	63	67	64
Yield (percent)	100	95	98	89
Disease resistance				
BCMV	R	R	R	R
Anthracnose race 7	R	S	R	S
Anthracnose race 73	R	R	R	R
Rust race 53	R	R	R	R
Common blight	T	T	T	S
Halo blight	4	2	5	9
White mold (1-5)	3	3	3	3
Canning quality				
Color L-scale	14	14	14	15
Texture (kg/100 g)	79	85	82	106
Washed drained ratio	1.6	1.5	1.6	1.7
Hydration ratio	1.5	1.5	1.5	1.4
Organoleptic rating (1-5)	4.3	4.0	3.8	3.6

Lodging: 1 = erect, 5 = prostrate
Selection index: 1 = worst, 5 = average, 9 = best, based on adaptation
Diseases: R = resistant, T= tolerant, S = susceptible
Halo blight: 1 = resistant, 5 = intermediate, 9 = susceptible
White mold: 1 = resistant, 5 = susceptible
Organoleptic rating: 1 = worst, 5 = best on general cooked appearance

Release and research assessment

Red Hawk is released as a public, 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 certified seed sold.

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