

DYNASTY DARK RED KIDNEY BEAN

Dynasty is a mid season maturity dark red kidney bean with excellent yield and good seed size



Variety	Market Class	Maturity DAP ^{a,b}	Yield lbs/ac ^{a, b}	100 Seed Weight g ^{a*}
Dynasty	DRK	96	2392	67
Red Hawk	DRK	96	1962	59
Majesty	DRK	97	2231	73
GTS 104	DRK	97	2035	59
Pink Panther	LRK	93	2234	70
OAC Inferno	LRK	100	2523	66
Yeti	WK	99	2258	61
Mean		97.	2234	65

^a Yield, Days to Maturity and Seed weight are 3 year averages. Maturity rating is affected by planting date and area where variety is being grown. Varieties are rated as mature when 95% of the pods are ripe. Normally, 3-10 additional drying days are needed before the crop is dry enough for combining.

^b 2013-2015 OPCC Performance data, 13 location years, To convert lbs/acre to t/ha divide by 893.

^b Days to maturity after planting

* Adapted from GoBeans.ca Infosheets



DYNASTY DARK RED KIDNEY BEAN

Disease Reaction ^a					
Variety	BCMV		Anthracnose ^b		
	Race		Race		
	1	15	17	23	73
Dynasty	R	S	R	S	R
Red Hawk	R	R	R	S	R
Majesty	R	R	R	S	S
GTS 104	NA	NA	NA	NA	NA
Pink Panther	R	R	R	S	R
OAC Inferno	R	S	R	S	R
Yeti	R	R	NA	S	R

^a R = Resistant, S = Susceptible, NA = Not Available

^b Anthracnose ratings, the predominant race found now in Ontario is Race 73. Race 17 (binary system) is equivalent to the Alpha race, race 23 (binary system) is equivalent to the Delta race.*

* Adapted from GoBeans.ca Infosheets



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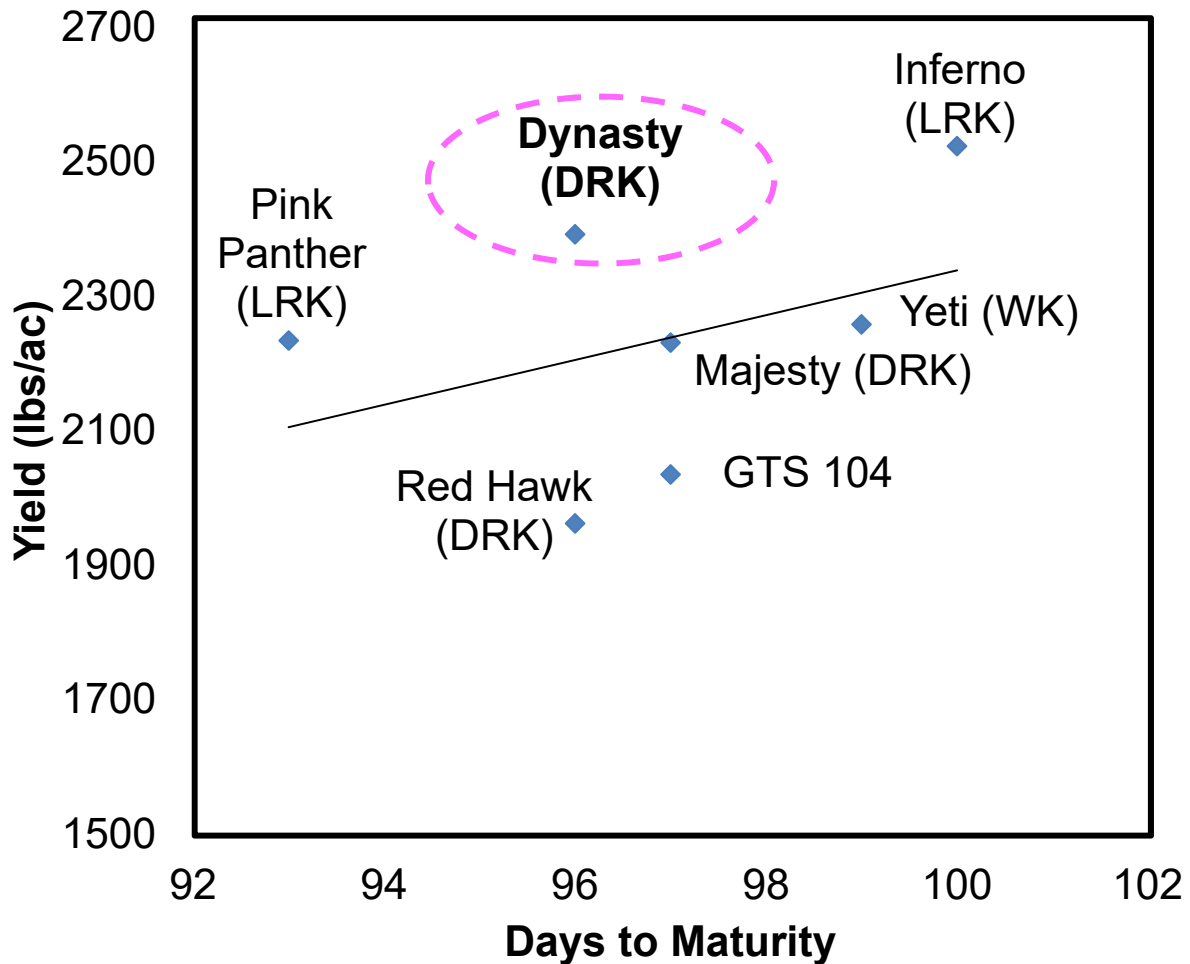


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Developed by the University of Guelph Dry Bean Breeding Program.
http://www.plant.uoguelph.ca/research/bean_breeding/index.html
Pedigreed seed available from Hensall District Co-operative (HDC),
1 Davidson Drive, P.O. Box 219, Hensall ON N0M 1X0 Canada,
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DYNASTY DARK RED KIDNEY BEAN

Yield vs Maturity Comparison



Data from 2013-2015 OPCC Performance Trials, 13 location years; Adapted from GoBeans.ca Infosheets
DRK, Dark Red Kidney; LRK, Light Red Kidney; WK White Kidney

Dynasty kidney bean

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Abstract: Dynasty is a dark red kidney bean (*Phaseolus vulgaris* L.) cultivar with excellent yield potential and resistant to races 17 and 73 of anthracnose.

Key words: kidney bean, cultivar description.

Résumé : Dynasty est une variété de haricot (*Phaseolus vulgaris* L.) rouge foncé caractérisée par un excellent rendement potentiel. Ce cultivar résiste aux races 17 et 73 de l'anthracnose. [Traduit par la Rédaction]

Mots-clés : haricot, description de cultivar.

Introduction

The kidney bean (*Phaseolus vulgaris* L.), Dynasty is a mid to late season maturity cultivar with excellent yield potential, superior seed size, and good cooking quality. Dynasty was developed by the University of Guelph, bean breeding program, Guelph, ON. Registration no. 7205 was issued for Dynasty by the Variety Registration Office, Canadian Food Inspection Agency, Ottawa on 9 May 2012.

Pedigree and Breeding Methods

Dynasty was derived from a double-cross between HR85-1885 and Montcalm and USWA-39 and AC Litekid. Montcalm a dark red kidney bean variety developed by Michigan State University in 1974, has the I gene, resistance to anthracnose and halo blight and excellent canning quality (Miklas et al. 2002). It originated from crosses of Michigan kidney types and three halo blight-tolerant light red kidney beans. AC Litekid, a medium-full season maturing and high yielding light red kidney bean cultivar (Park and Tu 1996) with resistance to anthracnose and races 1 and 15 of bean common mosaic virus, has Ruddy and California dark red kidney (CDRK) bean. HR85-1885 is an unregistered elite line from Agriculture and Agri-Food Canada, Greenhouse and Processing Crop Research Center (GPCRC), Harrow, ON (Personal communication with T. Rupert). USWA-39 is an upright bush type kidney bean from Montcalm/K59-7. Germplasm line K59-7, is a curly top virus resistant

light red kidney. Both parents have dominant resistance to BCMV (Personal communication with P. Miklas).

F₁ plants were grown in the growth room in 1997 at the Department of Plant Agriculture, University of Guelph, Guelph, ON and crossing was made between F₁s to derive the F₁ double hybrids. The F₁ double hybrids were grown in the field in 1998 at the Elora Research Station, Ontario and all seeds were bulked. The F₂–F₄ generations were advanced using the modified bulk method. Single plant selection for maturity, resistance to common bacterial blight, kidney bean seed type, and high pod number were made from space planted F₅ bulk plots in the field in 2002.

Performance

Dynasty was entered into the Ontario Color Bean Registration and Performance Trials as OAC 07-6D1 and was evaluated at Kippen and Thorndale in 2007; Elora, St Thomas, Kippen, Monkton, and Thorndale in 2008; and Elora, Kippen, Monkton, Thorndale, and St. Thomas in 2009. These tests were performed under the guidelines set by the Ontario Pulse Committee. Test locations with a coefficient of variation lower than 15% were considered valid tests. Agronomic data, including yield, days to maturity, and seed weight (estimated for 100 seeds) were collected for each plot in each location. Each year's data were subjected to analysis of variance and least squares mean, standard error of the means, and least significant difference ($P = 0.05$) were estimated for each genotype. Moreover, a composite seed sample

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Table 1. Yield, days to maturity, and seed weight for Dynasty kidney bean compared with commercial checks tested in the Ontario Color Bean Co-operative Trials during 2007, 2008 and 2009^a.

Cultivar	Yield (kg ha ⁻¹)				Days to maturity				100-Seed weight (g)			
	2007	2008	2009	Mean	2007	2008	2009	Mean	2007	2008	2009	Mean
Red Hawk	2548	2944	2125	2539	91.5	94.2	97.8	94.5	53.2	56.7	56.1	55.4
Montcalm	2235	2654	2431	2440	97.5	99.4	102.0	99.6	51.0	60.6	58.2	56.7
AC Calmont	2424	2828	2470	2574	97.5	99.2	101.8	99.5	49.8	60.3	57.6	56.0
OAC Redstar	2623	2917	2346	2628	95.5	96.0	99.6	97.0	57.7	59.5	60.6	59.3
Majesty	2889	2904	2315	2703	96.0	97.8	101.6	98.4	61.9	72.0	67.4	67.1
Dynasty	2971	3023	3157	3050	95.0	95.8	99.4	96.7	61.0	65.0	64.0	63.4
LSD 5%	506	292	246		5.1	1.9	1.8		4.4	2.3	2.2	

^aTest locations were Kippen and Thorndale in 2007; Elora, St Thomas, Kippen, Monkton, and Thorndale in 2008; and Elora, Kippen, Monkton, Thorndale, and St. Thomas in 2009.

Table 2. Cooking quality of canned beans of Dynasty compared with commercial check cultivars grown in the Ontario Color Bean Registration and Performance Trials during 2007–2009.

Cultivar	Hydration coefficient ^d			Degree of packing (1–5) ^b			Washed drained wt. (%) ^c			Texture measurement ^d					
	2007	2008	2009	2007	2008	2009	2007	2008	2009	Plateau force (N)			Firmness (N mm ⁻¹)		
AC Calmont	1.91	1.80	1.87	2.33	3.00	2.33	67.58	68.61	64.91	227.7	225.2	238.5	15.97	15.41	12.29
Montcalm	1.94	1.79	1.85	2.19	3.00	2.00	64.69	64.58	68.92	212.7	201.5	190.9	15.28	17.32	13.77
Dynasty	1.87	1.81	1.85	1.33	3.00	2.00	70.88	71.60	71.39	218.3	237.9	212.9	18.33	18.81	13.70
LSD 5%	0.05	0.05	0.03	0.85	0.80	0.38	2.39	3.22	1.77	26.2	48.4	44.7	2.48	5.59	2.66

^aSoaked wt. (blanched in 88 °C water for 45 min) divided by dry weight (determined for 500 g of beans).

^bScored visually; 1: no clumping and 5: over half clumped.

^cWeight of beans after washed and drained on a screen, presented as percentage of unwashed-undrained weight.

^dTexture of canned beans was measured on Instron Texture measurement system using wire extrusion cells.

Table 3. Response of Dynasty to anthracnose and bean common mosaic virus (BCMV) compared with check cultivars.

Cultivar	Anthracnose ^a			BCMV ^b	
	Race 17	Race 23	Race 73	Race 1	Race 15
Dynasty	R	S	R	R	S
AC Calmont	R	S	Na	R	R
Montcalm	R	S	Na	R	R

^aReactions against Anthracnose race 17, 23, and 73 were assessed after artificial inoculation under controlled conditions.

^bReactions against bean common mosaic virus race 1 and 15 were assessed after artificial inoculation under controlled conditions.

from three locations was formed by mixing approximately 200 g of the seed of each entry in each replication. These samples were processed in the food laboratory at the GPCRC, AAFC Harrow, ON, and evaluated for cooking and canning quality parameters.

Across 12 location-years in the Ontario Color Bean Registration and Performance Trials during 2007, 2008, and 2009 Dynasty kidney bean on average yielded

3050 kg ha⁻¹, which was 21% higher than the mean of the check cultivars (Table 1). In these tests, Dynasty was rated as mid-late season maturity line with days to maturity significantly earlier than check cultivars Montcalm and AC Calmont (Table 1). The seed size for Dynasty was significantly larger than all other check cultivars, except Majesty, with seed mass ranging between 61.05 and 65.08 g 100 seed⁻¹. In canning evaluations, Dynasty's hydration coefficient was lower than the checks in the year 2007 and 2009. The degree of packing was significantly lower than check cultivars in 2007 but was similar to checks in 2008 and 2009. The washed drained solids was significantly higher in all years than check cultivars indicating that starch content was higher in the cultivar Dynasty compared to checks (Table 2). Dynasty had the harder texture than the checks for firmness in three years but needed less force than check cultivar AC Calmont for texture plateau force (Table 2).

Based on greenhouse disease inoculation tests, Dynasty is resistance to race 17 and race 73 of anthracnose and race 1 of bean common mosaic virus (Table 3). Molecular marker screening shows that Dynasty carries the SCAR marker SAS13 (Young et al. 1998) and SSR marker PVctt001 (Rodríguez-Suárez et al. 2008)

associated with anthracnose resistance. Based on the pedigree of the Dynasty, it likely derived its anthracnose resistance from the *Co-1* gene. It also carries the SCAR marker SW13 which is known to be linked to *I* gene on chromosome Pv02 which is resistant to bean common mosaic virus (Melotto et al. 1996). Dynasty has green hypocotyl, determinate growth habit with pink flowers.

Pedigreed Seed Stock

Breeder seed of Dynasty is maintained by the University of Guelph, bean breeding program, Guelph, ON, N1G 2W1, Canada. The pedigree seed is distributed through Hensall District Co-operative (HDC), 1 Davidson Drive, P.O. Box 219, Hensall ON N0M 1X0 Canada, Phone: 519-262-3002, Fax: 519-262-2317.

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