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CDC Athabasca yellow field pea

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Keywords:	field pea, <i>Pisum sativum</i> , cultivar description

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CULTIVAR DESCRIPTION

CDC Athabasca yellow field pea

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CDC Athabasca, a yellow cotyledon field pea (*Pisum sativum* L.) cultivar, was released in 2016 by the Crop Development Centre, University of Saskatchewan for distribution to Select seed growers through the Variety Release Committee of the Saskatchewan Pulse Growers. CDC Athabasca has good lodging resistance, large-sized, round seeds, and good yielding ability. CDC Athabasca is adapted to the field pea growing regions of western Canada.

Key words: field pea, *Pisum sativum* L., cultivar description

CDC Athabasca is a field pea (*Pisum sativum* L.) cultivar developed by the Crop

Development Centre (CDC), University of Saskatchewan. It was issued registration number 7972 on April 8, 2016 by the Canadian Food Inspection Agency, Variety Registration Office.

Breeding Methods and Pedigree

CDC Athabasca was developed from the cross Ceb 4152/1658-7 made in 2006. Ceb 4152 was developed by Cebeco Zaden (The Netherlands). Line 1658-7 was developed by the Crop Development Centre, University of Saskatchewan from the cross Ceb 1475//9705/201-74. Ceb 1475 was later registered by Cebeco Zaden as Eclipse. Line 9705 was later registered as CDC Mozart (Vandenberg and Slinkard, 2002). Line 201-74 is a breeding line from the Crop Development Centre. The objective of this cross was the development of a high yielding cultivar with improved lodging resistance and large seed size, as both parents had relatively large seed size. Selection for seed size and shape was conducted in the F_1 and F_2 generations. The $F_{2:3}$ family was evaluated in field trials in Saskatoon in 2008. Preliminary replicated yield trials were conducted in the F_4 in Saskatoon in 2009. An F_4 line, 3094-5, was selected based on good yield, good lodging resistance, and large seed size. This line was evaluated in replicated yield trials in Saskatoon, Rosthern, Meath Park, Pasqua and Wilkie, Saskatchewan and Barrhead, Alberta in 2010, then in 2011 at the same six locations plus Outlook, Mildred, Yorkton in Saskatchewan, as well as Lacombe, St. Albert, and Vegreville, Alberta. It was then entered as CDC 3094-5, an $F_{2:7}$ line, in the Field Pea Co-operative Registration Test-A in 2012 and 2013.

These trials were conducted by the following organizations at the following locations:

British Columbia Ministry of Agriculture research site at Fort St. John, B.C., Alberta Agriculture Food and Rural Development research sites at Brooks, Barrhead, St. Albert, and Vegreville, AB, University of Saskatchewan in Saskatoon, Limerick, Yorkton, and Moose Jaw, SK, and Agriculture and Agri-Food Canada Research Centres located in Indian Head, Scott, Melfort, and Swift Current, SK, Lacombe, AB and Brandon, MB.

Breeder seed of CDC 3094-5, later named CDC Athabasca, was derived by bulking 32 F_{6,9} lines in 2013, after discarding phenotypic outliers.

Performance

In two years of testing in the Field Pea Co-operative Test-A (21 site-years), CDC Athabasca had significantly greater yield than the check cultivar CDC Golden, but not significantly different from Agassiz (Table 1). CDC Athabasca was one day later maturing on average than Agassiz and three days later than CDC Golden, with longer vines compared to the checks. In the lodging score, CDC Athabasca was superior to both checks. CDC Athabasca had substantially greater seed weight than the checks, with blockier seed shape and similar protein concentration. CDC Athabasca had the same percent seed coat breakage (Reichert et al., 1986) as Agassiz, but greater than CDC Golden. CDC Athabasca is adapted to the field pea growing region of western Canada.

Other Characteristics

CDC Athabasca has a semileafless leaf type, white flowers, yellow cotyledons, opaque seed coat and round, smooth seed. CDC Athabasca was evaluated in mist-irrigated field

disease nurseries at Morden and Saskatoon as part of the Field Pea Co-operative Registration Test in 2012 and 2013. CDC Athabasca was resistant to powdery mildew, as were Agassiz and CDC Golden (Table 1). CDC Athabasca was moderately susceptible to mycosphaerella blight [*Mycosphaerella pinodes* (Berk. & Bloxam) Vestergren] and moderately resistant to Fusarium wilt [*Fusarium oxysporum* Schlecht. emend. Snyder & Hans. f. sp. *pisi* (van Hall) Snyder & Hans], similar to the checks (Table 1).

Availability of Propagating Material

Breeder seed of CDC Athabasca is maintained by the Crop Development Centre, University of Saskatchewan, 51 Campus Drive, Saskatoon, Saskatchewan, Canada, S7N 5A8. Distribution rights for CDC Athabasca are held by the Saskatchewan Pulse Growers (207-116 Research Drive, Saskatoon, Saskatchewan, Canada, S7N 3R3). Breeder seed of CDC Athabasca was first distributed in 2016 to seed growers qualified as Select seed growers by the Canadian Seed Growers' Association.

Appreciation is expressed to the pulse crop breeding staff at the Crop Development Centre, University of Saskatchewan, for their technical assistance in the development of CDC Athabasca, and to Dave Benallack and Craig Ells (also at the Crop Development Centre) for breeder seed production. Financial support of the Saskatchewan Pulse Growers and Saskatchewan Ministry of Agriculture is gratefully acknowledged.

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Table 1. Summary of agronomic, quality, and disease data for CDC Athabasca and yellow cotyledon check cultivars Agassiz and CDC Golden for all station-years based on data from Field Pea Co-operative Test-A in western Canada, 2012-2013

Cultivar	Yield (t ha ⁻¹)	Maturity (d)	Vine	Lodging	Seed wt (g 1000 sd ⁻¹)	Seed	Seed coat	Protein (%) ^d	Mycosphaerella blight		Powdery	Fusarium
			length (cm)	score (1-9) ^a		shape (1-5) ^b	breakage (%) ^c		MB	SK	mildew (0-9) ^f	wilt (%)
CDC Athabasca	5.14	99	93	3.0	291	2.8	6	24.4	5.4	5.8	0.0	43
CDC Golden	4.60	96	83	4.4	206	2.5	1	25.0	4.9	6.4	0.0	49
Agassiz	5.02	98	86	4.0	223	2.6	6	23.9	4.7	6.0	0.0	32
LSD (P=0.05)	0.26	0.7	3.2	0.5	6.4	0.1	1.9	0.6	1.6	1.6	-	19
Site-yr (<i>n</i>)	21	19	17	21	21	21	7	11	2	2	2	2

Note:^a1 = no lodging, 9 = completely lodged, assessed at physiological maturity.

^b1 = round, 5 = cubed.

^cBased on Reichert et al. (1986) with the following modifications: seed equilibration to 14% moisture content, use of equal seed volumes per well, instead of equal numbers of seeds per well, and without arcsin data transformation.

^dProtein content (N X 6.25) expressed as dry weight basis, predicted by near infrared spectroscopy (NIR).

^e0 = no disease; 9 = whole plant severely blighted.

^f0 = no disease; 9 = whole plant severely mildewed.