CDC Spruce green field pea

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

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CULTIVAR DESCRIPTION

CDC Spruce green field pea

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CDC Spruce, a green 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 Spruce has good lodging resistance, medium-sized, round seeds, and good yielding ability. CDC Spruce is adapted to the field pea growing regions of western Canada.

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

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

Development Centre (CDC), University of Saskatchewan. It was issued registration number 7974 on April 8, 2016 by the Canadian Food Inspection Agency, Variety Registration Office.

Breeding Methods and Pedigree

CDC Spruce was developed from the pedigree MP1838/MP1835 made in 2005. Both parents were developed by Agriculture and Agri-Food Canada. MP1835 was later registered as Mendel (Bing et al., 2009), while MP1838 was later registered as Hugo (Bing et al., 2009). The pedigree of Mendel is 9427004/Carneval. The pedigree of Hugo is AC Melfort/CDC Mozart. Line 9427004 and AC Melfort (Warkentin et al., 2000) were developed by Agriculture and Agri-Food Canada, Carneval was developed by Svalof Weibull (Sweden), and CDC Mozart (Vandenberg and Slinkard, 2002) was developed by the Crop Development Centre, University of Saskatchewan. The objective of this cross was the development of a high yielding cultivar with improved lodging resistance and good resistance to cotyledon bleaching. 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, 3007-6, was selected based on good yield, good lodging resistance, and resistance to green cotyledon bleaching. 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, Milden, Yorkton in Saskatchewan, as well as Lacombe, St. Albert, and

Vegreville, Alberta. It was then entered as CDC 3007-6, 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 and Forestry 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

3007-6, later named CDC Spruce, was derived by bulking 22 $F_{6:9}$ 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 Spruce had significantly greater yield than the check cultivars CDC Striker and Cooper (Table 1).

CDC Spruce had the same time to maturity on average as Cooper, two days later than

CDC Striker, with longer vines compared to the checks. In the lodging score, CDC

Spruce was similar to both checks. CDC Spruce had similar seed weight and shape as

CDC Striker, somewhat smaller and rounder compared to Cooper. Protein concentration

of CDC Spruce was the same on average as Cooper, somewhat less than CDC Striker.

CDC Spruce had similar percent seed coat breakage (Reichert et al., 1986) as Cooper,

somewhat greater than CDC Striker. CDC Spruce is adapted to the field pea growing

region of western Canada.

Other Characteristics

CDC Spruce has a semileafless leaf type, white flowers, green cotyledons, opaque seed coat and round, smooth seed. CDC Spruce 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 Spruce was resistant to powdery mildew, as was Cooper, while CDC Striker was susceptible (Table 1). CDC Spruce 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 Spruce is maintained by the Crop Development Centre, University of Saskatchewan, 51 Campus Drive, Saskatoon, Saskatchewan, Canada, S7N 5A8. Distribution rights for CDC Spruce are held by the Saskatchewan Pulse Growers (207-116 Research Drive, Saskatoon, Saskatchewan, Canada, S7N 3R3). Breeder seed of CDC Spruce was first distributed in 2016 to seed growers qualified as Select seed growers by the Canadian Seed Growers' Association.

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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 Spruce and green cotyledon check cultivars CDC Striker and Cooper 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 length (cm)	Lodging score (1-9) ^a	Seed wt (g 1000 sd ⁻¹)	Seed shape (1-5) ^b	Seed coat breakage (%) ^c	Protein (%) ^d	Bleach (1-5) ^e	Mycosphaerella blight		Powdery mildew (0-9) ^g	Fusarium wilt (%)
										MB	SK		
CDC Spruce	5.11	99	90	3.7	244	2.6	4	23.7	2.9	4.4	5.7	0.0	31
CDC Striker	4.63	97	78	3.6	241	2.5	1	25.1	3.0	4.4	5.8	7.0	29
Cooper	4.72	99	81	3.5	263	2.9	6	23.7	3.3	3.5	6.5	0.0	43
LSD (P=0.05)	0.26	0.7	3.2	0.5	6.4	0.1	1.9	0.6	0.1	1.6	1.6	0.4	19
Site-yr (<i>n</i>)	21	19	17	21	21	21	7	11	21	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).

^eGreen cotyledon bleaching score where 1=no bleaching to 5=completely bleached

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

^g0 = no disease; 9 = whole plant severely mildewed.