CDC Forest green field pea

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CULTIVAR DESCRIPTION

CDC Forest green field pea

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CDC Forest, a green cotyledon field pea (*Pisum sativum* L.) cultivar, was released in 2017 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 Forest has good lodging resistance, medium-sized, round seeds, and good yielding ability. CDC Forest is adapted to the field pea growing regions of western Canada.

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

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

Development Centre (CDC), University of Saskatchewan. It was issued registration number 8220 on March 31, 2017 by the Canadian Food Inspection Agency, Variety Registration Office.

Breeding Methods and Pedigree

CDC Forest was developed from the pedigree CDC Bronco/Nitouche//MP1846, whereby the F₁ from the simple cross was used to develop the second cross made in 2006. CDC Bronco was developed by the Crop Development Centre (CDC), University of Saskatchewan (Warkentin et al., 2005). Nitouche was developed by DLF Trifolium (Denmark). MP1846 was developed by Agriculture and Agri-Food Canada and was later registered as Argus (Bing et al., 2008). The objective of this cross was the development of a high yielding cultivar with powdery mildew (*Erysiphe pisi* DC.) resistance, improved lodging resistance and good resistance to cotyledon bleaching. Selection for seed size and shape was conducted in the F₁ and F₂ generations. Selection for powdery mildew resistance was conducted in the F₂ generation under natural infection conditions, with CDC Bronco and MP1846 being resistant parents. The F_{2:3} family was evaluated in field trials in Saskatoon in 2009. Preliminary replicated yield trials were conducted in the F₄ in Saskatoon in 2010. An F₄ line, 3422-8, was selected based on good yield, good lodging resistance, and good resistance to green cotyledon bleaching. This line was evaluated in replicated yield trials in Saskatoon, Rosthern, Meath Park, Pasqua and Wilkie, Saskatchewan and St. Albert, Alberta in 2011, then in 2012 at the same locations (except Pasqua) plus Mildred, Yorkton in Saskatchewan, as well as Barrhead, Lacombe, and

Vegreville, Alberta. It was then entered as CDC 3422-8, an F_{2.7} line, in the Field Pea Co-operative Registration Test-A in 2013 and 2014.

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

Alberta Agriculture Food and Rural Development research sites at Brooks, Barrhead, St. Albert, and Vegreville, AB, University of Saskatchewan in Saskatoon, Limerick, and Yorkton, SK, 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 3422-8, later named CDC Forest, was derived by bulking 60 F_{6.9} lines in 2014, after discarding phenotypic outliers.

Performance

In two years of testing in the Field Pea Co-operative Test-A (22 site-years), CDC Forest had significantly greater yield than the check cultivars CDC Striker and Cooper (Table 1). CDC Forest was one day later maturing on average than Cooper and three days later than CDC Striker, with similar vine length and lodging score compared to the checks. CDC Forest had somewhat smaller seed weight than the checks, with seed shape similar to Cooper, somewhat blockier than CDC Striker. Protein concentration of CDC Forest was similar to Cooper, somewhat less than CDC Striker. CDC Forest had less seed coat breakage (Reichert et al., 1986) than Cooper, but more than CDC Striker. CDC Forest is adapted to the field pea growing region of western Canada.

Other Characteristics

CDC Forest has a semileafless leaf type, white flowers, green cotyledons, opaque seed coat and round, smooth seed. CDC Forest was evaluated in mist-irrigated field disease nurseries at Morden and Saskatoon as part of the Field Pea Co-operative Registration Test in 2013 and 2014. CDC Forest was resistant to powdery mildew, as was Cooper, while CDC Striker was susceptible (Table 1). CDC Forest was moderately susceptible to mycosphaerella blight [*Mycosphaerella pinodes* (Berk. & Bloxam) Vestergren], with a lower mean score than the checks at Saskatoon, but similar at Morden. CDC Forest was 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 Forest is maintained by the Crop Development Centre, University of Saskatchewan, 51 Campus Drive, Saskatoon, Saskatchewan, Canada, S7N 5A8.

Distribution rights for CDC Forest are held by the Saskatchewan Pulse Growers (207-116 Research Drive, Saskatoon, Saskatchewan, Canada, S7N 3R3). Breeder seed of CDC Forest was first distributed in 2017 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 Forest, and to Dave Benallack and Craig Ells (also at the Crop Development Centre) for breeder seed production. Financial support of the Saskatchewan Pulse

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Table 1. Summary of agronomic, quality, and disease data for CDC Forest 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, 2013-2014

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 (0-9) ^f	SK (0-9) ^f		
CDC Forest	4.95	100	86	3.8	230	2.9	2	22.8	3.2	4.3	3.0	0.0	29
CDC Striker	4.18	97	80	3.9	242	2.5	0	24.0	3.0	4.5	3.9	7.4	25
Cooper	4.31	99	82	3.8	257	3.1	6	22.6	3.2	4.0	3.8	0.0	32
LSD (P=0.05)	0.33	0.9	6.9	0.5	9.3	0.2	2.4	0.9	0.2	1.3	0.7	1.0	22
Site-yr (n)	22	20	17	23	19	20	4	9	19	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.