CDC Tollefson yellow field pea

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Source: Canadian Journal of Plant Science, 102(3) : 767-769

Published By: Canadian Science Publishing

URL: https://doi.org/10.1139/CJPS-2021-0225

Canadian Science Publishing

CULTIVAR DESCRIPTION

CDC Tollefson yellow field pea

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Abstract: CDC Tollefson, a yellow cotyledon field pea (*Pisum sativum* L.) cultivar, was released in 2021 by the Crop Development Centre, University of Saskatchewan, SK, Canada, for distribution to Select seed growers through the Variety Release Committee of the Saskatchewan Pulse Growers. CDC Tollefson has good lodging resistance, medium time to maturity, medium-sized round seeds, mean seed protein concentration of 23.9%, and good yielding ability. It is resistant to powdery mildew and moderately susceptible to *Mycosphaerella* blight and *Fusarium* root rot. CDC Tollefson is adapted to the field pea growing regions of western Canada.

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

Résumé : CDC Tollefson est un cultivar de pois de grande culture (*Pisum sativum* L.) à cotylédons jaunes homologué en 2021 par le Crop Development Centre de l'Université de la Saskatchewan. La variété sera remise aux producteurs de semences Select par le biais du Variety Release Committee des Saskatchewan Pulse Growers. CDC Tollefson se caractérise par une bonne résistance à la verse, parvient à maturité au bout d'un temps moyen, donne des graines rondes de calibre moyen d'une teneur en protéines moyenne de 23,9 % et présente de bonnes aptitudes de rendement. Le cultivar résiste au blanc et est modérément sensible à la brûlure causée par *Mycosphaerella* de même qu'au pourridié fusarien. CDC Tollefson est acclimaté aux régions de l'Ouest canadien où l'on cultive le pois de plein champ. [Traduit par la Rédaction]

Mots-clés : pois de grande culture, *Pisum sativum* L., description de cultivar.

Introduction

CDC Tollefson is a field pea (*Pisum sativum* L.) cultivar developed by the Crop Development Centre (CDC), University of Saskatchewan (SK, Canada). It is named after Torvald (Torie) and Margaret (Marg) Tollefson who were strong financial supporters of the College of Agriculture and Bioresources, University of Saskatchewan. During their lives, they established multiple renewable entrance scholarships for students at the college. Torvald received a Diploma in Agriculture in 1936 and a Bachelor of Science in Agriculture degree in 1942. He died in 2009. Margaret Tollesfon's estate made an additional gift to the college in 2015, which will support these awards in perpetuity. CDC Tollefson was issued registration number 9203 on 12 Feb. 2021 by the Canadian Food Inspection Agency, Variety Registration Office.

Breeding Methods and Pedigree

CDC Tollefson was developed from the cross CDC 2648-21//MP1899/2847-21 made in 2011. CDC 2648-21 was a high yielding F_8 breeding line from the CDC's pea breeding program. Line 2847-21 was later registered as CDC Inca (Warkentin et al. 2018). MP1899 is from the Agriculture and Agri-Food Canada program in Lacombe and was later registered as AAC Lacombe (Bing et al. 2014).

The objective of this cross was the development of a high yielding cultivar with good lodging resistance and medium seed size. Selection for seed size and shape was conducted in the F_1 and F_2 generations in Saskatoon, SK. The $F_{2:3}$ family was evaluated in field trials in Saskatoon in 2013. Preliminary replicated yield trials were conducted in the F_4 in Rosthern and Meath Park, SK, in 2014. An F_4 line, 4947-2, was selected based on

Received 15 October 2021. Accepted 25 November 2021.

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Table 1. Summary of agronomic, quality, and disease data for CDC Tollefson and yellow cotyledon check cultivars CDC Amarillo and AAC Lacombe for all station-years based on data from Field Pea Co-operative Test-A in western Canada, 2017–2018.

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]	*Mycosphaerella* blight (0–9)[e]		Powdery mildew (0–9)[f]	*Fusarium* root rot (1–7)[g]
									AB	SK		
CDC Tollefson	4.06	95	86	2.5	244	2.5	4	23.9	1.7	4.6	0.0	5.0
CDC Amarillo	3.79	93	81	2.4	231	2.5	12	24.5	3.3	5.1	0.0	5.6
AAC Lacombe	3.70	93	77	2.7	260	2.5	9	23.1	2.3	5.2	0.0	5.5
LSD ($P = 0.05$)	0.16	0.6	2.5	0.2	4.1	0.1	2.0	0.7	1.2	0.4	—	1.3
Site-yr (n)	24	22	20	23	24	18	11	13	2	2	2	2

[a]1 = no lodging, 9 = completely lodged, assessed at physiological maturity.
[b]1 = round, 5 = cubed.
[c]Based 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.
[d]Protein concentration (N × 6.25) expressed as dry weight basis, predicted by near-infrared spectroscopy.
[e]0 = no disease; 9 = whole plant severely blighted. AB = Lethbridge data; SK = mean of two Saskatchewan trials per year.
[f]0 = no disease; 9 = whole plant severely mildewed.
[g]1 = no disease; 7 = tap root completely decayed.

good yield and good lodging resistance. This line was evaluated in replicated yield trials in Saskatoon, Rosthern, Scott, Kamsack, and Limerick, SK, and Lacombe, Alberta, in 2015, then in 2016 at the same five Saskatchewan locations plus Lucky Lake and Meath Park, SK, and Vegreville, Namao, and Barrhead, AB. It was then entered as CDC 4947-2, an $F_{2:7}$ line, in the Field Pea Co-operative (Co-op) Registration Test-A in 2017 and 2018. The Co-op trials were conducted by the following organizations at the following locations: British Columbia Ministry of Agriculture research site at Fort St. John, British Columbia, Alberta Agriculture and Forestry research sites at Brooks, Barrhead, Morinville, and Vegreville, AB, University of Saskatchewan in Saskatoon, Limerick, and Kamsack, SK, Agriculture and Agri-Food Canada (AAFC) Research Centres located in Indian Head, Scott, Melfort, and Swift Current, SK, Lacombe, AB, and Brandon, Manitoba, with disease evaluation at AAFC Lethbridge, AB and University of Saskatchewan, Saskatoon, SK. Breeder seed of CDC 4947-2, later named CDC Tollefson, was derived by bulking 19 $F_{6:9}$ lines in 2019, after discarding phenotypic outliers.

Performance

In 2 yr of testing in the Field Pea Co-operative Test-A (24 site-years), CDC Tollefson had significantly greater yield than the check cultivars CDC Amarillo and AAC Lacombe (Table 1), i.e., 108% of the mean of these two checks. CDC Tollefson was 2 d later maturing on average than the checks, with longer vines than both checks. CDC Tollefson had similar lodging resistance as both checks. CDC Tollefson had intermediate seed weight compared with the checks, and seed shape was similarly round as the checks. Seed protein concentration of CDC Tollefson was similar to CDC Amarillo, slightly greater than AAC Lacombe. CDC Tollefson had lower percent seed coat breakage than both checks. CDC Tollefson is adapted to the field pea growing region of western Canada.

Other Characteristics

CDC Tollefson has a semi-leafless leaf type, white flowers, yellow cotyledons, opaque seed coat and round, smooth seed. CDC Tollefson was evaluated in mist-irrigated field disease nurseries at Lethbridge and Saskatoon as part of the Field Pea Co-operative Registration Test in 2017 and 2018. CDC Tollefson was rated as resistant to powdery mildew (*Erysiphe pisi* var. *pisi*), as were CDC Amarillo and AAC Lacombe (Table 1). CDC Tollefson was moderately susceptible to *Mycosphaerella* blight [*Mycosphaerella pinodes* (Berk. & Bloxam) Vestergren], but with lower disease score than CDC Amarillo in AB, and lower disease score than both checks in SK (Table 1). CDC Tollefson was moderately susceptible to *Fusarium* root rot (multiple *Fusarium* species), similar to the checks (Table 1).

Availability of Propagating Material

Breeder seed of CDC Tollefson is maintained by the Crop Development Centre, University of Saskatchewan, 51 Campus Drive, Saskatoon, SK, Canada, S7N 5A8. Distribution rights for CDC Tollefson are held by the Saskatchewan Pulse Growers (207-116 Research Drive, Saskatoon, SK, Canada, S7N 3R3). Breeder seed of CDC Tollefson was first distributed in 2021 to seed growers qualified as Select seed growers by the Canadian Seed Growers' Association.

Acknowledgements

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 Tollefson, 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 the Saskatchewan Ministry of Agriculture is gratefully acknowledged.

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