

CDC Falcon winter wheat

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Fowler D. B. 1999. **CDC Falcon winter wheat**. *Can. J. Plant Sci.* **79**: 599–601. CDC Falcon is a high-yielding, lodging-resistant, semidwarf winter wheat (*Triticum aestivum* L.) with good winter hardiness and excellent stem and leaf rust resistance. CDC Falcon is the first winter wheat cultivar with a high level of leaf and stem rust resistance to be registered for production in western Canada. It is especially well adapted to the high-moisture and rust-hazard regions of the western Canadian prairies. CDC Falcon is eligible for grades of the Canada Western Red Winter Wheat class.

Key words: *Triticum aestivum* L., cultivar description, wheat (winter)

Fowler, D. B. 1999. **Nouveau cultivar de blé d'hiver CDC Falcon**. *Can. J. Plant Sci.* **79**: 599–601. CDC Falcon est un blé d'hiver demi-nain (*Triticum aestivum* L.) résistant à la verse et à haut rendement qui démontre une bonne rusticité hivernale et une excellente résistance à la rouille noire et à la rouille des feuilles. C'est le premier cultivar de blé d'hiver possédant ce niveau de résistance à être homologué pour la production dans l'Ouest du Canada. Il convient particulièrement bien aux zones irriguées et aux régions à climat humide ainsi qu'aux zones à rouille de l'ouest des Prairies. Le nouveau cultivar est admissible dans la classe des blés d'hiver roux de l'ouest canadien.

Mots clés: *Triticum aestivum* L., description de cultivar, blé (d'hiver)

CDC Falcon is a high-yielding, rust-resistant, semidwarf winter wheat (*Triticum aestivum* L.) that was developed at the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan. The Canadian Food Inspection Agency issued registration no. 4821 for CDC Falcon on 26 October 1998.

Pedigree and Breeding Method

CDC Falcon was selected from the progeny of a cross Norstar × 2/Vona//Abilene. The final cross was made in 1988. The F₁ and F₂ generations were produced in a greenhouse. F₂-derived F₃ lines and F₃-derived F₄ lines were grown in the field at Saskatoon where winter hardiness, height, straw strength, disease reaction, and plant and kernel type were evaluated. F₄ single plant selections were made in the fall of 1990. These selections were grown as F₅ head

rows in an artificially inoculated rust nursery under irrigation at Saskatoon in 1990–1991. Head rows and single plants from these head rows were selected for further evaluation in yield trials and in an artificially inoculated rust nursery in Saskatchewan in 1992. F₇ single rows, one of which was later designated S94-4, were selected in the 1993 disease nursery. The agronomic performance and disease reaction of S94-4 were evaluated in trials grown in Saskatchewan in 1994. S94-4 was entered into the Central Hard Red Winter Wheat Co-operative Tests in the fall of 1994 and was registered for production in Canada in 1998.

Performance

CDC Falcon had an average grain yield (Table 1) equal to CDC Kestrel (Fowler 1997a), which occupied 82% of western Canadian winter wheat acreage in 1998 (1998 Variety

Table 1. Grain yield (t ha⁻¹) of CDC Falcon compared with CDC Kestrel, CDC Clair, CDC Osprey, and CDC Harrier. Data from the Western and Central Hard Red Winter Wheat Cooperative tests (1995–1998)^z

Cultivar	Alberta		Saskatchewan			Southeast Manitoba	Mean
	Southwest	Central	Brown soils	Parkland	Irrigation		
CDC Kestrel	4.23	7.63	3	3.93	6.36	5.62	4.57
CDC Clair	4.21	7.83	3.05	4.05	5.74	5.19	4.54
CDC Osprey	3.96	7.66	2.95	4.03	5.63	5.21	4.46
CDC Harrier	4.21	7.97	3.13	3.91	6.91	5.69	4.69
CDC Falcon	3.75	8.01	3.05	3.66	7.28	5.68	4.57
LSD ($P \leq 0.05$)	0.3	0.44	0.1	0.15	0.5	0.35	0.12
No. of tests	4	4	8	15	4	4	39

^zAll means are weighted by the number of tests within a zone. Alberta locations included Lethbridge (Southwest) and Lacombe (Central). Saskatchewan locations included Elrose and Saskatoon (Brown soils); Clair, Indian Head, Melfort, and Yorkton (Parkland); and Saskatoon (Irrigation). The Manitoba location was Winnipeg.

Table 2. Agronomic performance of CDC Falcon compared with CDC Kestrel, CDC Clair, CDC Osprey, and CDC Harrier. Data from the Western and Central Hard Red Winter Wheat Cooperative tests (1995–1998)

Character	CDC Kestrel	CDC Clair	CDC Osprey	CDC Harrier	CDC Falcon	LSD ($P \leq 0.05$)	No. of tests
Winter survival (%)	95	98	98	97	94	3.9	5
Heading date (DOY) ^z	171	171	171	172	170	0.4	25
Maturity (DOY) ^z	216	215	214	216	214	0.5	29
Plant height (cm)	90	84	86	91	70	1.1	32
Lodging (0-9) ^y	3.6	4.1	2.6	2.6	0.8	0.8	12

^zDay of year^y0, all plants vertical; 9, all plants horizontal.**Table 3. Disease reactions of CDC Falcon compared with CDC Kestrel, CDC Clair, CDC Osprey, and CDC Harrier. Data from artificial rust infections at the University of Saskatchewan, Saskatoon (a and b) and the Plant Science Dept., University of Manitoba (W) using epidemic mixtures supplied by Agriculture and Agri-Food Canada in Winnipeg, and from a natural leaf rust epidemic at Clair, Sask. (C). Common bunt data are from trials inoculated by Agriculture and Agri-Food Canada staff at Lethbridge, Alta. Powdery mildew ratings were supplied by the Field Crop Development Centre, Alberta Agriculture**

	CDC Kestrel	CDC Clair	CDC Osprey	CDC Harrier	CDC Falcon
a) <i>Stem rust</i>					
1995a	60S ^z	50S	60S	0R	0R
1995b	20S	60S	50S	0R	0R
1996a	40 S	40 S	45 S	15 MS	0R
1996b	0 R	20 S	35 S	0 R	0R
1997a	60 M	60 MS	40 MS	40 MR	20MR
1997b	60 MS	40 S	50 S	10 M	0R
1997W	40 S	45 S	45 S	5 MR	0R
1998a	40 MS	60 M	60 MS	40 MR	10MR
1998b	20 MS	65 S	65 S	5 MR	0R
1998W	10 MS	20 MS-S	50 S	20R-MR	10MR-MS
b) <i>Leaf rust</i>					
1997a	45 S	40 S	35 S	60 S	5MR
1997C	20 S	15 S	50 S	15 S	5M
1997W	45 S	30 S	50 S	30 S	5M
1998a	20 MS	20 M	20 MS	40 MS	TR
1998b	40 MS	40 S	40 S	20 MS	5MR
1998W	35 MS-S	55 S	60 S	60 S	40S
c) <i>Common bunt</i>					
1996	25VS	24S	32VS	29VS	15S
1997	73VS	55S	78VS	N/A	60S
1998	68VS	57VS	68VS	N/A	40S
d) <i>Powdery mildew</i>					
1997	5	6	6.1	5.1	4

^zPercent infection and type of reaction: VS, very susceptible; S, susceptible; MS, moderately susceptible; MR, moderately resistant; TR, trace; R, resistant; N/A, not available.

Survey, Canadian Wheat Board, Winnipeg, Canada). It is especially well adapted to irrigation and the higher moisture regions of the western Canadian prairies.

The winter hardiness of CDC Falcon was similar to that of CDC Kestrel (Table 2). CDC Falcon headed 1 d earlier than CDC Kestrel, CDC Clair (Fowler 1997b), and CDC Osprey (Fowler 1997c) and 2 d earlier than CDC Harrier. It matured 1 to 2 d earlier than CDC Kestrel, CDC Clair, and CDC Harrier and at the same time as CDC Osprey. CDC Falcon had significantly shorter, stronger straw than the check cultivars. The short, strong straw of CDC Falcon makes it an attractive option for farmers who direct-seed and direct-combine harvest. It also allows farmers in higher moisture regions to adopt nitrogen fertilizer strategies aimed at both high grain yield and protein concentration targets (Fowler 1992).

The leaf rust (*Puccinia recondita* Rob. ex Desm.) reaction of CDC Falcon was superior to all other western Canadian winter wheat cultivars (Table 3). It had a stem rust (*Puccinia*

graminis Pers. f. sp.) reaction that was equal to or better than that of CDC Harrier, the only other winter wheat cultivar available in western Canada with a high level of stem rust resistance. The release of CDC Harrier represented a significant step towards achieving target leaf and stem rust objectives for the rust hazard area of western Canada and the release of CDC Falcon realized these objectives. CDC Falcon has given western Canadian farmers the first winter wheat option with leaf and stem rust resistance in the range of adapted spring wheat varieties.

CDC Falcon is eligible for grades of the Canada Western Red Winter Wheat Class. It had test weight similar to CDC Kestrel and CDC Harrier (Table 4). Its kernel weight and flour yield were at the low end of the range for the cultivars considered and it had a slightly higher flour ash than the check cultivars. CDC Falcon had a protein concentration higher than CDC Kestrel and CDC Harrier and similar to CDC Clair and CDC Osprey. It was rated superior to the

Table 4. Grain quality of CDC Falcon compared with CDC Kestrel, CDC Clair, CDC Osprey, and CDC Harrier. Data provided by K.P. Preston, Grain Research Laboratory, Canadian Grain Commission, Winnipeg, Manitoba, from analyses of Central Hard Red Winter Wheat Cooperative test composites (1995–1996). American Association of Cereal Chemists methods were followed for determining the various end-use suitability traits

Character	CDC Kestrel	CDC Clair	CDC Osprey	CDC Harrier	CDC Falcon	No. of tests
Test weight (kg hL ⁻¹)	81.9	82.3	82.5	81.4	81.7	2
Kernel weight (mg)	33.9	35	32.9	33.9	32.1	2
Wheat protein (%)	11.8	12.7	12.8	12.1	12.8	2
Starch damage (Farrand units)	17.1	17.1	15.3	18.1	16.6	2
Falling number (sec)	367	373	392	360	425	2
Amylograph peak viscosity (BU)	648	625	758	627	880	2
Flour yield (%)	76.6	75.2	77.2	76.5	74.3	2
Flour ash (%)	0.39	0.41	0.42	0.41	0.44	2
Flour color (Kent–Jones)	-1.7	-1.4	-2.1	-1.8	-1.7	2
Farinograph						
Absorption (%)	57.9	58.9	56.6	57.9	57.4	2
Dough development (min)	4.45	5.33	6.05	4.2	5.05	2
Stability (min)	7.1	10.1	14	7.7	11.5	2
Remix loaf volume (cm ³)	770	823	835	770	850	2

checks for both falling number and amylograph viscosity. Its physical dough properties were similar to CDC Clair. The loaf volume of CDC Falcon was the higher than the checks.

Other Characteristics

PLANT. Winter growth habit; coleoptile color green to red-dish; juvenile growth prostrate; leaves dark green; flag leaf dark green, mid-wide to wide, mid-long to long, intermediate attitude; sheath and leaf blades glabrous; auricles light red with few hairs; tillers many; straw short, internode hollow, culm neck straight, anthocyanin coloration at maturity absent.

SPIKES. Tapering, mid-dense, semi-nodding, mid-long, awned; glumes mid-wide, mid-long to long, glabrous, white; glume shoulders wanting, narrow; glume beak mid-long to long, acuminate.

KERNEL. Medium red, hard, mid-size to small, short to mid-long, mid-wide, elliptical to ovate; cheeks slightly angular to rounded; brush hairs mid-size to small, short; crease mid-wide, shallow to mid-deep; germ small to mid-size, oval to ovate.

Maintenance and Distribution of Pedigreed Seed

Breeder seed will be maintained by the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 5A8. Western Canadian distribution and multiplication of pedigreed seed stocks are handled by SeCan Association, 200 -57 Auriga Drive, Nepean, Ontario, Canada K2E 8B2.

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