

CDC Kestrel winter wheat

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Fowler, D. B. 1997. **CDC Kestrel winter wheat**. *Can. J. Plant Sci.* **77**: 673–675. CDC Kestrel is a lodging-resistant, high-yielding, semidwarf winter wheat with good winterhardness and rust tolerance that is superior to Norstar. CDC Kestrel is eligible for grades of the Canada Western Red Winter Wheat class.

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

Fowler, D. B. 1997. **Nouveau cultivar de blé d'automne CDC Kestrel**. *Can. J. Plant Sci.* **77**: 673–675. CDC Kestrel est un blé d'automne demi-nain à rendement élevé et résistant à la verse, doté en plus d'un bon niveau de résistance au froid de l'hiver et d'une meilleure tolérance aux rouilles que le témoin Norstar. Son grain est admissible aux grades de la catégorie des blés d'automne roux de l'ouest canadien (BAROC).

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

CDC Kestrel is a high-yielding, semidwarf winter wheat (*Triticum aestivum* L.) that was developed at the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan. The Food Production and Inspection Branch of Agriculture and Agri-Food Canada issued registration no. 3468 for CDC Kestrel on 8 October 1991.

Pedigree and Breeding Method

CDC Kestrel was selected from the progeny of a cross Norstar*2/Vona made in 1979. The F₁ and F₂ generations were produced in a greenhouse. F₂-derived F₃ lines and F₃-derived F₄ lines were grown in the field where winter hardiness, height, straw strength, and plant and kernel type were evaluated. Irrigation and dryland trials that were extensively damaged during the high stress winter of 1984–1985 identified the winter hardiness and straw strength of the GA insensitive line later designated S86-15 (W202). The agronomic performance of S86-15 was further evaluated in yield trials at six locations in Saskatchewan in both 1985–1986

and 1986–1987. S86-15 was entered into the Western and Central Hard Red Winter Wheat Cooperative Tests in the fall of 1987. Seed of 98 head rows selected from S86-15 was bulked in 1990 to produce the original breeder seed of CDC Kestrel.

Performance

CDC Kestrel had an average grain yield that was 116% of Norstar, the dominant cultivar in western Canada during the 6-yr test period considered in this summary (Table 1). However, as expected, this yield advantage was not consistent across western Canada. CDC Kestrel maintained a yield level similar to Norstar when grown under drought conditions that are often associated with the no-till re-crop management system (stubbing-in) used for winter wheat production in Saskatchewan. In contrast, the short, strong straw of CDC Kestrel made it particularly well adapted to higher moisture environments and irrigation. CDC Kestrel yielded 21 and 25% higher than Norstar when grown under the more

Table 1. Grain yield (t ha⁻¹) of CDC Kestrel compared with Norstar and Norwin. Data from the Western and Central Hard Red Winter Wheat Cooperative tests (1988–1993)

Cultivar	Southwest Alberta		Central Alberta	Saskatchewan			Southeast Manitoba	Mean
	Dryland	Irrigation		Brown soils	Parkland	Irrigation		
Norstar	3.37	3.45	5.66	2.28	2.88	4.23	3.72	3.28
Norwin	3.27	4.23	5.13	2.13	2.64	5.56	3.32	3.23
CDC Kestrel	3.77	4.34	6.83	2.32	2.98	6.10	4.65	3.79
LSD (<i>P</i> ≤ 0.05)	.31	.46	.84	.18	.16	.88	.61	.17
No. of tests	12	6	7	20	26	7	11	89

^aAll means are weighted by the number of tests within a zone. Alberta locations included Lethbridge, Coaldale, Etzekom, Spring Coulee, and Warner (southwest dryland); Lethbridge and Vauxhall (irrigation); and Bowden, Lacombe, and Olds (central). Saskatchewan locations included Shaunavon, Swift Current, Elrose, and Saskatoon (brown soils); Indian Head, Clair, Melfort, Canora, and Porcupine Plain (parkland); and Outlook and Saskatoon (irrigation). Southeast Manitoba locations included Portage la Prairie and Winnipeg.

Table 2. Agronomic performance of CDC Kestrel compared with Norstar and Norwin. Data from the Western and Central Hard Red Winter Wheat Cooperative tests (1988–1993)

Character	Norstar	Norwin	CDC Kestrel	LSD ($P \leq 0.05$)	No. of tests
Winter survival (%)	70	66	67	7.0	12
Heading date (DOY) ^z	171	169	169	0.8	16
Maturity (DOY) ^z	219	216	219	1.1	18
Plant height (cm)	112	69	96	2.1	53
Lodging (0–9) ^y	6.0	1.1	2.3	0.84	25

^zDay of year.^y0, all plants vertical; 9, all plants horizontal.**Table 3. Disease reactions of CDC Kestrel and Norstar based on data from the Western and Central Hard Red Winter Wheat Cooperative tests**

Cultivar	Year	Leaf rust (%) ^z		Stem rust (%) ^z		Common ^{ax} bunt (%)
		Manitoba ^y	Saskatoon ^x	Manitoba ^y	Saskatoon ^x	
Norstar	1988					53S
	1989	S				
	1990		30MS		60S	57S
	1991	20MS-S		75S-VS	65S	43S
Norwin	1992				60S	
	1988					60S
	1989	MS-S				
	1990		40MS		5MR	67S
	1991	80S		5R	0w	53S
CDC Kestrel	1992				5MR	
	1988					48S
	1989	MS-S				
	1990		20MR		20MR	46S
	1991	5MR-MS		20MS-S	0w	43S
	1992				30MS	

^zPercent infection and type of reaction: VS, very susceptible; S, susceptible; MS, moderately susceptible; MR, moderately resistant.^yRatings based on natural infection.^xRust ratings based on artificial infection using epidemic mixtures supplied by Agriculture and Agri-Food Canada in Winnipeg, Manitoba. Common bunt ratings from trials inoculated by Agriculture and Agri-Food Canada staff at Lethbridge, Alberta.^wSlow rusting. Plants matured before rust established on these lines.**Table 4. Comparison of CDC Kestrel and Norstar grain quality. Data provided by K. P. Preston, Grain Research Laboratory, Canadian Grain Commission, Winnipeg, Manitoba, from analyses of Western and Central Hard Red Winter Wheat Cooperative test composites (1988–1993). American Association of Cereal Chemists methods were followed for determining the various end-use suitability traits**

Character	Norstar	CDC Kestrel	LSD ($P \leq 0.05$)	No. of tests
Test weight (kg hL ⁻¹)	82.1	80.6	0.8	8
Kernel weight (mg)	32.7	32.4	1.0	8
Wheat protein (%)	12.8	12.1	0.2	10
Starch damage (Farrand units)	21.5	21.6	2.2	8
Falling number (sec)	351	371	44	8
Flour yield (%)	76.0	76.4	0.7	10
Flour ash (%)	0.41	0.41	.01	8
Flour color (Kent-Jones)	-1.2	-1.2	0.3	8
Farinograph				
Absorption (%)	57.9	58.1	0.3	10
Dough development (min)	5.1	3.5	0.4	8
Stability (min)	7.7	5.7	0.3	8
Baking strength index	104.1	105.5	1.9	8
Remix loaf volume (cm ³)	805	772	55	10

favorable moisture conditions found in central Alberta and southeastern Manitoba, respectively. This yield advantage increased to 126 and 144% of Norstar in irrigated tests in Alberta and Saskatchewan, respectively. The large yield advantage over Norstar under dryland production in Manitoba and irrigation in Saskatchewan may have been partially due to the superior stem and leaf rust reaction of CDC Kestrel (Table 3). When compared with Norstar, the

short, strong straw of CDC Kestrel also allows farmers in higher moisture regions the opportunity to more effectively capitalize on agronomic inputs, such as nitrogen fertilizer (Fowler 1992). CDC Kestrel out-yielded the shorter-strawed Norwin in all the western Canadian environments considered in the cooperative testing program (Tables 1 and 2).

The winter hardiness of CDC Kestrel was similar to Norstar and Norwin and its date of maturity was the same as

Norstar but 3 d later than Norwin (Table 2). The stem and leaf rust reactions of CDC Kestrel were superior to Norstar while its common bunt ratings were similar to Norstar (Table 3).

CDC Kestrel is eligible for grades of the Canada Western Red Winter Wheat Class. CDC Kestrel has a baking strength index that is similar to Norstar, but it has weaker physical dough properties, lower test weight, and lower grain protein concentration than Norstar (Table 4). The protein dilution associated with the expression of the very high yield potential of CDC Kestrel has been partially responsible for its low grain protein concentration in cooperative tests (Fowler 1992). However, when compared with Norstar, the short, strong straw of CDC Kestrel allows for the use of higher nitrogen fertilizer rates thereby providing the farmer with the opportunity to achieve both target grain protein concentration and increased yield.

Other Characteristics

PLANT. Winter growth habit; coleoptile color reddish-green; juvenile growth prostrate; leaves dark green with slight waxy bloom; flag leaf dark green, mid-wide, mid-long, intermediate attitude; sheath and leaf blades glabrous, auricles white to purplish with few hairs; many tillers; straw mid-long, internode hollow, culm neck fine and straight, no anthocyanin coloration at maturity.

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

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

Maintenance and Distribution of Pedigreed Seed

Breeder seed originating from 98 breeder lines will be maintained by the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 5A8. 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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Fowler, D. B. 1992. Cultivar development and selection. Winter wheat production manual. Ducks Unlimited Canada, Yorkton, SK. pp. 801–818.