

# CDC Makwa hard red spring wheat

---

Hughes, G. R. and Hucl, P. 1992. **CDC Makwa hard red spring wheat**. *Can. J. Plant Sci.* **72**: 225–227. CDC Makwa is a hard red spring wheat (*Triticum aestivum* L.) cultivar which performs best in the Brown and Dark Brown soil zones of Saskatchewan and Alberta. CDC Makwa yields, on average, 3% more than Katepwa and is similar in maturity and quality.

Key words: Cultivar description, *Triticum aestivum* L., wheat (spring)

Hughes, G. R. et Hucl, P. 1992. **CDC Makwa, nouveau cultivar de blé roux vitreux de printemps**. *Can. J. Plant Sci.* **72**: 225–227. Le nouveau cultivar CDC Makwa est un blé roux vitreux de printemps (*Triticum aestivum* L.) qui est à son meilleur dans le zones de sols Bruns et Brun foncé de la Saskatchewan et de l'Alberta. Son rendement dépasse de 3% en moyenne celui de Katepwa dont il a par ailleurs la même précocité et la même qualité.

Mots clés: Description de cultivar, *Triticum aestivum* L., blé de printemps

---

CDC Makwa hard red spring wheat (*Triticum aestivum* L.) was developed jointly by the Department of Crop Science and Plant Ecology and the Crop Development Centre, University of Saskatchewan. Registration no. 3311 was issued for CDC Makwa on 18 May 1990 by the Food Production and Inspection Branch, Seed Division, Variety Registration Office, Agriculture Canada, Ottawa.

## Pedigree and Breeding Method

CDC Makwa was selected from the cross S7432/Manitou//Benito. S7432 is a University of Saskatchewan experimental spring wheat line with the pedigree Huelquen/Wisconsin 261. The three-way cross was made in 1976 and the resulting population was advanced to the F<sub>5</sub> generation by a modified single-plant bulk method of selection. Selection criteria in the F<sub>2</sub> to F<sub>5</sub> generations were plant height, maturity and rust resistance. Single-plant progeny rows were grown in the F<sub>6</sub> generation and each selected row harvested in bulk. The F<sub>6</sub>-derived lines were evaluated for yield and quality in the F<sub>7</sub> to F<sub>9</sub> generations; additional selection criteria were straw strength and disease resistance.

One F<sub>6</sub>-derived line (W82382) was entered in the Western Bread Wheat 'B' Test in 1985. From 1986 to 1988 this line was evaluated in the Western Bread Wheat Cooperative Test as BW606. Breeder seed of CDC Makwa consists of 159 breeder lines which are individually maintained. Each line was derived from a single F<sub>10</sub> head selection.

## Performance and Adaptation

CDC Makwa out-yielded Katepwa by 2% in the Brown soil zone and 3% in the Dark Brown soil zone (Table 1). Similarly, CDC Makwa yielded 3% more than Neepawa in the Brown soil zone and 5% more in the Dark Brown soil zone. CDC Makwa yielded equal to Laura in the Brown soil zone but 6% less in the Dark Brown soil zone (Table 1). In general, CDC Makwa has a grain yield intermediate between that of Katepwa and Laura (Table 1).

CDC Makwa is similar in maturity to Neepawa, 1 d later than Katepwa and 2 d earlier than Laura. It is taller than the check cultivars, has similar lodging resistance to Katepwa and Laura but is not as good as Neepawa. CDC Makwa has a test weight similar to that of Neepawa and Katepwa but lower than Laura. The kernel weight of CDC Makwa is similar to that of Laura but higher than that of Neepawa and Katepwa (Table 2).

Table 1. Grain yield ( $t\ ha^{-1}$ ) of CDC Makwa wheat and check cultivars in the Western Bread Wheat Cooperative Tests (1986-1988)

Cultivar	Soil zone <sup>z</sup>			Mean
	Brown	Dark Brown	Black	
Neepawa	2.26	2.67	3.76	2.72
Katepwa	2.29	2.72	3.52	2.73
Laura	2.33	3.00	3.47	2.92
CDC Makwa	2.33	2.81	3.59	2.81
SE	0.04 (5) <sup>y</sup>	0.04 (17)	0.12 (3)	0.03 (25)

<sup>z</sup>Brown soil zone sites were Swift Current, Stewart Valley and Kindersley; Dark Brown soil zone sites were Lethbridge, Irricana, Regina, Watrous, Saskatoon, Scott and Acme; the Black soil zone site was Ellerslie.

<sup>y</sup>Number of station years.

Table 2. Agronomic characteristics of CDC Makwa wheat and check cultivars in the Western Bread Wheat Cooperative Tests (1986-1988)

Cultivar	Maturity (d)	Height (cm)	Lodging (1-9) <sup>z</sup>	Test wt. (kg hL <sup>-1</sup> )	Kernel wt. (mg)
Neepawa	99	75	2.6	79.3	31.1
Katepwa	98	75	3.2	79.4	31.5
Laura	101	73	3.1	80.0	32.2
CDC Makwa	99	77	3.2	79.1	32.8
SE	0.7 (21) <sup>y</sup>	0.5 (25)	0.2 (9)	0.2 (23)	0.3 (23)

<sup>z</sup>1 = no lodging, 9 = severely lodged.

<sup>y</sup>Number of station years.

Table 3. Disease reactions of CDC Makwa and check cultivars in the Western Bread wheat Cooperative Tests (1986-1988)

Cultivar	Year	Leaf rust	Stem rust	Common bunt	Loose smut	Common root rot
Neepawa	1986	30M <sup>z</sup>	10R	4R	12MR	28 <sup>y</sup>
	1987	40MR-MS	10R	13S	3R	27
	1988	20MR	20R	16I		45
Katepwa	1986	10M	10R	1R	16MR	29
	1987	30MR-MS	5R	5I	5R	26
	1988	20MR	10R	1R		47
Laura	1986	TR	5R	46S	56S	32
	1987	3R	5R	34S	52S	21*
	1988	10MR	5VR	29S		35**
CDC Makwa	1986	20M	10R	12I	12MR	30
	1987	30MR	5R	7I	8R	26
	1988	10R	10R-MR	8I	0R	42

<sup>z</sup>Percent infection and reaction type. Type of reactions: TR = trace resistant; VR = very resistant; R = resistant; MR = moderately resistant; I = intermediate resistance; M = intermediate to MR and MS; MS = moderately susceptible; S = susceptible.

<sup>y</sup>Disease index.

\*,\*\*Differed from Neepawa at the 5 and 1% probability levels, respectively. SE = 1.7, Station years = 9.

CDC Makwa is best adapted to the Brown and Dark Brown soil zones of Saskatchewan and Alberta. CDC Makwa is resistant to prevalent races of stem rust (caused by *Puccinia graminis* Pers. f. sp. *tritici* Eriks. & E. Henn.) and is moderately resistant to leaf rust (caused by *Puccinia recondita* Rob. ex Desm. f. sp. *tritici*), being similar to Katepwa, better than Neepawa but more susceptible than Laura (Table 3). CDC Makwa is equal to Neepawa and Katepwa for resistance to common bunt (caused by *Tilletia foetida* (Wallr.) Liro and *Tilletia caries* (DC.) Tul.), loose smut (caused by *Ustilago tritici* (Pers.) Rostr.) and common root rot (caused by *Bipolaris sorokiniana* (Sacc. in Sorok.) Shoem.) (Table 3).

### Other Characteristics

GROWTH HABIT. Spring

COLEOPTILE COLOR. Green

LEAVES. Medium green, glabrous, slight waxy bloom.

TILLERS. Intermediate number.

CULM. Slight waxy bloom on upper internode, little or no anthocyanin at maturity, medium straight neck, hollow internodes, three nodes.

HEADING. Mid-season, similar to Katepwa.

PHOTOPERIOD RESPONSE. Sensitive.

SAWFLY REACTION. Susceptible.

SHATTERING. Resistant, similar to Katepwa.

SPROUTING TENDENCY. Medium, similar to Katepwa.

### Spike Characteristics

AWNS. Apically awnletted.

SHAPE. Strap or oblong, mid-dense, mid-long.

ATTITUDE. Erect.

GLUMES. Glabrous, white at maturity, mid-wide, mid-long; shoulders square, mid-wide; beaks narrow, acute, slight basal folds on lower glumes.

### Kernel Characteristics

COLOR. Medium red.

TEXTURE. Hard.

SHAPE. Mid-size, mid-wide, mid-long, ovate.

GERM. Mid-size, oval.

CREASE. Narrow, shallow.

CHEEKS. Angular to rounded.

BRUSH. Mid-size, hairs mid-long.

GRADE ELIGIBILITY. Top grades of Canadian Western Red Spring Wheat.

### Maintenance and Distribution of Pedigreed Seed

Breeder seed will be maintained by the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0. Distribution and multiplication of pedigreed seed stocks will be handled by SeCan Association, 200-57 Auriga Drive, Nepean, Ontario, Canada K2E 8B2.

Appreciation is expressed to D. Lucuik, D. Beauchesne, K. Wu, D. Cyca, and D. Bergh for their technical assistance in developing this bread wheat cultivar.

### G. R. Hughes<sup>1</sup> and P. Hucl<sup>2</sup>

<sup>1</sup>Department of Crop Science and Plant Ecology, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0; and <sup>2</sup>Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0. Received 12 Apr. 1991, accepted 8 July 1991.