

## **CDC Silex spring spelt wheat**

### **Breeding background:**

CDC Silex (04SPELT49) was selected from the cross PI 348771/Oberkulmer. PI 348771 is an awned, hulled spring spelt accession (land race) originally collected in northern Spain. Oberkulmer is a winter spelt wheat from Switzerland and is a 1930's selection from a Swiss land race.

The cross between PI 348771 and Oberkulmer was made during the summer of 1994. The F<sub>1</sub> generation was grown in the field in 1995. The F<sub>2</sub> and F<sub>3</sub> generations were grown in bulk plots at Saskatoon during the 1996 and 1997 crop seasons, respectively. F<sub>3</sub>-derived F<sub>4</sub> head rows were grown in a dryland nursery in 1998. The F<sub>4</sub> rows were selected on the basis of earlier heading relative to CDC Nexon, lack of awns, reduced height and lodging. Selected lines were evaluated in an unreplicated yield plot nursery in 1999 and selected using the same criteria as in 1998, with the addition of yield, grain protein concentration and SDS sedimentation volume. A line identified as 00SPELT20 was subsequently evaluated in local yield tests in 2000 at four sites and in the Private Spring Spelt Wheat Test from 2001 to 2003, under the same identity. Single spikes were picked from an F<sub>7</sub> increase plot and grown as F<sub>8</sub> short breeder rows (1.3 m) in 2002. When a subset of these breeder rows was grown in long breeder rows (50 m) in 2003, variability for days to heading, days to maturity and plant height precluded bulking the individual breeder rows. Early heading breeder rows were tagged and harvested individually. A set of these selections were grown in replicated trials at a single site in 2004 and three sites in 2005. The line 04SPELT49 was subsequently evaluated in the Private Spring Spelt Wheat Test from 2006 to 2011. CDC Silex is F<sub>7</sub>-derived and breeder seed was developed from spikes harvested in the F<sub>13</sub> generation

**AREA OF ADAPTATION:** Longer crop season wheat growing areas of Saskatchewan and Alberta.

**STRENGTHS:** High yield coupled with earlier maturity and shorter straw. Intermediate reaction to FHB with low DON values.

**WEAKNESSES:** Those inherent to spelt wheat: weaker straw, susceptibility to stem rust, spike shattering if left standing past combine-maturity and the requirement for de-hulling.

**DESCRIPTION:** CDC Silex spring spelt is awnless with purple-brown glumes and hollow stems. Based on 44 site-years of data from the Private Spring Spelt Wheat Test, CDC Silex was 19% and 4% higher yielding (hull on basis) than CDC Nexon and CDC Zorba, respectively but 3% lower yielding than CDC Origin. CDC Silex was shorter-strawed than the spelt checks with an intermediate lodging score (Table1). CDC Silex was earlier heading and maturing than the spelt checks. CDC Silex had a higher test weight than the spelt checks but a lower kernel weight. The threshability of CDC Silex was intermediate (Table 1). CDC Silex had a higher grain protein concentration than CDC Nexon and CDC Zorba but a lower protein concentration than CDC Origin.

CDC Silex gave an intermediate reaction to prevalent races of leaf rust but was susceptible to stem rust. CDC Silex was resistant to loose smut and bunt. The average (n=8 trials) FHB index for CDC Silex was 32% while the spelt checks ranged from 15 to 23%. The average DON value (n=4) was lower than that of the checks.

CDC Silex has a soft red kernel and weak gluten characteristics desired for spelt wheat marketing (Table 2). In seven years of testing CDC Silex consistently had a higher Falling Number value, higher RVA peak value and lower alpha-amylase activity than the spelt checks.

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**Table 1. Summary of agronomic data (Private Spring Spelt Registration Test (2006-2011))**

Entry	NAME	Grain		Heading	Maturity	Height	Lodging	Test	Kernel	Thresh	Grain
		Yield	%								
		kg/ha	CDC Nx	days	days	cm	1 to 9	kg/hL	mg	%	%
1	AC Barrie	3945	<b>101.2</b>	60.0	98.1	94.8	1.6	78.9	35.1	98	16.1
2	CDC Nexon	3898	<b>100.0</b>	68.9	105.0	124.4	6.4	76.3	40.0	40	15.2
3	CDC Zorba	4444	<b>114.0</b>	66.8	102.1	123.9	3.3	75.7	39.6	41	15.9
4	CDC Origin	4780	<b>122.6</b>	65.9	102.9	119.1	2.4	76.7	39.0	18	16.6
5	CDC Silex	4631	<b>118.8</b>	63.5	101.2	114.9	3.3	77.4	38.5	28	16.1
	# of site-years	44		28	32	42	23	44	44	44	44

**Table 2. Quality analyses for CDC Silex, average of seven years (2006-2012)**

Entry		Protein	Flour		Flour	SKCS	Farinograph					CSP Bake Test			Mixing	Mixing	FN	RVA Pk	a-amylase	
			14%amb	yield			FI Ash	protein	FABS	DDT	MTI	STA	LV	App	Struct	CrColor				Energy
			14%amb	(%)	14%amb	H.I.	Agtron	(%)	(min)	(BU)	(min)	(cc)				Whr/Kg	(min)	(sec)	(RVU)	(c.u.)
1	AC Barrie	14.9	74.8	0.5	14.1	57.9	51.7	62.9	5.6	28.1	7.5	1003	3.7	3.2	3.2	6.8	4.8	427	159	0.112
2	CDC Nexon	14.3	73.6	0.5	13.2	27.0	43.1	56.8	3.2	50.7	3.7	914	3.2	2.9	2.9	4.2	3.0	294	109	0.148
3	CDC Zorba	15.0	72.5	0.5	13.9	25.6	48.2	58.9	2.8	56.9	3.3	932	3.2	2.8	2.7	4.1	2.6	257	71	0.178
4	CDC Origin	15.6	73.8	0.6	14.6	30.2	43.0	58.8	2.9	61.6	2.9	918	2.9	2.6	2.8	3.4	2.2	320	95	0.159
5	CDC Silex	15.1	72.7	0.6	13.8	33.2	36.8	59.7	2.8	51.9	2.9	885	2.9	2.6	2.8	4.0	2.6	372	150	0.104