

OSLO RED SPRING WHEAT

Oslo red spring wheat (*Triticum aestivum* L.) is a mid-season, semidwarf wheat with intermediate yield potential, eligible for grades of Canada Prairie Spring. Oslo performs best in the black soil zone; it is not well adapted to areas prone to pre-anthesis drought stress. Breeder seed of Oslo will be maintained by Saskatchewan Wheat Pool Product Development, Watrous, Saskatchewan.

Key words: *Triticum aestivum*, wheat (spring), high yielding, cultivar description

[Blé roux de printemps Oslo.]

Titre abrégé: Blé roux de printemps Oslo.

Le blé roux de printemps Oslo (*Triticum aestivum* L.) est une variété de mi-saison seminaire, capable de produire un rendement intermédiaire et admissible aux catégories de blé de printemps des Prairies canadiennes. Oslo donne les meilleurs résultats dans la zone de sols noirs; il n'est pas bien adapté aux régions sujettes à la sécheresse avant l'anthèse. Les semences de l'obteneur de la variété Oslo seront conservées par le Saskatchewan Wheat Pool Product Development, à Watrous (Saskatchewan).

Mots clés: *Triticum aestivum*, blé de printemps, rendement élevé, description du cultivar

Oslo red spring wheat (*Triticum aestivum* L.), the second cultivar registered for the Canada Prairie Spring class, was developed by Nickerson American Plant Breeders (NAPB), Berthoud, Colorado. Oslo was tested from 1985 to 1988 as HY925 and PT807 in the High Yielding and Parkland Wheat Cooperative Tests, respectively. Registration number 2803 was issued for Oslo on 18 Mar. 1987 by the Plant Products Directorate, Food Production and Inspection Branch, Agriculture Canada, Ottawa, Ont.

Breeding Methods and Pedigree

Oslo originated from a 1972 single plant selection from a CIMMYT F₂ population with the pedigree Sonora 64/Yaqui 50E//Guajalote/3/Inia/4/Ciano//Elgan/Sonora 64. Selection criteria were straw strength and maturity. Based on the high yield of an F₄ bulk plot (HS 74183), one of five F₃-derived F₄ rows was selected and subsequently yield tested in 1975. From this preliminary yield trial, 132 plants were selected and seeded as single rows for initial purification (F₆ generation). One hundred seventy-eight plants were selected from this increase and grown as rows in 1977. Of these rows, 11 were discarded

(6%) due to off-type beaks. Two hundred random plants from the 1977 purification increase plot were grown as plant row increases in 1978, with only one row discarded as off-type. Breeder seed originated from the 1977 and 1978 plant row increases and thus consisted of F₉ and F₁₀ seed. A U.S. Plant Patent was obtained for Oslo on 19 Nov. 1981. Reconstitution of breeder seed took place in 1985 from the same 1977/1978 seed source and formed the basis of breeder seed production in Canada.

Performance and Adaptation

Oslo yielded 87 and 88% of HY320 in the High Yielding and Parkland Wheat Cooperative Tests in western Canada (1985-1988), respectively. In provincial regional trials, Oslo yielded 78% of HY320 in Alberta, 88% of HY320 in Saskatchewan, and 94% of HY320 in Manitoba. Overall, Oslo performs best in the black soil zone, where moisture is less likely to be a limiting factor (Table 1). Observation suggests that the substantial yield variability of Oslo in zone 2 (Brown and Dark Brown soil zones, lower rainfall areas) and zone 3 (Grey-Wooded soil zone, short growing season) is the result of pre-anthesis drought stress. Under drought-stressed conditions, yields are comparable to Neepawa,

Table 1. Grain yield ($^{\circ}00 \text{ kg ha}^{-1}$) of Oslo and check cultivars in the High Yielding Wheat Cooperative Tests (1985–1988), Parkland Wheat Cooperative Tests (1985–1988) and the Alberta, Saskatchewan and Manitoba Regional Grain Variety Trials (1986–1988)

Cultivar	Zone 1 [†]	Zone 2	Zone 3	Mean
<i>High Yielding Wheat Cooperative Tests</i>				
Oslo	34.1	28.5	46.7	32.9
HY320	37.9	33.8	55.8	38.0
Glenlea	35.3	30.0	47.4	34.3
SE‡	0.3	0.2	2.0	0.2
Tests	25§	25	6	56§
<i>Parkland Wheat Cooperative Tests</i>				
Oslo	37.8	41.0	39.9	40.2
HY320/HY368¶	42.2	45.4	46.3	45.7
Neepawa	36.3	36.7	36.3	36.5
SE	—	0.4	0.5	0.4
Tests	3	20	21	44
<i>Alberta Regional Grain Variety Trials</i>				
Oslo	51.9	35.5	37.7	39.3
HY320	61.7	46.3	50.3	50.3
Neepawa	45.2	36.3	37.0	38.2
SE	1.1	0.5	0.6	0.5
Tests	7	20	8	35
<i>Saskatchewan Regional Grain Variety Trials</i>				
Oslo	29.6	26.3	47.2	30.4
HY320	33.7	29.1	54.3	34.4
Katepwa	27.2	26.3	38.4	28.1
SE	0.4	0.4	1.2	0.3
Tests	17	13	4	34
<i>Manitoba Regional Grain Variety Trials</i>				
Oslo	28.0	—	31.0	28.3
HY320	30.1	—	30.8	30.2
Neepawa	26.0	—	25.9	26.0
SE	0.2	—	1.1	0.2
Tests	40	—	5	45

†Zone 1 = Black Soil zone, high rainfall areas; Zone 2 = Brown and Dark Brown soil zone, lower rainfall areas; Zone 3 = Grey-Wooded soil zone, short season area.

‡SE of the mean using the pooled cultivar \times location mean square for each year.

§One test less for Oslo.

¶HY320 was not included in the 1988 tests.

whereas the long-term averages in the Parkland Wheat Cooperative Tests and the provincial regional grain variety trials show Oslo with a three to ten percent yield advantage. Under irrigated conditions in the southern grain belt of Alberta and Saskatchewan (Table 2), Oslo was equal in yield to Glenlea but 20% lower yielding than HY320.

On average, Oslo is 4 d earlier maturing than HY320 (Table 3), which tends to have a prolonged ripening period under cool, moist conditions (DePauw et al. 1987). Oslo is a semidwarf, being 3 cm shorter than HY320

and 22 cm shorter than Glenlea; lodging resistance is very good. Test weight and kernel weight are slightly lower than HY320.

The kernel hardness of Oslo is intermediate between HY320 and Neepawa (Table 4). In combination with protein content and gluten strength, this cultivar satisfies the end-use requirements for wheat of the Canada Prairie Spring class.

Description

SPIKES. Tapering, middense, long, erect; awns midlong, slightly spreading; glumes

Table 2. Agronomic performance of Oslo and check cultivars in the Irrigated High Yielding Cooperative Tests (1985–1988)

Cultivar	Yield ($^{\circ}00 \text{ kg ha}^{-1}$)	Maturity (d)	Height (cm)	Lodging (1-9) [†]
Oslo	37.3	106	73	1.0
HY320	46.9	107	76	2.6
Glenlea	37.0	108	94	1.0
SE‡	0.5	0.3	1.1	—
Tests	17	13	11	3

†1-9: 1 = no lodging, 9 = completely lodged.

‡SE of the mean using the pooled cultivar \times location mean square for each year.

Table 3. Agronomic performance of Oslo and check cultivars in the High Yielding Wheat Cooperative Tests (1985–1988)

Cultivar	Yield ($^{\circ}00 \text{ kg ha}^{-1}$)	Maturity (d)	Height (cm)	Lodging (1-9) [†]	Test wt. (kg hL^{-1})	1000 kernel wt (g)
Oslo	32.9	98	66	2.0	78.5	37.4
HY320	38.0	102	69	3.1	79.2	39.4
Glenlea	34.3	101	88	3.4	79.1	42.6
SE‡	0.2	0.2	0.3	0.1	0.1	0.2
Tests	56	38	55	16	48	48

†1-9: 1 = no lodging, 9 = completely lodged.

‡SE of the mean using the pooled cultivar \times location mean square for each year.

Table 4. Kernel hardness of Oslo and check cultivars as measured by Particle Size Index

Cultivar	Particle size index			
	1985	1986	1987	1988
Oslo	61.4	63.1	63.0	62.8
HY320	63.3	65.2	62.5	67.1
Glenlea	52.4	54.0	53.7	51.9
Neepawa	51.1	54.2	55.2	—

midwide, long, pubescent, white; glume shoulders oblique, medium wide; glume beaks midwide, acute; medium basal folds; color medium green 5 d post-heading, slight waxy bloom, white at maturity.

KERNEL. Color medium red; shape long, midwide, elliptical; cheeks rounded; brush midsize, midlong hairs; crease narrow, shallow; germ midsize, oval; slightly harder than HY320.

MATURITY. About 4 d earlier than HY320.

STATURE. Semidwarf, averaging 3 cm shorter than HY320 and 22 cm shorter than Glenlea.

LODGING TOLERANCE. Better than HY320.

SHATTERING RESISTANCE. Good.

DROUGHT TOLERANCE. Susceptible to pre-anthesis drought stress.

DISEASE REACTION. Good resistance to the prevalent races of stem rust (*Puccinia graminis* ssp. *tritici*); resistant to the prevalent races of leaf rust (*P. recondita* ssp. *tritici*); intermediate reaction to common bunt (*Tilletia caries* and *T. foetida*); highly susceptible to loose smut (*Ustilago tritici*); moderately susceptible to common root rot (*Cochliobolus sativus*) (Table 5).

PHOTOPERIOD RESPONSE. Insensitive.

Maintenance and Distribution of Pedigreed Seed

Breeder seed will be maintained by Saskatchewan Wheat Pool, Product Development Branch, Watrous, Saskatchewan, Canada S0K 4T0. Distribution and multiplication of pedigreed seed stocks will be handled by

Table 5. Disease reactions of Oslo and check cultivars in the High Yielding Wheat Cooperative Tests (1985-1988)

Cultivar	Year	Stem rust	Leaf rust	Common bunt	Loose smut	Common root rot
Oslo	1985	20 [†] VR‡	TR	17I	92HS	46§
	1986	20R	TR,10MR	14I	79HS	30
	1987	10R	10R-MR	10I	78HS	28
	1988	10R	10R	19S-	—	76
HY320	1985	10VR	1R,20MR	53S	93HS	39
	1986	20R	10R	76S	—	36
	1987	20R	10R	42S	97HS	29
	1988	30R-MR	10R	54S	100HS	66
Glenlea	1985	10R	TR	21I	OR	27
	1986	5R	TR	2R	—	19
	1987	5R	3VR	13S	OR	16
	1988	10R	5M	21S	OR	49
Neepawa	1985	10R	40M	29S	24MR	33
	1986	10R	30M	6I	—	27
	1987	5R	40MR-MS	13S	8R	25
	1988	—	—	—	—	—

[†]Percent infection.

[‡]Types of reaction: 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; HS = highly susceptible; — = no data available.

[§]Disease index.

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DePauw, R. M., Hurd, E. A., Townley-Smith, T. F., McCrystal, G. E. and Lendrum, C. W. B. 1987. HY320 red spring wheat. Can. J. Plant Sci. 67: 807-811.

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