CULTIVAR DESCRIPTION

AC Ultima spring triticale

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McLeod, J. G., Pfeiffer, W. F., DePauw, R. M. and Clarke, J. M. 2000. **AC Ultima spring triticale.** Can. J. Plant Sci. **80**: 831–833. AC Ultima, a spring triticale cultivar (*X Triticosecale* Wittmack), is widely adapted to the Canadian Prairies. AC Ultima represents an improvement in Hagberg Falling Number, which is usually associated with improved harvest-time sprouting resistance. AC Ultima expressed high grain yield, early maturity, heavy kernels and excellent lodging resistance compared to the check cultivars. AC Ultima is very resistant to the prevalent races of leaf rust, stem rust, and common bunt and resistant to common root rot. AC Ultima is eligible for the grades of Canada Triticale.

Key words: Cultivar description, triticale (spring, *X Triticosecale* Wittmack), Hagberg Falling Number, yield, maturity, disease resistance, seed size

McLeod, J. G., Pfeiffer, W. H., DePauw, R. M. et Clarke, J. M. 2000. **Cultivar de triticale de printemps AC Ultima**. Can. J. Plant Sci. **80**: 831–833. AC Ultima est un cultivar de triticale de printemps, (*X Triticosecale* Wittmack), doté d'une large adaptation aux conditions de culture des Prairies canadiennes. Il apporte une amélioration quant au temps de chute de Hagberg, caractère habituellement relié à la résistance à la germination sur pied à l'époque de la moisson. Aux essais, il a démontré, par rapport aux cultivars témoins, un plus haut rendement grainier, une grande précocité, des grains plus gros et une excellente résistance à la verse. Le nouveau cultivar est très résistant aux races dominantes de la rouille de la feuille, de la rouille noire et de la carie commune et raisonnablement résistant à la pourriture sèche. Il est admissible aux grades de qualité du triticale du Canada.

Mots clés: Description de cultivar, triticale de printemps (*X Triticosecale* Wittmack), temps de chute de Hagberg, rendement, précocité, résistance aux maladies, grosseur du grain

AC Ultima, spring triticale (*X Triticosecale* Wittmack), originated from the International Maize and Wheat Improvement Centre (CIMMYT) triticale breeding program. It was introduced by the Semiarid Prairie Agricultural Research Centre (SPARC), Research Branch, Agriculture and Agri-Food Canada (AAFC), Swift Current, SK as part of the Triticale Breeding Project, via the 25th International Triticale Screening Nursery (ITSN) in 1993 and further selected for improved Hagberg Falling Number. AC Ultima received restricted registration no. 4988 from the Variety Registration Office, Canadian Food Inspection Agency, Agriculture and Agri-Food Canada on 23 September 1999.

Pedigree and Breeding Method

AC Ultima is a complete hexaploid triticale which derives from the progeny of the spring × winter cross Drago/Ibex//Civet#2 made by CIMMYT at Ciudad Obregon, Sonora, México in 1986–1987 cycle. It was developed by a modified pedigree selection method known as the "shuttle breeding method" (Borlaug 1968) employed in CIMMYT cereal breeding programs (Rajaram 1995). Shuttling germplasm between Obregon (40 m altitude and 27.5°N latitude) El Batan (2249 m altitude and 19°N latitude)and Toluca (2640 m altitude and 18°N latitude) enables cereal breeders to select cultivars that are adapted to a wide range of biotic and abiotic stress. The F_1, F_3, F_5, F_7, and F_9 generations were grown in Obregon, with F_5 being grown from reserve seed. The F_2, F_4, F_6, and F_{10} generations were grown in El Batan, Mexico State, with the F_6 and F_{10} being harvested in bulk. The F_8 generation was grown at Papalotla, Mexico State and harvested in bulk.

In Ciudad Obregon, an arid region, selection was done in three "mega-environments" (ME), designated as ME1, a high input environment with full irrigation, ME4, arid conditions with an irrigation before planting and ME5, with heat stress. Early-generation selection in Obregon and Papalotla was based primarily on agronomic type, and resistance to leaf rust (caused by *Puccinia recondita* Rob. ex Desm. *f. sp. tritici*) and stem rust (caused by *P. graminis* Pers.:Pers f. sp. *tritici* Eriks. & E. Henn.). Grain yield and test weight were added as selection traits in advanced generations. At El Batan, a high rainfall site with acid soils (ME3), selection criteria were resistance to yellow rust (caused by *P. striiformis* West.), scab or head blight (caused by *Fusarium* spp.), septoria leaf spot (caused by *Septoria* spp.), tolerance to low pH soils, harvest time sprouting and agronomic traits.

Table 1. Mean grain yield performance of AC Ultima compared with AC Copia, Pronghorn and AC Certa triticales, based on data from the Western Spring Triticale Cooperative Tests, 1996–1998, inclusive

Experimental designation	Cultivar	Yield (kg ha^{-1})				
		Zone 1[z]	Zone 2	Zone 3	Zone 4	Mean[y]
T111	AC Copia	4334	4981	7304	7751	5263
T124	Pronghorn	4710	4956	8740	7325	5499
T128	AC Certa	4620	4985	7914	7330	5392
T150	AC Ultima	4687	5148	9290	7764	5672
	$LSD_{(0.05)}$	336	270	717	792	239
No. of tests		11	12	3	3	29

[z]Zone 1 – Black soils of Manitoba and Saskatchewan; Zone 2 – Brown and Brown soils of Saskatchewan and Alberta; Zone 3 – Black soils of Alberta; Zone 4 – Irrigated brown soils of Alberta.
[y]All means are weighted by the number of tests within a zone.

Table 2. Mean grain yield performance of AC Ultima compared with AC Copia, Pronghorn and AC Certa triticales and AC Taber Canada Prairie Spring Wheat, based on data from the Western Spring Triticale Co-operative Tests, 1996–1997, inclusive

Experimental designation	Cultivar	Yield (kg ha^{-1})				
		Zone 1	Zone 2	Zone 3	Zone 4	Mean
T380	AC Taber	3720	4255	8655	8125	4818
T111	AC Copia	4195	4760	8175	9635	5307
T124	Pronghorn	4480	4755	9820	8860	5510
T128	AC Certa	4475	4845	8810	8855	5446
T150	AC Ultima	4445	4900	10520	9555	5684
	$LSD_{(0.05)}$	500	348	813	1268	322
No. of tests		8	8	2	2	20

Table 3. Means for agronomic performance of AC Ultima compared with AC Copia, Pronghorn and AC Certa triticales, based on data from the Western Spring Triticale Co-operative Tests, 1996–1998, inclusive

Experimental designation	Cultivar	Maturity (d)	Height (cm)	Lodging (1–9)[z]	Test wt. (kg hL^{-1})	Kernel wt. (mg)
T111	AC Copia	107	104	2.3	72.1	43.5
T124	Pronghorn	106	105	2.1	69.0	41.4
T128	AC Certa	106	108	1.8	74.1	40.9
T150	AC Ultima	105	101	1.7	70.5	45.4
	$LSD_{(0.05)}$	1	2	0.5	0.5	1.1
No. of tests		21	29	8	29	29

[z]1 = all plants are standing; 9 = all plants are lying horizontally.

AC Ultima was introduced into the triticale program at SPARC in 1993 as entry No. 62 of the 25th ITSN and designated 9330A-062. It was evaluated for agronomic, kernel and quality characteristics in the 25th ITSN, in 1993 and entered into the Triticale 'A' Test in 1994 and advanced to the Triticale 'B' Test in 1995. It was evaluated in the Western Spring Triticale Cooperative Test from 1996 to 1998, inclusive under the experimental designation T150. AC Ultima was grown in special nurseries established for the evaluation of reaction to common root rot, common bunt, and leaf and stem rust at Agriculture and Agri-Food Canada Research Centres located at Swift Current SK, Lethbridge, AB, and Winnipeg, MB.

Performance and Adaptation

AC Ultima is well adapted to the soils of the Canadian Prairies. Averaged over 29 site years, the grain yield of AC Ultima was significantly greater than that of AC Copia and AC Certa and equal to that of the best check cultivar, Pronghorn (Table 1). On the Brown and Dark Brown soils of Saskatchewan and Alberta and the irrigated Brown soil of Alberta sites, there were no significant differences in grain yield between AC Ultima and the three check cultivars. In 20 site years of trials during 1996 and 1997, AC Ultima yielded significantly more grain (18%) than AC Taber, Canada Prairie Spring wheat (Table 2)

AC Ultima matured significantly earlier than AC Copia, AC Certa and Pronghorn, the earliest check cultivars (Table 3). AC Ultima was significantly shorter than all of the check cultivars. Lodging resistance of AC Ultima was greater than that of AC Copia and equal to that of AC Certa and Pronghorn. The test weight of AC Ultima was significantly less than that of AC Copia and AC Certa, and significantly greater than that of Pronghorn. The kernel weight of AC Ultima was significantly greater than that of all of the check cultivars.

Disease Reaction

AC Ultima was very resistant to the prevalent races of leaf and stem rust and common bunt. AC Ultima was moderately resistant to common root rot (Table 4).

Table 4. Disease reaction of AC Ultima compared with AC Copia, Pronghorn and AC Certa triticales, based on data from the Western Spring Triticale Co-operative Tests, 1996–1998, inclusive

Experimental designation	Cultivar	Year	Type of reaction: Rust[z] Leaf	Rust[z] Stem	Common root rot[y]	Common bunt[x]
T111	AC Copia	1996	TR	1.1	2.7	·
		1997	TR	1.1	8.0	·
		1998	VR	1.1	2.7	R+
T124	Pronghorn	1996	TR	10.3	6.7	·
		1997	TR	1.1	0.0	·
		1998	VR	20.4	18.9	R+
T128	AC Certa	1996	TR	1.1	5.3	·
		1997	TR	1.1	6.7	·
		1998	VR	1.1	18.7	R+
T150	AC Ultima	1996	TR	1.1	8.0	·
		1997	TR	1.1	6.7	·
		1998	VR	1.1	18.9	R+

[z]Rust reaction: TR = trace resistant; VR = very resistant; number indicates percent infection.
[y]Numbers indicate percentage of plants with moderate to large lesions on the sub-crown internode.
[x]Bunt reaction: R+ = resistant

Table 5. Hagberg Falling Number of AC Ultima compared with AC Copia, Pronghorn and AC Certa triticales. Based on data from the Western Spring Triticale Co-operative Tests, 1996–1998, inclusive

Experimental designation	Cultivar	1996	1997	1998	Mean
T111	AC Copia	64(0)[z]	70(0)	70(0)	68(0)
T124	Pronghorn	65(0)	66(0)	97(1)	75(1)
T128	AC Certa	72(0)	76(0)	136(1)	93(1)
T150	AC Ultima	98(1)	152(3)	223(7)	155(11)
No. of tests		10	10	9	29

[z]Number of sites with Hagberg Falling Number greater than or equal to 200.

End Use Suitability

The Hagberg Falling Number of AC Ultima was greater than those of all of the triticale check cultivars (Table 5). Falling Numbers for AC Ultima were ≥ 200 s for 11 of the 29 site years sampled over 3 yr compared to AC Copia which was ≥ 200 s for 0 and Pronghorn and AC Certa which were ≥ 200 for only 1 of the 29 site years. AC Ultima is suitable for use as an ultra high yielding feed grain, high quality grain for manufacture of triticale baked goods and industrial ethanol feedstock.

Other Characteristics

The spikes are long, tapered and nodding at maturity; middense and glaucous; chaff is white; awns are long, white and spreading at maturity. The kernels are red, soft and large in size; elliptical in shape with rounded cheeks; crease is of medium depth and narrow; brush hairs are of medium length; germ is large and oval in shape; phenol reaction is black.

Maintenance and Distribution of Pedigreed Seed

AC Ultima has been released to Quality Assured Seeds Limited for multiplication, distribution and marketing. Breeder Seed will be maintained by the Seed Increase Unit of the Experimental Farm, Research Branch, Agriculture and Agri-Food Canada, Indian Head, SK, S0G 2K0.

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