

## AC Alta spring triticale

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McLeod, J. G., Townley-Smith, T. F., DePauw, R. M. and Clarke, J. M. 1996. **AC Alta spring triticale**. Can. J. Plant Sci. **76**: 139–141. AC Alta, a spring triticale cultivar ( $\times$  *Triticosecale* Wittmack) was developed at the Semi-arid Prairie Agricultural Research Centre, Research Branch, Agriculture and Agri-Food Canada, Swift Current, Saskatchewan. AC Alta is a high-yielding, large kernelled, lodging resistant cultivar of triticale which is widely adapted to the Prairie Provinces. AC Alta is very resistant to leaf and stem rust, resistant to common bunt and moderately resistant to common root rot. AC Alta will be distributed by Progressive Seeds Limited.

**Key words:** Cultivar description, grain yield, test weight, triticale (spring),  $\times$  *Triticosecale* Wittmack

McLeod, J. G., Townley-Smith, T. F., DePauw, R. M. et Clarke, J. M. 1996. **Triticale de printemps AC Alta**. Can. J. Plant Sci. **76**: 139–141. Le nouveau cultivar de triticale de printemps ( $\times$  *Triticosecale* Wittmack) AC Alta a été sélectionné au Centre fédéral de recherches agricoles de la prairie semi-aride à Swift Current en Saskatchewan. C'est une variété forte productrice à gros grains et résistante à la verse, bien adaptée aux conditions de culture des provinces des Prairies. Elle possède une forte résistance aux rouilles des feuilles et de la tige, une résistance convenable à la carie commune et une résistance passable à la pourriture sèche. Sa distribution est assurée par la maison Progressive Seeds Limited.

**Mots clés:** Description de cultivar, rendement grainier, poids spécifique, triticale de printemps,  $\times$  *Triticosecale* Wittmack

AC Alta spring triticale ( $\times$  *Triticosecale* Wittmack) was developed at the Semi-arid Prairie Agricultural Research Centre, Research Branch, Agriculture and Agri-Food Canada, Swift Current, Saskatchewan as part of the Triticale Breeding Project. Registration no. 4133 was issued for AC Alta on 12 May 1995 by the Plant Health and Plant Products Directorate, Food Production and Inspection Branch of Agriculture and Agri-Food Canada.

### Pedigree and Breeding Methods

AC Alta derives from a cross made in 1984, at the University of Manitoba between Cinnamon/Ciano//Beagle/3/Merino 'S' and entry number 169 (W74.103-Addax/Beagle 'S'-Maya 2A  $\times$  IRA) from the 12th International Triticale Screening Nursery. AC Alta was tested under the experimental designation T122 from 1991 to 1993, inclusively.

In 1984, F<sub>3</sub> seed was transferred to the Swift Current program from the University of Manitoba. The F<sub>4</sub>, F<sub>6</sub> and F<sub>8</sub> generations were grown in a winter nursery near Brawley, California to multiply seed for early generation, replicated yield tests. The F<sub>5</sub>, F<sub>7</sub> and F<sub>9</sub> generations were grown as replicated yield trials at two locations to evaluate agronomic performance. The line designated UM8401A-29E1 was evaluated in the Triticale 'A' Test in 1988 and entered into the Western Spring Triticale Cooperative Test in 1989 as T103. In 1990 the breeder lines were observed to be heterogeneous for anthesis date. Late heading lines were selected and reevaluated in the Western Spring Triticale Cooperative Test from 1991 to 1993 as T122. The 42 breeder lines grown

at Swift Current in 1990 as 3m rows and in 1993–1994 at Brawley, California as 7 m rows, derive from an F<sub>7</sub> derived F<sub>11</sub> single plant progeny row.

AC Alta 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 Saskatoon, Lethbridge and Winnipeg.

### Performance and Adaptation

AC Alta is well adapted to the soils of the Canadian Prairies and has a large kernel that meets the criteria of the Canada Triticale class.

In the Black soil zone of Manitoba and Saskatchewan, the yield of AC Alta was equal to the best triticale check (Wapiti) and greater than Biggar Canada Prairie Spring wheat (*Triticum aestivum* L.) by 50.6%, while in the Brown and Dark Brown soil zones of Saskatchewan and Alberta it was equal in yield to the best triticale check (AC Copia) and greater than Biggar Canada Prairie Spring wheat by 26.8% (Table 1). In the Black soil zone of Alberta, AC Alta was equal in yield to both the best triticale check (Frank) and Biggar Canada Prairie Spring wheat. Under irrigated Brown soil conditions of Alberta, AC Alta was equal in yield to the best triticale check (Frank) and Biggar Canada Prairie Spring wheat. Overall, AC Alta outyielded the best triticale check (Frank) by 6.0% and Biggar by 28.4%.

The test weight of AC Alta is equal to that of Wapiti but less than that of Frank and AC Copia (Table 2). The kernel weight of AC Alta is 7.5% greater than that of the largest

**Table 1. Mean grain yield performance of AC Alta compared with Wapiti, Frank and AC Copia triticales and Biggar Canada Prairie Spring wheat, based on data from the Western Spring Triticale Tests (1991–1993)**

Cultivar	Yield (t ha <sup>-1</sup> )				Mean
	Zone 1 <sup>z</sup>	Zone 2	Zone 3	Zone 4	
Biggar	3.75	4.42	7.73	6.61	4.68
Wapiti	5.40	5.31	7.52	5.97	5.63
Frank	5.34	5.24	7.82	6.51	5.67
AC Copia	5.13	5.36	7.60	6.48	5.60
AC Alta	5.65	5.60	8.05	6.98	6.01
LSD <sub>.05</sub>	0.46	0.40	1.43	0.81	0.30
No. of tests	15	11	3	4	33

<sup>z</sup>Zone 1, Black soils of Manitoba and Saskatchewan; Zone 2, Brown and Dark Brown soils of Saskatchewan and Alberta; Zone 3, Black soils of Alberta; Zone 4, Irrigated Brown soils of Alberta.

**Table 2. Means for agronomic performance of AC Alta compared with Frank, Wapiti and AC Copia triticales and Biggar Canada Prairie Spring wheat, based on the Western Spring Triticale Cooperative Tests (1991–1993)**

Cultivar	Maturity (d)	Height (cm)	Lodging (1-9) <sup>z</sup>	Test wt. (kg hL <sup>-1</sup> )	Kernel wt. (mg)
Biggar	107	80	1.8	75.0	34.1
Wapiti	112	108	2.3	66.6	43.3
Frank	112	104	2.4	68.4	38.6
AC Copia	112	108	2.3	71.0	44.2
AC Alta	113	97	1.6	66.7	47.5
LSD <sub>.05</sub>	1.2	1.5	0.7	1.0	1.3
No. of tests	27	32	10	33	33

<sup>z</sup>1 = no lodging; 9 = completely lodged.

**Table 3. Disease reactions of AC Alta compared with Wapiti, Frank and AC Copia triticales and Biggar Canada Prairie Spring wheat, based on the Western Spring Triticale Cooperative Tests (1991–1993)**

Cultivar	Year	Type of Reaction <sup>z</sup>			Common root rot (% infection)
		Leaf rust	Stem rust	Common bunt	
Biggar	1991	5VR	–	S	44
	1992	40RMR	40RMR	S	2
	1993	5R	10RMR	S	9
Wapiti	1991	5VR	–	VR	26
	1992	10VR	VR	VR	19
	1993	5VR	TR	–	3
Frank	1991	5VR	–	VR	51
	1992	10VR	VR	VR	56
	1993	5VR	5VR	–	15
AC Copia	1991	5VR	–	VR	36
	1992	10VR	VR	–	31
	1993	5VR	TR	–	11
AC Alta	1991	5VR	–	VR	43
	1992	10VR	VR	–	37
	1993	5VR	TR	–	16

<sup>z</sup>Types of reaction: TR = trace resistant; VR = very resistant; R = resistant; MR = moderately resistant; S = susceptible. Numbers indicate percent infection.

check cultivar (AC Copia). AC Alta is shorter than the triticales check cultivars. It is more resistant to lodging than the check cultivar (Frank). AC Alta is equal in maturity to the triticales checks.

### Disease Reaction

AC Alta is very resistant to the prevalent races of stem rust (caused by *Puccinia graminis* Pers. f. sp. *tritici* Eriks. and E.

Henn.), leaf rust (caused by *P. recondita* Rob. ex Desm. f. sp. *tritici*); resistant to common bunt (caused by *Tilletia foetida* (Wallr.) Liro and *Tilletia caries* (DC.) Tul. & C. Tul.) and moderately resistant to common root rot (caused primarily by *Bipolaris sorokiniana* (Sacc. in Sorok.) Shoem.) (Table 3).

### End-use Suitability

AC Alta was similar to Wapiti in protein content (9.4%) and

**Table 4. Means for grain quality parameters of AC Alta compared with Wapiti, Frank and AC Copia triticales and Biggar Canada Prairie Spring wheat, based on the Western Spring Triticale Cooperative Tests (1991–1993)<sup>2</sup>**

Cultivar	Grinding time (min)	Flour yield (%)	Grain protein (%)	Mixing development time (min)	Hagberg falling number (S)
Biggar	0.49	46.1	10.6	2.6	313
Wapiti	0.60	41.4	9.4	1.5	78
Frank	0.60	36.1	9.7	1.6	80
AC Copia	0.58	37.9	9.1	1.2	64
AC Alta	0.56	41.0	9.4	1.7	62

<sup>2</sup>Quality parameters were determined on two samples from each of two locations in each year; 1991, Indian Head and Stewart Valley; 1992, Indian Head and Floral; 1993, Indian Head and Lethbridge.

1.2% less than Biggar Canada Prairie Spring wheat; kernel hardness (measured by grinding time) is slightly softer than other check triticales; flour yield is equal to Wapiti (Table 4). AC Alta is eligible for the grades of Canada Triticale.

#### Other Characteristics

**SPIKES.** Long, tapered and nodding at maturity; mid-dense and glaucous; chaff is white; awns are long, white and spreading at maturity.

**KERNELS.** Red, soft and of large 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 Alta has been released to Progressive Seeds Limited, 155-4752 Ross Street, Red Deer, Alberta, Canada T4N 1X2, for multiplication and distribution. Breeder seed originating

from 42 breeder lines will be maintained by the Seed Increase Unit of the Experimental Farm, Indian Head, Saskatchewan, Canada S0G 2K0.

Appreciation is expressed to J. S. Noll for providing end-use quality analysis; J. A. Kolmer and D. E. Harder (Research Centre, Agriculture and Agri-Food Canada, Winnipeg, MB) for determining leaf and stem rust reaction; K. L. Bailey (Research Centre, Agriculture and Agri-Food Canada, Saskatoon, Saskatchewan) for determining the reaction to common root rot; D. A. Gaudet and B. Puchalski (Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB) for determining the reaction to common bunt; and R.A. Ferguson (Research Centre, Agriculture and Agri-Food Canada, Regina, Saskatchewan), D. Green and D. T. Gehl (Research Farm, Agriculture and Agri-Food Canada, Indian Head, Saskatchewan), J. F. Payne, C. W. B. Lendrum, and G. McClare, (Semiarid Prairie Agricultural Research Centre, Agriculture and Agri-Food Canada, Swift Current, Saskatchewan) for their expert technical assistance in developing AC Alta.