# AC Minto hard red spring wheat

Townley-Smith, T. F., Czarnecki, E. M., Campbell, A. B., Dyck, P. L. and Samborski, D. J. 1993. **AC Minto hard red spring wheat**. Can. J. Plant Sci. **73**: 1091–1094. Minto hard red spring wheat (*Triticum aestivum* L.) combines excellent resistance to leaf rust and stem rust with higher yield potential than Neepawa or Katepwa. Registered 29 January 1991, it is best adapted to the southern portions of the wheat-growing area of the Canadian prairies. Breeder seed of AC Minto will be maintained by the Agriculture Canada Experimental Farm, Indian Head, Saskatchewan.

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

Townley-Smith, T. F., Czarnecki, E. M., Campbell, A. B., Dyck, P. L. et Samborski, D. J. 1993. **AC Minto, nouveau cultivar de blé roux vitreux de printemps.** Can. J. Plant Sci. **73**: 1091–1094. Le blé roux vitreux de printemps (*Triticum aestivum* L.) AC Minto allie à une excellente résistance aux rouilles des feuilles et de la tige une plus grande productivité que chez Neepawa ou Katepwa. Homologué en janiver 1991, il convient en particulier aux parties sud de la zone du blé dans les Prairies canadiennes. La semence de l'obtenteur est conservés par la Ferme expérimentale d'Indian Head (ministère de l'Agriculture du Canada) en Saskatchewan.

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

## Origin and Breeding

AC Minto is a new hard red spring wheat (*Triticum aestivum* L.) cultivar developed at the Agriculture Canada Research Station at Winnipeg. The pedigree system was used to select AC Minto from the double cross Columbus/BW63//Katepwa/BW552. BW63 is a Neepawa backcross derivative with four additional leaf rust resistance genes (*Lr11*, *Lr14b*, *Lr22a*, and *Lr30*). BW552 is a Neepawa backcross line with added bunt resistance. Plants of this double cross, made in 1979, were selected for leaf and stem rust resistance and resistance to preharvest sprouting in $F_2$. Lines were selected for stem and leaf rust resistance and grain quality in the $F_4$, $F_6$, and $F_8$ generations. The $F_3$ and $F_5$ generations were grown in a greenhouse, while the $F_7$ generation was grown as a head row in New Zealand. AC Minto derives from a single $F_6$ plant. This line was tested as entry No. 28 in the 1985 Central Bread Wheat 'A' test and RL4582 in the Central Bread Wheat 'B' test in 1986. It was tested as BW120 in the Central Bread Wheat Cooperative Test from 1987 to 1989, and also in the Western Bread Wheat Cooperative Test from 1988 to 1989. In 1991, AC Minto was granted Registration no. 3363 in 1991 by the Seed Division, Plant Health Directorate, Food Production and Inspection Branch, Agriculture Canada. Breeder seed of AC Minto derives from 118 heads selected in $F_{11}$ and grown as rows in isolation for two generations.

## Performance and Adaptation

AC Minto is a hollow-stemmed wheat that is similar to Neepawa and Katepwa in most agronomic characteristics but with superior resistance to leaf rust. In the Central Bread Wheat Cooperative Test AC Minto yielded 4.6% higher than Katepwa, while in 2 yr in the Western Bread Wheat Cooperative test it was intermediate in yield between Neepawa and Katepwa (Tables 1 and 2). AC Minto yielded 2.6% higher than Columbus in the Central Bread Wheat Cooperative Test and matured on average 2.6 d earlier.

AC Minto is slightly taller than Neepawa and Katepwa and has similar lodging resistance to Katepwa. It has similar kernel

Table 1. Grain yield and agronomic characteristics of AC Minto and check cultivars in the Central Bread Wheat Cooperative Tests (1987–1989)

| Cultivar | Grain yield (t ha$^{-1}$) Man.[z] | Sask. | Overall | Maturity (d) | Lodging (1–9)[y] | Height (cm) | Test weight (kg hL$^{-1}$) | Kernel weight (mg) |
|---|---|---|---|---|---|---|---|---|
| Neepawa | 3.18 | 1.97 | 2.59 | 91.5 | 2.1 | 75.9 | 78.0 | 30.5 |
| Katepwa | 3.19 | 1.96 | 2.60 | 91.6 | 2.3 | 75.6 | 78.5 | 31.0 |
| Columbus | 3.21 | 2.05 | 2.65 | 94.5 | 2.0 | 81.2 | 78.9 | 33.0 |
| Roblin | 2.86 | 1.79 | 2.35 | 89.3 | 1.4 | 68.0 | 78.0 | 33.2 |
| AC Minto | 3.32 | 2.07 | 2.72 | 91.9 | 2.3 | 78.5 | 77.8 | 33.3 |
| SE of mean | 0.02 | 0.05 | 0.04 | 0.32 | 0.12 | 0.67 | 0.15 | 0.24 |
| Station yr | 14 | 13 | 27 | 23 | 11 | 25 | 29 | 29 |

[z]Manitoba sites were Brandon, Dauphin, Glenlea, Morden, and Portage; Saskatchewan sites were Indian Head, Ituna, Melfort, Regina, Saskatoon, and Yorkton.
[y]1 = no lodging, 9 = severely lodged.

Table 2. Grain yield and agronomic characteristics of AC Minto and check cultivars in the Western Bread Wheat Cooperative Tests (1988–1989)

| Cultivar | Grain yield (t ha$^{-1}$) Soil zone[z] Brown | Dk Brown | Black | Overall | Maturity (d) | Lodging (1–9)[y] | Height (cm) | Test weight (kg hL$^{-1}$) | Kernel weight (mg) |
|---|---|---|---|---|---|---|---|---|---|
| Neepawa | 2.44 | 2.69 | 3.72 | 2.76 | 94.9 | 4.4 | 76 | 77.4 | 29.3 |
| Katepwa | 2.51 | 2.64 | 3.21 | 2.69 | 94.7 | 6.0 | 76 | 77.7 | 29.8 |
| Leader | 2.37 | 2.48 | 3.24 | 2.54 | 95.8 | 6.5 | 74 | 78.1 | 30.5 |
| Laura | 2.59 | 2.67 | 3.07 | 2.70 | 95.9 | 5.5 | 73 | 78.0 | 30.6 |
| AC Minto | 2.52 | 2.72 | 3.10 | 2.73 | 95.3 | 5.5 | 79 | 78.0 | 30.6 |
| SE of mean | 0.09 | 0.02 | 0.08 | 0.03 | 0.21 | 0.62 | 0.61 | 0.15 | 0.28 |
| Station yr | 3 | 13 | 2 | 18 | 13 | 4 | 17 | 18 | 18 |

[z]Brown soil zone sites were Kindersley, Stewart Valley and Swift Current; Dark Brown soil zone sites were Acme, Irricana, Lethbridge, Regina, Saskatoon, Scott and Watrous; Black soil zone site was Ellerslie.
[y]1 = no lodging, 9 = severely lodged.

weight to Columbus, Roblin, Leader, and Laura and higher kernel weight than Neepawa or Katepwa.

This cultivar is highly resistant to races of leaf and stem rust prevalent in western Canada. It is similar to Neepawa in its reaction to loose smut, common root rot, tanspot, and septoria leaf blotch; however, it is more resistant to common bunt than Neepawa or Katepwa (Table 3). AC Minto is intermediate between Katepwa and Columbus in resistance to preharvest sponting (Table 4).

AC Minto is well adapted to the southern portions of the wheat growing area of the prairie provinces of Canada. It has very good leaf and stem rust resistance in combination with improved yield level over Neepawa and Katepwa, while being earlier maturing than Columbus.

## Description

SPIKE: Erect, strap shaped, apically awnleted, mid-lax to mid- dense; glumes glabrous and white, mid-long, mid-wide with square medium width shoulder and obtuse beak.

KERNEL: Colour medium red; shape mid-size, mid-long, mid-wide, ovate to elliptical; germ mid-size, round; crease mid-wide to wide, mid-deep; cheeks angular to rounded; brush mid-size, mid-long.

STRAW: Little or no anthocyanin coloration, medium thickness; hollow internodes; slight waxy bloom, slightly taller than Katepwa.

SAWFLY REATION: Susceptible.

Table 3. Disease reactions of AC Minto wheat and check cultivars in the Central Bread Wheat Cooperative Tests (1987–1989)

| Cultivar | Year | Stem rust | Leaf rust | Common root rot | Loose smut | Common bunt |
|---|---|---|---|---|---|---|
| Neepawa | 1987 | 10 R-MR[z] | 40 MS | 19[y] | 3 R | 13 MR |
| | 1988 | 10 R | 20 MR-MS | 29 | 11 MR | 16 MR |
| | 1989 | T MR | 20 R-MR | 36 | 6 R | 36 I |
| Katepwa | 1987 | 3 VR | 30 MR-MS | 21 | 6 R | 13 MR |
| | 1988 | 5 R | 30 MR-MS | 36 | 21 MR | 1 R |
| | 1989 | 2 R-MR | 20 R-MR | 35 | 3 R | 15 R |
| Columbus | 1987 | 20 R-MR | 5 R | 31** | 43 MS | 1 R |
| | 1988 | 10 R-MR | 10 R | 39* | 20 MS | 2 R |
| | 1989 | 10 MS-20RMR | 5 R | 37 | 0 R | 7 R |
| Roblin | 1987 | 5 VR | 10 M | 16 | 9 R | 55 S |
| | 1988 | 3 VR | 3 VR | 25 | 11 MR | 21 S |
| | 1989 | T R | 10 M | 26 | 5 R | 44 S |
| AC Minto | 1987 | 5 R | 5 VR | 22 | 5 R | 2 R |
| | 1988 | 3 VR | 3 VR | 41* | 20 MR | 1 R |
| | 1989 | T R | 5 VR | 32 | 3 R | 9 R |

[z]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.
[y]Disease index.
*Different from Neepawa ($P < 0.05$).
**Different from Neepawa ($P < 0.01$).

Table 4. Falling number or sprout score after field weathering or artificial weathering (1986–1989)

| | Falling number field-weathered 2 months after maturity (s) | | | | Sprout score (1–7)[x] | Falling number[z] (artificially sprouted) |
|---|---|---|---|---|---|---|
| | 1989[y] | 1988 | 1987 | Mean | 1988 | 1986 |
| Neepawa | 373 | 143 | 284 | 214 | 5.00 | 81 |
| Katepwa | 375 | 157 | 240 | 199 | 5.15 | 52 |
| Columbus | 445 | 307 | 403 | 355 | 3.15 | 346 |
| Roblin | 212 | 90 | 184 | 137 | ND[w] | 51 |
| AC Minto | 389 | 211 | 326 | 269 | 5.60 | 107 |
| SE of mean | 52.1 | 11.0 | 25.4 | 13.8 | 0.55 | 13.8 |

[z]Minimum value is 50 with this machine.
[y]Not included in mean due to large error variance.
[x]1 = no sprouting, 7 = more than 5 visibly sprouted kernels on all heads.
[w]Not determined.

MATURITY: Slightly later than Katepwa.

DISEASE REACTION: Highly resistant to leaf and stem rust (caused by *Puccinia recondita* Rob. ex. Desm. f. sp. *tritici* and *P. graminis* Pers. f. sp. *tritici* Eriks. and E. Henn., respectively); resistant to common bunt (caused by *Tilletia foetida* (Wallr.) Liro and *T. caries* (DC.) Tul.); moderately resistant to loose smut (caused by *Ustilago tritici* (Pers) Rostr.); and moderately resistant to root rot (caused by *Cochiobolus sativus* Ito and Kurib.).

QUALITY: Equal to Neepawa; good overall quality.

## Seed Distribution

AC Minto has been released to SeCan Association, 200–57 Auriga Drive, Nepean, Ontario, Canada K2E 8B2 for distribution. Breeder seed will be maintained by the Seed Section, Agriculture Canada Experimental Farm, Indian Head, Saskatchewan, S0G 2K0.

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