# Snowhite476 hard white spring wheat

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*Agriculture and Agri-Food Canada, Semiarid Prairie Agricultural Research Centre, Swift Current, Saskatchewan, Canada S9H 3X2.* *Received 27 December 2006, accepted 17 March 2007.*

Knox, R. E., DePauw, R. M., Clarke, J. M., Clarke, F. R., McCaig, T. N. and Fernandez, M. R. 2007. **Snowhite476 hard white spring wheat.** Can. J. Plant Sci. **87**: 521–526. Snowhite476 hard white spring wheat (*Triticum aestivum* L.) is the first Canadian wheat cultivar to deploy the gene Bt8, which confers resistance to prevalent races of common bunt [*Tilletia laevis* Kuhn in Rabenh. and *T. caries* (DC.) Tul. & C. Tul.]. The productivity traits of Snowhite476 were intermediate to the check cultivars. Snowhite476 had intermediate kernel hardness combined with yellow alkaline and white salted noodle colour and textural attributes comparable to AC Vista.

**Key words**: *Triticum aestivum* L., cultivar description, grain yield, disease resistance, Bt8

Knox, R. E., DePauw, R. M., Clarke, J. M., Clarke, F. R., McCaig, T. N. et Fernandez, M. R. 2007. **Le blé dur blanc de printemps Snowhite476**. Can. J. Plant Sci. **87**: 521–526. Snowhite476 est une variété de blé dur blanc de printemps (*Triticum aestivum* L.). Il s'agit du premier cultivar de blé canadien à incorporer le gène Bt8 qui lui confère la résistance aux races courantes de la carie [*Tilletia laevis* Kuhn *in* Rabenh. et *T. caries* (DC.) Tul. & C. Tul.]. Snowhite476 a un rendement intermédiaire à celui des cultivars témoins. La variété se caractérise par un grain de dureté moyenne dont la couleur rappelle le jaune alcalin et le blanc des nouilles salées. Sa texture est comparable à celle de AC Vista.

**Mots clés**: *Triticum aestivum* L., description de cultivar, rendement grainier, résistance à la maladie, Bt8

Snowhite476, hard white spring wheat (*Triticum aestivum* L.), was developed at the Semiarid Prairie Agricultural Research Centre (SPARC), Agriculture and Agri-Food Canada (AAFC), Swift Current, SK. It received interim registration No. 319 from the Variety Registration Office, Plant Production Division, Canadian Food Inspection Agency on 2006 May 5.

## Pedigree and Breeding Method

Snowhite476 derives from the backcross HY393/HY423//5*HY393 to incorporate Bt8, which confers resistance to prevalent races of common bunt [*Tilletia laevis* Kuhn in Rabenh., and *T. caries* (DC.) Tul. & C. Tul.] (Goates 1996). HY393 is a white-seeded experimental line which expressed high grain yield, high milling yield, medium strong gluten properties, hard kernels, and moderate susceptibility to common bunt (DePauw et al. 1992). HY423 is an experimental line (DePauw et al. 1995) that derives from the transfer of the Bt8 gene from a winter wheat common bunt differential genotype into HY358 by partial backcrossing (Thomas et al. 1989). The final cross was made in 1997 at SPARC, AAFC. The $BC_5$ $F_1$ seed was inoculated with common bunt race T19 (Hoffmann and Metzger 1976) and grown as individual plants in the greenhouse. $BC_5F_2$ seed from uninfected heads were grown in the greenhouse and as head-rows in an out of season nursery near Lincoln, New Zealand to multiply seed for subsequent testing. $BC_5F_3$ lines were screened for quantitative and qualitative traits by conducting a replicated trial near Swift Current, SK, and single replicate trials near Indian Head, SK, and near Portage La Prairie, MB. Also, 100 seeds of each $BC_5F_3$ line were inoculated with common bunt races T19 and L16 and grown in a bunt nursery near Swift Current from which bunt-free heads were collected for inbreeding in an out of season nursery. Reaction to leaf rust (*Puccinia triticina* Eriks.) and stem rust (*P. graminis* Pers.:Pers. f.sp. *tritici* Eriks. & E. Henn.) was measured in an epiphytotic nursery near Glenlea, Manitoba. A sample of seed from the grain yield trial composites was used to assess grain quality and kernel characteristics. Thirty $BC_5F_4$ families, at five selections per family were grown near Irwell, New Zealand, in a contra season nursery. One hundred and seven $BC_5F_5$ lines were evaluated in trials similar to the $BC_5F_3$ generation. Twelve selected $BC_5F_6$ lines were screened in the greenhouse with common bunt race T19.

One of the 12 selected experimental lines, P9711-PAE03B1, was evaluated in the High Yield Wheat 'A' test 2000, and as HY476 in the High Yield Wheat Cooperative test from 2001 to 2003. The check cultivars in the High Yield Wheat Cooperative test for the three year period were AC Vista, AC Crystal, and AC2000. AC Barrie was also a check cultivar in 2001. 5701HR was a check cultivar in 2002 and 2003, while Snowbird was a check cultivar in 2003. The variables measured and the protocols followed in

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the High Yield Wheat Cooperative test have been described by Graf and Fox (2000). The PROC MIXED procedure was used to analyze the data each year and to perform a combined analysis over years, using a mixed model with environments and replications considered random and genotypes considered fixed (SAS Institute, Inc. 1999).

During the High Yield Wheat Cooperative testing period, leaf and stem rust seedling infection types were assessed in a greenhouse by pathologists at the Cereal Research Centre, AAFC, Winnipeg, MB. Stem rust races used each year were: QTHST (C25), RHTSK (C20), RKQSR (C63), RTHJT (C57), TMRTK (C10), and TPMKR (C53) (Roelfs and Martens 1988; Fetch 2003). Leaf rust races used each year were: MBDS (12-3), MBRJ (128-1), MGBJ (74-2), and TJBJ (77-2) (McCallum and Seto-Goh 2003). Field evaluations of leaf and stem rust reactions at the adult plant stage using leaf rust races representative of those found the previous years and the same stem rust races as for the seedling tests were measured in an epiphytotic nursery near Glenlea, MB. Reaction to fusarium head blight caused by *Fusarium graminearum* Schwabe [teleomorph *Gibberella zeae* (Schwein. Petch)] was assessed in artificially inoculated field tests conducted near Glenlea and Carman, MB (Yang et al. 2005). To determine the response to loose smut [*Ustilago tritici* (Pers.) Rostr.] a mixture of the prevalent races T2, T9, T10 and T39 (Nielsen 1987) was injected at anthesis into florets of plants grown in the field, and seed off the inoculated plants was grown in a greenhouse to determine disease reaction. To determine the response to common bunt, a mixture of prevalent races L1, L16, T1, T6, T13 and T19 was used to inoculate the seed planted in mid-April of each year near Lethbridge, Alberta. Response to leaf spots [caused by *Pyrenophora tritici-repentis.* (Died.) Drechs., *Phaeosphaeria nodorum* (E. Muller) Hedjaroude, *Mycosphaerella graminicola* (Fuckel) J. Schrot. in Cohn (anamorph *Septoria tritici* Roberge in Desmaz.), and *Cochliobolus sativus* (Ito & Kuribayashi) Drechs. ex Dastur] was determined by scoring leaf area infected on naturally inoculated plots grown near Swift Current, SK, following procedures described by Fernandez et al. (1996).

End-use suitability was determined on a composite sample made up of unequal quantities from those sites that met the top grades for the market class of the check cultivars and that would generate a composite with a protein concentration deemed to be representative of the spring wheat crop. All end-use suitability analyses were performed at the Grain Research Laboratory, Canadian Grain Commission following protocols of the American Association of Cereal Chemists. Polyphenol oxidase activity was measured using catechol as a substrate (Hatcher and Kruger 1993). Texture measurements on cooked noodles were measured using an TA-ST2i instrument (Oh et al. 1983; Kruger et al. 1994). Determination of kernel attributes and eligibility to meet grades of Canada Western Hard White Spring and Canada Prairie Spring White wheat market class was done by the Inspection Division, Canadian Grain Commission.

## Performance

Based on 44 replicated trials over 3 yr (2001–2003), Snowhite476 yielded grain within the range of the checks, except for AC Vista which had significantly ($P \leq 0.05$) higher grain yield in Zone 2 (Table 1). In 2003, Snowhite476 yielded 6.1% more grain than Snowbird ($P \leq 0.05$). Snowhite476 matured 2 days later than AC Vista, and about the same time as AC2000 averaged over 3 yr, and about 2 d later than Snowbird in 2003 (Table 2). Snowhite476 expressed slightly taller plant height than any of the checks but was 6 cm shorter than Snowbird. Snowhite476 had straw strength intermediate to that of AC Crystal and AC Vista. Snowhite476 had heavier test weight than AC Vista, similar to AC2000 and lighter than Snowbird. Snowhite476 had seed size intermediate to that of AC2000 and AC Vista and larger than Snowbird.

**Table 1. Mean grain yield, Least Significant Difference (LSD) and number of test sites of Snowhite476 compared with the check cultivars, based on data from the High Yield Wheat Cooperative tests from 2001–2003**

| | Zone 1[z] | | | Zone 2 | | | Zone 3 | | | Zone 1 | Zone 2 | Zone 3 | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cultivar | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 | 2001–2003 | | | |
| AC Barrie[y] | 3231[x] | | | 2911 | | | 3987 | | | | | | |
| AC Taber | 3185 | 3345 | 4810 | 3261 | 3421 | 2310 | 4749 | 3436 | 5361 | 3784 | 2916 | 4464 | 3592 |
| AC Vista | 3599 | 4170 | 5356 | 3376 | 3645 | 2546 | 4585 | 3017 | 5548 | 4370 | 3243 | 4345 | 3892 |
| AC2000 | 3367 | 4084 | 4904 | 3357 | 3424 | 2307 | 4916 | 3859 | 5685 | 4122 | 2960 | 4797 | 3805 |
| 5701PR[w] | | 3951 | 4834 | | 3183 | 2004 | | 3123 | 5542 | | | | |
| Snowbird[v] | | | 4593 | | | 2187 | | | 4815 | | | | |
| Snowhite476 | 3300 | 3797 | 4632 | 2950 | 3258 | 2314 | 4265 | 3351 | 5402 | 3903 | 2856 | 4332 | 3574 |
| LSD[u] | 436 | 653 | 411 | 315 | 556 | 213 | 501 | 561 | 434 | 528 | 347 | 474 | 275 |
| No. tests | 5 | 5 | 5 | 6 | 6 | 6 | 3 | 4 | 4 | 15 | 18 | 11 | 44 |

[z]Zone 1, near Brandon, Glenlea, Rosemank, Souris, MB, and Indian Head, SK; Zone 2, near Irricana, AB, Kernen, Regina, Scott, Stewart Valley, Swift Current, SK; Zone 3, near Beaverlodge, Lacombe, AB, and Lake Lenore and Melfort, SK.
[y]AC Barrie grown as a check in 2001 only.
[x]All means are weighted by the number of tests within a zone.
[w]5701PR grown as a check in 2002 and 2003.
[v]Snowbird grown as a check in 2003.
[u]Least significant difference, $P \leq 0.05$, includes variation from the genotype by environment interaction.

**Table 2 Means, Least Significant Difference (LSD) and number of test sites for agronomic performance traits of Snowhite476 compared with the check cultivars, based on data from the High Yield Wheat Cooperative tests (2001–2003)**

| | Maturity (d) | | Height (cm) | | Lodging[z] (1–9) | | Test weight (kg hL$^{-1}$) | | Seed size (mg) | |
|---|---|---|---|---|---|---|---|---|---|---|
| cultivar | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 |
| AC Crystal | 98.5 | 98.8 | 72.1 | 73.2 | 2.1 | 2.8 | 77.8 | 78.4 | 37.5 | 38.0 |
| AC Vista | 95.7 | 96.7 | 73.8 | 75.0 | 2.4 | 3.0 | 76.3 | 76.8 | 39.9 | 39.9 |
| AC2000 | 97.9 | 98.9 | 72.4 | 73.7 | 1.6 | 2.3 | 77.2 | 77.9 | 35.8 | 36.6 |
| 5701PR | 95.8 | | 70.9 | | 1.8 | | 76.4 | | 38.2 | |
| Snowhite476 | 97.7 | 98.5 | 75.8 | 77.3 | 2.2 | 2.9 | 77.2 | 77.7 | 38.6 | 39.1 |
| LSD[y] | 1.3 | 1.0 | 2.1 | 1.7 | 0.4 | 0.4 | 0.9 | 0.6 | 1.5 | 1.1 |
| No. tests | 26 | 40 | 29 | 41 | 7 | 10 | 31 | 44 | 31 | 44 |

[z]Straw strength rated on a scale of 1 indicating that all plants in plot are erect to 9 indicating that all plants in a plot are lying horizontal.
[y]Least significant difference, $P \leq 0.05$, includes variation from the genotype by environment interaction.

**Table 3. Disease reactions of Snowhite476 and check cultivars, based on data from High Yield Wheat Cooperative trials (2001–2003)**

| | Leaf rust[z] | | | Stem rust[z] | | |
|---|---|---|---|---|---|---|
| Cultivar | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 |
| AC Crystal | 35MRMS | 60MS | 40 R-MS | 2RMR | 20MR | 10 RMR |
| AC Vista | 45MRMS | 80S | 33 R-MS | 3RMR | 5RMR | 3 R |
| AC2000 | 45MRMS | 70S | 48 MS-S | 3RMR | 20MRMS | 10 RMR |
| 5701PR | | Tr R | 0 R | | 1R | tr R |
| Snowbird[y] | | | 13 RMR | | | 1R |
| Snowhite476 | 45MRMS | 50MS | 20 MR-MS | 1R | 1R | tr R |

| | Common bunt[z] | | | Loose smut[z] | | |
|---|---|---|---|---|---|---|
| | 2001 | 2002[x] | 2003 | 2001 | 2002 | 2003 |
| AC Crystal | 1 R | 0 R | 0 VR | | 13 MR | 71MS |
| AC Vista | 2 R | 0 R | 0 VR | | 2 R | 78 S |
| AC2000 | 0 R | 0 R | 0 VR | 0 R | 38 I | 41 I |
| 5701PR | | 0 R | 2 R | | 0 R | 40 I |
| Snowbird | | | 8 I | | | 13 R |
| Snowhite476 | 1 R | 0 R | 1 R | 25 MR | 0 R | 38 I |

| | Fusarium head blight | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2001 | | 2002 | | | | 2003 | | | |
| | Glenlea | | Glenlea | | Carman | | Glenlea | | Carman | Ottawa |
| | Index[w] | Reac[v] | Index | Reac | Index | Reac | Index | Reac | Index | Index |
| AC Crystal | 64 | S | 45 | I | 39 | S | 65 | S | 72 | 68 |
| AC Vista | 38 | MS | 77 | S | 40 | S | 52 | S | 41 | 75 |
| AC2000 | 48 | S | 50 | I | 15 | I | 53 | S | 40 | 52 |
| 5701PR | | | 69 | S | 56 | S | 57 | S | 46 | 60 |
| Snowbird | | | | | | | 31 | MS | 19 | 30 |
| Snowhite476 | 60 | S | 56 | MS | 32 | S | 43 | S | 48 | 51 |

| | Leaf spots[u] | | | | | |
|---|---|---|---|---|---|---|
| | 2001 | | | 2002 | | |
| Identity | Regina[t] | *P. nodorum* | *M. graminicola* | Indian Head[s] | Swift Current[r] | *C. sativus*[q] |
| AC Crystal | 7.3 | 10.9 | 10.0 | 9.8 | 8.3 | – |
| AC Vista | 7.0 | 10.0 | 11.0 | 9.5 | 8.0 | 41.7 |
| AC2000 | 7.5 | 10.0 | 10.3 | 9.8 | 8.8 | 45.8 |
| 5701PR | – | – | – | 9.5 | 7.5 | 20.2 |
| Snowbird | – | – | – | – | – | – |
| Snowhite476 | 7.8 | 10.0 | 10.0 | 9.0 | 8.5 | 41.2 |

[z]Percent infection and type of reaction: Tr, trace; VR, very resistant; R, resistant; MR, moderately resistant; I, intermediate resistant; MS, moderately susceptible; S, susceptible.
[y]Snowbird included as a check in 2003 only.
[x]Due to low infection levels bunt ratings in 2002 may not be indicative of reaction.
[w]FHB Disease index = (%infected spikelets on infected spikes x % infected spikes)/100.
[v]Response category: I, intermediate resistant; MS, moderately susceptible; S, susceptible.
[u]McFadden scale; 5 = R; 6 = MR; 7 = I; 8–9 = MS; 10–11 = S.
[t]Percent isolation of the main leaf spotting pathogens: *Septoria avenae* f. sp. *triticea* 45%, *Pyrenophora tritici-repentis* 28%, *M. graminicola* 17%, *P. nodorum* 5%, *Cochliobolus sativus* 4%.
[s]Percent isolation of the main leaf spotting pathogens: *P. tritici-repentis* 62%, *P. nodorum* 19%, *M. graminicola* 3%, *C. sativus* 16%.
[r]Percent isolation of the main leaf spotting pathogens: *P. tritici-repentis* 38%, *P. nodorum* 57%, *M. graminicola* 5%, *C. sativus* 5%.
[q]*C. sativus* composite rating: percent of disease lesion coverage on flag and middle canopy leaves. The single value derives from a weighted score of 60%*(flag leaf coverage) plus 40%*(mid canopy coverage).

**Table 4. Means and standard deviations of end-use suitability[z] traits of Snowhite476 and check-cultivars, based on High Yield Wheat Co-operative tests (2001–2003)**

| | Wheat protein (%) | | Flour protein (%) | | Flour yield (%) | | Flour colour Agtron | |
|---|---|---|---|---|---|---|---|---|
| Cultivar | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 |
| AC Crystal | 13.1 | 13.0 | 12.4 | 12.2 | 74.8 | 75.1 | 74.8 | 76.3 |
| AC Vista | 13.3 | 13.3 | 12.2 | 12.2 | 73.8 | 74.3 | 76.4 | 76.6 |
| AC2000 | 13.1 | 13.0 | 12.3 | 12.2 | 75.2 | 75.8 | 81.5 | 82.8 |
| 5701PR[Y] | 13.7 | | 13.0 | | 75.8 | | 80.0 | |
| Snowhite476 | 13.4 | 13.4 | 12.7 | 12.5 | 75.2 | 75.8 | 80.5 | 81.0 |
| Std. dev.[x] | 0.05 | 0.05 | 0.05 | 0.05 | 0.34 | .034 | 0.9 | 0.9 |

| | Flour ash (%) | | Amylograph viscosity (BU) | | Hagberg falling no. (s) | | Starch damage (megazm) | |
|---|---|---|---|---|---|---|---|---|
| | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 |
| AC Crystal | 0.42 | 0.43 | 660 | 712 | 363 | 378 | 6.5 | 6.5 |
| AC Vista | 0.43 | 0.43 | 600 | 652 | 405 | 412 | 9.1 | 9.2 |
| AC2000 | 0.43 | 0.44 | 520 | 603 | 340 | 367 | 7.4 | 7.3 |
| 5701PR | 0.39 | | 568 | | 325 | | 7.0 | |
| Snowhite476 | 0.43 | 0.43 | 543 | 632 | 370 | 387 | 7.8 | 8.0 |
| Std. dev. | 0.005 | 0.005 | 5 | 5 | 15 | 15 | 0.08 | 0.08 |

| | Farinograph | | | | | |
|---|---|---|---|---|---|---|
| | Absorption (%) | | DDT[w] (min.) | | Stability (min.) | |
| | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 |
| AC Crystal | 62.7 | 62.5 | 6.6 | 6.7 | 8.8 | 8.7 |
| AC Vista | 70.3 | 70.5 | 5.5 | 5.5 | 6.3 | 6.2 |
| AC2000 | 66.0 | 65.8 | 5.1 | 5.1 | 7.5 | 7.3 |
| 5701PR | 63.9 | | 9.9 | | 25.5 | |
| Snowhite476 | 70.2 | 70.1 | 5.4 | 5.3 | 6.8 | 6.8 |
| Std. dev. | 0.17 | 0.17 | 0.4 | 0.4 | 1.4 | 1.4 |

| | Canadian short process (150 ppm ascorbic acid) | | | | | |
|---|---|---|---|---|---|---|
| | Loaf volume (cc) | | Mixing time (min.) | | Absorption (%) | |
| | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 | 2002–2003 | 2001–2003 |
| AC Crystal | 878 | 868 | 2.9 | 2.9 | 64.5 | 64.3 |
| AC Vista | 778 | 783 | 2.4 | 2.5 | 66.0 | 66.0 |
| AC2000 | 813 | 813 | 2.4 | 2.3 | 64.0 | 64.0 |
| 5701PR | 1005 | | 3.1 | | 65.5 | |
| Snowhite476 | 818 | 818 | 1.9 | 2.0 | 65.5 | 65.7 |
| Std. dev. | 45 | 45 | 0.3 | 0.3 | 0 | 0 |

[z]American Association of Cereal Chemists methods were followed by the Grain Research Laboratory, Canadian Grain Commission for determining the various end-use suitability traits on a composite of 6 to 10 locations each year.
[y]5701PR was included as a check for end-use suitability in 2002 and 2003.
[x] Std. dev. is the standard deviation based on repeated testing of Allis mill check samples, and standard bake flour sample with replicate tests carried out over an extended period of time each season, provided by GRL, CGC.
[w]DDT is the Farinograph dough development time.

## Other Characteristics

SPIKES: Tapering to oblong, mid-dense, mid-long to long, inclined to nodding, awned; glumes mid-wide to wide, mid-long to long, glabrous, white; glume shoulder primarily square to elevated with some sloping; glume beak short to mid-long.

KERNEL: Color white; large to mid-large, long; mid-wide, elliptical to ovate, cheeks angular to rounded; brush hairs mid-long; crease mid-wide to wide, shallow to mid-deep; germ mid-size to large, oval.

SHATTERING: Resistant to seed shelling due to wind.

DISEASE REACTION: Resistant to prevalent races of common bunt and stem rust; moderately resistant to loose smut, intermediate resistance to prevalent races of leaf rust, and moderately susceptible to leaf spots, and susceptible to fusarium head blight (Table 3).

END-USE SUITABILITY: Snowhite476 performed within the range of the check cultivars for milling, flour, and baking properties with the exception of gluten strength as measured by the farinograph (Table 4). The kernel hardness, as measured by starch damage, was not as hard as AC Vista, which has excessively hard kernel texture. Yellow alkaline and white salted noodle brightness and yellowness and textural attributes were comparable to the check cultivars (Table 5).

## Maintenance and Distribution of Pedigreed Seed

Snowhite476 consists of a composite of 124 Breeder Lines selected from $BC_5F_3$-derived $BC_5F_7$ random single plants grown out as 144 Breeder-Lines in 3-m-long rows in isolation near Swift Current in 2002 and again as 15-m rows near

**Table 5. Attributes of kanusi and white salted noodles made from flour of Snowhite476 and check-cultivars, based on High Yield Wheat Wheat Co-operative test (2003)**

| | Raw yellow alkaline noodle colour[z] | | | | | | Cooked noodle colour | | |
|---|---|---|---|---|---|---|---|---|---|
| cultivar | L*2h | a*2h | b*2h | L*24h | a*24h | b*24h | L* | a* | b* |
| AC Crystal | 77.4 | –0.73 | 25.5 | 70.4 | –0.15 | 26.0 | 69.8 | –1.49 | 27.5 |
| AC Vista | 81.1 | –1.01 | 27.1 | 74.7 | –0.62 | 27.1 | 70.4 | –1.59 | 30.6 |
| AC 2000 | 80.1 | –0.44 | 29.7 | 73.9 | 0.19 | 29.8 | 71.5 | –1.89 | 30.7 |
| 5701PR | 78.3 | –0.68 | 28.0 | 71.5 | –0.04 | 27.8 | 71.3 | –1.65 | 29.1 |
| Snowbird | 78.9 | –0.18 | 27.7 | 72.2 | 0.30 | 27.9 | 71.5 | –1.98 | 25.8 |
| Snowhite476 | 81.1 | –0.59 | 29.0 | 73.0 | –0.26 | 29.0 | 72.3 | –1.98 | 30.7 |
| | Raw white salted noodle colour | | | | | | Cooked noodle colour | | |
| co-op | L*2h | a*2h | b*2h | L*24h | a*24h | b*24h | L* | a* | b* |
| AC Crystal | 80.6 | 2.49 | 22.6 | 73.7 | 2.97 | 23.0 | 75.7 | 0.79 | 18.5 |
| AC Vista | 82.6 | 2.20 | 21.9 | 75.5 | 2.73 | 23.6 | 77.9 | 0.50 | 19.8 |
| AC 2000 | 81.0 | 2.47 | 23.7 | 75.8 | 3.00 | 25.4 | 77.9 | 0.62 | 20.8 |
| 5701PR | 81.3 | 2.39 | 23.5 | 73.4 | 2.36 | 23.2 | 77.8 | 0.57 | 19.9 |
| Snowbird | 80.7 | 2.42 | 21.8 | 74.0 | 2.87 | 23.4 | 78.5 | 0.44 | 18.5 |
| Snowhite476 | 82.5 | 2.38 | 24.1 | 75.9 | 2.99 | 24.3 | 78.1 | 0.54 | 20.3 |

| | | | Yellow alkaline noodle texture[y] | | | | White salted noodle texture | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Flour protein | PPO[x] | Specks 24 h | Firmess (MCS) | Chewiness (RTC) | Recovery | Specks 24 h | Firmess (MCS) | Chewiness (RTC) | Recovery |
| AC Crystal | 12.1 | 14.9 | 112 | 30.5 | 28.1 | 32.5 | 95 | 23.8 | 21.3 | 25.4 |
| AC Vista | 11.8 | 33.8 | 16 | 26.0 | 25.3 | 30.1 | 12 | 22.9 | 20.7 | 24.8 |
| AC 2000 | 11.8 | 7.0 | 25 | 29.2 | 26.8 | 32.9 | 17 | 23.1 | 21.9 | 27.5 |
| 5701PR | 12.4 | 14.9 | 48 | 29.3 | 25.1 | 31.6 | 72 | 28.2 | 20.4 | 27.3 |
| Snowbird | 13.6 | 0.0 | 22 | 33.0 | 27.8 | 34.8 | 11 | 26.5 | 21.8 | 28.4 |
| Snowhite476 | 12.1 | 17.8 | 27 | 27.6 | 26.8 | 31.5 | 19 | 23.0 | 21.3 | 26.2 |

[z]Colour measurements were conducted using a Hunterlab Spectrocolourimeter and reported in reflectance CIE colour scale.
[y]Texture measurements using an TA-XT2i.
[x]Polyphenol oxidase.

Indian Head in 2003. Breeder Seed will be maintained by the Seed Increase Unit of the Research Farm, Indian Head, Saskatchewan, Canada S0G 2K0. Application for Plant Breeders' Rights has been filed. The cultivar will be added to the OECD list of Cultivars. Snowhite476 has been released for distribution and multiplication to FarmPure Seeds, 418B McDonald Street, Regina, Saskatchewan, Canada S4N 6E1

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