



APPLICATIONS UNDER EXAMINATION

WHEAT

WHEAT

(*Triticum aestivum*)

Proposed denomination: 'AAC Goldrush'
Application number: 16-9033
Application date: 2016/10/21
Applicant: Agriculture & Agri-Food Canada, Lethbridge, Alberta
Agent in Canada: Agriculture & Agri-Food Canada, Lacombe, Alberta
Breeder: Robert Graf, Agriculture & Agri-Food Canada, Lethbridge, Alberta

Varieties used for comparison: 'CDC Buteo' and 'AAC Elevate'

Summary: At booting, the frequency of plants with recurved flag leaves is high to very high for 'AAC Goldrush' whereas the frequency is absent or very low to low for 'AAC Elevate'. The anthocyanin colouration of the flag leaf auricle is weak to strong for 'AAC Goldrush' whereas it is absent or very weak for 'AAC Elevate'. At maturity, the plants of 'AAC Goldrush' head later than those of 'CDC Buteo'. The plants of 'AAC Goldrush' are shorter than the plants of 'CDC Buteo' and taller than those of 'AAC Elevate'. The culm glaucosity is medium for 'AAC Goldrush' whereas it is weak for 'CDC Buteo'. The spike of 'AAC Goldrush' is shorter than the spike of 'AAC Elevate'. The lower glume shoulder shape is sloping to slightly sloping for 'AAC Goldrush' whereas it is straight for 'CDC Buteo'. The lower glume beak is short to medium in length for 'AAC Goldrush' whereas it is medium to long for 'AAC Elevate'.

Description:

PLANT: winter type, hard red, common wheat, intermediate growth habit at the 5 to 9 tiller stage, high to very high frequency of plants with recurved flag leaves, matures mid-season

SEEDLING (4-leaf stage): very weak intensity of anthocyanin colouration of the coleoptile, glabrous sheath and blade of the lower leaves

FLAG LEAF: weak to strong intensity of anthocyanin colouration of the auricles, medium to strong glaucosity of the sheath, glabrous blade and sheath

CULM: medium glaucosity, straight neck

STRAW: very thin pith in cross-section, no anthocyanin colouration at maturity

SPIKE: medium glaucosity, tapering, medium density, white to yellow at maturity, inclined to nodding attitude

AWNS: equal to length of spike, white to light yellow at maturity

LOWER GLUME SHOULDER: narrow, sloping to slightly sloping

LOWER GLUME: medium to long, narrow to medium width, glabrous

LOWER GLUME BEAK: short to medium length, slightly curved shape

KERNEL: medium red, medium sized

AGRONOMIC CHARACTERISTICS: good resistance to lodging, good to very good winter hardiness

BREAD QUALITY: fair to good

DISEASE REACTIONS: resistant to moderately resistant to Leaf rust (*Puccinia recondita*); moderately resistant to Stem rust (*Puccinia graminis* f. sp. *tritici*); and moderately resistant to moderately susceptible to Stripe rust (*Puccinia striiformis*) and Fusarium head blight (*Fusarium* species and specifically *Fusarium graminearum*); and highly susceptible to Common bunt (*Tilletia caries*, *Tilletia foetida*)

Origin and Breeding: 'AAC Goldrush' (experimental designations LL430 and W526) was selected from the cross 'S98-11' // 'Crimson'/'CDC Falcon' conducted in 2004 at the Agriculture and Agri-Food Canada Lethbridge Research and

Development Centre, Lethbridge, Alberta. In 2005, the F1 seed was increased in the greenhouse. In 2006, F2 bulk plots were grown in Lethbridge and 97 heads selected based on winter survival, plant type, height and straw strength and planted as rows. In 2007, 87 spikes were selected from desirable F3 rows based on similar characteristics and planted as head rows in an inoculated leaf and stem rust nursery at the University of Manitoba, Winnipeg, Manitoba. In 2008, 92 spikes were selected based on rust resistance and planted as F5 observation rows in Lethbridge. In 2009, 38 rows were harvested and seeded in single replicate plots in Lethbridge, as well as disease and cold tolerance assessment nurseries in Manitoba and Saskatchewan respectively. Replicated, multi-location agronomic trials across Western Canada were conducted in 2011 and 2012, and reactions to stem, leaf and stripe rust, Fusarium head blight and common bunt were assessed in inoculated nurseries. End-use quality was assessed from 2010-2012. LL430 entered the Western Winter Wheat Cooperative Registration as W526 and was evaluated for registration from 2012/13 to 2014/15.

Tests and Trials: The comparative trials were conducted during the 2016 and 2018 growing seasons at the Agriculture and Agri-Food Canada Lethbridge Research and Development Centre, Lethbridge, Alberta. Plots consisted of 4 rows, with a row length of 3.5 metres and a row spacing of 23 cm. There were 4 replications arranged in an RCB design. Measured characteristics were based on a minimum of 12 measurements per variety per year. Mean differences are significant at the 5% probability level based on a Student's t-test. Disease reaction ratings were provided, through the Disease Evaluation team of the Prairie Recommending Committee for Wheat, Rye and Triticale from the registration trials conducted from 2013 to 2015.

Comparison table for 'AAC Goldrush'

	'AAC Goldrush'	'CDC Buteo'*	'AAC Elevate'*
<i>Days to heading (days from planting to when 50% heads are fully emerged from boot)</i>			
mean 2016	163	161	162
mean 2018	165	163	164
<i>Plant height (at maturity) (including awns) (cm)</i>			
mean 2016	102	104	89
std. deviation 2016	2.2	2.5	2.3
mean 2018	92	94	87
std. deviation 2018	1.3	1.2	1.2
<i>Spike length (excluding awns) (cm)</i>			
mean 2016	7.9	7.4	8.3
std. deviation 2016	0.7	0.9	0.6
mean 2018	9.4	9.4	9.7
std. deviation 2018	0.6	0.7	0.5

*reference varieties



Wheat: 'AAC Goldrush' (centre) with reference varieties 'CDC Buteo' (left) and 'AAC Elevate' (right)



Wheat: 'AAC Goldrush' (top) with reference varieties 'AAC Elevate' (centre) and 'CDC Buteo' (bottom)

Proposed denomination: 'AAC Icefield'
Application number: 15-8743
Application date: 2015/11/04
Applicant: Agriculture & Agri-Food Canada, Lethbridge, Alberta
Agent in Canada: Agriculture & Agri-Food Canada, Lacombe, Alberta
Breeder: Robert Graf, Agriculture & Agri-Food Canada, Lethbridge, Alberta

Varieties used for comparison: 'Flourish', 'AAC Gateway' and 'Whitebear'

Summary: *At booting, the frequency of plants with recurved flag leaves is medium for 'AAC Icefield' whereas the frequency is absent or very low for 'Flourish', absent or very low to low for 'AAC Gateway' and high to very high for 'Whitebear'. The anthocyanin colouration of the flag leaf auricle is weak to strong for 'AAC Icefield' whereas it is absent or very weak for 'AAC Gateway' and 'Whitebear'. The flag leaf of 'AAC Icefield' is wider than that of 'Flourish' and 'AAC Gateway'. The plants of 'AAC Icefield' head later than those of 'Whitebear'. At maturity, the spike for 'AAC Icefield' is longer than the spike of 'Flourish' and 'AAC Gateway'. The lower glume shoulder shape is sloping to slightly sloping for 'AAC Icefield' whereas it is elevated to strongly elevated for 'AAC Gateway'. The kernel is white for 'AAC Icefield' whereas it is medium red for 'Flourish' and 'AAC Gateway'. The kernel size is medium for 'AAC Icefield' whereas it is large for 'Whitebear'.*

Description:

PLANT: winter type, hard white, common wheat, semi-erect to intermediate growth habit at the 5 to 9 tiller stage, medium frequency of plants with recurved flag leaves, matures mid-season

SEEDLING (4-leaf stage): absent or very weak intensity of anthocyanin colouration of the coleoptile, glabrous sheath and blade of the lower leaves

FLAG LEAF: weak to strong intensity of anthocyanin colouration of the auricles, medium glaucosity of sheath, glabrous blade and sheath

CULM: strong glaucosity, slightly curved neck

STRAW: very thin pith in cross-section, no anthocyanin colouration at maturity

SPIKE: medium glaucosity, tapering, medium density, white to yellow at maturity, inclined to nodding attitude

AWNS: shorter than length of spike, white to light yellow at maturity

LOWER GLUME SHOULDER: absent or very narrow to narrow, sloping to slightly sloping

LOWER GLUME: medium to long, narrow to medium width, glabrous

LOWER GLUME BEAK: short to medium length, slightly curved shape

KERNEL: white, medium sized

AGRONOMIC CHARACTERISTICS: good resistance to lodging, fair winter hardiness

DISEASE REACTIONS: resistant to Stem rust (*Puccinia graminis* f. sp. *tritici*); moderately resistant to Leaf rust (*Puccinia recondita*) and Stripe rust (*Puccinia striiformis*); moderately resistant to moderately susceptible to Fusarium head blight (*Fusarium* species and specifically *Fusarium graminearum*); and susceptible to Common bunt (*Tilletia caries*, *Tilletia foetida*)

Origin and Breeding: ‘AAC Icefield’ (experimental designations LF1706W and W530) was selected from the cross ‘McClintock’/‘W349’ conducted in 2000 at the Agriculture and Agri-Food Canada Lethbridge Research and Development Centre, Lethbridge, Alberta. In 2001-2002, 279 F1 derived, double haploid lines were produced. In 2003, 219 lines were evaluated with selection based on winter survival, plant type, plant vigor, plant height, straw strength, seed colour, test weight, protein content and SDS sedimentation volume. The resulting 19 selections were planted in a stem and leaf rust nursery at the University of Manitoba in Winnipeg, Manitoba and the line LF1706W was identified for evaluation in a single replicate preliminary trial in Lethbridge in 2005. Further agronomic, disease resistance and end-use quality evaluations took place in replicated, multi-location trials and supplementary nurseries in 2006 and 2009. LF1706W was tested as W530 in the Western Winter Wheat Cooperative Registration Trials from 2012/13 to 2016/17.

Tests and Trials: The comparative trials were conducted during the 2016 and 2018 growing seasons at the Agriculture and Agri-Food Canada Lethbridge Research and Development Centre, Lethbridge, Alberta. Plots consisted of 4 rows, with a row length of 3.5 metres and a row spacing of 23 cm. There were 4 replications arranged in an RCB design. Measured characteristics were based on a minimum of 20 measurements per variety per year. Mean differences are significant at the 5% probability level based on a Student’s t-test. Disease reaction ratings were provided from the Western Canada Winter Wheat Cooperative Registration trials conducted from 2013 to 2017.

Comparison table for ‘AAC Icefield’

	‘AAC Icefield’	‘Flourish’*	‘AAC Gateway’*	‘Whitebear’*
<i>Flag leaf width (cm)</i>				
mean 2016	14.8	13.7	13.3	15.7
std. deviation 2016	1.2	1.0	0.7	1.0
mean 2018	15.4	13.5	14.5	14.8
std. deviation 2018	1.6	1.0	1.2	1.4
<i>Days to heading (days from planting to when 50% heads are fully emerged from boot)</i>				
mean 2016	160	158	159	157
mean 2018	163	162	163	160
<i>Spike length (excluding awns) (cm)</i>				
mean 2016	8.8	7.2	7.5	N/A
std. deviation 2016	0.8	0.5	0.5	N/A
mean 2018	11.7	8.2	8.9	9.0
std. deviation 2018	0.8	0.7	0.5	0.9

*reference varieties



Wheat: 'AAC Icefield' (centre left) with reference varieties 'Flourish' (left), 'Whitebear' (centre right) and 'AAC Gateway' (right)



Wheat: 'AAC Icefield' (top left) with reference varieties 'Whitebear' (top right), 'AAC Gateway' (bottom left) and 'Flourish' (bottom right)

WHEAT*(Triticum turgidum subsp. durum)*

Proposed denomination: 'AAC Congress'
Application number: 15-8635
Application date: 2015/04/21
Applicant: Agriculture & Agri-Food Canada, Swift Current, Saskatchewan
Agent in Canada: Agriculture & Agri-Food Canada, Lacombe, Alberta
Breeder: Asheesh K. Singh, Agriculture & Agri-Food Canada, Swift Current, Saskatchewan

Varieties used for comparison: 'AAC Spitfire', 'Enterprise', 'Strongfield' and 'Transcend'

Summary: At booting, the flag leaf for 'AAC Congress' is longer than the flag leaf of 'AAC Spitfire' and 'Transcend' and wider than the flag leaf of 'Enterprise', 'Strongfield' and 'Transcend'. The plants of 'AAC Congress' head later than the plants of 'Transcend'. The spike of 'AAC Congress' is shorter than that of 'Transcend'. At maturity, the lower glume for 'AAC Congress' is shorter than that of 'AAC Spitfire'. The kernel weight for 'AAC Congress' is greater than the kernel weight of 'Enterprise'. The shape of the kernel cheek is rounded for 'AAC Congress' whereas it is angular for 'Strongfield'. The kernel crease is narrow for 'AAC Congress' while it is of medium width for 'Strongfield'.

Description:

PLANT: spring type, durum wheat, semi-erect to intermediate growth habit at 5 to 9 tiller stage, high frequency of plants with recurved flag leaves, heads mid-season

SEEDLING (4-leaf stage): strong to very strong intensity of anthocyanin colouration of the coleoptile, glabrous sheath and blade of lower leaves

FLAG LEAF: absent or very weak intensity of anthocyanin colouration of auricles, weak to medium glaucosity of sheath, glabrous blade and sheath

CULM: medium to strong glaucosity, straight to curved neck

STRAW: thin pith in cross-section, no anthocyanin colouration at maturity

SPIKE: medium to strong glaucosity, parallel-sided, dense, off-white at maturity, erect attitude

AWNS: longer than length of spike, white at maturity

LOWER GLUME SHOULDER: very narrow to medium width, slightly sloping to strongly elevated shape

LOWER GLUME: short to medium length, medium width, glabrous

LOWER GLUME BEAK: short, straight to moderately curved shape

LOWEST LEMMA: straight to moderately curved beak

KERNEL: amber, large, long, medium width, elliptical, rounded cheek, short brush hairs, narrow crease of medium depth

GERM: large, oval shape

AGRONOMIC CHARACTERISTICS: good resistance to shattering, good tolerance to drought

PASTA QUALITY: good

DISEASE REACTIONS: resistant to Leaf rust (*Puccinia recondita*) and Common bunt (*Tilletia caries*, *Tilletia foetida*); moderately resistant to Stem rust (*Puccinia graminis* f. sp. *tritici*) and Loose smut (*Ustilago tritici*); and moderately susceptible to Fusarium head blight (*Fusarium* species and specifically *Fusarium graminearum*) and Leaf spot (*Pyrenophora tritici-repentis* and *Mycosphaerella graminicola*)

Origin and Breeding: 'AAC Congress' (experimental designations DT856 and A0703-EP01) was selected from the cross DT789 / DT790 made in 2007 at the Swift Current Research and Development Centre, Swift Current, Saskatchewan. In 2007, the F1 seeds were increased in the greenhouse. In 2008, the F2 seed was space planted in a leaf and stem rust epiphytotic field nursery near Swift Current where individual plants were selected for disease resistance, plant height, straw strength and maturity. Seeds of individual spikes were grown in F3 rows near Lincoln, New Zealand in 2008-2009 and

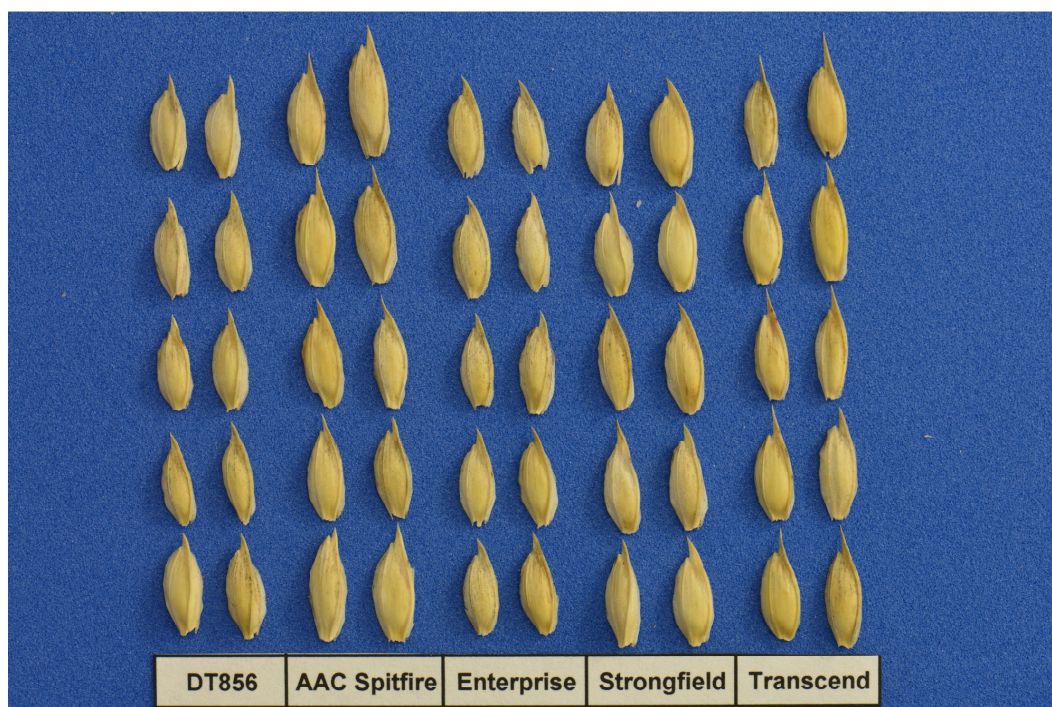
selections made for plant height, maturity and straw strength. In 2009, the F4 lines were grown in plots near Swift Current and Regina, Saskatchewan and assessed for agronomic performance. F5 lines were grown in rows in Irwell, New Zealand and selections made based on plant height, straw strength and maturity. The selected F6 lines were grown in various locations in Saskatchewan and Alberta in 2010 where selections were made based on agronomic performance, disease resistance and quality characteristics. The line designated as A0703-EP01 was identified as meeting all selection criteria at each stage. In 2011, A0703-EP01 was tested in the Durum Central A6 test and further assessed for disease reaction at various locations in Manitoba. From 2012 to 2014, A0703-EP01 was entered and tested as DT856 in the Durum Cooperative Registration Test.

Tests and Trials: The comparative tests and trials were conducted during the 2015 and 2017 growing seasons at the Agriculture & Agri-Food Canada Swift Current Research and Development Centre, Swift Current, Saskatchewan. Plots consisted of 4 rows, with a row length of 3 metres and a row spacing of 23 cm. There were 4 replications arranged in an RCB design. Measured characteristics were based on 20 measurements per variety per year except kernel weight which was based on 4 measurements per variety per year. Mean differences are significant at the 5% probability level based on LSD values. Disease reaction ratings were provided through the Disease Evaluation team of the Prairie Recommending Committee for Wheat, Rye and Triticale and Prairie Grain Development Committee from trials conducted in 2012 to 2014.

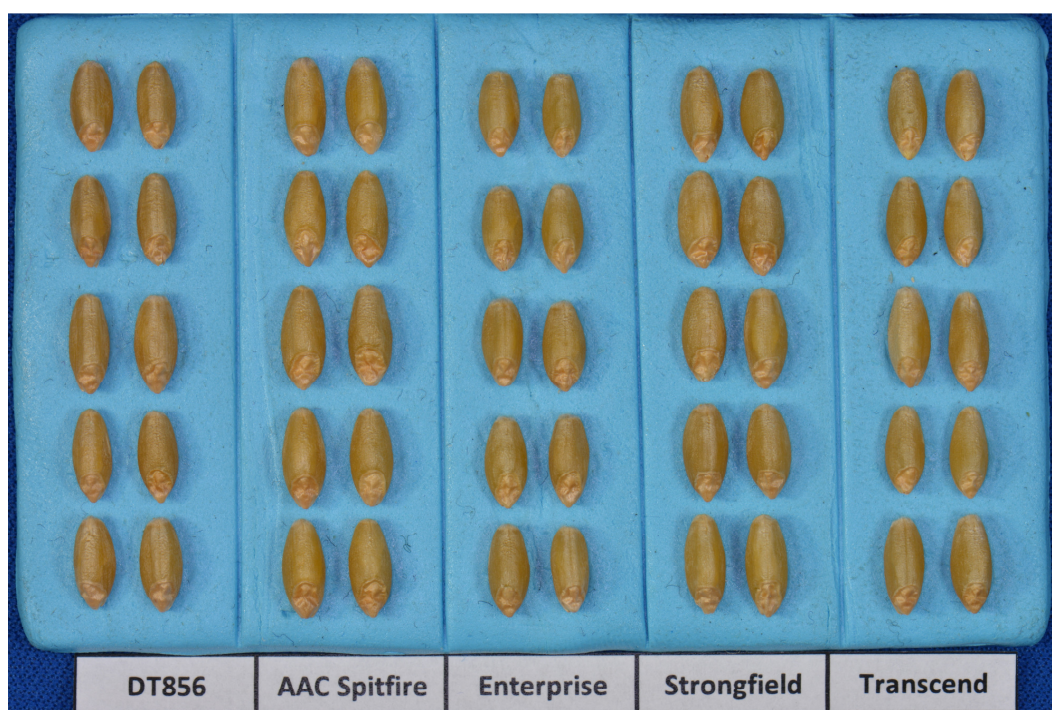
Comparison table for 'AAC Congress'

	'AAC Congress'	'AAC Spitfire'*	'Enterprise'*	'Strongfield'*	'Transcend'*
<i>Flag leaf length (cm)</i>					
mean 2015 (LSD=2.2)	25.6	20.7	21.2	22.8	19.8
std. deviation 2015	3.0	2.1	2.6	2.1	1.3
mean 2017 (LSD=1.5)	29.7	25.3	28.7	28.8	25.8
std. deviation 2017	2.5	2.4	2.6	2.4	1.8
<i>Flag leaf width (cm)</i>					
mean 2015 (LSD=0.8)	15.8	14.0	13.4	14.0	12.9
std. deviation 2015	1.0	0.8	1.0	1.1	0.7
mean 2017 (LSD=0.8)	19.4	18.6	18.3	18.4	16.3
std. deviation 2017	1.1	0.9	1.2	0.9	0.9
<i>Days to heading (days from planting to when 50% heads are fully emerged from boot)</i>					
mean 2015	59.8	57.3	56.8	58.0	56.8
mean 2017	62.0	60.5	60.3	60.3	59.8
<i>Spike length (excluding awns) (cm)</i>					
mean 2015 (LSD=2.9)	7.7	7.5	7.6	7.9	8.3
std. deviation 2015	0.4	0.4	0.3	0.6	0.4
mean 2017 (LSD=2.9)	7.9	7.8	8.5	8.5	9.1
std. deviation 2017	0.3	0.5	0.4	0.4	0.4
<i>Lower glume length (mm)</i>					
mean 2015 (LSD=0.3)	9.5	10.4	8.9	9.6	9.8
std. deviation 2015	0.6	0.5	0.4	0.4	0.4
mean 2017 (LSD=0.3)	8.7	9.8	9.1	9.1	9.6
std. deviation 2017	0.3	0.4	0.4	0.3	0.5
<i>Kernel weight (grams per 1000 kernels)</i>					
mean 2015 (LSD=2.3)	46.8	48.0	42.0	46.5	44.1
std. deviation 2015	0.6	1.4	0.4	1.7	2.3
mean 2017 (LSD=2.0)	47.0	49.9	44.3	50.8	46.3
std. deviation 2017	1.0	1.7	1.3	0.9	1.3

*reference varieties



Wheat: 'AAC Congress' (furthest left) with reference varieties 'AAC Spitfire' (centre left), 'Enterprise' (centre), 'Strongfield' (centre right) and 'Transcend' (furthest right)



Wheat: 'AAC Congress' (furthest left) with reference varieties 'AAC Spitfire' (centre left), 'Enterprise' (centre), 'Strongfield' (centre right) and 'Transcend' (furthest right)