



APPLICATIONS UNDER EXAMINATION

BARLEY

BARLEY (*Hordeum vulgare*)

Proposed denomination: 'AAC Bell'
Application number: 18-9532
Application date: 2018/06/21
Applicant: Agriculture & Agri-Food Canada, Ottawa, Ontario
Agent in Canada: Agriculture & Agri-Food Canada, Saskatoon, Saskatchewan
Breeder: Raja Khanal, Agriculture & Agri-Food Canada, Ottawa, Ontario

Variety used for comparison: 'Leader'

Summary: *At booting, the flag leaf of 'AAC Bell' is wider than that of 'Leader'. The flag leaf auricles and lemma awn tips of 'AAC Bell' have anthocyanin colouration present whereas anthocyanin colouration is absent on the flag leaf auricles and lemma awn tips of 'Leader'. At the end of anthesis, the spike of 'AAC Bell' has a medium degree of glaucosity whereas the spike of 'Leader' has a weak degree of glaucosity. At ripening, the first segment of the rachis of 'AAC Bell' is medium in length with a weak degree of curvature whereas it is long with a medium degree of curvature for 'Leader'.*

Description:

YOUNG PLANT: erect growth habit at tillering, absent or very sparse pubescence on lower leaf sheaths

PLANT: two row, spring feed barley, spike emergence occurs mid-season

FLAG LEAF (AT BOOTING): very high frequency of plants with recurved flag leaves, sparse pubescence on blade

FLAG LEAF SHEATH: strong glaucosity, sparse pubescence

AURICLES: weak intensity of anthocyanin colouration, sparse pubescence on margins

SPIKE: medium glaucosity, semi-erect attitude, v-shaped collar, parallel shape, lax density, divergent sterile spikelet attitude, glume and awn of the median spikelet are longer relative to the grain

LEMMA AWNS: weak intensity of anthocyanin colouration of tips, longer than spike, rough spiculations on margins

FIRST SEGMENT OF RACHIS: medium length, weak degree of curvature

KERNEL: whitish aleurone layer, short rachilla hairs, husk present, absent or very weak anthocyanin colouration of nerves of lemma, absent or very weak spiculation of inner lateral nerves of dorsal side of lemma, hairless ventral furrow, clasping disposition of lodicules, transverse crease shaped basal markings, medium to long, medium width

AGRONOMIC CHARACTERISTICS: good resistance to lodging, poor malting quality

Origin and Breeding: 'AAC Bell' (experimental designation CH2714-4) originated from the cross between the varieties 'Leader' (female parent) and 'Chief' (male parent) conducted in 2006 at the Charlottetown Research and Development Centre, Harrington, Prince Edward Island, Canada. The F1 generation was grown in the field at Harrington in 2007. The plants were advanced using the bulk breeding method with the F2 to F4 bulks grown out in 2008 to 2010. One hundred twenty five F4 heads were selected based on head type and grown out in head-rows. Eleven F5 lines were selected for preliminary yield trials in 2013 with four of these lines advancing to the Maritime and Ontario Two-Row Barley Screening Trials in 2014. Based on grain yield, lodging and disease resistance, one line was designated as CH2714-4 and advanced to the Maritime and Quebec Two-Row Barley Registration and Recommendation Trials conducted in 2015 to 2017 and the Ontario Barley Orthogonal Trials in 2016 to 2017.

Tests and Trials: The comparative trials for 'AAC Bell' were conducted during the 2018 and 2019 growing seasons at the Agriculture and Agri-Food Canada Ottawa Research and Development Centre in Ottawa, Ontario, Canada. Each trial was arranged in a RCB design with 4 replicates and a seeding density of 350 seeds per squared metre. Plots consisted of 6 rows with a row length of 5 metres spaced 0.18 metres apart. Measured characteristics were based on 40 measurements per variety per year. Mean differences were significant at the 5% probability level based on a paired Student's t-test.

Comparison table for 'AAC Bell'

	'AAC Bell'	'Leader'*
<i>Flag leaf width (mm)</i>		
mean 2018	9.8	8.9
std. deviation 2018	1.5	1.7
mean 2019	10.0	9.1
std. deviation 2019	1.1	1.0

*reference variety



Barley: 'AAC Bell' (left) with reference variety 'Leader' (right)

Proposed denomination: 'AAC Ling'
Application number: 18-9573
Application date: 2018/07/10
Applicant: Agriculture & Agri-Food Canada, Ottawa, Ontario
Agent in Canada: Agriculture & Agri-Food Canada, Saskatoon, Saskatchewan
Breeder: Raja Khanal, Agriculture & Agri-Food Canada, Ottawa, Ontario

Varieties used for comparison: 'Leader' and 'AAC Bell'

Summary: At booting, the flag leaf of 'AAC Ling' is wider than that of 'Leader'. The flag leaf auricles and lemma awn tips of 'AAC Ling' have anthocyanin colouration present whereas anthocyanin colouration is absent on the flag leaf auricles and lemma awn tips of 'Leader'. At ripening, the first segment of the rachis of 'AAC Ling' is long with a medium degree of curvature whereas it is medium in length with a weak degree of curvature for 'AAC Bell'. The rachilla hair on the kernel of 'AAC Ling' is long whereas it is short for 'AAC Bell'. 'AAC Ling' has incomplete horseshoe shaped basal markings on the kernel whereas 'AAC Bell' has transverse creased basal markings on the kernel.

Description:

YOUNG PLANT: erect growth habit at tillering, absent or very sparse pubescence on lower leaf sheaths

PLANT: two row, spring feed barley, spike emergence occurs mid-season

FLAG LEAF (AT BOOTING): very high frequency of plants with recurved flag leaves, sparse pubescence on blade

FLAG LEAF SHEATH: strong glaucosity, sparse pubescence

AURICLES: weak intensity of anthocyanin colouration, sparse pubescence on margins

SPIKE: weak to medium degree of glaucosity, semi-erect attitude, v-shaped collar, parallel shape, lax density, parallel to weakly divergent sterile spikelet attitude, glume and awn of the median spikelet are longer relative to the grain

LEMMA AWNS: medium intensity of anthocyanin colouration of tips, longer than spike, rough spiculations on margins

FIRST SEGMENT OF RACHIS: long, medium degree of curvature

KERNEL: whitish aleurone layer, long rachilla hairs, husk present, absent or very weak anthocyanin colouration of nerves of lemma, absent or very weak spiculation of inner lateral nerves of dorsal side of lemma, hairless ventral furrow, clasping disposition of lodicules, incomplete horseshoe shaped basal markings, medium to long, medium width

AGRONOMIC CHARACTERISTICS: good resistance to lodging, fair malting quality

Origin and Breeding: 'AAC Ling' (experimental designation CH2720-5) originated from the cross between the varieties 'Leader' (female parent) and 'Pasadena' (male parent) conducted in 2006 at the Charlottetown Research and Development Centre, Harrington, Prince Edward Island, Canada. The F1 generation was grown in the field at Harrington in 2007. The plants were advanced using the bulk breeding method with the F2 to F4 bulks grown out in 2008 to 2010. Fifty four F4 heads were selected based on head type and grown out in head-rows. Nine F5 lines were selected for preliminary yield trials in 2013 with two of these lines advancing to the Maritime and Ontario Two-Row Barley Screening Trials in 2014. Based on grain yield, lodging and disease resistance, one line was designated as CH2720-5 and advanced to the Maritime and Quebec Two-Row Barley Registration and Recommendation Trials conducted in 2015 to 2017 and the Ontario Barley Orthogonal Trials in 2016 to 2017.

Tests and Trials: The comparative trials for 'AAC Ling' were conducted during the 2018 and 2019 growing seasons at the Agriculture and Agri-Food Canada Ottawa Research and Development Centre in Ottawa, Ontario, Canada. Each trial was arranged in a RCB design with 4 replicates and a seeding density of 350 seeds per squared metre. Plots consisted of 6 rows with a row length of 5 metres spaced 0.18 metres apart. Measured characteristics were based on 40 measurements per variety per year with the exception of 30 measurements in 2019 for the variety 'Leader'. Mean differences were significant at the 5% probability level based on a LSD values.

Comparison table for 'AAC Ling'

	'AAC Ling'	'Leader'*	'AAC Bell'*
<i>Flag leaf width (mm)</i>			
mean 2018 (LSD=0.98)	10.0	8.9	9.8
std. deviation 2018	1.9	1.7	1.5
mean 2019 (LSD=1.02)	10.6	9.1	10.0
std. deviation 2019	1.5	1.0	1.1

*reference varieties



Barley: 'AAC Ling' (left) with reference variety 'AAC Bell' (right)

Proposed denomination: 'AAC Madawaska'
Application number: 19-10007
Application date: 2019/09/24
Applicant: Agriculture & Agri-Food Canada, Ottawa, Ontario
Agent in Canada: Agriculture & Agri-Food Canada, Saskatoon, Saskatchewan
Breeder: Raja Khanal, Agriculture & Agri-Food Canada, Ottawa, Ontario

Variety used for comparison: 'AAC Bell'

Summary: *At booting, the frequency of plants with recurved flag leaves is medium to high on 'AAC Madawaska' whereas it is very high for 'AAC Bell'. The anthocyanin colouration on the flag leaf auricles of 'AAC Madawaska' is of medium intensity whereas it is weak on those of 'AAC Bell'. At ripening, the first segment of the rachis of 'AAC Madawaska' is short whereas it is of medium length for 'AAC Bell'. The rachilla hair on the kernel of 'AAC Madawaska' is long whereas it is short for 'AAC Bell'.*

Description:

YOUNG PLANT: erect growth habit at tillering, absent or very sparse pubescence on lower leaf sheaths

PLANT: two row, spring feed barley, spike emergence occurs mid-season

FLAG LEAF (AT BOOTING): medium to high frequency of plants with recurved flag leaves, sparse pubescence on blade

FLAG LEAF SHEATH: strong glaucosity, sparse pubescence

AURICLES: medium intensity of anthocyanin colouration, sparse pubescence on margins

SPIKE: weak degree of glaucosity, semi-erect attitude, v-shaped to cup shaped collar, parallel shape, lax density, divergent sterile spikelet attitude, glume and awn of the median spikelet are longer relative to the grain

LEMMA AWNS: weak intensity of anthocyanin colouration of tips, longer than spike, rough spiculations on margins

FIRST SEGMENT OF RACHIS: short, weak curvature

KERNEL: whitish aleurone layer, short rachilla hairs, husk present, absent or very weak anthocyanin colouration of nerves of lemma, absent or very weak spiculation of inner lateral nerves of dorsal side of lemma, hairless ventral furrow, clasping disposition of lodicules, transverse crease shaped basal markings, medium to long, medium width

AGRONOMIC CHARACTERISTICS: fair resistance to lodging

Origin and Breeding: ‘AAC Madawaska’ (experimental designation CH2801-48) originated from the cross between the line CH2716F2 (female parent) and the variety ‘Leader’ (male parent) conducted in the fall of 2007 at the Charlottetown Research and Development Centre, Harrington, Prince Edward Island, Canada. The F1 generation was grown in the field at Harrington in 2008. The plants were advanced using the bulk breeding method with the F2 to F4 bulks grown out in 2009 to 2011. One hundred and sixty-eight F4 heads were selected based on head type and grown out in head-rows. In 2012, thirty-seven F5 lines were selected for preliminary yield trials with two of these lines advancing to the Maritime Two-Row Barley Screening Trials in 2015. Based on grain yield, lodging and disease resistance, one line was designated as CH2801-48 and advanced to the Maritime Two-Row Barley Registration and Recommendation Trials conducted in 2016 to 2017 and the Ontario Barley Orthogonal Trials in 2016 to 2017.

Tests and Trials: The comparative trials for ‘AAC Madawaska’ were conducted during the 2019 and 2021 growing seasons at the Agriculture and Agri-Food Canada Ottawa Research and Development Centre in Ottawa, Ontario Canada. Each trial was arranged in a RCB design with 4 replicates and a seeding density of 350 seeds per squared metre. Plots consisted of 6 rows with a row length of 5 metres spaced 0.18 metres apart. Measured characteristics were based on 40 and 20 measurements per variety in 2019 and 2021, respectively.



Barley: ‘AAC Madawaska’ (left) with the reference variety ‘AAC Bell’ (right)

Proposed denomination: 'Richer'
Application number: 19-9705
Application date: 2019/01/14
Applicant: C r la inc., St-Hugues, Quebec
Breeder: Annie Archambault, C r la inc., St-Hugues, Quebec

Varieties used for comparison: 'Chambly', 'Oceanik' and 'Sagamie'

Summary: *At booting, the flag leaf of 'Richer' is narrower than that of 'Sagamie'. At the beginning of ripening, the plants of 'Richer' are taller than the plants of 'Chambly'. Excluding the awns, the spike of 'Richer' is longer than that of 'Chambly'. The length of the first segment of the rachis is medium to long for 'Richer' whereas the first segment of the rachis is short for 'Chambly' and 'Sagamie'. The curvature on the first segment of the rachis of 'Richer' is weak to medium whereas the curvature on the first segment of the rachis is absent or very weak for 'Chambly'. The rachilla hair on the kernel of 'Richer' is short whereas it is long on the kernels of 'Oceanik' and 'Sagamie'.*

Description:

YOUNG PLANT: semi-erect or intermediate growth habit at tillering, absent or very sparse pubescence on lower leaf sheaths
PLANT: six row, spring feed barley, spike emergence occurs early in the season

FLAG LEAF (AT BOOTING): absent or very low to low frequency of plants with recurved flag leaves

FLAG LEAF SHEATH: absent or very sparse pubescence

AURICLES: very weak to weak intensity of anthocyanin colouration, absent or very sparse pubescence on margins

SPIKE: absent or very weak to weak glaucosity, semi-erect attitude, parallel shape, medium to dense, glume and awn of the median spikelet are longer than the grain

LEMMA AWNS: very weak to weak intensity of anthocyanin colouration of tips, longer than spike, rough spiculations on margins

FIRST SEGMENT OF RACHIS: medium to long, weak to medium curvature

KERNEL: short rachilla hairs, husk present, absent or very weak to weak anthocyanin colouration of nerves of lemma, weak spiculation of inner lateral nerves of dorsal side of lemma, glabrous ventral furrow

Origin and Breeding: 'Richer' (experimental designation OS13-12,20) originated from a cross conducted in Sainte-Rosalie, Quebec between the varieties 'Chambly' (female parent) and 'Oceanik' (male parent) in 2004. The resulting progeny, coded as 'SO04-6', was crossed with 'Oceanik' in 2006 at the same location. The F1 to F4 generations were mass cultivated in Ste. Rosalie, Quebec from 2007 to 2010 where seed selections were made based on grain density at each generation. Spikes were selected from the F5 plants based on their apparent disease resistance and lodging resistance. From 2012 to 2015, the line designated as OS13-12,20 was initially evaluated in agronomic trials with selections based on yield, thousand kernel weight and Fusarium head blight resistance. OS13-12,20 was advanced into screening trials in 2015 and further evaluated in registration trials conducted by the Quebec Recommending Committee for Cereals in 2016 and 2017.

Tests and Trials: The comparative trials for 'Richer' were conducted at C r la Inc. in St-Hugues, Quebec, during the 2019 and 2020 growing seasons. Each trial was arranged in a RCB design with 2 replicates. Each 4.5 metre squared plot consisted of 5 rows, each row 5 metres long with an inter-row spacing of 0.19 metres. The seeding density was 375 seeds per squared metre resulting in a total of at least 3375 plants per variety each year. Measured characteristics were based on 25 and 20 measurements per variety in 2019 and 2020, respectively. Mean differences were significant at the 5% probability level based on a Tukey Test.

Comparison table for 'Richer'

	'Richer'	'Chambly'*	'Oceanik'*	'Sagamie'*
<i>Flag leaf width (mm)</i>				
mean 2019	10.2	11.7	10.6	14.0
std. deviation 2019	1.8	1.9	1.3	2.2
mean 2020	7.5	7.4	6.4	8.6
std. deviation 2020	1.5	1.7	1.5	1.2

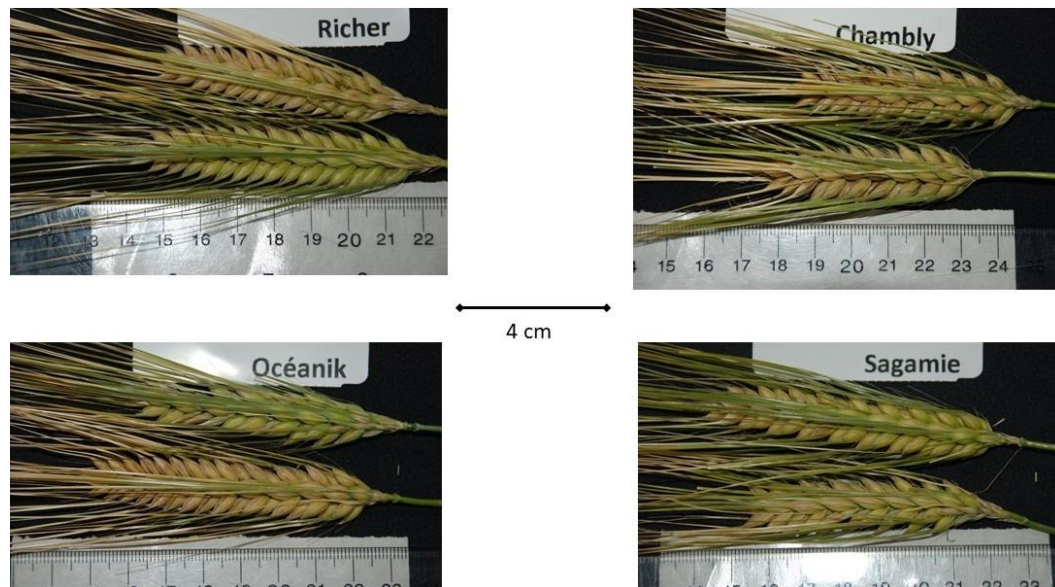
Plant height (stem plus spike, including awns) (cm)

mean 2019	109.8	97.8	101.8	106.7
std. deviation 2019	6.1	5.8	5.0	7.1
mean 2020	80.1	66.8	78.2	78.6
std. deviation 2020	5.4	4.4	4.0	7.0

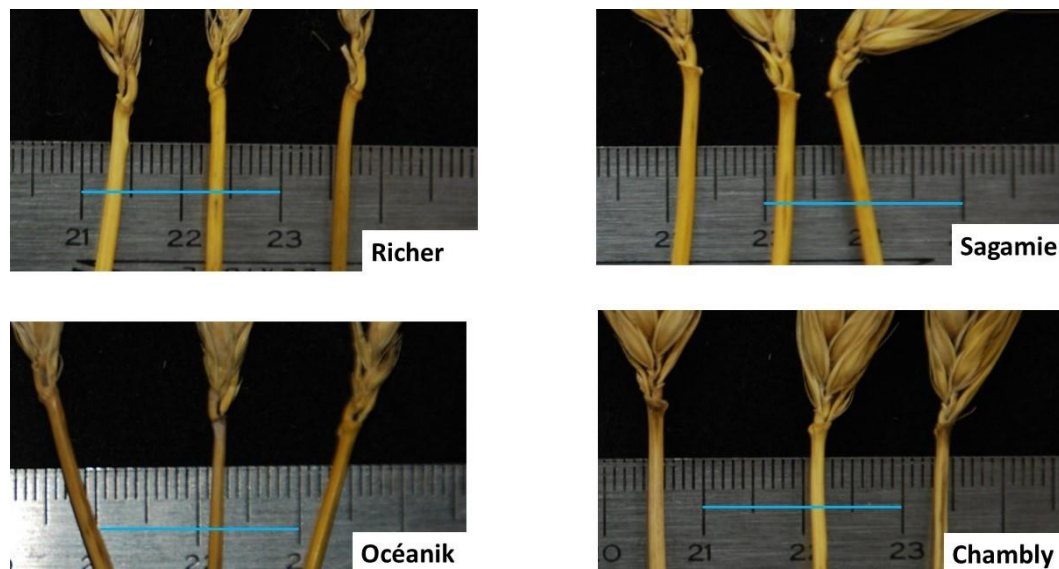
Spike length (excluding awns) (cm)

mean 2019	8.12	6.74	8.38	8.26
std. deviation 2019	0.65	0.65	0.77	0.81
mean 2020	7.76	6.61	8.39	7.67
std. deviation 2020	0.66	0.59	0.63	0.71

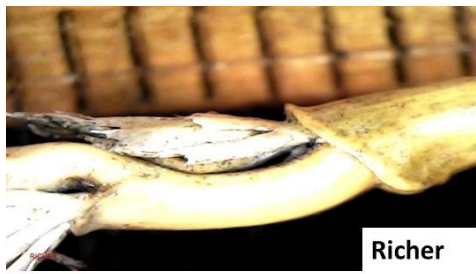
*reference varieties



Barley: 'Richer' (top left) with reference varieties 'Chambly' (top right), 'Océanik' (bottom left) and 'Sagamie' (bottom right)



Barley: 'Richer' (top left) with reference varieties 'Sagamie' (top right), 'Océanik' (bottom left) and 'Chambly' (bottom right)



← 2 cm →



Barley: 'Richer' (top left) with reference varieties 'Sagamié' (top right), 'Océanik' (bottom left) and 'Chambly' (bottom right)