



APPLICATIONS UNDER EXAMINATION

BARLEY

BARLEY (*Hordeum vulgare*)

Proposed denomination: 'Bighorn'
Application number: 22-10883
Application date: 2022/04/19
Applicant: Highland Specialty Grains, Almira, Washington, United States of America
Agent in Canada: Nutrien Ag Solutions, Calgary, Alberta
Breeder: Highland Specialty Grains, Almira, Washington, United States of America

Varieties used for comparison: 'Champion' and 'Claymore'

Summary: *At tillering, the pubescence on the lower leaf sheath of 'Bighorn' is sparse while pubescence is absent or very sparse on the lower leaf sheath of 'Champion'. At booting, anthocyanin colouration is absent on the flag leaf auricles of 'Bighorn' while it is present on the flag leaf auricles of 'Champion' and 'Claymore'. The flag leaf of 'Bighorn' is longer than the flag leaf of 'Claymore'. At the soft dough stage, the anthocyanin colouration of the nerves of lemma on the kernel of 'Bighorn' is of an absent or very weak to weak intensity while it is of a medium intensity for 'Champion'. At the beginning of ripening, the spike of 'Bighorn' is lax while the spike of 'Champion' is of a medium density. The glume and awn of the median spikelet for 'Bighorn' are equal in length relative to the grain while the glume and awn of the median spikelet for 'Champion' are longer than the grain. The spiculation of the inner lateral nerves on the dorsal side of the lemma on the kernel of 'Bighorn' is medium to strong while that of 'Champion' is weak to medium and that of 'Claymore' is weak. The kernel of 'Bighorn' is wider than the kernel of 'Champion'.*

Description:

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

PLANT: two row, spring feed barley

AURICLES: no anthocyanin colouration, absent or very sparse pubescence on margins

SPIKE: mid-season emergence, medium to strong glaucosity at end of anthesis, semi-erect attitude, platform shaped collar, tapering to parallel shape, lax, parallel to weakly divergent sterile spikelet attitude, glume and awn of the median spikelet are equal in length relative to the grain

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

FIRST SEGMENT OF RACHIS: short, medium to strong curvature

KERNEL: absent or very weak to weak intensity of anthocyanin colouration of nerves of lemma, whitish aleurone layer, short rachilla hairs, husk absent, medium to strong spiculation of inner lateral nerves of dorsal side of lemma, hairless ventral furrow, horseshoe shaped basal markings, long and wide

AGRONOMIC CHARACTERISTICS: fair to good resistance to lodging, good resistance to shattering, good tolerance to straw breakage, fair to good tolerance to drought

Origin and Breeding: 'Bighorn' (experimental designations H0516-388 and TR18748) originated from a cross conducted by Highland Specialty Grains between the varieties 'Claymore' and 'Champion' in Casa Grand, Arizona, USA in March, 2014. The F1 seed was bulk harvested in May, 2014 and planted in Gilroy, California, USA. Subsequent selections were made based on seed plumpness, standability and favourable plant type, from the F2 to F4 generations in Gilroy, California, Holtville, California and Moses Lake, Washington respectively. One F5 head row, designated as H0516-388, that satisfied criteria for standability, uniformity and tillering, was selected and planted in replicated trials in Alberta, Canada in 2016 and in Alberta and Saskatchewan, Canada in 2017. The variety was tested in The Western Cooperative Two-Row Barley Registration Trials as 'TR18748' in 2018 and 2019. In 2020, F10 heads were selected and planted in head rows near Yuma, Arizona. A single F11 headrow was selected based on uniformity, and planted as strips near Moses Lake, Washington, USA. Resulting F12 strips that appeared uniform were bulk harvested as breeder seed in 2021.

Tests and Trials: The comparative trials for ‘Bighorn’ were conducted in Neapolis, Alberta during the 2021 and 2022 growing seasons. There were 3 row blocks each consisting of 3 replicates per variety with the second and third row blocks arranged in a RCB design. The individual plots consisted of 5 rows, 5 metres in length, with 0.25m inter-row spacing and 0.45m spacing between the plots. The seeding density was 275 seeds per square metre resulting in 13,500 plants per variety per year. Measured characteristics were based on a minimum of 20 measurements. Mean differences were significant at the 5% probability level based on a paired Student’s T-test.

Comparison table for ‘Bighorn’

	‘Bighorn’	‘Champion’*	‘Claymore’*
<i>Flag leaf length (cm)</i>			
mean 2021	16.2	19.1	13.7
std. deviation 2021	1.49	1.23	1.41
mean 2022	19.7	17.4	16.4
std. deviation 2022	1.68	1.65	1.60
<i>Kernel width (mm)</i>			
mean 2021	3.9	3.6	3.6
std. deviation 2021	0.33	0.49	0.49
mean 2022	4.1	3.9	4.0
std. deviation 2022	0.30	0.27	0.25

*reference varieties



Barley: ‘Bighorn’ (right) with reference varieties ‘Champion’ (left) and ‘Claymore’ (centre)



Barley: 'Bighorn' (right) with reference varieties 'Champion' (left) and 'Claymore' (centre)

Proposed denomination: 'CDC Durango'
Application number: 22-10886
Application date: 2022/04/19
Applicant: University of Saskatchewan, Saskatoon, Saskatchewan
Breeder: Aaron Beattie, University of Saskatchewan, Saskatoon, Saskatchewan

Varieties used for comparison: 'CDC Austenson' and 'Claymore'

Summary: *At booting, the flag leaf of 'CDC Durango' is smaller than the flag leaf of 'CDC Austenson' and larger than that of 'Claymore'. At maturity, the plants of 'CDC Durango' are shorter than those of 'Claymore'. The sterile spikelet of 'CDC Durango' is fully developed while that of 'Claymore' has rudimentary development. Excluding the awns, the spike of 'CDC Durango' is longer than that of 'CDC Austenson'. The spiculation of the inner lateral nerves on the dorsal side of the lemma on the kernel of 'CDC Durango' is of a weak to medium degree while that of 'CDC Austenson' is of a medium to strong degree and that of 'Claymore' is absent or of a very weak degree. The rachilla hairs on the kernel of 'CDC Durango' are long while those of 'CDC Austenson' are short.*

Description:

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

PLANT: two row, spring feed barley

FLAG LEAF (AT BOOTING): absent or very sparse pubescence on blade

FLAG LEAF SHEATH: medium glaucosity, absent or very sparse pubescence

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

SPIKE: mid to late season emergence, medium glaucosity at end of anthesis, erect to semi-erect attitude, platform shaped collar, parallel shape, lax, divergent sterile spikelet attitude, glume and awn of the median spikelet are equal in length 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 to medium length, weak to medium curvature

KERNEL: whitish aleurone layer, long rachilla hairs, husk present, weak to medium spiculation of inner lateral nerves of dorsal side of lemma, hairless ventral furrow, frontal disposition of lodicules, incomplete horseshoe shaped basal markings, medium in length and width

AGRONOMIC CHARACTERISTICS: good resistance to lodging, good resistance to shattering, good tolerance to straw breakage, fair to good tolerance to drought

Origin and Breeding: 'CDC Durango' (experimental designations TR19175 and SB160566) originated from a cross between the varieties 'Claymore' and 'CDC Austenson' conducted under a glass greenhouse in the summer of 2013 at the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada. The F1 seed was grown in Leeston, New Zealand during the winter of 2013-2014 and the resulting F2 seed grown as a bulk population in Saskatoon, Saskatchewan in 2014. The variety was advanced through the F3 and F4 generations as single seed derived lines in greenhouse facilities at the University of Saskatchewan during the winter of 2014-2015. The F5 generation was grown as

single hill plots in Saskatoon, Saskatchewan with one hill plot bulk harvested and designated SB160566 in 2015. The line was tested in yield trials at the University of Saskatchewan and entered in the Western Cooperative Two-Row Barley Registration Trials as TR19175 in 2019 and 2020. Selection criteria used in the development of 'CDC Durango' included grain yield, lodging resistance, plant height and maturity and adaptability across western Canada.

Tests and Trials: The comparative trials for 'CDC Durango' were conducted at the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan in the 2021 and 2022 growing seasons. The trials were conducted using a RCB design consisting of 4 replications per variety. Each plot consisted of 5 rows spaced 20 cm apart, with a row length of 3.66 metres. The planting density of 215 seeds per square metre resulted in approximately 5600 plants per variety per year. Measured characteristics were based on a minimum of 24 measurements per variety per year, except for seed weight, which was based on a minimum of 10 measurements per variety per year. Mean differences were significant at the 5% probability level based on LSD values.

Comparison table for 'CDC Durango'

	'CDC Durango'	'CDC Austenson'*	'Claymore**'
<i>Flag leaf length (cm)</i>			
mean 2021 (LSD=0.8)	13.6	14.5	12.4
std. deviation 2021	2.3	1.9	1.9
mean 2022 (LSD=0.9)	16.2	17.4	13.0
std. deviation 2022	2.5	2.4	2.1
<i>Flag leaf width (mm)</i>			
mean 2021 (LSD=0.5)	8.3	8.9	7.8
std. deviation 2021	1.3	1.4	1.1
mean 2022 (LSD=0.5)	10.2	11.3	8.7
std. deviation 2022	1.5	1.8	1.2
<i>Plant height (stem and spike, including awns) (cm)</i>			
mean 2021 (LSD=1.2)	53.9	52.6	57.9
std. deviation 2021	2.4	2.7	2.1
mean 2022 (LSD=1.7)	74.5	76.7	76.9
std. deviation 2022	3.1	3.7	3.1
<i>Spike length (excluding awns) (cm)</i>			
mean 2021 (LSD=0.4)	9.3	8.5	9.8
std. deviation 2021	1.0	0.8	1.1
mean 2022 (LSD=0.3)	8.9	8.3	9.1
std. deviation 2022	0.5	0.3	0.6

*reference varieties



Barley: 'CDC Durango' (centre) with reference varieties 'CDC Austenson' (left) and 'Claymore' (right)



Barley: 'CDC Durango' (centre) with reference varieties 'CDC Austenson' (left) and 'Claymore' (right)

Proposed denomination: ‘Cantu’
Application number: 22-10884
Application date: 2022/04/19
Applicant: Highland Specialty Grains, Almira, Washington, United States of America
Agent in Canada: Nutrien Ag Solutions, Calgary, Alberta
Breeder: Highland Specialty Grains, Almira, Washington, United States of America

Varieties used for comparison: ‘Champion’ and ‘Claymore’

Summary: *At booting, anthocyanin colouration is absent on the flag leaf auricles of ‘Cantu’ while it is present on the flag leaf auricles of ‘Champion’ and ‘Claymore’. At the end of anthesis, the spike attitude of ‘Cantu’ is horizontal to semi-nodding while the spike attitude of ‘Champion’ and ‘Claymore’ is erect to semi-erect. At the soft dough stage, the anthocyanin colouration of the nerves of lemma on the kernel of ‘Cantu’ is of a very strong intensity while it is of a medium intensity for ‘Champion’ and a weak intensity for ‘Claymore’. At the beginning of ripening, the spike of ‘Cantu’ is lax while the spike of ‘Champion’ is of a medium density. Excluding the awns, the spike of ‘Cantu’ is longer than the spike of ‘Champion’. The first segment of the rachis for ‘Cantu’ is long and has an absent or very weak to weak degree of curvature while the first segment of the rachis for ‘Champion’ is short to medium in length and has a strong degree of curvature and that of ‘Claymore’ is short with a medium to strong degree of curvature. The glume and awn of the median spikelet of ‘Cantu’ are longer than the length of the grain while the glume and awn of the median spikelet of ‘Claymore’ are shorter than the length of the grain.*

Description:

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

PLANT: two row, spring feed barley

AURICLES: no anthocyanin colouration, absent or very sparse pubescence on margins

SPIKE: mid-season emergence, medium to strong glaucosity at end of anthesis, horizontal to semi-nodding attitude, platform shaped collar, tapering to parallel shape, lax, parallel to weakly divergent sterile spikelet attitude, glume and awn of the median spikelet are longer than length of grain

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

FIRST SEGMENT OF RACHIS: long, absent or very weak to weak curvature

KERNEL: very strong intensity of anthocyanin colouration of nerves of lemma, whitish aleurone layer, short rachilla hairs, husk absent, weak spiculation of inner lateral nerves of dorsal side of lemma, hairless ventral furrow, horseshoe shaped basal markings, long, medium width

AGRONOMIC CHARACTERISTICS: good resistance to lodging, good resistance to shattering, fair to good tolerance to straw breakage, good tolerance to drought

Origin and Breeding: ‘Cantu’ (experimental designations H0516-373 and TR18747) originated from a cross conducted by Highland Specialty Grains between the varieties ‘Claymore’ and ‘Champion’ in Casa Grand, Arizona, USA in March 2014. The F1 seed was bulk harvested in May, 2014 and planted in Gilroy, California, USA. Subsequent selections were made based on seed plumpness, standability and favourable plant type, from the F2 to F4 generations in Gilroy, California, Holtville, California and Moses Lake, Washington respectively. One F5 head row designated as H0516-373, that satisfied criteria for standability, uniformity and tillering, was selected and planted in replicated trials in Alberta, Canada in 2016 and in Alberta and Saskatchewan, Canada in 2017. The variety was tested in The Western Cooperative Two-Row Barley Registration Trials as ‘TR18747’ in 2018 and 2019. In 2020, F10 heads were selected and planted in head rows near Yuma, Arizona. A single F11 headrow was selected based on uniformity and planted as strips near Moses Lake, Washington, USA. Uniform appearing F12 strips were bulk harvested as breeder seed in 2021.

Tests and Trials: The comparative trials for ‘Cantu’ were conducted in Neapolis, Alberta during the 2021 and 2022 growing seasons. There were 3 row blocks each consisting of 3 replicates per variety with the second and third row blocks arranged in a RCB design. The individual plots consisted of 5 rows, 5 metres in length, with 0.25m inter-row spacing and 0.45m between the plots. The seeding density was 275 seeds per square metre resulting in 13,500 plants per variety per year. Measured characteristics were based on a minimum of 20 measurements. Mean differences were significant at the 5% probability level based on a paired Student’s t-test.

Comparison table for 'Cantu'

	'Cantu'	'Champion'*	'Claymore'*
<i>Spike length (excluding awns) (cm)</i>			
mean 2021	8.9	7.7	8.8
std. deviation 2021	0.34	0.38	0.32
mean 2022	8.8	8.2	8.3
std. deviation 2022	0.80	0.61	0.56

*reference varieties



Barley: 'Cantu' (right) with reference varieties 'Champion' (left) and 'Claymore' (centre)



Barley: 'Cantu' (right) with reference varieties 'Champion' (left) and 'Claymore' (centre)

Proposed denomination: 'Elegancia'
Application number: 22-10807
Application date: 2022/01/26
Applicant: Sollio Agriculture, Saint-Hyacinthe, Quebec
Breeder: Valerie Chabot, Sollio Agriculture, Saint-Hyacinthe, Quebec

Varieties used for comparison: 'Leader', 'Selena' and 'Champion'

Summary: At booting, the frequency of plants with recurved flag leaves is high for 'Elegancia' whereas the frequency is low for 'Selena' and medium for 'Champion'. The intensity of anthocyanin colouration on the flag leaf auricles of 'Elegancia' is very weak whereas it is weak for 'Champion', medium for 'Selena' and strong for 'Leader'. The glaucosity on flag leaf sheath of 'Elegancia' is of a medium degree whereas the glaucosity on the flag leaf sheath of 'Leader' is strong and that of 'Champion' is weak. The flag leaf of 'Elegancia' is wider than the flag leaf of 'Selena' and 'Champion' and longer than that of 'Selena'. The plants of 'Elegancia' head earlier than the plants of 'Champion'. The spike attitude of 'Elegancia' is horizontal whereas the spike attitude is semi-erect for 'Champion' and nodding for 'Leader' and 'Selena'. The anthocyanin colouration of the nerves of the lemma on the kernel of 'Elegancia' is absent or very weak whereas it is strong on the kernels of 'Selena' and 'Champion'. At the beginning of ripening, the plants, including the awns, of 'Elegancia' are taller than the plants of 'Selena' and 'Champion'. Excluding the awns, the spike of 'Elegancia' is longer than those of the reference varieties. The sterile spikelets of 'Elegancia' have a parallel to weakly divergent attitude whereas the sterile spikelets of 'Leader' and 'Selena' have a divergent attitude and those of 'Champion' have a parallel attitude.

Description:

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

PLANT: two row, spring feed barley, high frequency of plants with recurved flag leaves

FLAG LEAF (AT BOOTING): absent or very sparse pubescence on blade

FLAG LEAF SHEATH: medium glaucosity, absent or very sparse pubescence

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

SPIKE: mid-season emergence, absent or very weak degree of glaucosity, horizontal attitude, v-shaped collar, parallel shape, medium density, glume and awn of the median spikelet are shorter than length of grain

LEMMA AWNS: very weak intensity of anthocyanin colouration of tips, longer than spike, rough due to the presence of spiculations on entire margin

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

KERNEL: long rachilla hairs, husk present, absent or very weak intensity of anthocyanin of nerves of lemma, absent or very weak spiculation of inner lateral nerves of dorsal side of lemma, hairless ventral furrow, medium length, wide

Origin and Breeding: ‘Elegancia’ (experimental designation CFO1803) originated from the cross conducted between ‘Boroe’, as the female parent, and ‘Leader’, as the male parent, in a contra-season nursery in the winter of 2010 in Gorbea, Chile. A modified mass selection technique was used from the F1 to F5 generations based on yield, maturity, lodging resistance, test weight, 1000 kernel weight and disease resistance. The F1, F3 and F5 generations were grown in Saint-Hyacinthe, Quebec in 2011, 2012 and 2014 while the F2 and F4 generations were grown in Gorbea, Chile in winter 2011 and 2012. In Saint-Hyacinthe, one line from the F5 generation was designated as CFO1803 in 2014 and seeds from 60 selected spikes were sown in individual rows in 2015. ‘Elegancia’ was then evaluated in performance trials from 2016 to 2018 and advanced to the public trials conducted by the Réseau Grandes Cultures du Québec in 2019 and 2020. Spikes, representing 22 lines of the F9 generation, were selected and bulked to establish breeder seed in 2018.

Tests and Trials: The comparative trials for ‘Elegancia’ were conducted in 2021 and 2020 at the Sollio Agricultural Research Farm in Saint-Hyacinthe, Quebec. There were 4 replicates per variety arranged in an RCB design. Each plot was 5 square metres and consisted of seven 4.5 m long rows spaced 0.18 m apart. The seeding density was 333 seeds per metre squared resulting in a minimum of 5940 plants per variety per year based on a 90% germination rate. Measured characteristics were based on 20 measurements per variety per year. Mean differences were significant at the 5% probability level based on a Tukey test.

Comparison table for ‘Elegancia’

	‘Elegancia’	‘Leader’*	‘Selena’*	‘Champion’*
<i>Flag leaf width (mm)</i>				
mean 2021	9.5	8.2	6.4	7.3
std. deviation 2021	1.7	1.7	1.0	1.8
mean 2022	10.2	8.3	7.1	6.1
std. deviation 2022	1.5	1.5	1.3	1.4
<i>Flag leaf length (cm)</i>				
mean 2021	13.0	13.4	9.5	13.7
std. deviation 2021	2.0	2.5	2.0	2.2
mean 2022	12.4	12.4	10.7	12.8
std. deviation 2022	2.0	1.8	1.4	2.2
<i>Time of spike emergence (number of days from planting to when first spikelet visible on 50% of spikes)</i>				
mean 2021	186	186	184	189
mean 2022	182	180	185	185
<i>Plant height (stem and spike, including awns) (cm)</i>				
mean 2021	88.4	85.2	67.0	74.6
std. deviation 2021	4.0	6.5	3.5	6.3
mean 2022	115.7	113.6	88.7	97.2
std. deviation 2022	2.4	2.9	2.2	2.7
<i>Spike length (excluding awns) (cm)</i>				
mean 2021	11.2	9.5	8.6	9.6
std. deviation 2021	1.4	1.0	1.0	1.7
mean 2022	9.8	8.9	8.7	7.6
std. deviation 2022	0.8	0.8	0.8	0.6

*reference varieties



Barley: 'Elegancia' (right) with reference varieties 'Selena' (left), 'Champion' (centre left) and 'Leader' (centre right)



Barley: 'Elegancia' (right) with reference varieties 'Champion' (left), 'Selena' (centre left) and 'Leader' (centre right)



Barley: 'Elegancia' (centre right) with reference varieties 'Champion' (left), 'Selena' (centre left) and 'Leader' (right)
