



APPLICATIONS UNDER EXAMINATION

WHEAT

WHEAT
(Triticum aestivum)

Proposed denomination: 'Bolles'
Application number: 18-9413
Application date: 2018/03/29
Applicant: Regents of the University of Minnesota, Minneapolis, Minnesota, United States of America
Agent in Canada: Seed Depot Corporation, Pilot Mound, Manitoba
Breeder: James A. Anderson, Regents of the University of Minnesota, Minneapolis, Minnesota, United States of America

Variety used for comparison: 'Glenn'

Summary: *At booting, the frequency of plants with recurved flag leaves is high for 'Bolles' whereas it is low for 'Glenn'. The anthocyanin colouration of the flag leaf auricles is absent or very weak for 'Bolles' whereas it is strong for 'Glenn'. The flag leaf of 'Bolles' is longer and wider than that of 'Glenn'. The plants of 'Bolles' head later than the plants of 'Glenn'. At heading, the glaucosity on the spike of 'Bolles' is strong whereas the spike of 'Glenn' has a medium degree of glaucosity. The lower glume shoulder for 'Bolles' is narrow whereas the lower glume shoulder is broad for 'Glenn'. The lower glume beak is very long for 'Bolles' whereas it is short for 'Glenn'.*

Description:

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

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

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

CULM: strong glaucosity, curved neck

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

SPIKE: strong glaucosity at heading, tapering shape in profile, medium to dense, light brown at maturity, erect attitude, absent or very sparse hairiness of convex surface of apical rachis segment

AWNS: shorter than length of spike, white at maturity

LOWER GLUME: medium to long, narrow, glabrous, sparse extent of internal hair

LOWER GLUME SHOULDER: narrow, straight to slightly elevated

LOWER GLUME BEAK: very long, slightly curved shape

LOWEST LEMMA: slightly curved beak

KERNEL: hard red, medium red, medium to large, medium length and width, elliptical, rounded cheek, short brush hairs, narrow crease of medium depth

GERM: medium in size, round

BREAD MAKING QUALITY: good

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

Origin and Breeding: 'Bolles' (experimental designation MN08165-8) originated from the cross between the selections, MN02268-1 and MN01333-A-1, made in the University of Minnesota greenhouses in St. Paul, Minnesota, USA, in 2004.

The F1 was grown in University greenhouses. In 2005, from the F2 population space planted on University of Minnesota research land in St. Paul, 19 individual spikes were selected based on plant height, maturity, grain colour, grain quality and disease resistance. From the 19 resulting F3 head rows, 4 spikes were harvested from each of 14 rows selected based on plant height, maturity and disease resistance. These 14 F4 families were evaluated in 2007, as single row observation plots, and 9 families were discarded due to weak straw. One row from each of the remaining 5 families was harvested and grown in a winter nursery in Lincoln, New Zealand. In 2008, one of the five resulting F6 rows was selected, based on plant height, maturity, disease resistance, grain protein content, test weight, grain yield, milling and baking quality. This selection, designated as MN08165, was advanced into the Preliminary Yield Trials at Crookston and St. Paul, Minnesota. In 2009, eight spikes were randomly selected from the yield trials and grown as head rows in St. Paul. One of the 8 rows, selected based on uniformity, was designated as MN08165-8, and grown as head rows in a winter nursery in Lincoln, New Zealand. From 2010 to 2012, MN08165-8 was further purified based on a uniform phenotype and time of heading. In 2013, 1.5 kg of seed was planted for seed increase in St. Paul. Plants with taller spikes, were seen at approximately 0.3 % and these were rogued. Half of the seed harvested was increased near Brawley, California with the resulting seed used for further seed increases at 2 locations in Minnesota. In 2011 and 2012, MN08165-8 was tested in the Tri-State Regional Performance Nursery and from 2011 to 2014 in the Statewide Variety Trials at multiple locations in Minnesota. MN08165-8 was released as 'Bolles' by the Minnesota Agricultural Experimental Station in 2015.

Tests and Trials: The comparative trial for 'Bolles' was conducted during the 2019 growing season at Seed Depot Corp. near Rosebank, Manitoba. There were 3 replications arranged in an RCB Design. Plots consisted of 7 rows, with a row length of 3 metres and a row spacing of 18 cm. Planting density was 500 seeds per metre squared with each plot having approximately 2400 plants. Measured characteristics were based on 20 measurements per variety for one year of data. Mean differences were significant at the 5% confidence probability level based on a paired Student's t-test. 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 2015, 2016 and 2018. Results were supported by the official technical examination report number 201600163 purchased from the Plant Variety Protection Office, Washington, District of Columbia, USA.

Comparison table for 'Bolles'

	'Bolles'	'Glenn'*
<i>Flag leaf length (cm)</i>		
mean	22.1	16.6
std. deviation	2.5	1.6
<i>Flag leaf width (mm)</i>		
mean	14.0	13.0
std. deviation	1.0	1.2
<i>Days to heading (days from planting to when 50% heads are fully emerged from boot)</i>		
mean	57	53
*reference variety		



Wheat: 'Bolles' (right) with reference variety 'Glenn' (left)