OAT
(Avena sativa)

Proposed denomination: **'AAC Douglas'**
Application number: 19-9832
Application date: 2019/05/01
Applicant: Agriculture & Agri-Food Canada, Brandon, Manitoba
Agent in Canada: Agriculture & Agri-Food Canada, Saskatoon, Saskatchewan
Breeder: Jennifer Mitchell Fetch, Agriculture & Agri-Food Canada, Brandon, Manitoba

Variety used for comparison: 'AC Morgan'

Summary: *At the 5 to 9 tiller stage, the pubescence on the lower leaf sheath of 'AAC Douglas' is absent or very sparse to sparse whereas the pubescence on the lower leaf sheath is medium to dense for 'AC Morgan'. At booting, the flag leaf of 'AAC Douglas' is shorter and narrower than that of 'AC Morgan'. The pubescence on the stem above and below the upper culm node of 'AAC Douglas' is absent to very sparse whereas it is sparse to medium for 'AC Morgan'. The plants of 'AAC Douglas' head earlier than the plants of 'AC Morgan'. After heading at the green stage, the plants of 'AAC Douglas' are shorter than the plants of 'AC Morgan'.*

Description:
PLANT: spring hulled type, erect to semi-erect juvenile growth habit at 5 to 9 tiller stage, low to medium frequency of plants with recurved flag leaves at booting

STEM: absent to very sparse pubescence above and below the upper culm node

LOWER LEAF: absent or very sparse to sparse pubescence on sheath, absent to very sparse pubescence on blade
LEAF: medium to dark green, absent to very sparse pubescence on margin of leaf below flag leaf, medium glaucosity at green stage

PANICLE: equilateral/symmetrical orientation, lax to medium density, semi-erect to horizontal attitude of branches, 30 to 45 degree angle between rachis and dominant side branch
SPIKELET: two to three grains
LEMMA: small extent of lateral overlap on palea, white at maturity, absent to very sparse pubescence on lateral and dorsal surface, absent to very weak tendency to be awned

KERNEL (PRIMARY KERNELS FROM UPPER SPIKELETS): short to medium basal hairs, cream colour
GROAT: medium pubescence

Origin and Breeding: 'AAC Douglas' (experimental designations OT2122 and 11P17A-165) originated from the cross made in 2011 between OT7070 and 'CS Camden' at the Agriculture & Agri-Food Canada Cereal Research Centre in Winnipeg, Manitoba. It was selected using a modified bulk breeding strategy followed by a pedigree breeding method. After increasing the F1 seed near Palmerston North, New Zealand, the F2 seed was planted as a bulk plot in an artificial disease nursery at the University of Manitoba, Winnipeg, Manitoba. The harvested F3 seed was increased in the winter nursery near Palmerston North, New Zealand in 2012-2013 where plants were exposed to natural infections. Seeds harvested in bulk were returned to the disease nursery at the University of Manitoba in Winnipeg for another cycle of selection. F5 seed was harvested and grown in rows in New Zealand during the winter of 2013 and 2014. Five hundred panicles were selected from disease free and lodging resistant plants within these rows and seeds were selected based on visual appearance for plumpness, lack of awns and white hulls. In 2014, two hundred and fifty F5 panicles were planted in hill plots and inoculated in the disease nursery in Brandon, Manitoba. Due to a flood, seed from the remaining 250 panicles produced in New Zealand in 2012-2013 were increased again and thirty-five F7 lines were selected based on the previous criteria. These lines were tested in preliminary yield tests in Manitoba, Alberta and British Columbia in 2015. In 2016, two F8 lines were advanced and evaluated in the 'B' Oat Yield Trial grown in western Canada and were evaluated for disease resistance, quality traits and agronomic performance. One line, designated as OT2122, was advanced into the 2017 Western Cooperative Oat Registration Test.

Tests and Trials: The comparative trials for 'AAC Douglas' were conducted at the Agriculture & Agri-Food Canada Brandon Research and Development Centre in Brandon, Manitoba in 2020 and 2021. There were 4 replicates arranged in a RCB design. The size of the plots were 4.4 metres squared. Plots consisted of five 5 metre long rows with 0.177 metre inter-row spacing. The seeding density was 300 seeds per metre squared resulting in a minimum of 3834 plants per variety. The measured characteristics were based on 20 measurements per variety per year. The mean differences were significant at the 5% probability level based on LSD values.

Comparison table for 'AAC Douglas'

	'AAC Douglas'	**'AC Morgan'***
Flag leaf length (cm)		
mean 2020 (LSD=1.3)	23.6	33.2
std. deviation 2020	1.6	1.6
mean 2021 (LSD=1.1)	16.8	22.5
std. deviation 2021	1.6	2.0
Flag leaf width (mm)		
mean 2020 (LSD=0.9)	14.8	16.5
std. deviation 2020	1.7	1.5
mean 2021 (LSD=0.7)	13.2	15.0
std. deviation 2021	1.0	0.9
Days to heading (days from planting to when 50% of panicles are fully emerged)		
mean 2020	52	58
mean 2021	50	56
Plant height (shortly after heading, culm plus panicle) (cm)		
mean 2020 (LSD=2.1)	114.1	118.7
std. deviation 2020	3.7	4.1
mean 2021 (LSD=2.0)	87.9	91.0
std. deviation 2021	3.7	3.1

*reference variety

Oat: 'AAC Douglas' (left) with reference variety 'AC Morgan' (right)

Proposed denomination: **'AAC Wesley'**
Application number: 21-10541
Application date: 2021/05/20
Applicant: Agriculture & Agri-Food Canada, Brandon, Manitoba
Agent in Canada: Agriculture & Agri-Food Canada, Saskatoon, Saskatchewan
Breeder: Jennifer Mitchell Fetch, Agriculture & Agri-Food Canada, Brandon, Manitoba
Kirby Nilsen, Agriculture & Agri-Food Canada, Brandon, Manitoba

Varieties used for comparison: 'AC Morgan' and 'Summit'

Summary: *At the 5 to 9 tiller stage, the lower leaf sheath of 'AAC Wesley' has dense pubescence whereas the pubescence is sparse to medium on the lower leaf sheath of 'Summit'. The pubescence on the lower leaf blade of 'AAC Wesley' is of a medium density whereas it is absent to very sparse on the lower leaf blades of the reference varieties. At booting, the pubescence on the margins of the leaf below the flag leaf of 'AAC Wesley' is sparse whereas it is absent to very sparse for 'Summit'. The flag leaf of 'AAC Wesley' is shorter and narrower than that of 'AC Morgan'. The pubescence above and below the upper culm node on the stem of 'AAC Wesley' is dense to very dense while it is sparse to medium in density for 'AC Morgan' and absent or very sparse to sparse for 'Summit'. The plants of 'AAC Wesley' head earlier than the plants of 'AC Morgan'. After heading at the green stage, the plants of 'AAC Wesley' are shorter than the plants of 'AC Morgan'. The tendency of the lemmas to be awned on 'AAC Wesley' is medium whereas the tendency to be awned is absent to very weak for the reference varieties.*

Description:
PLANT: spring hulled type, erect to semi-erect juvenile growth habit at 5 to 9 tiller stage, medium to high frequency of plants with recurved flag leaves at booting

STEM: dense to very dense pubescence above and below the upper culm node

LOWER LEAF: dense pubescence on sheath, medium pubescence on blade
LEAF: medium to dark green, sparse pubescence on margin of leaf below flag leaf, weak to medium glaucosity at green stage

PANICLE: equilateral/symmetrical to unilateral orientation, medium to dense, semi-erect to horizontal attitude of branches, 30 to 45 degree angle between rachis and dominant side branch
SPIKELET: two grains
LEMMA: small extent of lateral overlap on palea, white at maturity, absent to very sparse to sparse pubescence on lateral and dorsal surface, medium tendency to be awned

KERNEL (PRIMARY KERNELS FROM UPPER SPIKELETS): short basal hairs, cream colour
GROAT: sparse pubescence

Origin and Breeding: 'AAC Wesley' (experimental designations OT2129 and 14P12-DM) originated from the cross made in 2014 between OT3076 and OT8004 at the Agriculture & Agri-Food Canada Brandon Research and Development Centre in Brandon, Manitoba. It was selected using a modified bulk breeding strategy followed by a pedigree breeding method. After increasing the F1 seed near Leeston, New Zealand, the F2 seed was planted as a bulk plot in an artificial disease nursery in Brandon, Manitoba in 2015. The harvested F3 seed was increased in the winter nursery near Palmerston North, New Zealand in 2015-2016 and four hundred panicles were then selected from four rows based on resistance to naturally occuring diseases, maturity, plant height and lodging resistance. In 2016, two hundred F3:F4 panicles were planted in F4 hills and inoculated in the disease nursery in Brandon. Eighty selections were made based on the previous criteria and nutritional quality traits. The F5 generation was increased near Palmerston North, New Zealand in 2016-2017 followed by another year of selections in the disease nursery. Twenty-four F6 lines were tested in preliminary yield tests in Manitoba, Alberta and British Columbia in 2017. In 2018, 9 selections from this population, including 14P12-DM, were advanced and evaluated in the 'B' Oat Yield Trial grown in western Canada. Selections were made for agronomic performance, disease resistance and nutritional quality traits. Six of the selected lines were entered into the 2019 Western Cooperative Oat Registration Test Canada and were evaluated for disease resistance, quality traits and agronomic perfomance. Three of the lines, including OT2129, were advanced to a second year of trials in 2020.

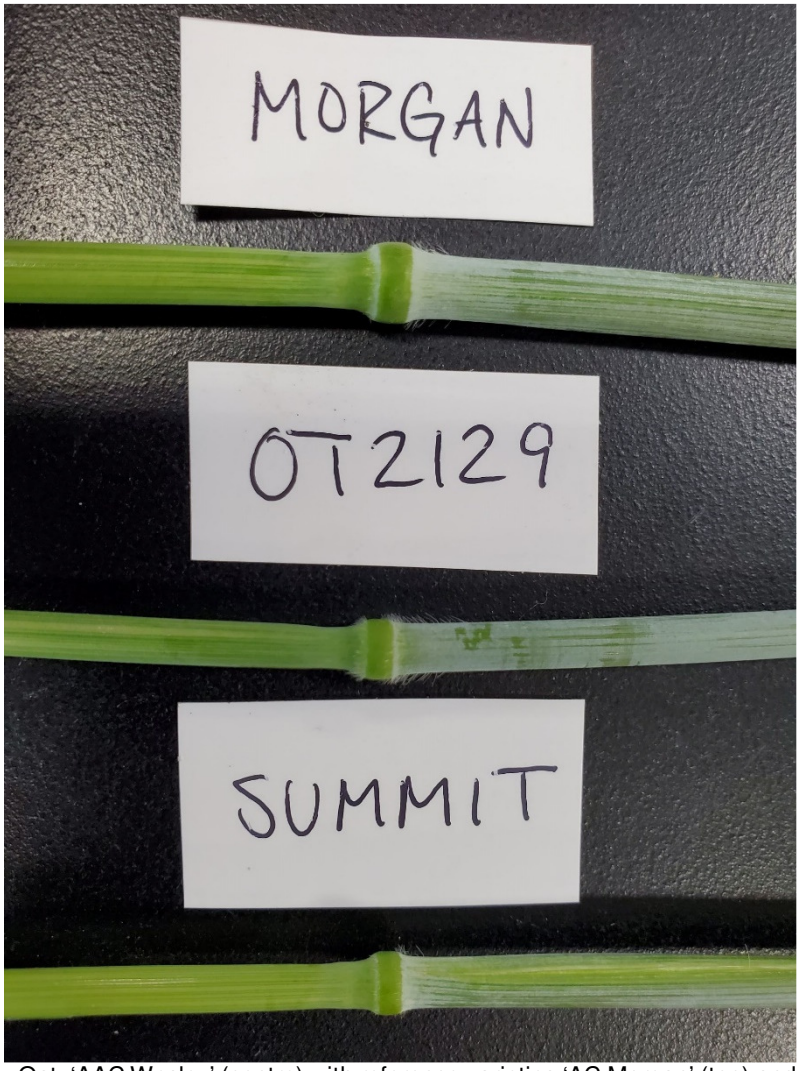
Tests and Trials: The comparative trials for 'AAC Wesley' were conducted at the Agriculture & Agri-Food Canada Brandon Research and Development Centre in Brandon, Manitoba in 2020 and 2021. There were 4 replicates arranged in a RCB design. The size of the plots was 4.4 square metres. Plots consisted of five 5 metre long rows with 0.177 metre inter-row spacing. The seeding density was 300 seeds per metre squared resulting in a minimum of 3834 plants per variety. The measured characteristics were based on a minimum of 20 measurements per variety per year. The mean differences were significant at the 5% probability level based on LSD values.

Comparison table for 'AAC Wesley'

	'AAC Wesley'	'AC Morgan'*	'Summit'*
Flag leaf width (mm)			
mean 2020 (LSD=0.9)	12.3	16.5	11.8
std. deviation 2020	1.2	1.5	1.4
mean 2021 (LSD=0.7)	12.4	15.0	14.3
std. deviation 2021	1.2	0.9	1.2
Flag leaf length (cm)			
mean 2020 (LSD=1.3)	25.3	33.2	23.5
std. deviation 2020	2.3	1.6	2.3
mean 2021 (LSD=1.1)	17.7	22.5	19.7
std. deviation 2021	1.6	2.0	1.9

Days to heading (days from planting to when 50% of panicles are fully emerged)			
mean 2020	54	58	58
mean 2021	51	56	52
Plant height (shortly after heading, culm plus panicle) (cm)			
mean 2020 (LSD=2.1)	107.6	118.7	102.2
std. deviation 2020	3.0	4.1	2.9
mean 2021 (LSD=2.0)	82.2	91.0	86.2
std. deviation 2021	5.0	3.0	3.4

*reference varieties



Oat: 'AAC Wesley' (centre) with reference varieties 'AC Morgan' (top) and 'Summit' (bottom)