



APPLICATIONS UNDER EXAMINATION

BROMEGRASS

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(*Bromus riparius* x *B. inermis*)

Proposed denomination: 'AAC Torque'
Application number: 19-9757
Application date: 2019/04/15
Applicant: Agriculture & Agri-Food Canada, Saskatoon, Saskatchewan
Agent in Canada: Agriculture & Agri-Food Canada, Saskatoon, Saskatchewan
Breeder: Bruce Coulman, Agriculture & Agri-Food Canada, Saskatoon, Saskatchewan

Varieties used for comparison: 'Success', 'Knowles' and 'S9593'

Summary: *The sheath of the first leaf on the seedling of 'AAC Torque' has a weak intensity of anthocyanin colouration while those of 'S9593' and 'Knowles' have an absent or very weak intensity of anthocyanin colouration. Without vernalization in the first year of sowing, the plants of 'AAC Torque' have a weak tendency to form inflorescences while those of 'S9593' and 'Knowles' have an absent or very weak tendency to form inflorescences. At inflorescence emergence, the leaf of 'AAC Torque' is wider than those of 'Knowles' and 'S9593'. At inflorescence emergence, the flag leaf of 'AAC Torque' is wider than that of 'S9593'. The inflorescence of 'AAC Torque' is of a medium density while those of 'Knowles' and 'S9593' are lax. At maturity and including the beak, the glume of 'AAC Torque' is longer than that of 'Success'.*

Description:

SEEDLING: absent or very weak intensity of anthocyanin colouration on sheath of first leaf

PLANT (1st YEAR AFTER SOWING): weak tendency to form inflorescences without vernalization, fine foliage, medium height one month after sowing

LEAF (1ST YEAR AFTER SOWING): dark to very dark green in fall

PLANT (2nd YEAR AFTER SOWING): fine foliage, inflorescence emergence mid to late in the season, medium height at inflorescence emergence, ranging between erect and erect to intermediate growth habit at inflorescence emergence, medium degree of basal tillering at flowering stage

STEM: medium length when fully expanded, upper internode of short to medium length

LEAF: broad

FLAG LEAF (AT INFLORESCENCE EMERGENCE): medium length, broad

INFLORESCENCE: medium length, medium density, absent or very weak to weak anthocyanin colouration at flowering

GLUME: medium length at maturity

Origin and Breeding: 'AAC Torque' (experimental designation S9356M) originated from a hybrid population produced by crossing plants of meadow brome grass (*Bromus riparius*) with plants of smooth brome grass (*Bromus inermis*) with a subsequent cross of the resulting hybrids with plants of a reduced creeping smooth brome grass designated S7133 as the female parent. These crosses occurred from 1976 to 1982 in the Agriculture & Agri-Food Canada forage breeding program in Saskatoon, Saskatchewan. From one of the resulting populations, hybrid progeny plants were selected and inter crossed to produce a line designated as S9183. From this population, several cycles of selections were conducted based on uniformity, floret fertility and plant vigor. Further plant selections made based on plant height, seed size, regrowth ability and reduced creeping were inter crossed to produce a line designated as S9356. Between 1990 and 1995, several populations designated S9356A-H were selected and evaluated in trials and nurseries. In 1995, 31 tall, vigorous and later maturing plants were selected and cross pollinated in a growth cabinet during the winter of 1995-1996. Seed was bulked from 21 resulting plants based on seed yield to form S9356I syn-1, which was later released as 'AC Success' in 2003. In 1999, 35 plants were selected out of a S9356I nursery based on vigor and yield and cross-pollinated. After further evaluation of resulting progeny lines, 12 of the original 35 plants were selected based on yield and crosspollinated in the greenhouse in 2004-2005 to produce

syn-1 seed of S9356M. After further evaluation in multiple locations, S9356M was seeded in a plot in Saskatoon, Saskatchewan for breeder seed production from 2018 to 2020.

Tests and Trials: The comparative trials for ‘AAC Torque’ were conducted at the Forage Centre of Excellence of the University of Saskatchewan in Clavet, Saskatchewan during the summers of 2021, 2022 and 2023. Early vegetative stage observations in the first year after sowing were taken in 2021 and in a second trial planted in 2023 solely to observe these early vegetative traits for a second cycle. The trials consisted of 6 replicates in an RCB design. Each replicate contained 15 plants spaced 1 metre apart for a total of approximately 90 plants per variety. Measured characteristics were based on a minimum of 45 measurements per variety per year. Mean differences were significant at the 5% probability level based on a Student’s t-test.

Comparison table for ‘AAC Torque’

	‘AAC Torque’	‘Success’*	‘Knowles’*	‘S9593’*
<i>Leaf width (fully expanded leaf from middle third of plant at inflorescence emergence) (mm)</i>				
mean (2022)	13.2	13.6	12.2	12.1
std. deviation (2022)	2.02	2.48	2.07	1.51
mean (2023)	10.9	11.0	9.2	9.7
std. deviation (2023)	1.75	1.68	1.65	1.92
<i>Flag leaf width (at inflorescence emergence) (mm)</i>				
mean (2022)	8.9	8.9	8.5	7.9
std. deviation (2022)	1.46	1.27	1.63	1.26
mean (2023)	7.3	7.2	6.7	6.6
std. deviation (2023)	1.40	1.55	1.44	1.21
<i>Glume length (including the beak at seed maturity) (mm)</i>				
mean (2022)	10.4	9.9	10.2	10.4
std. deviation (2022)	1.07	1.22	0.92	1.27
mean (2023)	10.7	10.0	10.4	10.4
std. deviation (2023)	1.26	1.17	1.12	1.00

*reference varieties



Bromegrass: ‘AAC Torque’ (centre right) with reference varieties ‘Knowles’ (left), ‘Success’ (centre left) and ‘S9593’ (right)



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