

## AAC Current durum wheat

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Singh, A. K., Clarke, J. M., DePauw, R. M., Knox, R. E., McCaig, T. N. and Cuthbert, R. D. 2015. AAC Current durum wheat. *Can. J. Plant Sci.* **95**: 589–594. AAC Current durum wheat (*Triticum turgidum* L. subsp. *durum* (Desf.) Husn.) is adapted to the durum production area of the Canadian prairies. AAC Current combines high grain yield, high grain protein concentration, strong straw strength, very high test weight, high grain pigment and strong gluten strength, and low grain cadmium concentration.

**Key words:** *Triticum turgidum* L. subsp. *durum* (Desf.) Husn., durum wheat, cultivar description, grain yield, grain protein, test weight, cadmium

Singh, A. K., Clarke, J. M., DePauw, R. M., Knox, R. E., McCaig, T. N. et Cuthbert, R. D. 2015. Le blé dur AAC Current. *Can. J. Plant Sci.* **95**: 589–594. La variété de blé dur [*Triticum turgidum* L. ssp. *durum* (Desf.) Husn.] AAC Current est acclimatée aux zones de culture du blé dur des Prairies canadiennes. Elle se caractérise par un rendement grainier élevé, une forte teneur en protéines dans le grain, une paille robuste, un poids spécifique très élevé, un grain très pigmenté, un gluten ferme et une faible concentration de cadmium dans le grain.

**Mots clés:** *Triticum turgidum* L. ssp. *durum* (Desf.) Husn., blé dur, description de cultivar, rendement grainier, teneur en protéines du grain, poids spécifique, cadmium

AAC Current durum wheat was developed at the Semiarid Prairie Agricultural Research Centre (SPARC), Agriculture and Agri-Food Canada (AAFC), Swift Current, SK. Plant Breeders' Rights protection (12-7605) was granted on 2012 May 01 and AAC Current (experimental names: DT813, A0139-VJ03E) received registration No. 7312 from the Variety Registration Office, Canadian Food Inspection Agency, on 2013 Feb. 07.

### Pedigree and Breeding Method

AAC Current was selected from the cross 9667B-AA4/DT704//Strongfield made in 2001 at the Semiarid Prairie Agricultural Research Centre, Swift Current, SK. Line 9667B-AA4 is derived from a cross of W9260-BK03/AC Navigator//AC Pathfinder (Clarke et al. 2000a, b). DT704 and Strongfield are sister lines derived from AC Avonlea/DT665 (Clarke et al. 2005b). In 2001–2002, F<sub>1</sub> seeds were increased in the greenhouse and seed of the F<sub>2</sub> were space planted in a disease epiphytotic field nursery in 2002 near Swift Current. Representative leaf rust races found the previous year were applied

(McCallum and Seto-Goh 2006). Stem rust races used were: QTHST (C25), RHTSK (C20), RKQSR (C63), RTHJT (C57), TMRTK (C10), and TPMKR (C53) (Roelfs and Martens 1988; Fetch 2005). Individual plants were selected for leaf spot resistance, leaf and stem rust resistance, plant height, straw strength, and time to maturity. The F<sub>3</sub> seeds of individual F<sub>2</sub> spikes from selected plants were grown in 524, 2-m long F<sub>3</sub> rows near Leeston, New Zealand, in 2002–2003, and were selected for plant height, straw strength and time to maturity. Selected F<sub>3</sub> rows were individually harvested as the seed source for agronomic trials in Canada. In 2003, 291 F<sub>4</sub> lines were grown in 2.74-m<sup>2</sup> four-row plots (one replication and with parents and checks) near Swift Current, Regina and Avonlea, SK. Data from the Avonlea site were not generated due to severe drought at that site. Five heads from the test grown in Swift Current were collected from each selected entry based on agronomic performance and quality testing (protein concentration, pigment and gluten strength). In 2003–2004, 325, 2-m rows (65 lines × 5 heads per line) were grown near Leeston, New Zealand, and selected primarily on plant height, straw strength, and time to maturity. The selected rows were individually harvested as the seed source for agronomic trials in Canada. In 2004, the 175 selected F<sub>6</sub> lines were grown in 2.74-m<sup>2</sup>

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four-row plots (one replication and with parents and checks) under dryland conditions near Swift Current, Regina and Indian Head, SK, and under irrigated conditions near Lethbridge, AB. Selection was based on agronomic performance, quality traits (protein concentration, pigment and gluten strength), and disease resistance primarily leaf spot. Genotype A0139-VJ03 was visually deemed segregating for plant height, and therefore, five heads were picked from the Swift Current plot and grown as 2-m rows near Leeston, New Zealand, and selected on uniformity of plant height, straw strength, and time to maturity. The selected rows were individually harvested as the seed source for agronomic trials in Canada. In 2005, genotype A0139-VJ03E (F<sub>8</sub> line) was grown under dryland conditions near Swift Current, Regina and Lethbridge in 2.74- m<sup>2</sup> four-row plots (one replication and with parents and checks) and selected for further testing based on agronomic performance, quality traits (protein concentration, pigment and gluten strength), and disease resistance.

In 2006, A0139-VJ03E was tested in Durum Western A3 test grown as a two replication alpha-lattice design near Swift Current, Regina, and Indian Head, SK, Lethbridge, AB, and Brandon, MB, to assess agronomic performance. In 2007, it was tested in Durum B-test grown as a three replication alpha-lattice design near Swift Current, Regina, Indian Head, Kernen, Goodale, SK, and Lethbridge, AB, to assess agronomic performance. In both years the disease evaluations included response to leaf rust and stem rust evaluated in hill plots in a rust nursery near Glenlea, MB, using a mixture of races. Response to leaf spotting pathogens was assessed from within the yield plots under conditions of natural inoculums. Response to *Fusarium graminearum* Schwabe [teleomorph *Gibberella zeae* (Schwein. Petch)] was assessed in an FHB nursery near Portage la Prairie, MB. Response to loose smut [*Ustilago tritici* (Pers.) Rostr.] was based on inoculation with a mixture of races T26, T32 and T33 Nielsen (1987) under field conditions near Swift Current, SK. Remnant seed from the yield trials was used to assess end-use suitability by the Central Quality Laboratory, Cereal Research Centre, MB, and included protein concentration, pigment, milling properties, gluten strength, and Hagberg falling number. This procedure identified the experimental line, A0139-VJ03E, as having met all of the selection criteria at each stage of selection. A0139-VJ03E was advanced to the Durum Cooperative Registration Trial and evaluated as DT813 from 2008 to 2011. The Durum Cooperative test was grown as a four-row plot test at up to 12 locations annually in a 6 × 5 lattice design including five checks, with two replications in two repetitions. The check cultivars were AC Avonlea (Clarke et al. 1998), AC Morse, AC Navigator (Clarke et al. 2000a), Commander (Clarke et al. 2005a), and Strongfield (Clarke et al. 2005b). The Durum Wheat

Cooperative test operating protocols are described in the Prairie Recommending Committee for Wheat Rye and Triticale operating procedures (link can be found at [http://www.pgdc.ca/committees\\_wrt.html](http://www.pgdc.ca/committees_wrt.html)). The PROC MIXED procedure was used to analyze the data annually and to perform a combined analysis over years using a mixed model with environments and replications considered random and genotypes considered fixed (SAS Institute Inc. 2003).

The durum wheat cooperative test entries were evaluated in inoculated nurseries to determine the response to leaf rust, stem rust, and loose smut near Glenlea, MB. Fusarium head blight was assessed in inoculated nurseries near Carman and Glenlea, MB, Ottawa, ON, and Charlottetown, PE (Gilbert and Woods 2006). Stem rust inoculum consisted of races of TPM, TMR, QTH, RKQ, RHT, RTH, which comprised select historical races representing a range of virulence genes (Fetch 2005), whereas the leaf rust inoculums was representative of recently occurring races (McCallum and Seto-Goh 2006). The loose smut inoculum consisted of races T26, T32 and T33. Response to common bunt caused by *Tilletia laevis* Kuhn in Rabenh. and *T. tritici* (Bjerk.) G. Wint. in Rabenh. was assessed from a nursery grown near Lethbridge, AB, using prevalent races in a mixture of the races T-1, T-6, T-13, T-19, L-1 and L-16 (Gaudet and Puchalski 1989). The race designations are those described by Roelfs and Martens (1988) for stem rust, Long and Kolmer (1989) for leaf rust, Hoffmann and Metzger (1976) for common bunt, and Nielsen (1987) for loose smut. Leaf spot reaction was determined with natural infestation at Saskatchewan and Manitoba locations. Reaction to stripe rust (*Puccinia striiformis* f. *tritici* Eriks) was determined in a nursery in 2011 near Lethbridge, AB.

### Performance

In 4 yr of cooperative testing, grain yield of AAC Current was not significantly different from the checks AC Avonlea, AC Morse, Strongfield, and Commander, but was significantly higher than AC Navigator (Table 1). Time to maturity of AAC Current was similar to Strongfield in both soil zones and significantly earlier than AC Navigator (Table 2). Test weight (kg hL<sup>-1</sup>) of AAC Current was significantly higher than all checks (Table 2), while the 1000-kernel weight (g) was significantly smaller than AC Navigator and Commander. AAC Current was significantly taller than other checks except AC Avonlea, with straw strength similar to AC Avonlea and Strongfield and significantly less than AC Morse (Table 2). Grain protein concentration of AAC Current was similar to the highest protein checks, AC Avonlea and Strongfield and significantly higher than other checks (Table 3).

AAC Current was resistant to leaf and stem rust, and its common bunt resistance was intermediate and similar to the other checks (Table 4). AAC Current was

**Table 1. Grain yield (kg ha<sup>-1</sup>) of AAC Current and check cultivars in the Durum Cooperative Test, 2008 to 2011 in Zones 1 and 2<sup>z</sup>**

	2008			2009			2010			2011			2008–2011		
	Zone 1	Zone 2	Mean <sup>y</sup>	Zone 1	Zone 2	Mean	Zone 1	Zone 2	Mean	Zone 1	Zone 2	Mean	Zone 1	Zone 2	Mean
AC Avonlea	4515	4270	4359	6211	4279	4922	4466	3607	3895	4312	3700	3823	4966	3972	4270
AC Morse	4690	4256	4413	5961	4172	4771	4907	3746	4133	4245	3876	3949	5043	4009	4323
AC Navigator	4385	4483	4446	5772	4499	4921	3635	3631	3633	3793	3667	3692	4506	4060	4186
Strongfield	4321	4383	4359	6258	4405	5021	4658	3749	4053	4487	3886	4008	5012	4119	4387
Commander	4384	4561	4499	6244	4569	5128	4307	3767	3943	4164	3940	3983	4852	4219	4407
AAC Current	4751	4585	4648	5926	4392	4905	4437	3952	4110	4087	3846	3892	4904	4201	4411
LSD <sub>0.05</sub>	430	268	251	526	216	250	445	338	279	908	208	231	390	185	194
No. tests	4	7	11	4	8	12	3	6	9	2	8	10	13	29	42
Mean of checks	4459	4391	4415	6089	4385	4953	4395	3700	3931	4200	3814	3891	4876	4076	4315

<sup>z</sup>Zone 1 (Black Soils): Indian Head (2010 excluded), Souris, Brandon (2008–2010), Langdon (2008–2010); Zone 2 (Brown and Dark Brown Soils): Swift Current, Stewart Valley, Saskatoon, Regina, Lethbridge, Bieseker (2008), Vulcan (2009–2011), Avonlea (2008), Moose Jaw (2009–2011), Pense (2009), Scott (2011).

<sup>y</sup>Means are LS means obtained from PROC MIXED procedure of SAS.

<sup>x</sup>Least significant difference,  $P \leq 0.05$ , includes the appropriate genotype by environment interaction variation.

moderately susceptible to loose smut and similar to Strongfield (Table 4). AAC Current has leaf spot reaction (field rating of natural infection, primarily tan spot [*Pyrenophora tritici-repentis* (Died.) Drechs., anamorph *Drechslera tritici-repentis* (Died.) Shoemaker], and stagonospora nodorum blotch [*Phaeosphaeria nodorum* (E. Müll.) Hedjaroude, anamorph *Stagonospora nodorum* (Berk.) Castell. & E.G. Germano] similar to AC Avonlea and Strongfield and slightly better than AC Morse (Table 4). AAC Current expressed very good resistance to stripe rust similar to Strongfield and slightly better than AC Avonlea (Table 4). The FHB reaction and DON content of AAC Current was similar to the checks (Table 5).

AAC Current has low grain cadmium concentration similar to Strongfield (Table 6). Falling number of AAC Current was lower than the checks, while the hard vitreous kernel count was higher than the checks except Strongfield. Semolina yield was higher than checks

except AC Navigator. AAC Current has good gluten strength properties similar to Strongfield and AC Navigator. Yellow pigment grain concentration of AAC Current was greater than AC Avonlea and AC Morse. AAC Current had better pasta pigment at both 70 and 90°C cooking temperatures compared with Strongfield. Pasta cooking quality as indicated by firmness (peak cooking force) was better in AAC Current than all checks.

#### Other Characteristics

**SPIKES:** Tapering, mid-dense to dense, erect to incline; white awns; glumes mid-wide, mid-long, glabrous.

**KERNEL:** Colour amber; kernel large and elliptical; cheeks angular; crease mid-deep, mid-wide; brush small and short; embryo mid to large; germ shape oval.

**END-USE SUITABILITY:** Eligible for grades of Canada Western Amber Durum wheat market class.

**Table 2. Agronomic characteristics of AAC Current and check cultivars in the Durum Cooperative Test, 2008–2011**

	Days to maturity <sup>zy</sup>			Test weight (kg hL <sup>-1</sup> ) <sup>z</sup>			1000-kernel wt(g) <sup>z</sup>	Height (cm) <sup>z</sup>	Lodging (1–9) <sup>x</sup>
	Zone 1	Zone 2	Mean	Zone 1	Zone 2	Mean			
AC Avonlea	102.5	111.9	110.0	75.5	79.5	78.4	43.9	88.8	2.2
AC Morse	101.9	111.5	109.6	75.0	78.9	77.8	43.5	84.9	1.7
AC Navigator	103.5	113.0	111.0	75.9	80.2	78.9	46.3	78.7	2.4
Strongfield	102.1	111.5	109.6	76.3	80.4	79.2	44.6	87.3	2.4
Commander	102.2	112.2	110.2	74.8	79.4	78.1	46.6	76.0	2.2
AAC Current	102.1	112.2	110.1	76.9	81.5	80.2	43.8	90.6	2.1
LSD <sub>0.05</sub>	1.6	0.7	0.7	1.1	0.5	0.6	1.1	1.8	0.4
No. tests	8	25	33	13	29	42	42	42	13

<sup>z</sup>Zone 1 (Black Soils): Indian Head (2010 excluded), Souris, Brandon (2008–2010), Langdon (2008–2010); Zone 2 (Brown and Dark Brown Soils): Swift Current, Stewart Valley, Saskatoon, Regina, Lethbridge, Bieseker (2008), Vulcan (2009–2011), Avonlea (2008), Moose Jaw (2009–2011), Pense (2009), Scott (2011).

<sup>y</sup>All Zone 1 and Zone 2 locations, except Langdon (in Zone 1), Souris in 2010 and 2011, and Stewart Valley (in Zone 2).

<sup>x</sup>Regina, Saskatoon (2008, 2009, 2011), Souris (2008, 2010), Avonlea (2008), Brandon (2009), Swift Current (2010), Moose Jaw (2011).

<sup>w</sup>Least significant difference,  $P \leq 0.05$ , includes the appropriate genotype by environment interaction variation.

**Table 3. Grain protein concentration (13.5% moisture basis) of AAC Current and check cultivars measured on grain samples bulked across replications at each location of the durum cooperative test, 2008–2011**

	Protein concentration (%)												4-yr mean
	2008			2009			2010			2011			
	Z1 <sup>z</sup>	Z2	Mean <sup>y</sup>	Z1	Z2	Mean	Z1	Z2	Mean	Z1	Z2	Mean	
AC Avonlea	14.1	13.7	13.8	12.7	14.4	13.9	15.4	13.3	13.8	15.8	12.5	13.2	13.7
AC Morse	13.5	13.4	13.5	12.5	13.8	13.5	14.2	12.7	13.1	15.3	12.4	13.0	13.2
AC Navigator	13.7	13.0	13.2	12.6	13.4	13.2	14.7	12.5	13.1	14.5	12.0	12.5	13.0
Strongfield	14.4	13.7	13.9	13.1	14.1	13.9	15.8	13.4	14.0	15.4	12.4	13.0	13.7
Commander	13.9	13.0	13.3	12.7	13.3	13.1	14.8	12.8	13.3	14.9	11.8	12.4	13.0
AAC Current	14.5	13.8	14.0	13.0	14.4	14.0	16.1	13.4	14.1	15.9	12.0	12.8	13.7
LSD <sub>0.05</sub> <sup>x</sup>	0.6	0.5	0.4	0.5	0.4	0.3	0.9	0.5	0.4	0.9	0.4	0.4	0.2
# Tests	3	7	10	3	8	11	2	6	8	2	8	10	39

<sup>z</sup>Z1 = Zone 1 (Black Soils): Indian Head (2010 excluded), Souris, Brandon (2008–2010); Z2 = Zone 2 (Brown and Dark Brown Soils): Swift Current, Stewart Valley, Saskatoon, Regina, Lethbridge, Bieseker (2008), Vulcan (2009–2011), Avonlea (2008), Moose Jaw (2009–2011), Pense (2009), Scott (2011).

<sup>y</sup>Means are LS means obtained from PROC MIXED procedure of SAS.

<sup>x</sup>Least significant difference,  $P \leq 0.05$ , includes the appropriate genotype by environment interaction variation.

### Maintenance and Distribution of Pedigreed Seed

In 2008, 108 single plants ( $F_{6:11}$ ) were individually harvested and constituted the seed source for short rows grown in 2009 near Swift Current, SK. Seed from

these plants were planted in 108 single 3-m-long rows in 2009 near Swift Current. From these, 107 rows deemed to be the most uniform were grown in 2010 as paired 15-m-long breeder rows near Indian Head, which led to

**Table 4. Summary of disease reactions of AAC Current and check cultivars grown in the durum cooperative test, 2008–2011**

	Year	Stem rust			Common bunt Rtn <sup>z</sup> /Rxn <sup>y</sup>	Loose smut Rtn <sup>z</sup> /Rxn <sup>y</sup>	Leaf spot		Stripe rust		
		Garden Rtn <sup>z</sup> /Rxn <sup>y</sup>	Field Rtn <sup>z</sup> /Rxn <sup>y</sup>	Leaf rust <sup>x</sup>			GL <sup>w</sup>	SC <sup>v</sup>	LB-1 <sup>u</sup>	LB-2	LB-3
AC Avonlea	2008	5(R)	5(R)	R	13(MR)	44(I)	4.9(MR)	7.5(I)	–	–	–
	2009	5(R)	10(RMR)	R	1(R)	90(S)	24.0(MR)	–	–	–	–
	2010	10(R)	3(R)	R	20(MS)	51(I)	10.0(R)	7.2(I)	–	–	–
	2011	20(MR)	5(R)	R	1(MR)	27(MR)	37.0(MS)	8.5(MS)	25(I)	25(I)	–
AC Morse	2008	5(R)	5(R)	R	2(VR)	60(MS)	2.5(R)	8.8(MS)	–	–	–
	2009	5(R)	3(R)	R	0(R)	75(MS)	31.7(MR)	–	–	–	–
	2010	5(R)	1(R)	R	7(R–)	56(MS)	19.0(MR)	9.7(S)	–	–	–
	2011	10(MR)	1(R)	R	2(MR)	70(MS)	39.3(MS)	10.5(S)	20(I)	10(R)	5(VR)
AC Navigator	2008	5(R)	2(R)	R	2(VR)	–	3.1(R)	8.5(MS)	–	–	–
	2009	10(RMR)	10(RMR)	R	2(R)	67(MS)	28.0(MR)	–	–	–	–
	2010	10(R)	2(R)	R	2(R–)	29(MR)	36.0(MS)	8.5(MS)	–	–	–
	2011	5(R)	1(R)	R	0(R)	15(R)	49.7(S)	10(S)	1(VR)	35(I)	1(VR)
Strongfield	2008	5(R)	2(R)	R	4(VR)	75(MS)	3.1(R)	7.0(I)	–	–	–
	2009	5(R)	5(R)	R	2(R)	70(MS)	39.7(I)	–	–	–	–
	2010	5(R)	2(R)	R	2(R–)	52(I)	17.0(MR)	7.7(I)	–	–	–
	2011	1(R)	1(R)	R	2(MR)	26(MR)	43.3(S)	8.5(MS)	1(VR)	30(I)	10(R)
Commander	2008	5(R)	2(R)	R	7(R)	66(MS)	3.8(R)	7.3(I)	–	–	–
	2009	1(R)	1(R)	R	1(R)	100(S)	50.3(MS)	–	–	–	–
	2010	3(R)	2(R)	R	1(R–)	41(I)	28.0(I)	7.7(I)	–	–	–
	2011	1(R)	1(R)	R	0(R)	9(R)	41.0(S)	9.8(S)	8(R)	35(I)	5(VR)
AAC Current	2008	2(R)	2(R)	R	12(MR)	14(R)	2.5(R)	7.5(I)	–	–	–
	2009	1(R)	1(R)	R	3(R)	57(MS)	46.7(I)	–	–	–	–
	2010	3(R)	2(R)	R	13(I)	63(MS)	4.6(R)	7.3(I)	–	–	–
	2011	1(R)	1(R)	R	0(R)	50(I)	53.3(S)	10(S)	0(VR)	30(I)	5(VR)

<sup>z</sup>Rtn = rating as % infection.

<sup>y</sup>Reaction type: VR, very resistant; R, resistant; MR, moderately resistant; I, intermediate; MS, moderately susceptible; S, susceptible.

<sup>x</sup>Checks and AAC Current had 0% leaf rust infection in all 4 yr.

<sup>w</sup>GL = Glenlea.

<sup>v</sup>Adult plant, rated mid-grainfill at Swift Current (2008) McFadden scale (0 = no symptoms, 11 = severe symptoms) (McFadden 1991).

<sup>u</sup>LB = Lethbridge (LB-1, -2 and -3: three distinct stripe rust nurseries).

Table 5. Summary of disease reactions of AAC Current and check cultivars grown in the Durum Cooperative Test, 2008–2011

	Year	FHB							Ottawa	DON (ppm) GL	ISD <sup>x</sup> GL
		Carman		Glenlea		PEI (Index <sup>z</sup> )					
		Index <sup>z</sup>	Rxn <sup>y</sup>	Index <sup>z</sup>	Rxn <sup>y</sup>	Early	Late				
AC Avonlea	2008	44.2	MS	24.5	S	–	17.0	–	25.5	18.7	
	2009	25.8	MS	48.8	S	31.7	55.3	–	23.9	18.6	
	2010	64.5	S	37.7	S	86.3	100.0	98	41.0	20.1	
	2011	–	–	17.3	MS	54.8	95.0	62	7.8	6.3	
AC Morse	2008	50.1	S	17	MS	–	16.0	–	20.5	14.7	
	2009	33.6	MS	54.2	S	47.3	65.7	–	36.9	26.6	
	2010	68.1	S	20.7	I	75.4	97.5	54	38.1	18.2	
	2011	–	–	25.2	S	53.5	90.0	80	11.4	7.8	
AC Navigator	2008	60.7	S	19.7	MS	–	8.0	–	39.5	26.5	
	2009	35.5	MS	41.3	S	20.7	47.3	–	35.6	25.3	
	2010	58.6	S	43.0	S	70.8	98.8	90	40.2	20.2	
	2011	–	–	21.0	S	53.7	100.0	83	16.2	9.7	
Strongfield	2008	54.0	S	22.7	S	–	13.3	–	30.5	21.6	
	2009	38.4	MS	59.2	S	24.3	39.7	–	27.3	21.0	
	2010	60.7	S	44.0	S	79.6	91.3	72	49.0	23.7	
	2011	–	–	15.0	I	31.3	80.0	73	7.8	6.0	
Commander	2008	61.8	S	15.8	MS	–	18.0	–	36.9	25.2	
	2009	28.6	MS	56.9	S	38.0	61.0	–	27.2	20.9	
	2010	60.8	S	58.7	S	81.8	98.8	53	52.4	25.6	
	2011	–	–	15.3	MS	27.0	87.5	58	16.7	9.6	
AAC Current	2008	40.4	MS	21.0	S	–	12.7	–	30.0	21.2	
	2009	32.8	MS	43.3	S	24.0	30.7	–	27.9	20.8	
	2010	54.8	S	49.5	S	55.0	95.0	41	34.0	17.9	
	2011	–	–	12.0	I	13.5	85.0	38	5.7	4.6	

<sup>z</sup>Fusarium head blight index: [(mean percent incidence × mean percent severity)/100].

<sup>y</sup>Rxn = Reaction type: I, intermediate; MS, moderately susceptible; S, susceptible.

<sup>x</sup>ISD (Incidence, Severity, DON) is calculated as (0.3\*AvgIncidence)+(0.3\*AvgSeverity)+(0.4\*DON) for a given entry.

the identification of 100 most uniform breeder rows of A0139-VJ03E (DT813). Breeder seed will be maintained by the Seed Increase Unit, Agriculture and Agri-Food Canada, Indian Head, Saskatchewan, Canada S0G

2K0. Distribution and multiplication of pedigreed seed stocks will be handled by Alliance Seed Corporation, 24th Floor, 333 Main Street, Winnipeg, Manitoba, Canada R3C 4E2.

Table 6. End-use suitability<sup>zyx</sup> of AAC Current and check cultivars from 2008, 2009 and 2011 Durum cooperative tests

	FN (s)	Test wt. (kg hL <sup>-1</sup> )	HVK (%)	Cd (mg kg <sup>-1</sup> )	Semo yld (%)	Semo ash (%)	Wht prot (%)	Semo prot (%)	GI (%)	P/L	W (ergs)	Semo YP (ppm)	Colour				Cooking peak force	
													70C b*	90C b*	70C a*	90C a*	70C (g)	90C (g)
AC Avonlea	378	82.8	87	0.22	67.1	0.62	13.3	12.4	11	0.52	121	8.19	61.5	60.1	1.6	5.1	896	963
AC Morse	425	81.4	87	0.19	66.8	0.63	13.1	12.0	49	0.99	193	7.99	58.3	59.2	1.6	4.9	897	967
AC Navigator	428	82.9	87	0.25	68.1	0.64	12.7	11.7	62	1.26	233	9.21	67.3	65.4	3.7	7.5	861	952
Commander	442	82.2	86	0.26	67.7	0.60	12.5	11.6	92	2.02	305	9.58	69.1	66.3	3.4	7.0	888	919
Strongfield	383	83.0	90	0.08	67.3	0.60	13.4	12.3	57	0.88	199	8.61	59.7	58.7	1.9	5.6	883	976
AAC Current	377	83.9	89	0.09	67.8	0.63	13.3	12.4	58	1.20	242	8.50	61.9	61.2	2.1	6.1	908	987
Std. dev. <sup>w</sup>	5			0.001	0.4	0.006	0.06	0.05	3	0.04	6	0.04						

<sup>z</sup>American Association of Cereal Chemists methods were followed by the Grain Research Laboratory (GRL), Canadian Grain Commission (CGC) for determining the various end-use suitability traits on a composite of eight to nine locations each year; 2010 durum cooperative test was not used for end-use suitability traits due to poor seed quality resulting from excessively wet weather.

<sup>y</sup>FN = Hagberg falling number; HVK = hard vitreous kernel; Cd = grain cadmium; Semo yld = semolina yield; Wht prot = wheat protein; GI = gluten index; P/L and W values determined through Alveograph; YP = yellow pigment; spectrophotometer colour b\* = yellowness; a\* = redness on the CIE scale.

<sup>x</sup>Means are from 2008, 2009 and 2011 durum composites, except colour (70 and 90°C) and cooking peak force that are mean from 2008 and 2009.

<sup>w</sup>Std. dev. is the standard deviation based on repeated testing of check samples with replicate tests carried out over an extended period of time each season, provided by GRL, CGC.

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