DATA PACKAGE FOR **BW5098**

CROP KIND: Wheat   **TYPE:** Canada Western Red Spring

PROPOSERS: P. Hucl and C. Briggs
CDC, Univ. of Saskatchewan, Saskatoon, SK, S7N 5A8

TEST NUMBERS: BW5098, W18122   **PEDIGREE**: AAC Brandon/W10093

BW5098 was selected from the cross AAC Brandon/W10093 made at the University of Saskatchewan during the summer of 2012. W10093 (Unity/BW864) is a sister-line of CDC Hughes and CDC Landmark and was evaluated in the 2013 WBWC Test as BW983.

The resulting F_1 from the cross AAC Brandon/W10093 was grown in a greenhouse at the University of Saskatchewan during the winter of 2012/2013.The $F_{2\ generation}$ was grown in a bulk plot in Saskatoon in 2013, the F_3 generation was grown in a winter nursery (2013/2014) while the F_4 generation was grown in a space-planted nursery at Saskatoon in 2014. F_5 and F_6 hills were grown at Saskatoon in 2015 and 2016. Seed from a bulked F_6 row was used as a source for entry into an unreplicated yield trial nursery at Saskatoon in 2017. The entry was also evaluated for reaction to leaf and stem rust in an irrigated nursery from 2017 to 2018.

BW5098 was evaluated as W18122 in a replicated test at three sites in 2018 (two in SK and one in MB) and in the Western Bread Wheat 'B' test in 2019 (as code#43). BW5098 was subsequently evaluated in the Western Bread Wheat Cooperative Test from 2020 to 2022.

AREA OF ADAPTATION: Spring wheat growing regions of Western Canada.

STRENGTHS: BW5098 was higher yielding than three of the four check cultivars with intermediate height and lower lodging scores. BW5098 is a Sm1 carrier and expresses partially solid stems. BW5098 has a significantly higher kernel weight than all the check cultivars.

WEAKNESSES: Slightly lower Test Weight than the checks but within the LSD (0.05) for all the checks other than Glenn.

DESCRIPTION: BW5098 is a semi dwarf line with a lodging score that is lower than that of all the check cultivars. BW5098 is awned and hollow-stemmed. In three years of testing in the Western Bread Wheat Cooperative Test, BW5098 was 10, 7 and 4% higher yielding than Glenn, Carberry and AAC Brandon respectively (Table 1). BW5098 yielded 0.7% less than AAC Viewfield (Table 1). In Zone 3 (9 SY of data) BW5098 yielded higher than all the check cultivars (4 to 10% advantage) – 2022 WBWC Report.

BW5098 matured in the same number of days as AAC Brandon (Table 1).). BW5098 had a marginally lower test than the check cultivars although this was not statistically significant for three of the four check cultivars. BW5098 had a significantly higher kernel weight than the four checks (Table 1).

BW5098 was rated MR or MS for common bunt (Tables 2 and 3) The FHB reactions for BW5098 were mostly "MR" or "I" (Tables 2 and 3). Averaged over the three years of testing, the mean FHB VRI, DON levels and FDK values were intermediate between those of Carberry and AAC Brandon.

After two years of quality evaluation BW5098 was awarded a "DNO" vote by the QET. BW5098 had a consistently higher Falling Number value than AAC Brandon and Glenn.

Internally trialing at two locations revealed that BW5098 expresses partially solid stems. See Supplemental tables (1 hollow - 5 solid).

Table 1. Agronomic data for BW5098 and check cultivars in the Western Bread Wheat Cooperative Test, 2020 to 2022

Entry	Yield (kg ha^{-1})	Maturity (days)	Height (cm)	Lodging (1-9)	Test Weight (kg hL^{-1})	Kernel wt (g)	Grain Protein (%)
Glenn	4039	92.8	86	2.4	83.2	32.2	14.8
Carberry	4170	93.2	80	1.7	81.3	33.8	14.9
AAC Viewfield	4517	93.1	77	2.6	81.7	31.4	14.4
AAC Brandon	4304	93.4	79	2.7	81.2	33.2	14.9
BW5098	4485	93.4	80	1.6	80.8	36.2	14.7
CV	6.5	1.8	4.5	30.8	0.9	5.5	2.8
Stations	34	30	33	5	34	34	34
LSD	305	1.5	4	1.5	1.1	2.1	0.4

Table 2. Disease reaction of BW5098 and check cultivars (2020 and 2021).

Fusarium Head Blight

Entry	Morden 2020				Carman 2020					Morden 2021				Carman 2021					Ottawa 2021
	VRI[a]	Rating[b]	DON[c]	Rating[d]	VRI[a]	Rating[e]	FDK[f]	DON[c]	Rating[g]	VRI %[a]	VRI Rating[h]	DON[c] (ppm)	DON Rating[i]	VRI %[a]	VRI Rating[j]	FDK[f]	DON[c]	DON Rating[k]	VRI %
Glenn	17	I	14.7	I	24	I	2.9	8.9	I	0.5	R	0.8	R	16.6	I	0.3	1.1	MR	26.3
Carberry	17	I	18.3	I	35	I	4.4	10.7	I	1.6	R	0.7	R	7.5	R	0.3	0.6	MR	46.7
AAC Viewfield	16	I	22.9	MS	40	I	2.8	10.2	I	7.8	I	1.3	R	12.0	MR	0.1	1.2	MR	45.0
AAC Brandon	11	MR	17.4	I	26	I	3.8	8.9	I	0.7	R	0.5	R	15.6	I	0.3	0.7	MR	40.7
BW5098	13	MR	12.3	MR	23	MR	1.8	4.4	MR	3.2	MR	1.6	R	10.8	MR	1.4	3.1	MS	26.7

Entry	Field Leaf Rust					Field Stem Rust			Stripe Rust			Bunt	
	Morden 2020		Morden 2021			Morden 2020			Lethbridge 2020			Lethbridge 2021	
	Severity	Rating[l]	Severity	Rating[l]		Severity[m]	Response[n]		Severity	Rating[o]		Average	Bunt Class[p]
Glenn	25	MR	12	MR		1	R		40	I		4	R/MR
Carberry	4	R	1	R		1	R		15	MR		1	R/MR
AAC Viewfield	30	MR	11	MR		1	R		20	MR		2	R/MR
AAC Brandon	5	R	8	R		1	R		60	S		13	I
BW5098	20	MR	5	R		1	R		30	I		28	MS

Table 3. Disease reaction of BW5098 and check cultivars (2022).

Entry	Morden FHB VRI %	VRI Rating	DON (ppm)	DON Rating	Carman FHB VRI %	VRI Rating	FDK	DON (ppm)	DON Rating	Indian Head FHB VRI %	FDK	Bunt Severity	Rating
Glenn	15.1	I	7.3	MR	23.3	MR	6.3	8.4	MR	4.3	20.0	14.0	I
Carberry	8.7	MR	9.0	I	28.8	MR	5.6	16.5	I	4.3	20.1	10.0	MR
AAC Viewfield	25.2	I	10.7	MS	40.3	I	12.4	32.7	MS	4.7	30.5	58.0	S
AAC Brandon	10.8	I	7.5	MR	29.2	MR	3.7	10.9	I	2.7	9.9	10.0	MR
BW5098	19.0	I	12.5	MS	31.5	I	4.6	14.2	I	2.3	20.8	8.0	MR

Entry	Leaf Rust Sev.	Rating	Stem Rust Severity	Rating	Stripe Rust Rep 1	Rep 2	Rating
Glenn	38	I	1	R	20	15	MR
Carberry	3	R	1	R	10	2	R
AAC Viewfield	27	MR	1	R	25	5	MR
AAC Brandon	17	MR	1	R	15	5	MR
BW5098	17	MR	1	R	5	1	R

Table 4. Quality evaluation of BW5098 and check cultivars, WBWC Test (2020-2022).

Variety	Yr in Test	S	DNO	O	A	Grade (and degrading factors)	Wheat Pro	Flour Pro	Pro Loss	FN	Amyl Peak	Clean Wht Flr Yld	Flr Yld PB 0.50 Ash	Flour Ash	Starch Dmg	Farino Abs	Farino DDT	Farino Stab	EXT Area	EXT Rmax	EXT Length	Abs	Pk Time	WHR/KG	LV	LTR	L* 2h	L* 24h	b* 2h	b* 24h
Glenn						1 CWRS	15.2	14.4	0.8	363	792	75.6	78.5	0.41	8.2	65.8	8.80	11.5	156	660	19.2	74	3.9	11.4	810	0.55	75.3	72.1	23.9	22.7
AAC Viewfield						1 CWRS	14.7	13.9	0.8	439	728	75.1	78.0	0.42	7.6	64.9	7.75	11.5	121	485	19.5	72	3.3	8.8	720	0.45	76.3	73.1	24.8	24.1
Carberry						1 CWRS	15.3	14.1	1.2	409	557	75.2	78.0	0.42	7.7	64.6	6.25	7.5	104	393	20.5	72	3.2	7.5	710	0.47	76.0	73.0	24.4	23.7
AAC Brandon						1 CWRS	15.1	14.2	0.9	418	724	76.0	78.5	0.41	7.8	67.0	7.00	8.5	82	327	19.3	74	2.9	8.8	760	0.41	76.0	73.0	25.7	24.8
2022 Mean of Checks							**15.1**	**14.1**	**0.9**	**405**	**690**	**75.3**	**78.2**	**0.42**	**7.8**	**65.1**	**7.50**	**10.0**	**127**	**513**	**19.7**	**73**	**3.5**	**9.2**	**745**	**0.49**	**75.9**	**72.7**	**24.4**	**23.5**
Glenn						1CWRS	14.8	14.1	0.6	305	573	74.7	79.0	0.40	7.7	63.1	10.50	18.5	172	823	17.8	70	4.0	10.6	760	0.60	75.6	72.1	23.8	22.2
AAC Viewfield						1CWRS	14.6	14.0	0.6	391	613	75.8	79.0	0.40	7.5	62.9	9.50	22.5	140	639	17.9	70	3.8	10.7	705	0.56	75.7	72.3	24.6	23.5
Carberry						1CWRS	14.7	13.7	1.0	385	587	75.4	79.5	0.39	7.2	61.7	8.75	15.0	150	689	17.8	69	4.2	11.4	700	0.57	76.8	73.0	24.7	23.4
AAC Brandon						3CWRS - SEV SPTD 0.3	15.1	14.2	0.9	331	427	76.0	79.5	0.39	7.3	65.0	8.50	12.5	117	476	19.4	72	3.2	9.1	765	0.53	76.1	73.1	25.8	24.8
2021 Mean of Checks							**14.7**	**13.9**	**0.7**	**360**	**590**	**75.3**	**79.2**	**0.40**	**7.5**	**62.6**	**9.50**	**18.5**	**154**	**717**	**17.8**	**70**	**4.0**	**10.9**	**720**	**0.58**	**76.1**	**72.5**	**24.4**	**23.0**
Glenn						1CWRS	14.9	14.3	0.6	370	895	75.4	78.5	0.41	7.8	65.8	7.25	10.0	147	614	19.7	74	3.8	9.8	780	0.59	75.8		24.7	
AAC Viewfield						1CWRS	14.5	13.9	0.6	425	800	75.8	78.0	0.42	7.4	64.3	8.00	10.5	134	532	20.7	71	3.3	8.3	715	0.53	76.5		25.9	
Carberry						1CWRS	15.2	14.4	0.9	410	600	76.2	77.5	0.43	7.3	64.7	6.50	7.0	105	379	21.8	72	3.0	7.4	705	0.47	76.3		25.2	
AAC Brandon						2CWRS - FRHTS	14.6	13.9	0.7	355	710	76.9	79.0	0.40	7.7	66.2	6.50	7.5	83	345	19.3	73	2.8	7.4	735	0.46	76.4		26.4	
2020 Mean of Checks							**14.9**	**14.2**	**0.7**	**400**	**765**	**75.8**	**78.0**	**0.42**	**7.5**	**64.9**	**7.25**	**9.0**	**129**	**508**	**20.7**	**72**	**3.4**	**8.5**	**735**	**0.53**	**76.2**		**25.3**	
BW 5098	3rd					1 CWRS	15.0	14.1	0.9	446	826	75.7	77.0	0.44	8.5	66.8	7.50	10.0	101	430	18.8	74	3.3	9.6	745	0.44	75.7	72.3	25.8	24.9
BW 5098	2nd	0	21	0	1	1CWRS	15.1	14.3	0.8	366	594	76.3	79.5	0.39	7.5	64.7	8.00	12.0	131	593	17.9	72	3.9	11.5	735	0.59	76.0	71.6	25.8	24.9
BW 5098	1st	Motion to accept data				1CWRS	14.7	14.1	0.6	405	880	76.9	77.0	0.44	8.2	66.4	6.50	8.5	106	428	20.1						76.3		26.5	

74% extraction flour was used for all flour, dough and baking tests

Supplemental Stem Solidness data (1 hollow; 5 solid)
Kernen Crop Research Farm, University of Saskatchewan

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Rep 1

Entry 1 - AAC Brandon	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	2	2	3	3	2	4	3
Middle	2	3	2	2	1	2	3	2	3	2
2" above first node	1	2	2	1	2	1	3	2	3	3
2nd node	2	1	2	2	2	1	2	2	1	2
3rd node	2	2	3	3	3	2	2	2	2	3
4th node	4	3			4	3	3	4	3	3
5th node										
6th node										
7th node										

Entry 2 - Viewfield	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	2	3	3	3	3	3	3	3
Middle	2	3	2	2	1	2	3	2	1	1
2" above first node	1	2	2	2	1	2	2	1	1	1
2nd node	1	2	2	2	2	2	1		3	
3rd node	2	2	2	5	2	2	2	3	2	3
4th node	3			2				3		
5th node										
6th node										
7th node										

Entry 3 - Lillian	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	3	3	3	4	3	3	3
Middle	4	4	5	5	3	4	5	3	4	
2" above first node	3	3	2	3	4	3	3	3	3	2
2nd node	4	3	3	2	4	3	3	3	3	3
3rd node	4	5	5	3	4	5	3	5	5	5
4th node										
5th node										
6th node										
7th node										

Entry 4 - CDC Adamant	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	4	3	3	4	3	3	3	4
Middle	3	3	3	3	3	3	3	3	3	4
2" above first node	2	2	2	3	2	2	2	2	2	2
2nd node	3	4	3	4	4	3	5	3	5	5
3rd node	5	4	3	5	4	4	5	3	5	5
4th node		4								
5th node										
6th node										
7th node										

Entry 5 - AAC Concord	1	2	3	4	5	6	7	8	9	10
2" below spike	4	4	5	5	4	5	4	5	3	4
Middle	4	5	5	5	4	5	5	4	5	
2" above first node	2	2	2	5	2	2	2	2	2	5
2nd node	5	5	4	5	5	3	5	5	5	4
3rd node	5	5		5	5	5	5	5	5	5
4th node	5	5		5	5	5	5		5	
5th node										
6th node										
7th node										

Entry 6 - BW5098	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	3	3	3	3	2	3	3
Middle	3	4	3	3	3	3	3	2	3	3
2" above first node	2	4	2	3	2	3	3	1	2	3
2nd node	3	1	2	1	3	3	2	3	3	2
3rd node	2	3	3	3	2	3	4	3	2	
4th node	3	4	4		3	3			3	
5th node										
6th node										
7th node										

Entry 7 - CDC Bradwell	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	3	4	3	3	3	3	2
Middle	2	3	3	3	3	3	3	3	2	1
2" above first node	3	3	2	2	2	2	2	2	2	1
2nd node	1	2	1	1	1	1	1	1	1	1
3rd node	2	3	2	2	3	2	2	2	2	2
4th node	3	3		3			3			
5th node										
6th node										
7th node										

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Rep 2

Entry 1 - AAC Brandon	1	2	3	4	5	6	7	8	9	10
2" below spike	3	2	3	2	1	2	1	2	2	3
Middle	1	1	1	1	2	2	1	2	1	1
2" above first node	2	1	1	1	2	2	1	2	3	3
2nd node	2	1	1	1	2	2	1	2	2	2
3rd node	2	2	2	2	3	3	3	3	2	3
4th node	3	4	3	3	3	3		3	3	3
5th node										
6th node										
7th node										

Entry 2 - Viewfield	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	3	3	3	3	3	3	3
Middle	2	3	1	2	1	2	3	1	2	2
2" above first node	2	2	1	2	2	2	2	1	2	2
2nd node	2	1	2	2	2	2	1	3	1	
3rd node	2	2	2	2	2	2	3	1	3	3
4th node			3				3	3		
5th node										
6th node										
7th node										

Entry 3 - Lillian	1	2	3	4	5	6	7	8	9	10
2" below spike	4	3	3	3	3	3	3	3	3	3
Middle	3	5	4	3	2	3	4	5	4	3
2" above first node	3	2	3	2	3	2	2	2	2	2
2nd node	2	4	4	3	2	3	3	3	3	3
3rd node	5	5	5	4		4	5	4	4	4
4th node				4	4	5	4			
5th node										
6th node										
7th node										

Entry 4 - CDC Adamant	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	4	4	3	4	4	3	4	33
Middle	2	3	3	3	3	4	5	3	3	2
2" above first node	2	2	3	2	2	2	4	2	2	4
2nd node	3	4	3	4	3	4	4	4	3	5
3rd node	3		4	5	4	4		5	4	
4th node										
5th node										
6th node										
7th node										

Entry 5 - AAC Concord	1	2	3	4	5	6	7	8	9	10
2" below spike	5	5	4	4	4	4	4	3	4	4
Middle	5	5	5	5	4	5	5	5	5	5
2" above first node	3	2	2	3	2	2	2	2	3	2
2nd node	5	5	5	5	5	5	5	4	5	5
3rd node	5	5	5	5	5	5	5	5	3	5
4th node		5	5	5		5	5	5	5	
5th node										
6th node										
7th node										

Entry 6 - BW5098	1	2	3	4	5	6	7	8	9	10
2" below spike	4	2	2	3	2	2	2	2	3	3
Middle	4	2	3	3	3	2	2	4	3	1
2" above first node	5	2	2	2	2	2	2	3	1	1
2nd node	2	2	1	2	3	3	2	3	5	1
3rd node	2	3	2	3	2	2	4	4	3	2
4th node	3		3	4	3	3		4		3
5th node										
6th node										
7th node										

Entry 7 - CDC Bradwell	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	3	3	2	3	3	3	3
Middle	3	3	3	2	2	3	3	1	3	2
2" above first node	2	2	2	2	2	3	1	3	2	
2nd node	1	3	2	1	2	1	1	2	1	1
3rd node		3	3	3	2	1	3	3	3	2
4th node	3			3						
5th node										
6th node										
7th node										

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Rep 3

Entry 1 - AAC Brandon	1	2	3	4	5	6	7	8	9	10
2" below spike	2	2	2	2	2	2	3	3	2	3
Middle	1	1	1	2	2	3	3	3	3	2
2" above first node	2	1	1	1	2	2	3	3	3	2
2nd node	2	2	2	1	2	2	2	3	2	1
3rd node	2	3	2	2	2	2	3	3	2	3
4th node			3	3	3				3	
5th node										
6th node										
7th node										

Entry 2 - Viewfield	1	2	3	4	5	6	7	8	9	10
2" below spike	2	2	2	3	3	3	3	3	3	3
Middle	1	1	2	2	2	2	1	3	2	2
2" above first node	1	1	2	2	2	2	2	3	2	2
2nd node	1	1	2	3	2	2	3		1	2
3rd node	2	1	2	3	2	2	3	3		2
4th node	3				3					
5th node										
6th node										
7th node										

Entry 3 - Lillian	1	2	3	4	5	6	7	8	9	10
2" below spike	3	4	3	3	3	3	3	3	4	3
Middle	3	4	4	4	5	4	4	4	5	3
2" above first node	2	2	2	3	3	3	3	3	3	2
2nd node	3	3	3	3	3	3	3	3	2	3
3rd node	4	5	4	5	5	5	5	5	3	5
4th node					5	4	4	4		
5th node										
6th node										
7th node										

Entry 4 - CDC Adamant	1	2	3	4	5	6	7	8	9	10
2" below spike	3	4	3	4	3	3	4	4	3	4
Middle	5	4	3	5	3	3	4	4	4	3
2" above first node	2	3	2	3	3	2	2	3	3	2
2nd node	5	4	2	3	3	5	5	3	4	5
3rd node		4	5	3	3		4	3	4	5
4th node	4									
5th node										
6th node										
7th node										

Entry 5 - AAC Concord	1	2	3	4	5	6	7	8	9	10
2" below spike	4	5	4	4	4	4	4	4	3	4
Middle	5	5	5	5	5	5	5	5	2	5
2" above first node	2	2	2	3	2	2	2	2	3	2
2nd node	5	5	5	5	4	5	5	5	2	5
3rd node	5	5	5	5	5	5	5	5	3	5
4th node			5	5		5	5	3		
5th node										
6th node										
7th node										

Entry 6 - BW5098	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	3	3	3	3	3	3	3
Middle	3	3	3	3	3	4	2	3	3	3
2" above first node	1	3	3	2	3	2	2	3	3	2
2nd node	2	3	3	3	2	4	3	3	3	
3rd node	3	3	3	3	3		2	3	3	3
4th node	3									
5th node										
6th node										
7th node										

Entry 7 - CDC Bradwell	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	3	3	3	3	3	3	3
Middle	2	3	2	3	3	3	3	3	3	3
2" above first node	2	1	2	2	3	3	3	3	3	2
2nd node	2	1	2	2	3	3	3	3	3	3
3rd node	2	1	3	3	2	3	3	3	3	3
4th node					3	3				
5th node										
6th node										
7th node										

Rep 4

Entry 1 - AAC Brandon	1	2	3	4	5	6	7	8	9	10
2" below spike	2	2	2	2	2	2	2	2	2	2
Middle	1	1	1	1	2	2	2	2	1	1
2" above first node	2	1	1	1	2	2	2	2	2	1
2nd node	2	1	1	1	2	2	1	1	2	1
3rd node	3	2	2	3	2	2	2	2	2	3
4th node	3						3	3	3	
5th node										
6th node										
7th node										

Entry 2 - Viewfield	1	2	3	4	5	6	7	8	9	10
2" below spike	2	2	3	2	2	3	3	3	3	3
Middle	1	2	2	2	2	3	1	2	2	1
2" above first node	1	2	2	2	2	3	2	1	2	1
2nd node	1	1	1	2	2	2	3	2	2	2
3rd node	3	2	2	2	3	3	3	2	3	2
4th node					3					
5th node										
6th node										
7th node										

Entry 3 - Lillian	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	4	3	3	2	3	3	4
Middle	3	3	3	4	3	3	5	5	5	5
2" above first node	2	2	2	3	4	3	3	3	3	5
2nd node	4	3	3	4	3	3	3	3	4	3
3rd node	4	4	4	4	5	3			3	5
4th node	4	4	5	4						5
5th node										
6th node										
7th node										

Entry 4 - CDC Adamant	1	2	3	4	5	6	7	8	9	10
2" below spike	3	4	3	4	3	4	3	4	3	4
Middle	3	4	3	3	3	3	3	3	3	3
2" above first node	2	3	2	3	3	2	3	2	2	3
2nd node	4	4	3	4	4	3	4	4	3	4
3rd node	4	5	4	4	4	3	4	4	4	4
4th node	5					5	4	4		
5th node										
6th node										
7th node										

Entry 5 - AAC Concord	1	2	3	4	5	6	7	8	9	10
2" below spike	5	5	5	5	5	5	5	5	4	5
Middle	5	5	5	5	5	5	5	5	5	5
2" above first node	2	2	2	4	2	3	2	2	2	2
2nd node	5	5	5	5	5	5	5	5	5	5
3rd node	5	5	5	5	5	5	5	5	5	5
4th node										
5th node										
6th node										
7th node										

Entry 6 - BW5098	1	2	3	4	5	6	7	8	9	10
2" below spike	2	2	3	3	3	3	3	3	2	3
Middle	2	3	3	3	3	3	3	3	2	3
2" above first node	2	2	5	3	3	3	3	3	3	3
2nd node	3	3	3	3	3	2	3	3	3	2
3rd node	3	4	4	4	3	4	3	4	3	3
4th node					4	4				
5th node										
6th node										
7th node										

Entry 7 - CDC Bradwell	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	2	3	2	3	3	3	3	3
Middle	2	3	2	3	2	2	2	2	2	2
2" above first node	2	3	2	3	2	2	2	2	2	2
2nd node	1	2	2	3	2	2	2	2	2	2
3rd node	1	1	2	3	4	2	2	2	2	2
4th node			3			3	3	3		
5th node										
6th node										
7th node										

Supplemental Stem Solidness data (1 hollow; 5 solid)
Brown Crop Research Farm, University of Saskatchewan

BROWN

Rep 1

Entry 1 - AAC Brandon	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	3	2	3	3	2	2	3
Middle	1	1	3	2	1	1	3	2	1	2
2" above first node	2	1	3	2	1	1	3	2	2	2
2nd node	1	1	1	2	1	2	3	2	1	3
3rd node	2	1	2	2	1	2	3	2	3	3
4th node	3	3	3	3	3	3	4	5	4	4
5th node										
6th node										
7th node										
Entry 2 - Viewfield										
2" below spike	2	3	3	2	3	2	3	2	3	2
Middle	1	2	3	2	2	3	1	1	2	2
2" above first node	1	2	3	2	2	3	1	1	2	2
2nd node	1	2	1	1	2	1	1	3	2	2
3rd node	2	3	2	2	3	2	2	3	3	3
4th node		3	3	3		3	3		3	
5th node										
6th node										
7th node										
Entry 3 - Lillian										
2" below spike	4	3	3	3	3	5	3	5	5	3
Middle	5	5	5	5	2	5	5	5	5	5
2" above first node	4	4	3	4	2	5	3	3	3	3
2nd node	3	5	3	2	3	4	4	3	5	3
3rd node	5	5	4	3	3	4	5	5	5	3
4th node	5			4	3	4		5	4	3
5th node										
6th node										
7th node										
Entry 4 - CDC Adamant										
2" below spike	4	4	4	4	4	4	4	4	4	4
Middle	5	4	4	4	5	4	4	3	5	
2" above first node	3	2	3	4	3	5	4	3	3	
2nd node	4	4	4	3	4	4	3	3	3	4
3rd node	4	4	5	4	3	4	4	3	5	4
4th node		4		5	3	4	4	3	3	5
5th node										
6th node										
7th node										
Entry 5 - AAC Concord										
2" below spike	4	3	4	4	4	5	4	4	5	4
Middle	5	2	5	5	5	5	5	5	5	5
2" above first node	5	2	2	4	2	3	2	3	2	3
2nd node	5	2	5	5	5	5	5	5	5	5
3rd node	5	3	5	5	5	5	5	5	5	5
4th node	5	3	5	5	5	5	5	5		
5th node										
6th node										
7th node										
Entry 6 - BW5098										
2" below spike	3	3	2	3	3	4	3	4	3	4
Middle	4	4	2	4	4	3	3	4	5	
2" above first node	3	3	3	2	4	3	4	3	4	5
2nd node	3	1	2	2	3	3	3	3	3	3
3rd node	3	2	3	3	3	3	3	3	3	3
4th node	3	4	3	3	3	3	3	4	4	
5th node	3			3						
6th node										
7th node										
Entry 7 - CDC Bradwell										
2" below spike	3	2	4	4	3	3	4	4	4	3
Middle	2	2	3	3	2	2	2	3	3	3
2" above first node	2	2	3	3	2	2	3	3	3	2
2nd node	1	3	1	3	2	3	2	2	3	3
3rd node	2	3	2	3	3	2	3	3		
4th node	3		2	3		3	2	3	3	3
5th node							3	3		
6th node										
7th node										

Rep 2

Entry 1 - AAC Brandon	1	2	3	4	5	6	7	8	9	10
2" below spike	4	4	3	3	3	3	3	2	3	2
Middle	2	2	2	1	1	2	2	1	2	1
2" above first node	2	2	1	2	2	2	2	1	2	1
2nd node	2	2	1	2	1	2	1	2	2	1
3rd node	2	2	2	2	2	2	2	3	2	2
4th node	3	3	3	3	3	3			3	3
5th node	3									
6th node										
7th node										
Entry 2 - Viewfield										
2" below spike	2	3	3	3	3	3	3	2	3	3
Middle	2	2	2	2	3	2	2	2	2	
2" above first node	2	1	2	2	1	3	2	2	2	2
2nd node	1	1	1	1	1	1	1	2	1	2
3rd node	2	1	2	2	2	1	2	2	2	2
4th node	2	2	3	2	3	2	2	3	2	2
5th node		2		3						
6th node										
7th node										
Entry 3 - Lillian										
2" below spike	3	3	4	3	3	3	3	3	3	3
Middle	5	5	5	5	5	5	5	5	5	4
2" above first node	3	3	2	5	5	3	2	5	4	4
2nd node	4	3	3	4	3	3	3	5	3	
3rd node	5	3	3	4	5	3	4	5	5	5
4th node		5	3	5	5	5	3	4		
5th node										
6th node										
7th node										
Entry 4 - CDC Adamant										
2" below spike	3	3	4	4	4	4	3	3	4	4
Middle	2	4	3	4	4	4	3	5	5	4
2" above first node	2	3	3	2	2	3	2	3	3	3
2nd node	3	3	3	3	3	3	3	4	4	4
3rd node	3	3	4	3	4	4	4	5	5	4
4th node	3	4	5	3		4		5	5	4
5th node										
6th node										
7th node										
Entry 5 - AAC Concord										
2" below spike	4	5	5	4	4	4	5	5	4	5
Middle	5	5	3	5	5	5	5	5	5	5
2" above first node	2	2	5	2	2	2	2	3	3	2
2nd node	3	5	5	4	5	3	5	5	5	5
3rd node	5	5	5	5	5	5	5	5	5	5
4th node	5	5	5	5	5	5	5	5	5	5
5th node	5		5			5	5		5	
6th node										
7th node										
Entry 6 - BW5098										
2" below spike	3	3	3	3	3	3	2	3	3	3
Middle	3	4	3	4	4	3	4	3	5	3
2" above first node	3	3	2	2	4	4	4	3	3	
2nd node	2	2	1	3	2	2	3	2	3	3
3rd node	3	3	2	3	3	3	3	3	3	3
4th node	3	4	3	2	3	3	3	4	3	3
5th node										
6th node										
7th node										
Entry 7 - CDC Bradwell										
2" below spike	4	3	3	2	3	3	3	3	3	3
Middle	2	2	2	2	2	2	2	2	2	2
2" above first node	3	2	2	3	2	2	2	2	2	2
2nd node	2	2	1	1	1	1	2	2	2	2
3rd node	2	3	1	2	2	2	2	3	3	
4th node	3	3	2	2	3	3	3	3	3	
5th node		3	3							
6th node										
7th node										

Rep 3

Entry 1 - AAC Brandon	1	2	3	4	5	6	7	8	9	10
2" below spike	3	3	3	4	2	3	3	2	3	3
Middle	2	2	1	2	2	2	2	1	2	2
2" above first node	2	3	2	2	2	1	1	1	2	3
2nd node	3	1	2	2	2	1	2	1	1	3
3rd node	3	2	2	2	3	1	2	2	2	3
4th node	3	3	3	4	3	3	3	3	3	3
5th node										
6th node										
7th node										
Entry 2 - Viewfield										
2" below spike	3	3	3	3	3	3	3	3	3	3
Middle	3	2	3	3	3	2	3	3	3	3
2" above first node	3	2	2	2	3	3	3	3	3	3
2nd node	2	3	3	3	2	3	3	3	3	3
3rd node	2	3	3	3	4	3	3	3	3	3
4th node	3	3			3	3		3		3
5th node										
6th node										
7th node										
Entry 3 - Lillian										
2" below spike	3	4	3	3	3	3	4	3	3	2
Middle	4	5	4	5	5	4	5	2	5	2
2" above first node	2	4	2	2	3	2	5	2	3	2
2nd node	3	3	3	3	3	3	3	3	3	
3rd node	5	5	5	4	5	3	4	3	4	4
4th node			5	5	5		3	4		
5th node										
6th node										
7th node										
Entry 4 - CDC Adamant										
2" below spike	3	3	4	3	4	3	3	3	4	3
Middle	3	4	5	4	4	3	3	4	2	
2" above first node	2	2	2	2	3	2	2	2	3	3
2nd node	3	3	3	4	3	3	4	3	3	4
3rd node	3	3	5	3	4	4	4	4	4	4
4th node	3	5	3	5	5			4		
5th node				4						
6th node										
7th node										
Entry 5 - AAC Concord										
2" below spike	5	5	4	5	4	3	5	5	4	5
Middle	5	5	5	5	5	5	5	5	5	5
2" above first node	4	5	2	4	3	2	3	2	3	3
2nd node	5	5	5	5	5	4	5	5	5	5
3rd node	5	5	5	5	5	5	5	5	5	5
4th node	5	5	5	5			5	5	5	
5th node										
6th node										
7th node										
Entry 6 - BW5098										
2" below spike	3	3	2	2	3	3	3	3	4	3
Middle	3	4	3	3	4	3	3	5	5	4
2" above first node	3	4	3	4	4	3	3	5	5	
2nd node	2	2	2	3	3	3	3	3	3	3
3rd node	3	3	3	3	4	4	3	3	3	4
4th node	3			3	3	4			4	
5th node										
6th node										
7th node										
Entry 7 - CDC Bradwell										
2" below spike	3	3	3	4	4	4	3	4	4	3
Middle	2	3	3	3	3	3	2	2	3	3
2" above first node	2	3	3	3	3	3	2	3	3	3
2nd node	2	2	3	2	2	2	2	2	3	
3rd node	3	3	5	3	3	2	2	2	3	3
4th node	3	3	2	4	3	3	3	3	3	
5th node				3		3				
6th node										
7th node										

Rep 4

Entry 1 - AAC Brandon	1	2	3	4	5	6	7	8	9	10
2" below spike	4	3	3	3	3	3	3	3	3	2
Middle	3	2	2	2	2	2	3	2	2	1
2" above first node	3	2	3	3	2	1	3	1	1	1
2nd node	3	3	3	2	3	2	3	2	2	1
3rd node	3	3	3	3	3	3	3	3	3	3
4th node	4		3	4	3		3	3	3	3
5th node										
6th node										
7th node										
Entry 2 - Viewfield										
2" below spike	3	2	3	3	3	3	3	3	2	3
Middle	2	2	3	2	3	2	2	2	2	3
2" above first node	2	2	3	2	2	3	2	2	2	2
2nd node	1	2	3	3	2	3	2	1	3	1
3rd node	2	2	3	3	3	3	3	3	2	2
4th node		3		3	3	3	3		3	
5th node										3
6th node										
7th node										
Entry 3 - Lillian										
2" below spike	3	4	3	4	3	3	3	3	3	3
Middle	4	5	5	5	5	5	4	4	5	5
2" above first node	3	4	3	3	4	4	3	3	4	5
2nd node	3	3	3	4	4	3	3	3	3	4
3rd node	3	3	5	5	5	3	5	3	5	5
4th node		3		5		5		5	5	
5th node										
6th node										
7th node										
Entry 4 - CDC Adamant										
2" below spike	4	3	4	4	4	5	3	3	3	3
Middle	3	4	5	5	4	4	4	3	3	3
2" above first node	2	3	3	3	3	3	3	3	3	3
2nd node	3	5	4	4	4	4	4	4	5	4
3rd node	4	5	4	5	5	4	5	5	5	5
4th node	4		4							
5th node										
6th node										
7th node										
Entry 5 - AAC Concord										
2" below spike	4	4	5	4	5	4	4	5	4	5
Middle	5	5	5	5	5	5	5	5	5	5
2" above first node	3	3	4	2	2	3	3	3	4	4
2nd node	5	5	5	5	5	5	5	5	5	5
3rd node	5	5	5	5	5	5	5	5	5	5
4th node	5	5	5	5	5	5		5		5
5th node										
6th node										
7th node										
Entry 6 - BW5098										
2" below spike	3	3	3	3	3	3	3	4	3	3
Middle	4	4	4	5	5	4	4	4	3	3
2" above first node	4	3	4	2	2	3	4	4	3	3
2nd node	3	2	3	2	3	3	3	3	3	3
3rd node	3	3	3	3	3	3	4	3	3	3
4th node	4	3	3	3			4	3	3	
5th node										
6th node										
7th node										
Entry 7 - CDC Bradwell										
2" below spike	3	4	3	4	3	4	3	3	3	3
Middle	3	2	3	3	4	3	3	3	3	3
2" above first node	3	2	3	3	3	3	3	3	3	3
2nd node	2	2	2	3	3	2	2	3	2	3
3rd node	3	3	5	5	3	5	3	5	5	5
4th node		3	3	3		3	3	3		
5th node										
6th node										
7th node										