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CANADIAN MALTING BARLEY TECHNICAL CENTRE

Quality of New Canadian Malting Barley Varieties

February 2017

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Canada has several new and promising malting barley varieties that have been registered in the past few years and are undergoing seed propagation or are already commercially available. This document provides an overview of certain new two-row Canadian malting barley varieties: **AAC Synergy, AAC Connect, CDC Bow, CDC Fraser and Lowe** and their quality characteristics.

Note that the data in this report is taken from breeder submissions for registration support. Quality data is the average of the two years of cooperative (Coop) trials unless otherwise indicated.

Malting Barley Seeded Area in Western Canada

The following table shows seeded area to two-row malting barley over the past 3 years. Of note is the significant year over year increases in seeding of CDC Copeland and AAC Synergy, the drops in seeded area to AC Metcalfe, CDC Kindersley and CDC Meredith, and the appearance of CDC Bow and AAC Connect for the first time on the list.

Percent of two-row malt barley seeded area in Western Canada			
	2016	**2015**	**2014**
CDC Copeland (99)	44.7	35.38	29.81
AC Metcalfe (94)	34.2	38.5	38.87
AAC Synergy (12)	5.19	0.84	0.21
Newdale (01)	3.07	5.23	5.69
Bentley (08)	2.71	3.35	2.37
CDC Meredith (08)	1.84	5.24	9.81
CDC Kindersley (10)	0.91	1.70	0.95
CDC PolarStar (10)	0.93	1.44	2.05
Merit 57(09)	0.20	0.67	0.65
Major (09)	0.13	0.43	0.75
CDC Kendall (95)	0.08	0.16	0.21
Cerveza (10)	0.04	0.02	0.03
Harrington (84)	0.04	0.16	0.27
CDC Bow (16)	0.01		
AAC Connect (16)	0.01		
Other	0.27	0.43	
Total	**94.3**	**93.5**	**91.7**

After 15 years as the number one seeded malting barley variety in Western Canada, **AC Metcalfe** ceded the mantle to CDC Copeland in 2016. With over 44% of seeded area in 2016, Copeland leapfrogged to number one place from 37% in 2015. While AC Metcalfe remains a highly desired variety on the part of the domestic and global malting and brewing industries, its lower yield compared with newer varieties

and increasing disease pressure has had it falling out of favour with producers. In terms of other changes of note, AAC Synergy also jumped significantly this year from 0.8% to over 5% of seeded area.

Area by Select Province

Provincially it is interesting that in 2016 **AC Metcalfe** remained the dominant variety in Saskatchewan while **CDC Copeland** was by far and away the leader in Alberta. In Manitoba, **AAC Synergy** was the most seeded two row variety, although the six row variety **Celebration** captured a few more acres. It is also of interest that the six row variety Legacy was seeded on over 65,000 acres in Saskatchewan, even more than AAC Synergy.

Barley - 2016 Insured Commercial Acres

	Alberta		Saskatchewan		Manitoba		Total	
	Acres	%	Acres	%	Acres	%	Acres	%
CDC COPELAND	548,256	13	462,446	11	23,045	1	1,034,665	25
AC METCALFE	239,703	6	515,744	12	25,534	1	785,007	19
AAC SYNERGY	44,525	1	52,774	1	31,943	1	129,242	3
NEWDALE	34,004	1	20,809	1	23,829	1	78,642	2
LEGACY	2,696		66,325	2	3,026		72,047	2
BENTLEY	48,133	1	8,471		9,950		66,554	2
CDC MEREDITH	18,761		20,627	1	424		42,330	1
CELEBRATION	120		4,654		32,807	1	37,581	1
CDC KINDERSLEY	13,328		6,017		2,517		21,862	1
CDC POLARSTAR	1,787		19,055	1	-		20,842	1

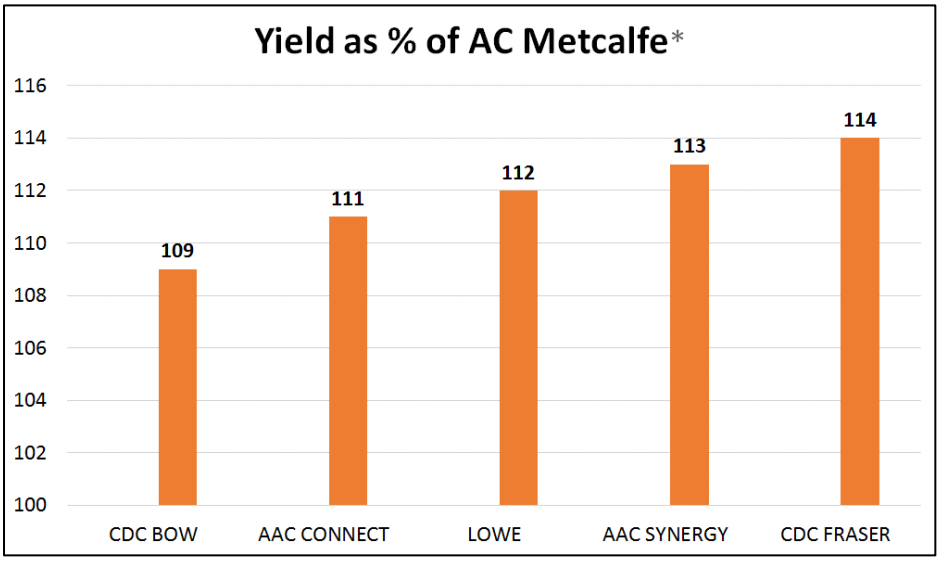
New Canadian Two-Row Malting Barley Varieties

The list below indicates the year in which the new varieties were registered and the year that commercial quantities became, or are projected to become, available. By 2015 some domestic Canadian maltsters had already approved and begun to contract AAC Synergy, and in 2016 enough commercial quantities of AAC Synergy were produced to have some available for buyers outside of the domestic malting industry. AAC Connect will become available in limited commercial quantities in 2017, followed by CDC Bow in 2018 and both Lowe and Fraser in 2019.

Variety	Year of Registration	Commercially Available
AAC SYNERGY	2012	2015
AAC CONNECT	2016	2017
CDC BOW	2016	2018
CDC FRASER	2016	2019
LOWE	2016	2019

New Variety Yields

The chart below provides a snapshot of the yield potential of new varieties in comparison with AC Metcalfe with all five new varieties offering a significant improvement. For comparison purposes, CDC Copeland yield was 106% of AC Metcalfe in its registration data.



* Based on Coop trials

New Variety Agronomics

The table below shows additional agronomic data, and also includes some older varieties for comparison purposes with yield, maturity, test weight and plant height shown in relation to AC Metcalfe.

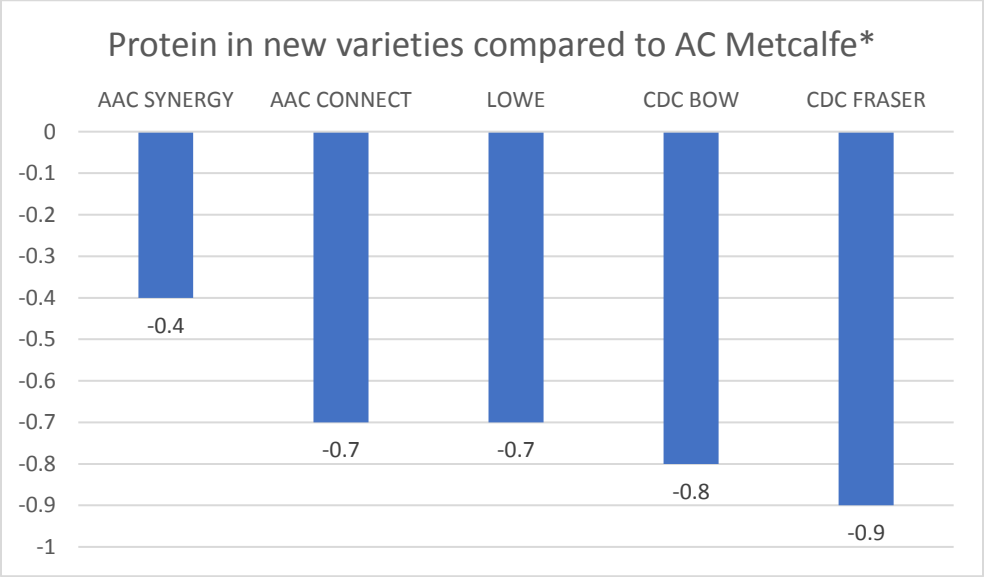
Variety	Year of Release	Yield Index (% of AC Metcalfe grain yield)	Date to Maturity (+/- AC Metcalfe)	Test Weight lb/bu (+/- AC Metcalfe)	Plant Height cm (+/- AC Metcalfe)	Lodging Rating	FHB Resistance*
Harrington	1984	93	-1	-1.6	-2	P	MR
AC Metcalfe	1997	100	0	0	0	G	I
CDC Copeland	2003	108	1	0	1	G	I
CDC Meredith	2012	113	2	0	-2	F	I
NEW VARIETIES							
CDC Kindersley	2014	106	-1	0.5	-2	G	I
AAC Synergy	2015	113	0	-0.6	-1	G	MS
CDC Bow	2017	109	1	0.7	2	E	MS
AAC Connect	2017	111	0	-0.7	-3	VG	MR
CDC Fraser	2019	114	1	-0.7	-1	VG	I
Lowe	2019	112	3	-1	5	G	MR

*MS = Moderately Susceptible; MR = Moderately Resistant; I = Intermediate

* Based on Coop trials

Grain Protein Content of New Varieties

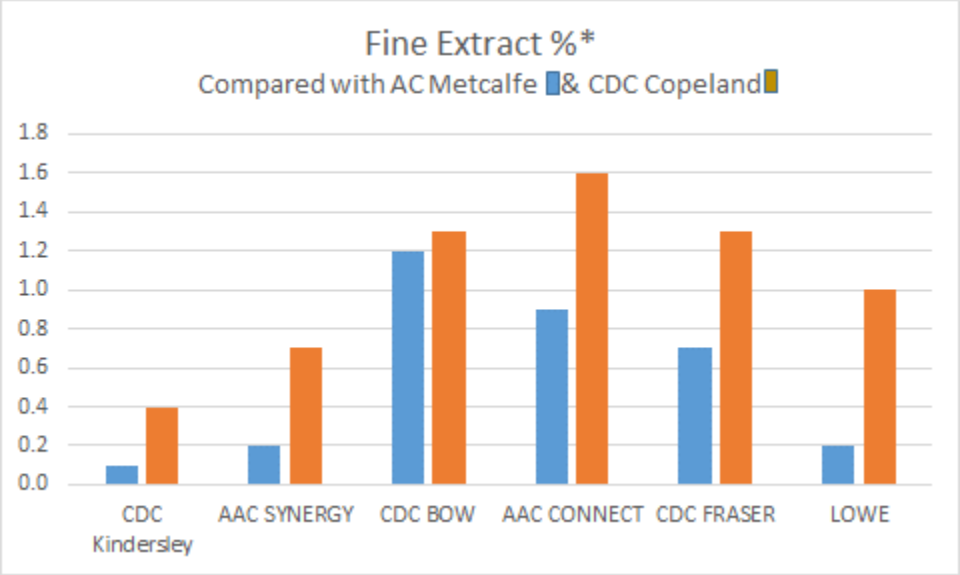
Protein content in the new varieties is lower than AC Metcalfe which is not surprising given the higher yields, breeding efforts to lower grain protein content and the fact that AC Metcalfe protein is relatively high compared with most other varieties introduced since its registration.



*Based on Coop data

Malt fine extract yield of New Varieties

Malt fine extract levels are higher in the new varieties than in both AC Metcalfe and CDC Copeland. This is impressive as AC Metcalfe has long been recognized for its very good extract levels. The graph below shows the fine extract levels of new varieties compared with AC Metcalfe (in blue) and CDC Copeland (in orange).



*Based on Coop data

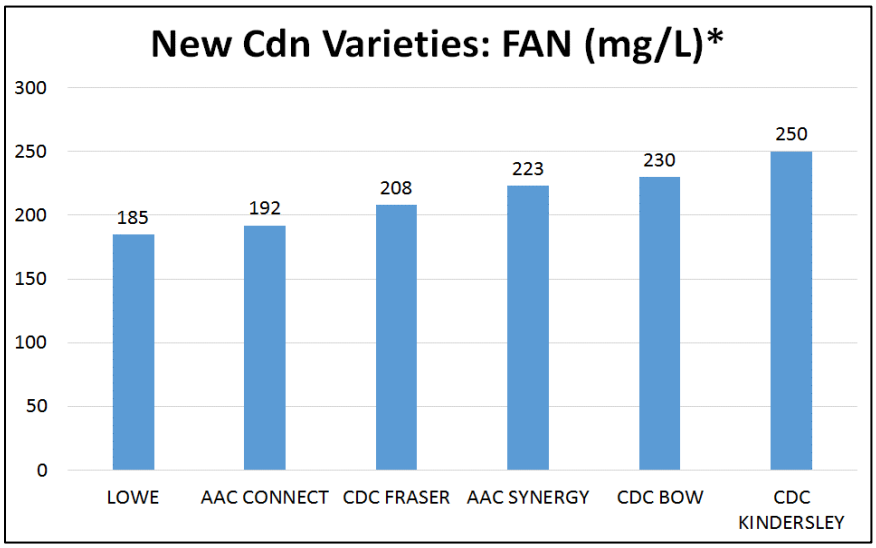
Enzymes of New Varieties

The enzyme package of new varieties tends to be lower than AC Metcalfe. Looking at Diastatic Power (DP), which is considered "very high" in AC Metcalfe (as in CDC Kindersley), AAC Connect and Fraser reported the next highest levels rating them as "high", while AAC Synergy and CDC Bow can be considered moderate, similar to CDC Copeland, while Lowe can be considered low/moderate. This profile would suggest that most of the new varieties are suitable for the mainstream brewing sector that tends to use solid adjuncts. Lowe meanwhile may be more suitable for all-malt brewers.

VARIETY	DP	SECTOR
AAC SYNERGY	MODERATE	MAINSTREAM
CDC BOW	MODERATE	MAINSTREAM
AAC CONNECT	HIGH	MAINSTREAM
CDC FRASER	HIGH	MAINSTREAM
LOWE	LOW/MODERATE	ALL-MALT
AC METCALFE	VERY HIGH	MAINSTREAM
CDC KINDERSLEY	VERY HIGH	MAINSTREAM

FAN Levels of New Varieties

FAN levels in new varieties tend to be lower than AC Metcalfe (note FAN was not measured when Metcalfe was registered; CDC Kindersley and AC Metcalfe tend to have similar FAN levels). The mainstream brewing sector is generally looking for FAN levels above 200 while the all-malt brewing sector desires lower levels (e.g. <200).



*Based on Coop data

Conclusions

Canada has excellent new varieties in the pipeline that are generally well suited for the mainstream brewing sector; Lowe's quality profile may also lend itself to all-malt brewers sector. With equal or better quality characteristics to existing varieties, the new cultivars have better agronomics which will make them more competitive both for producers and for buyers. As a result, the Canadian industry must work with end-users, as well as producers, to introduce these new malting barley varieties early in their life cycle to ensure a smooth and timely transition to their acceptance within the value chain.