CDC Fraser

Highlights:

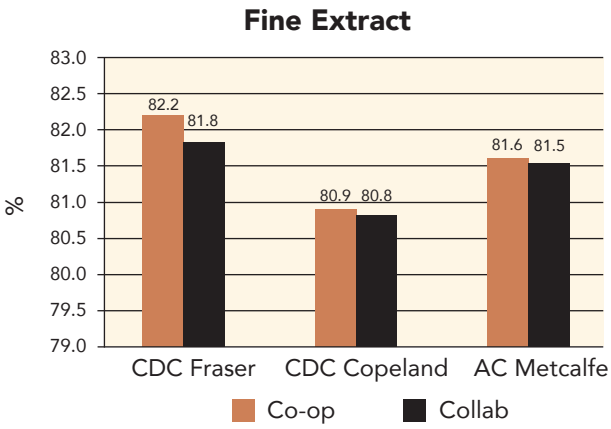
- Moderate grain protein content
- High extract yield
- High enzyme levels
- High FAN
- Very high grain yield
- Good disease resistance
- High brewhouse efficiency

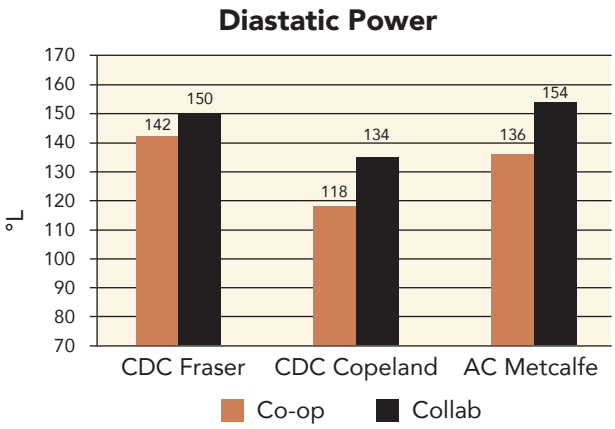
CDC Fraser is a two-row, hulled malting barley variety registered in Canada in 2016. A cross of TR04280 x SM04261, it was developed by Dr. Aaron Beattie at the Crop Development Centre, University of Saskatchewan.

All barley varieties in Canada undergo a rigorous process of evaluation prior to registration, and are required to meet minimum agronomic, disease and quality standards established by check varieties. The following are highlights of the results of the Cooperative and Collaborative trials[1] taken from the breeder's registration application.

Malting Quality Traits:

- Extract yield higher than CDC Copeland and AC Metcalfe
- Enzyme levels higher than CDC Copeland, lower than AC Metcalfe
- FAN levels comparable to CDC Copeland, lower than AC Metcalfe
- β-glucan lower than both AC Metcalfe and CDC Copeland
- Quicker conversion time than CDC Copeland and AC Metcalfe
- Comparable brewhouse efficiency to CDC Copeland and AC Metcalfe





Agronomic Traits:

- Moderate grain protein, similar to CDC Copeland
- Yields 14% higher than AC Metcalfe and 8% higher than CDC Copeland
- Shorter and stronger straw with good resistance to lodging
- High kernel weight and plumpness
- Good resistance to spot blotch and spot-form net blotch
- Maturity date similar to CDC Copeland

[1] Near the end of the breeding cycle, selected lines enter the "Cooperative" testing program, coordinated by breeders, for two years where they are grown in up to 20 sites across the prairies alongside check varieties (AC Metcalfe, CDC Copeland and AAC Synergy). After the first-year, the best lines from Cooperative trials also enter the "Collaborative" testing program grown at 8 sites across the prairies alongside the same check varieties for two years (coordinated by the Brewing & Malting Barley Research Institute). Cooperative and Collaborative test samples are evaluated for malting quality through micro-malting trials. Results are presented to the Prairie Registration Committee for Oats and Barley (PRCOB) leading to the recommendations for registration by the Canadian Food Inspection Agency.

CMBTC PILOT SCALE MALTING AND BREWING RESULTS

Once varieties have been registered in Canada and supply begins to be scaled up by the corresponding seed company responsible for commercializing the variety or by a contracting party, representative barley samples are sent to the CMBTC for pilot scale malting and brewing trials under standard processing conditions [2,3].

The data below represents average results generated by pilot scale trials at the CMBTC for samples of CDC Fraser from 2017 – 2019. In the case of the controls (CDC Copeland and AC Metcalfe), the data represents three-year averages from 2017-2019. Range figures are derived from annual data.

Malting Performance

The malt exhibits very good extract yield with enzymes higher than CDC Copeland and lower than AC Metcalfe. Soluble protein is comparable to CDC Copeland and lower than AC Metcalfe; FAN levels are comparable to CDC Copeland and lower than AC Metcalfe. β-glucan content is lower than both AC Metcalfe and CDC Copeland.

Table 1. Comparative Malt Quality Parameters

	CDC Fraser		CDC Copeland		AC Metcalfe	
	3 yr average (n=7)	3 yr range (n=7)	3 yr average (n=71)	3 yr range (n=71)	3 yr average (n=61)	3 yr range (n=61)
Fine Extract, %	82.0	80.1 – 84.3	81.7	78.7 – 83.4	81.9	79.3 – 83.9
Color, EBC	4.15	3.01 – 5.66	3.41	1.66 – 4.95	4.13	2.30 – 8.90
Color, ASBC	2.02	1.59 - 2.59	1.74	1.08 - 2.32	2.01	1.32 - 3.81
Total Protein, %	11.33	9.50 – 12.49	11.67	9.40 – 13.41	11.92	10.34 – 13.32
Soluble Protein, %	4.79	4.27 – 5.34	4.72	3.84 – 5.65	4.96	4.25 – 6.03
Kolbach Index, %	42.61	37.1 – 53.7	40.65	30.4 – 50.0	41.73	34.7 – 51.6
Diastatic Power, WK	478	383 – 604	450	334 – 600	520	366 – 583
Diastatic Power, °L	141	114 - 177	133	100 - 176	153	109 - 171
Wort β-glucan, ppm	108	56 – 183	126	58 - 375	127	60 – 284
FAN, ppm	179	163 – 197	178	128 – 215	202	158 – 273

[2] **Malting process conditions:** Steep: 44-46 hours at 14-15°C; Germination: up to 96 hours @14-16°C; Kiln: 21 hours with cure temperature @80-82°C for up to 4 hours.

Brewhouse Performance

CDC Fraser performs well in the brewhouse. Its runoff time is comparable to both AC Metcalfe and CDC Copeland. While conversion time is quicker than CDC Copeland and AC Metcalfe, time for wort to clear to <100 FTU during vorlauf is slightly longer than both CDC Copeland and AC Metcalfe. Wort colour is comparable to CDC Copeland and lighter than AC Metcalfe. Brewhouse efficiency is comparable to both AC Metcalfe and CDC Copeland. Attenuation limit is comparable to CDC Copeland and higher than AC Metcalfe.

Table 2. Comparative Brewing Quality Parameters

	CDC Fraser		CDC Copeland		AC Metcalfe	
	3 yr average (n=7)	3 yr range (n=7)	3 yr average (n=39)	3 yr range (n=39)	3 yr average (n=40)	3 yr range (n=40)
Conversion Time, min.	15	14 – 17	20	14 - 26	17	7 - 22
Time to Clear During Vorlauf, min.	7	5 - 9	6	2 - 9	6	4 - 11
Runoff Time, min.	48	45 - 53	50	42 - 55	50	40 - 55
Wort Colour, SRM	3.18	2.79 – 4.34	2.98	2.29 - 5.28	3.65	2.59 - 6.67
Brewhouse Efficiency, %	92.4	86.3 – 97.2	92.6	87.8 - 96.1	92.8	85.9 - 96.4
Attenuation Limit, %	88.1	83.5 – 90.2	88.8	84.3 - 92.4	86.8	80.4 - 89.5

[3] **Brewing process conditions:** Mash for 30 min. @ 48°C, 30 min. @65°C, 1 min. @77°C using 3.75:1 Water grist ratio. 135L sparge. 90 min. boil. 15 min. whirlpool rest.

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