

No.

202100270

# THE UNITED STATES OF AMERICA

**TO ALL TO WHOM THESE PRESENTS SHALL COME:**

## University of Saskatchewan

Whereas, THERE HAS BEEN PRESENTED TO THE

Administrator of the Agricultural Marketing Service

An application requesting a certificate of protection for an alleged novel variety of sexually reproduced, asexually reproduced, or tuber propagated plant, the name and description of which are contained in the application and exhibits, a copy of which is hereunto annexed and made a part hereof, and the various requirements of law in such cases made and provided have been complied with, and the title thereto is, from the records of the PLANT VARIETY PROTECTION OFFICE, in the applicant(s) indicated in the said copy, and whereas, upon due examination made, the said applicant(s) is (are) adjudged to be entitled to a certificate of plant variety protection under the law.

Now, therefore, this certificate of plant variety protection is to grant unto the said applicant(s) and the successors, heirs or assigns of the said applicant(s) for the term of TWENTY years from the date of this grant, subject to the payment of the required fees and periodic replenishment of viable germplasm material of the variety in a public repository as provided by law, the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety there from, to the extent provided by the PLANT VARIETY PROTECTION ACT. In the United States seed of this variety (1) shall be sold by variety name only as a class of certified seed and (2) shall conform to the number of generations specified by the owner of the rights. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)



BARLEY

'CDC Fraser'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this tenth day of December, in the year two thousand twenty one.*

Attest:

Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

Administrator  
Agricultural Marketing Service

**U.S. DEPARTMENT OF AGRICULTURE**  
**AGRICULTURAL MARKETING SERVICE**  
**SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE**

**APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE**

*The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.  
 Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421).  
 Information is held confidential until certificate is issued (7 U.S.C. 2426).  
 OMB Collection #0581-0055*

FOR OFFICIAL USE ONLY:	
PVPO NUMBER: 202100270	FILING DATE: 4/15/2021
FILING AND EXAMINATION FEES PAID 5150.00	DATE 4/15/2021
1. NAME OF OWNER: (Name to be printed on certificate) <b>University of Saskatchewan</b>	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME: <b>TR12135</b>
	3. VARIETY NAME: <b>CDC Fraser</b>
4. ADDRESS: Department of Plant Sciences College of Agriculture and Bioresources University of Saskatchewan Room 4D36, Agriculture Building 51 Campus Drive Saskatoon, SK S7N 5A8, Canada	
5. OWNER TELEPHONE: (+00 (000) 000-0000) 306.966.5855	6. OWNER FAX NUMBER AND/OR EMAIL ADDRESS: 306.966.5015/aaron.beattie@usask.ca
7. IF OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION: ( <i>corporation, partnership, association, etc.</i> ) <b>University</b>	
8. IF INCORPORATED, GIVE STATE OF INCORPORATION:	9. DATE OF INCORPORATION:
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) AND/OR BREEDERS(S) TO SERVE ON THIS APPLICATION: ( <i>First person listed will receive all documents including the certificate of protection</i> ) NAME(S): ADDRESS(ES): Kelly Pickett, SeCan 400-300 Terry Fox Drive Ottawa, ON K2K 0E3 Canada	
11. REPRESENTATIVE TELEPHONE: (+00 (000) 000-0000) <b>613 592 8600</b>	12. REPRESENTATIVE FAX: <b>613 592 9497</b>
13. REPRESENTATIVE EMAILS: <b>kpickett@secan.com</b>	

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14. CROP KIND: <i>(Common Name)</i> <b>Barley</b>	15. GENUS AND SPECIES: <b>Hordeum vulgare</b>	16. FAMILY NAME: <i>(Botanical)</i> <b>Poaceae</b>
17. IS THE VARIETY A FIRST-GENERATION HYBRID? <input type="radio"/> YES <input checked="" type="radio"/> NO		
18. DOES THE VARIETY CONTAIN ANY BIOTECHNOLOGY EVENTS? * <input type="radio"/> YES <input checked="" type="radio"/> NO  *A biotechnology event is defined as a single insertion of a nucleic acid construct into a specific site in a plant's chromosome that is regulated under the U.S. Coordinated Framework for the Regulation of Biotechnology.		
19. SEE ATTACHED CHECKLIST, PLEASE INCLUDE WITH FINAL SUBMISSION		
20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? <i>(See Section 83(a) of the Plant Variety Protection Act)</i> <input checked="" type="radio"/> YES <i>(If "yes", answer items 21 and 22 below)</i> <input type="radio"/> NO <i>(If "no", go to item 23)</i> <input type="radio"/> UNDECIDED		
21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input checked="" type="radio"/> YES <input type="radio"/> NO  IF YES, WHICH CLASSES? <input type="radio"/> FOUNDATION <input type="radio"/> REGISTERED <input checked="" type="radio"/> CERTIFIED		
22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="radio"/> YES <input type="radio"/> NO  IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS: 1 FOUNDATION                      1 REGISTERED                      1 CERTIFIED		
COMMENTS:		



**U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE**

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23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?

YES                       NO

IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES:

Breeder seed sale Canada May 15, 2017

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)?


YES                       NO

IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER:

Canada Plant Breeder rights. Date granted 2018-02-19 certificate number 5664

25. The owners declare that a viable seed sample will be furnished directly to an acceptable repository in support of the variety within three months of filing. For a tuber propagated variety or vegetatively reproduced variety, a germplasm sample will be deposited in a public repository within three months of the date of the Notice of Allowance letter. These will be maintained for the duration of the certificate. Germplasm will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned owner(s) is(are) the owner of this plant variety and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER: 		SIGNATURE OF OWNER:	
NAME: <i>(Please print or type)</i> Aaron Beattie		NAME: <i>(Please print or type)</i>	
CAPACITY OR TITLE: Breeder	DATE: 4/14/21	CAPACITY OR TITLE:	DATE:

**19. CHECK LIST: (Please include with final submission)****ST-470 APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE**

Owner and Variety Information.

See UPOV Explanatory Notes on Variety Denominations Under the UPOV Convention  
([https://www.upov.int/edocs/infdocs/en/upov\\_inf\\_12\\_4.pdf](https://www.upov.int/edocs/infdocs/en/upov_inf_12_4.pdf))

See UPOV Explanatory Notes on the Definition of Breeder Under the 1991 Act of the UPOV Convention  
([https://www.upov.int/edocs/expndocs/en/upov\\_exn\\_brd.pdf](https://www.upov.int/edocs/expndocs/en/upov_exn_brd.pdf))



Exhibit A. Origin and Breeding History of the Variety

See UPOV Explanatory Notes On The Definition Of Variety Under The 1991 Act Of The UPOV Convention  
([https://www.upov.int/edocs/expndocs/en/upov\\_exn\\_var.pdf](https://www.upov.int/edocs/expndocs/en/upov_exn_var.pdf))



Exhibit B. Statement of Distinctness

See UPOV General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants  
([https://www.upov.int/export/sites/upov/resource/en/tg\\_1\\_3.pdf](https://www.upov.int/export/sites/upov/resource/en/tg_1_3.pdf))



Exhibit C. Objective Description of Variety

Please submit the Exhibit C matching the subject crop (if one is not available please contact the PVPO)  
(<https://www.ams.usda.gov/services/plant-variety-protection/pvpo-c-forms>)

For Distinctness, Uniformity, and Stability (DUS) testing guidance please see UPOV Database of Test Guidelines for Specific Crop Kinds:  
([https://www.upov.int/test\\_guidelines/en/](https://www.upov.int/test_guidelines/en/))

An officially issued DUS report may be submitted in place of an Exhibit C for most crops. Additional information may be required during the examination. Please contact PVPO for more information.

Exhibit D. Additional Description of the Variety (*Optional*)

Additional information and Evidence (Including: Photographs, Data, Genetic Information, Attachments)



Exhibit E. Statement of the Basis of the Owner's Ownership

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the owner is an owner who is not the original owner, both the original owner and the owner must meet one of the above criteria. The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

**FILING AND EXAMINATION FEE**

Use ePVP, pay.gov, credit card, or make checks and money orders payable to "Treasurer of the United States" Fee of \$5,150 covers application and certificate filing fee.

**GERMPLASM DEPOSIT**

Germplasm has been deposited with:



Technical Infeasibility of Germplasm Deposit (Please contact PVPO)



Germplasm will be deposited after PVP Certificate Issuance (Potato and Vegetatively Reproduced Varieties)

**U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE**

**EXHIBIT A  
ORIGIN AND BREEDING HISTORY**

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OMB Collection #0581-0055*

NAME OF OWNER (S): <b>University of Saskatchewan</b>	TEMPORARY OR EXPERIMENTAL DESIGNATION: <b>TR12135</b>	VARIETY NAME: <b>CDC Fraser</b>
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**I. PROPAGATION:**

1. How is the variety propagated?

Sexually Propagated:

Seed

Asexually Propagated:

Bulb

Cutting

Grafting

Layering

Offset

Suckering

Tissue Culture

Tuber

Other (Specify)

**II. GENEALOGY:**

1. Describe the genealogy of the variety including the ownership, protections (with reference numbers), and origins of the stock plants. Please include the breeding methods used, duration of breeding stages, and any additional testing or development work completed. (Please attach more pages if necessary).

'CDC Fraser' (experimental designations 'TR12135', 'SM090669') originated from the cross 'TR04280' x 'SM04261' made in a greenhouse at the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan in 2005 and was developed using a bulk breeding system. Both the F1 and F2 generations were grown as bulk populations in a winter nursery in New Zealand in 2005-06 and in Saskatoon in 2006, respectively. The seed was returned to New Zealand during the winter of 2006-07 to grow as an F3 bulk population with the subsequent F4 grown as a space planted population in Saskatoon in 2007. Individual spikes were harvested and selected for general seed characteristics and then grown in the field as F5 hill plots in Saskatoon in 2008. Seed from the selected F5 hill plot was bulked as the line that became known as 'SM090669'. It was tested in the Crop Development Centre yield trials from 2009 to 2011 followed by testing in the Western Cooperative Two-Row Barley Registration Trials as 'TR12135' during 2012-13. Selection criteria included short and strong straw, yield, grain quality and disease resistances.

2. Give the details of subsequent stages of selection and multiplication.

Year(s)	Detail of Stage	Selection Criteria
2006	F1, F2	grown as bulk population
2007	F3	grown as bulk population
2007	F4	general seed characteristics
2008	F5	general seed characteristics
2009-2011	registration trials	short and strong straw, yield, grain quality and disease resistances.

**U.S. DEPARTMENT OF AGRICULTURE  
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**EXHIBIT A  
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NAME OF OWNER (S): University of Saskatchewan	TEMPORARY OR EXPERIMENTAL DESIGNATION: TR12135	VARIETY NAME: CDC Fraser
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III. UNIFORMITY:

1. YES Is the variety uniform?:
- A. Yes                       B. No

2. How did you test for uniformity?

The comparative trials were conducted at the University of Saskatchewan Crop Science Field Laboratory in Saskatoon, Saskatchewan during the 2015 and 2016 growing seasons. The trials were planted in a RCB design and consisted of 4 replicates for each variety. Each plot consisted of 5 rows 3.66 metres in length with a row spacing of 0.2 metres. The planting density was 215 plants per square metre. Measured characteristics were based on a minimum of 20 measurements each year. The mean differences were significant to at least a 5% probability level

IV. STABILITY:

1. YES Is the variety stable?:
- A. Yes                       B. No

2. How did you test for stability? Over how many generations?

The comparative trials were conducted at the University of Saskatchewan Crop Science Field Laboratory in Saskatoon, Saskatchewan during the 2015 and 2016 growing seasons. The trials were planted in a RCB design and consisted of 4 replicates for each variety. Each plot consisted of 5 rows 3.66 metres in length with a row spacing of 0.2 metres. The planting density was 215 plants per square metre. Measured characteristics were based on a minimum of 20 measurements each year. The mean differences were significant to at least a 5% probability level

3. NO Are genetic variants observed or expected during reproduction and multiplication?
- A. Yes                       B. No

If Yes, state how these variants may be identified, their type and frequency.

**U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE**

**EXHIBIT B  
STATEMENT OF DISTINCTNESS**

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NAME OF OWNER (S): <b>University of Saskatchewan</b>	TEMPORARY OR EXPERIMENTAL DESIGNATION: <b>TR12135</b>	VARIETY NAME: <b>CDC Fraser</b>
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BASED ON OVERALL MORPHOLOGY CDC Fraser IS MOST SIMILAR TO \_\_\_\_\_  
*(Subject Variety) (Most Similar Variety(ies))*

The variety CDC Fraser most clearly differs from CDC Copeland, AC Metclafe in the following traits:  
*(Subject Variety) (Most Similar Variety(ies))*

Traits	Subject Variety	Most Similar Variety	Location of Evidence
<b>Qualitative Traits</b>	Medium	weak	<a href="https://inspection.canada.ca/english/plaveg/pbr/pov/cropreport/bar/app00010400e.shtml">https://inspection.canada.ca/english/plaveg/pbr/pov/cropreport/bar/app00010400e.shtml</a> - see Exhibit D
The curvature of the first segment of the rachis.			
<b>Color Traits</b>			MAH 8-26-2021
<b>Quantitative Traits</b>			
Flag leaf width (mm)	9.60	CDC Copeland 6.55 AC Metcalfe 6.95	<a href="https://inspection.canada.ca/english/plaveg/pbr/pov/cropreport/bar/app00010400e.shtml">https://inspection.canada.ca/english/plaveg/pbr/pov/cropreport/bar/app00010400e.shtml</a>
Plant Height (including awns) (cm)	81.8	CDC Copeland 87.7 and AC Metcalfe 85.7	
<b>Other Traits</b>			
<b>Example</b>			
Leaf Pubescence	Heavy Pubescence	Glabrous	Photograph attached
Leaf Color	Dark Green (5GY 3/4)	Light Green (2.5GY 8/10)	Munsell Color Chart
Plant Height	200 cm +/- 10 cm (N=25)	250 cm +/- 15 cm (N=25)	Statistics attached

**Please use additional tables to present clear differences for additional comparison varieties.  
Include additional pages of supporting evidence in Exhibit D.**



According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

**U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY  
PLANT VARIETY PROTECTION OFFICE  
BELTSVILLE, MD 20705**

**OBJECTIVE DESCRIPTION OF VARIETY  
Barley (*Hordeum vulgare* L.)**

<b>NAME OF APPLICANT (S)</b>  Kelly Pickett, SeCan	<b>TEMPORARY OR EXPERIMENTAL DESIGNATION</b>  TR12135	<b>VARIETY NAME</b>  CDC Fraser
<b>ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country)</b>  SeCan Association 400-300 Terry Fox Drive Kanata ON K2K 0E3 Canada  Enter email address: kpickett@secan.com		<b>FOR OFFICIAL USE ONLY</b>  <b>PVPO NUMBER</b>

**PLEASE READ ALL INSTRUCTIONS CAREFULLY:**

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (i.e.,  or  ) when the number is either 99 or less or 9 or less.

**1. GROWTH HABIT:**

1 = Spring    2 = Facultative Winter    3 = Winter    Early Growth:  1 = Prostrate    2 = Semi-Prostrate    3 = Erect

**2. MATURITY: (50% Flowering)**

1 = Early (California Mariout) 2 = Mid-Season (Betzes) 3 = Late (Frontier)

No. Days Earlier Than \_\_\_\_\_ \*

Same as Check \_\_\_\_\_ \*

No. of Days Later Than \_\_\_\_\_ \*

**3. PLANT: (From Soil Level to Top of Head)**

1 = Semi-Dwarf    2 = Short (California Mariout)    3 = Medium Tall (Betzes)    4 = Tall (Conquest)

cm Shorter Than \_\_\_\_\_ \*

Same as Check \_\_\_\_\_ \*

cm Taller Than \_\_\_\_\_ \*

**4. STEM:**

Exsertion (Flag to Spike at Maturity): 1 = ( 0 – 3 cm)    2 = (3 – 10 cm)    3 = (10 – 15 cm)

Anthocyanin: 1 = Absent    2 = Present

No. of Nodes (Originating from Node Above Ground)

Collar Shape: 1 = Closed    2 = V-Shaped    3 = Open    4 = Modified Closed or Open

Shape of Neck: 1 = Straight    2 = Snaky    3 = Other (Specify) slightly curved to snake-shap

\* A commercial variety grown in the same trial.

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**5. LEAF:**

- 1 Basal Leaf Sheath (Seedling): 1 = Glabrous 2 = Pubescent
- Position of Flag Leaf (At Boot Stage): 1 = Drooping 2 = Upright
- 3 Waxiness: 1 = Absent (Glossy) 2 = Slightly Waxy 3 = Waxy
- 9  1 mm Width (First Leaf Below Flag Leaf)
- 9  3 cm Length (First Leaf Below Flag Leaf)
- 1 Anthocyanin in Leaf Sheath: 1 = Absent 2 = Present

**6. HEAD:**

- 1 Type: 1 = Two-Rowed 2 = Six-Rowed
- 1 Density: 1 = Lax 2 = Erect (Not Dense) 3 = Erect (Dense) 4 = Other (Specify) \_\_\_\_\_
- 2 Shape: 1 = Tapering 2 = Strap 3 = Clavate 4 = Other (Specify) \_\_\_\_\_
- 3 Waxiness 1 = Absent (Glossy) 2 = Slightly Waxy 3 = Waxy
- Lateral Kernels Overlap: 1 = None 2 = At Tip 3 = 1/4 – 1/2 of Head
- Rachis (Hair on Edge): 1 = Lacking 2 = Few 3 = Covered

**7. GLUME:**

- Length: 1 = 1/3 of Lemma 2 = 1/2 of Lemma 3 = More than 1/2 of Lemma
- 3 Hairs: 1 = None 2 = Short 3 = Long
- 3 Hair Covering: 1 = None 2 = Restricted to Middle 3 = Confined to Band 4 = Completely Covered
- 2 Awns: 1 = Less than Equal to Length of Glumes 2 = Equal to Length of Glumes 3 = More than Equal to Length of Glumes
- 3 Awn Surface: 1 = Smooth 2 = Semi-Smooth 3 = Rough

**8. LEMMA:**

- 5 Awn: 1 = Awnless  
2 = Awnlets on Central Rows, Awnless on Lateral Rows  
3 = Short on Central Rows, Awnlets on Lateral Rows  
4 = Short (Less than Equal to Length of Spike)  
5 = Long (Longer than Spike)  
6 = Hooded
- 4 Awn Surface: 1 = Awnless 2 = Smooth 3 = Semi-Smooth 4 = Rough
- Teeth: 1 = Absent 2 = Few 3 = Numerous
- Hair: 1 = Absent 2 = Present
- Shape of Base: 1 = Depression 2 = Slight Crease 3 = Transverse Crease
- 2 Raachilla Hairs: 1 = Short 2 = Long

**9. STIGMA:**

- Hairs: 1 = Few 2 = Many

**10. SEED:**

Type: 1 = Naked 2 = Covered

Hairs on Ventral Furrow: 1 = Absent 2 = Present

Length: 1 = Short (8.0 mm)  
2 = Short to Mid-Long (7.5 – 9.0 mm)  
3 = Mid-Long (8.5 – 9.5 mm)  
4 = Mid-Long to Long (9.0 – 10.5 mm)  
5 = Long (10.0 mm)

Wrinkling of Hull: 1 = Naked 2 = Slightly Wrinkled 3 = Semi-Wrinkled 4 = Wrinkled

Aleurone Color: 1 = Colorless (White or Yellow) 2 = Blue

Percent Abortive   GMS. per 1000 Seeds

**11. DISEASE:** (0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Intermediate, 4 - Tolerant)

Septoria  Net Blotch  Spot Blotch  Powdery Mildew

Loose Smut  Bacterial Blight  Covered Smut  False Loose Smut

Stem Rust  Leaf Rust  Scab  Scald

Aster Yellows Virus  BSMV  BYDV  Other (Specify) \_\_\_\_\_

**12. INSECT:** (0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Intermediate, 4 - Tolerant)

Green Bug  English Grain Aphid  Chinch Bug  Armyworm

Grasshoppers  Cerial Leaf Beetle  Other (Specify) \_\_\_\_\_

Hessian Fly Races {  GP  A  B  C  Other Specify \_\_\_\_\_  
 D  E  F  G

**13. CHEMICAL:** (0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Intermediate, 4 = Tolerant)

DDT  Other (Specify) \_\_\_\_\_

**14. INDICATE WHICH VAREITY MOST CLOSELY RESEMBLES THAT SUBMITTED:**

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Tillering		Seed Size	
Leaf Size		Coleoptile Elongation	
Leaf Color		Seedling Pigmentation	
Leaf Carriage			

**REFERENCES:**

The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

1. Wiebe, G.A., and D.A. Reid, 1961, Classifications of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Department of Agriculture.
2. Reid, D.A., and G.A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Department of Agriculture, pp. 61-84.
3. Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

**COLOR:** Nickerson's or any recognized color fan may be used to determine color of the described variety.



Government  
of Canada

Gouvernement  
du Canada

[Canada.ca](#) > [Canadian Food Inspection Agency](#) > [Plant varieties](#)

> [Plant Breeders' Rights](#)

## CDC Fraser

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### Barley

**Denomination:** 'CDC Fraser'

**Botanical Name:** *Hordeum vulgare*

**Applicant/Holder:** University of Saskatchewan  
Crop Development Centre  
4D36 Agriculture Building, 51 Campus Drive  
Saskatoon, Saskatchewan  
S7N 5A8  
Canada

**Breeder:** Aaron Beattie, University of Saskatchewan,  
Saskatoon, Saskatchewan

**Agent in Canada:** SeCan Association  
400-300 Terry Fox Drive  
Kanata, Ontario  
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Tel (telephone): 613-592-8600 ext.223

**Application Date:** 2016-06-06

**Provisional** 2016-06-06

**Protection::**

**Application Number:** 16-8941  
**Grant of Rights Date:** 2018-02-19  
**Certificate Number:** 5664  
**Grant of Rights Termination Date:** 2038-02-19

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## Variety Description

**Varieties used for comparison:** 'CDC Copeland' and 'AC Metcalfe'

**Summary:** *The flag leaves of 'CDC Fraser' are wider than those of both reference varieties. The plants of 'CDC Fraser' are shorter than those of both reference varieties. The curvature of the first segment of the rachis of 'CDC Fraser' is medium whereas it is weak for both reference varieties.*

### **Description:**

PLANT: two row, spring barley, weak to medium frequency of plants with recurved flag leaves

YOUNG PLANT (at tillering): intermediate growth habit, absent or very sparse pubescence on lower leaf sheaths

FLAG LEAF BLADE: absent or very sparse pubescence

FLAG LEAF SHEATH: medium to strong glaucosity, absent or very sparse pubescence



AURICLES: very weak to weak intensity of anthocyanin colouration, sparse pubescence on margins

SPIKE: emerges mid-season, medium glaucosity, erect to semi-erect attitude, v-shaped to open shaped collar, parallel shape, lax density, divergent attitude of sterile spikelet, glume and awn of median spikelet are equal to length of grain

FIRST SEGMENT OF RACHIS: medium length and curvature

LEMMA AWNS: absent or very weak intensity of anthocyanin colouration of tips, longer than length of spike, rough spiculation on margins along entire length

KERNEL: absent or very weak anthocyanin colouration of nerves of lemma at early to soft dough stage, whitish aleurone layer, long rachilla hairs, husk present, medium spiculation of inner lateral nerves of dorsal side of lemma, no hairiness of ventral furrow, clasping disposition of lodicules, horseshoe to incomplete horseshoe shape basal markings, long, medium width

AGRONOMY: good resistance to lodging, shattering and straw breakage; fair to good drought tolerance, good malting quality

DISEASE REACTION: resistant to True loose smut (*Ustilago nuda*)

**Origin & Breeding History:** 'CDC Fraser' (experimental designations 'TR12135', 'SM090669') originated from the cross 'TR04280' x 'SM04261' made in a greenhouse at the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan in 2005 and was developed using a bulk breeding system. Both the F1 and F2 generations were grown as bulk

populations in a winter nursery in New Zealand in 2005-06 and in Saskatoon in 2006, respectively. The seed was returned to New Zealand during the winter of 2006-07 to grow as an F3 bulk population with the subsequent F4 grown as a space planted population in Saskatoon in 2007. Individual spikes were harvested and selected for general seed characteristics and then grown in the field as F5 hill plots in Saskatoon in 2008. Seed from the selected F5 hill plot was bulked as the line that became known as 'SM090669'. It was tested in the Crop Development Centre yield trials from 2009 to 2011 followed by testing in the Western Cooperative Two-Row Barley Registration Trials as 'TR12135' during 2012-13. Selection criteria included short and strong straw, yield, grain quality and disease resistances.

**Tests & Trials:** The comparative trials were conducted at the University of Saskatchewan Crop Science Field Laboratory in Saskatoon, Saskatchewan during the 2015 and 2016 growing seasons. The trials were planted in a RCB design and consisted of 4 replicates for each variety. Each plot consisted of 5 rows 3.66 metres in length with a row spacing of 0.2 metres. The planting density was 215 plants per square metre. Measured characteristics were based on a minimum of 20 measurements each year. The mean differences were significant to at least a 5% probability level based on a paired Student's t-test.

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# Comparison tables for 'CDC Fraser' with reference varieties 'CDC Copeland' and 'AC Metcalfe'

## Flag leaf width (mm (millimetres))

	'CDC Fraser'	'CDC Copeland'	'AC Metcalfe'
mean 2015	9.60	6.55	6.95
std. (standard) deviation 2015	1.23	1.05	1.32
mean 2016	9.10	7.00	7.90
std. (standard) deviation 2016	0.91	0.73	0.72

## Plant height (including awns) (cm (centimetres))

	'CDC Fraser'	'CDC Copeland'	'AC Metcalfe'
mean 2015	81.8	87.7	85.7
std. (standard) deviation 2015	4.9	3.8	2.5
mean 2016	73.9	83.4	78.2
std. (standard) deviation 2016	2.6	3.4	3.4

Click on image for larger view



Barley: 'CDC Fraser' (centre) with reference varieties 'CDC Copeland' (left) and 'AC Metcalfe' (right)

Click on image for larger view



Barley: 'CDC Fraser' (centre) with reference varieties 'CDC Copeland' (left) and 'AC Metcalfe' (right)

**Date modified:**

2021-07-22

**U.S. DEPARTMENT OF AGRICULTURE  
 AGRICULTURAL MARKETING SERVICE  
 SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE**

**EXHIBIT E  
 STATEMENT OF THE BASIS OF OWNERSHIP**

*The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.  
 Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421).  
 Information is held confidential until certificate is issued (7 U.S.C. 2426).  
 OMB Collection #0581-0055*

NAME OF OWNER (S): University of Saskatchewan	TEMPORARY OR EXPERIMENTAL DESIGNATION: TR12135	VARIETY NAME: CDC Fraser
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1. Does the owner own all rights to the variety?

- YES                       NO

If NO, please explain:

2. Is the owner a U.S. national or a U.S. based entity?

- YES                       NO

If NO, give name of country:

Canada

3. Is the owner the original owner?

- YES                       NO

If NO, please answer one of the following:

A. If the original rights to the variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

- YES                       NO

If NO, give name of country:

B. If the original rights to the variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

- YES                       NO

If NO, give name of country:

4. Additional explanation on ownership (Trace ownership from original breeder to current owner):