

No.



201100263

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

## Crop Development Centre, University of Saskatchewan

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

An application requesting a certificate of protection for an alleged distinct variety of sexually 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 basic seed 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 therefrom, 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.)

LENTIL

'CDC Impala'



Attest:

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 eleventh day of March, in the year two thousand and fourteen.*

Commissioner

Secretary of Agriculture



REPRODUCE LOCALLY. Include form number and date on all reproductions

Form Approved - OMB No. 0581-0055

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

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)

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE  
(Instructions and information collection burden statement on reverse)

1 NAME OF OWNER Crop Development Centre University of Saskatchewan		2 TEMPORARY DESIGNATION OR EXPERIMENTAL NAME 3110	3 VARIETY NAME CDC Impala
4 ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 51 Campus Drive Saskatoon SK CANADA S7N 5A8		5 TELEPHONE (Include area code) 306-966-5855	FOR OFFICIAL USE ONLY PVPO NUMBER #201100263 FILING DATE FEBRUARY 16, 2011
6 FAX (include area code) 306-966-5015		7 IF THE OWNER NAMED IS NOT A "PERSON" GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) UNIVERSITY	
8 IF INCORPORATED, GIVE STATE OF INCORPORATION		9 DATE OF INCORPORATION	
10 NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION (First person listed will receive all papers) Byron Lannoye Pulse USA Inc. 1900 Commerce Drive Bismarck ND 58501			FILING AND EXAMINATION FEES: \$ 4,382.00 DATE 2/16/11 CERTIFICATION FEE: \$ DATE
11 TELEPHONE (Include area code) 701-530-0734	12 FAX (Include area code) 701-530-1826	13 E-MAIL byron@pulseusa.com	
14 CROP KIND (Common Name) Lentil	16 FAMILY NAME (Botanical) Leguminosae	18 DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
15 GENUS AND SPECIES NAME OF CROP Lens culinaris Medik.	17 IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION	
19 CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)		20 DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)	
a <input checked="" type="checkbox"/> Exhibit A Origin and Breeding History of the Variety b <input checked="" type="checkbox"/> Exhibit B Statement of Distinctness c <input checked="" type="checkbox"/> Exhibit C Objective Description of Variety d <input checked="" type="checkbox"/> Exhibit D Additional Description of the Variety (Optional) e <input checked="" type="checkbox"/> Exhibit E Statement of the Basis of the Owner's Ownership f <input checked="" type="checkbox"/> Exhibit F Declaration Regarding Deposit g <input checked="" type="checkbox"/> Voucher Sample (3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) h <input checked="" type="checkbox"/> Filing and Examination Fee (\$4,382), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		<input type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input checked="" type="checkbox"/> NO (If "no", go to item 23) <input checked="" type="checkbox"/> UNDECIDED	
		21 DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
		IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
		22 DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
		IF YES, SPECIFY THE NUMBER 1,2,3, etc FOR EACH CLASS <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
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? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO May 2010		24 IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Component USA 7,232,942	
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES (Please use space indicated on reverse)		IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER (Please use space indicated on reverse)	
25 The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate			
The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated 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 (Please print or type) Albert Vandenberg		NAME (Please print or type)	
CAPACITY OR TITLE Professor, Plant Sciences Plant Breeder, Crop Development Centre		CAPACITY OR TITLE	
DATE Feb 1, 2011		DATE	



#S0100501



ST 470 Pg 2

**GENERAL INSTRUCTIONS:** To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E, F; (3) for a tuber reproduced variety, verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for \$4,382 (\$518 filing fee and \$3,864 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice). **NEW:** With the application for a seed reproduced variety or by direct deposit soon after filing, the applicant must provide at least 3,000 viable untreated seeds of the variety *per se*, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to reproduce the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initiated and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of \$768 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

**NOTES:** It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

**Plant Variety Protection Office**  
**Telephone:** (301) 504-5518      **FAX:** (301) 504-5291  
**General E-mail:** PVPOmail@usda.gov  
**Homepage:** <http://www.ams.usda.gov/science/pvpo/PVPindex.htm>

**SPECIFIC INSTRUCTIONS:**

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, **Seed Regulatory and Testing Branch**, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870. <http://www.ams.usda.gov/lsg/seed.htm>.

**ITEM**

- 19a. Give:
  - (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
  - (2) the details of subsequent stages of selection and multiplication;
  - (3) evidence of uniformity and stability; and
  - (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
  - (1) identify these varieties and state all differences objectively;
  - (2) attach replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and
  - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
- 20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103)
- 23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements
- 24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date

**22. CONTINUED FROM FRONT** (Please provide a statement as to the limitation and sequence of generations that may be certified.)

**23. CONTINUED FROM FRONT** (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries)

**24. CONTINUED FROM FRONT** (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent))

USA Patent 7,232,942 June 19, 2007 lentil Plants Having Increased Resistance to Imidazolinone Herbicides

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 14 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). 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.



## Exhibit A

### Origin and Breeding History of CDC Impala

Pedigree: CDC Rosetown///CDC Rosetown//CDC Rosetown/CDC Impact

All parent varieties were developed at the developed at the Crop  
Development Centre (CDC) at the University of Saskatchewan.

The final cross was made in 2003. CDC Impala is a back-cross of CDC Rosetown. CDC Impact was the donor line for the imidazolinone tolerance trait. The  $F_2$ -derived family method was used to develop CDC Impala

Selection criteria: tolerance to the imidazolinone herbicide Odyssey (contains imazethapyr and imazamox), yield, lodging tolerance, ascochyta resistance, seed quality

Generation of first bulking of breeder seed:  $F_6$

Lines bulked to form variety: 25

CDC Impala was stable for herbicide tolerance, seed coat colour and cotyledon colour throughout the seed multiplication process.

No variants were noticed at any stage of seed multiplication.





June 29, 2012

Dr. Mark A. Hermeling  
Quality Assurance Plant Variety Examiner  
Plant Variety Protection Office, NAL BLDG., Room 401  
10301 Baltimore Avenue, Beltsville, Maryland

Dear Dr. Hermeling:

SUBJECT: **Application No. 201100263, Lentil, 'CDC Impala'**  
Application No. 201100264, Lentil, 'CDC Impress'  
Application No. 201100265, Lentil, 'CDC Maxim'

Regarding your correspondence with Byron Lannoye, Pulse USA Inc, of May 22, 2012, as the breeder of the varieties, I can provide you with the following information.

**Evidence of uniformity and stability:** All three varieties were bred at the Crop Development Centre. Our normal breeding procedure is to grow single plants in the field, followed by a year as small plots, followed by a year of long plots, then followed by a 1-2 acre plot of breeder seed. During this four year period we are able to assess uniformity and stability. All three varieties were found to be stable and uniform at all stages of seed production. All breeder seed stages are managed by the breeder seed unit in the Department of Plant Sciences, University of Saskatchewan in compliance with the required inspections by the Canadian Food Inspection Agency and the Canadian Seed Growers Association.

**Name check:** I have attached a page from the Agriculture and Agri-Food Canada website that shows a list of the officially registered lentil varieties in Canada. This list is provided by Canadian Food Inspection Agency which oversees the Variety Registration Office in Ottawa. I have provided the link to their website as follows: <http://www.inspection.gc.ca/english/plaveg/variet/lentile.shtml>. The search engine is only accessible within the USA. Mr. Byron Lannoye of Pulse ISA Inc has conducted a name search as described in your letter and he will inform you of the results. My preliminary search indicated that the names were in compliance with the regulations described in the correspondence.

I trust this information is sufficient to proceed with the PVP applications listed above.

Best regards,

A black and white signature of Dr. Albert Vandenberg, written in a cursive style.

Dr. Albert Vandenberg  
Plant Breeder, NSERC Industrial Research Chair  
in Genetic Improvement of Lentil  
Department of Plant Sciences, University of Saskatchewan



**Exhibit B – CDC Impala****Statement of Distinctness**

Prior to being registered as a variety in Canada, CDC Impala was subject to two years of official testing (2005-2006) under the experimental designation Line 3110 under the auspices of the Prairie Registration Recommending Committee for Grain (PRRCG) - Pulses and Special Crops Sub-Committee. Tests were conducted at six locations in 2005 and four locations in 2006.

This Statement of Distinctness is based on comparison of CDC Impala to the reference varieties for small red lentils in 2005-2006.

- 1) The most similar previous identifiable group of varieties are in the extra small red market class, namely CDC Imperial and CDC Rosetown, which were both included in the trials. The most useful characteristics that distinguish CDC Imperial from the check varieties are:
  - i. Herbicide Tolerance - CDC Impala is very similar in all characteristic to its backcross parent CDC Rosetown, except that CDC Impala is tolerant to the imidazolinone class of herbicides (imazethapyr and imazamox). CDC Rosteown is not tolerant.
  - ii. Seed Weight – 100 seeds of CDC Impala is 3.3 grams, most similar to seeds of CDC Imperial with 100 seed weight of 3.0 g and CDC Rosetown (seed weight of 3.2 g per 100 seeds. CDC Imperial is the only other extra small red lentil variety with imidazolinone tolerance in the world to our knowledge. [See Table 1 of the 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 1.75 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**

Exhibit C

**OBJECTIVE DESCRIPTION OF VARIETY**

**Lentil (*Lens culinaris* Medik.)**

NAME OF APPLICANT(S) <i>Crop Development Centre University of Saskatchewan</i>	TEMPORARY OR EXPERIMENTAL DESIGNATION <i>3110</i>	VARIETY NAME <i>CDC Impala</i>
ADDRESS (Street and No. or RD No., City, State, Zip Code and Country) <i>51 Campus Drive Saskatoon SK Canada S7N 5A8</i>	FOR OFFICIAL USE ONLY	
		PVPO NUMBER <b>#201100263</b>

**PLEASE READ ALL INSTRUCTIONS CAREFULLY:**

PLEASE READ ALL INSTRUCTIONS CAREFULLY. Place the appropriate number that describes the varietal character in the boxes below. Place a zero in the first box (e.g.    or   ) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 25 plants. Comparative data should be determined from varieties entered on the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: \_\_\_\_\_

Please answer all questions for your variety; lack of response may delay progress of your application.

**1. MATURITY:**

*see Table 13 Exhibit D4*

Relative Maturity:    1 = Early            2 = Medium            3 = Late

Days from Planting to Harvest

Days from Planting To Harvest of the Check Variety. Name of Check Variety: *Imperial CDC ~~Resurrection~~*

**2. PLANT HABIT:**

*Table "A" Exhibit D4*

Type:            1 = Determinate    2 = Intermediate    3 = Indeterminate

Plant Height in Centimeters

Plant Height of the Check Variety. Name the Check Variety: *CDC Imperial*

Pod Position:            1 = Low (Lower Pods Touching the Soil Surface)  
                                  2 = High (Lower Pods Not Touching the Soil Surface)  
                                  3 = Scattered (Not Concentrated High or Low)

Adaptability to Machine Harvest:    1 = Adapted            2 = Not Adapted

Lodging Resistance:    1 = Good                2 = Fair                3 = Poor

**3. LEAFLET MORPHOLOGY:**

Leaflet Texture:    1 = Smooth            2 = Wrinkled

Leaflet Surface:    1 = Dull                2 = Glossy            3 = Semiglossy        4 = Variable

3. LEAFLET MORPHOLOGY:

<input type="checkbox"/>	Relative Size:	1 = Small	2 = Medium	3 = Large		
<input type="checkbox"/>	Leaflet Shape:	1 = Ovate	2 = Lanceolate	3 = Deltoid	4 = Cordate	5 = Rhomboid
<input type="checkbox"/>	Apex of Leaflet:	1 = Acute	2 = Acuminate	3 = Cuspidate	4 = Obtuse	
<input type="checkbox"/>	Base of Leaflet:	1 = Obtuse	2 = Oblique	3 = Cordate	4 = Cuneate	5 = Attenuate

4. FLOWER:

<input type="checkbox"/>	Color of Standard:	1 = White	2 = Cream	3 = Pink	4 = Blue	5 = Purple	6 = White/Blue
		7 = Other (Specify) _____					
<input type="checkbox"/>	Color of Wings:	1 = White	2 = Cream	3 = Pink	4 = Blue	5 = Purple	6 = White/Blue
		7 = Other (Specify) _____					
<input type="checkbox"/>	Color of Keel:	1 = White	2 = Cream	3 = Pink	4 = Blue	5 = Purple	6 = White/Blue
		7 = Other (Specify) _____					
<input type="checkbox"/>	Number of Days to 50% Bloom	59					

Table 13 Exhibit D

5. POD MORPHOLOGY:

Green	Mature						
<input type="checkbox"/>	<input type="checkbox"/>	Color Pattern:	1 = Solid	2 = Striped	3 = Blotched	4 = Mottled	5 = Other (Specify) _____
<input type="checkbox"/>	<input type="checkbox"/>	Primary Color:	1 = Purple	2 = Red	3 = Green	4 = Yellow	5 = Tan 6 = Brown 7 = Other _____
<input type="checkbox"/>	<input type="checkbox"/>	Color Modifier:	1 = Light	2 = Light Medium	3 = Medium	4 = Medium Dark	5 = Dark
<input type="checkbox"/>	<input type="checkbox"/>	Secondary Color:	1 = Purple	2 = Red	3 = Green	4 = Yellow	5 = Tan 6 = Brown 7 = Other _____
<input type="checkbox"/>	<input type="checkbox"/>	Cross Section Shape:	1 = Flat	2 = Pear	3 = Round	4 = Figure 8	
<input type="checkbox"/>	<input type="checkbox"/>	Pod Curvature:	1 = Straight	2 = Slightly Curved	3 = Curved	4 = Recurved	
<input type="checkbox"/>	<input type="checkbox"/>	Pod Beak Orientation:	1 = Straight	2 = Curved Upward	3 = Curved Downward	4 = Variable	
<input type="checkbox"/>	<input type="checkbox"/>	Pod Constrictions:	1 = None	2 = Slight	3 = Deep		
<input type="checkbox"/>	<input type="checkbox"/>	Average Beak Length in Millimeters					
<input type="checkbox"/>	<input type="checkbox"/>	Average Number of Seeds per Pod					

6. SEED COLOR:

<input type="checkbox"/>	Seed Luster:	1 = Shiny	2 = Dull	3 = Semishiny	4 = Variable		
<input type="checkbox"/>		1 = Monochrome	2 = Polychrome				
<input type="checkbox"/>	Primary Color:	1 = White	2 = Yellow	3 = Beige	4 = Tan	5 = Brown	6 = Pink 7 = Red 8 = Purple
		9 = Blue	10 = Black	11 = Green	12 = Other	GRAY	
<input type="checkbox"/>	Secondary Color:	1 = White	2 = Yellow	3 = Beige	4 = Tan	5 = Brown	6 = Pink 7 = Red 8 = Purple
		9 = Blue	10 = Black	11 = Green	12 = Other	_____	
<input type="checkbox"/>	Seed Fleck Color:	1 = White	2 = Yellow	3 = Beige	4 = Tan	5 = Brown	6 = Pink 7 = Red 8 = Purple
		9 = Blue	10 = Black	11 = Green	12 = Other	_____	
<input type="checkbox"/>	Seedcoat Color Pattern:	1 = Solid	2 = Splashed	3 = Mottled	4 = Striped	5 = Flecked	6 = Dotted
<input type="checkbox"/>	Hilum Color:	1 = White	2 = Yellow	3 = Beige	4 = Tan	5 = Brown	6 = Pink 7 = Red 8 = Purple
		9 = Blue	10 = Black	11 = Green	12 = Other	_____	
<input type="checkbox"/>	Cotyledon Color:	1 = Yellow	2 = Orange	3 = Red	4 = Yellow/Orange	5 = Red/Orange	



7. SEED SHAPE AND WEIGHT:

1 Shape: 1 = Round 2 = Oval 3 = Cuboid 4 = Kidney 5 = Truncate/Fastigate  
3.3 Dry Seed Weight in Grams per 100 Seeds (Adjusted to 12% Moisture)

8. ANTHOCYANIN PIGMENTATION: 1 = Absent 2 = Present

2 Flowers Stems Pods Seeds  
Leaves Petioles Peduncles Nodes

9. DISEASE or PEST REACTION: 1 = Susceptible 2 = Resistant 3 = Tolerant 4 = Avoidance 0 = Not Tested

Give the Common Name (CN) Scientific Name (SN), and Race/Biotype/Panthotype (R), Where Applicable

- 3 Anthracnose (Colletotrichum spp.) Race Ct1
2 Ascochyta (Ascochyta blight) lewis
0 Fusarium (Fusarium solani)
0 Pythium (Pythium ultimum)
0 Pea Enation Mosaic Virus
0 White Mold (Sclerotinia sclerotiorum)
CN SN R
CN SN R
CN SN R
CN SN R
CN SN R
CN SN R
CN SN R
CN SN R
CN SN R
Weevils
CN SN R
CN SN R

10. PSYCHOLOGICAL STRESS REACTION: 1 = Susceptible 2 = Resistant 3 = Tolerant 4 = Avoidance 0 = Not Tested

0 Heat 0 Cold 0 Drought 0 Air Pollution

11. COMMENTS:

Exhibit D – Additional Declaration for CDC Impala (3010)

The following documents form Exhibit D

- D.1 Voting results for recommendation of registration of lentil line 3010 as CDC Impala.
- D.2 Registration application form for 3010 in Canada
- D.3 Objective Description Form of 3010 for Canadian registration
- D.4 Performance data for CDC Impala (3010) in Canadian lentil registration trials, 2005-6.



# PRCPSC

*Prairie Recommending Committee Pulse and Special Crops*

DI

Agriculture and Agri-Food Canada  
Morden Research Station  
Unit 100 - 101 Route 100  
Morden, MB R6M 1Y5  
Tel: (204) 822-7229

#201100263

March 14, 2007

Dr. Albert Vandenberg  
Crop Development Centre,  
University of Saskatchewan,  
51 Campus Drive,  
Saskatoon, SK S7N 5A8

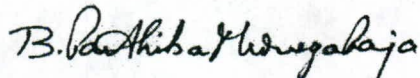
Dear Dr. Vandenberg

The Prairie Recommending Committee for Pulse and Special Crops (PRCPSC) met in Saskatoon on February 20-22, 2007. The Committee reviewed your request for support of registration for Lentil line 3110. I am pleased to inform you that the PRCPSC has agreed to recommend this line for registration to the Canadian Food Inspection Agency.

Enclosed are the voting records from the Committee.

Congratulations on your success.

Sincerely,



Parthiba Balasubramanian, Ph.D.  
Secretary,  
PRCPSC

10

#201100263

# PRCPSC

*Prairie Recommending Committee Pulse and Special Crops*

Agriculture and Agri-Food Canada  
Morden Research Station  
Unit 100 - 101 Route 100  
Morden, MB R6M 1Y5  
Tel: (204) 822-7229

**Candidate Name:** 3110

**Crop:** Lentil (Small Red)

**Subcommittee voting:**

Moved/Seconded by: Tom Warkentin / Bunyamin Taran to support the recommendation for registration. Presented by: Dr. Tom Warkentin

**Yes** 21; **No** 12; **Abstain** 0 **Result:** Supported

**Disease:** Do not object

**Disease Comments:** Disease profile for ascochyta similar to CDC Imperial; anthracnose rating of 2.1 higher than 1.3 for CDC Imperial.

**Quality:** Do not object

**Quality Comments:** Seed weight and diameter are greater than CDC Imperial (check). No data on dehulling efficiency is available.



DZ

Crop Common name: Lentil  
Scientific name: Lens culinaris L.

Experimental Designation(s) 3110

Proposed Variety Name CDC Impala

Please write name exactly as it should appear on legal documents with careful attention to the use of hyphens, spaces and capital letters.

I declare that I have not applied for or received a Canadian trademark for the name, or any part of the name, of this variety.

[Signature] Signature

September 12, 2007 Date

Has this variety been applied for or granted Plant Breeders' Rights in Canada? [ ] Yes [x] No  
If yes, the name proposed for registration must be the same as the one for Plant Breeders' Rights.

In which countries (if any) is this variety presently being marketed?  
None

Is this variety being marketed by any other name in other countries? [ ] Yes [x] No  
If yes, please specify the name(s) and country(s) where sold \_\_\_\_\_

Registration Type

- Full registration: [x]
- Restricted registration: [ ] Interim registration
- [ ] Regional registration
- [ ] Contract registration
- Reinstatement: [ ]

Restrictions to registration are subject to the recommendations of the recommending committee and the provisions of the Seeds Regulations Part III.

Origin and Breeding

The amount of information required varies from crop to crop. Please provide as much detail as possible.

Name and complete address of breeding institution:

Crop Development Centre, University of Saskatchewan, 51 Campus Drive  
Saskatoon, Saskatchewan, Canada S7N 5A8

Telephone #: 306-966-5855

Facsimile #: 306-966-5015

E-mail address: vandenberg@sask.usask.ca



**Pedigree:** For hybrid and composite crops, please give the uncoded pedigree and derivation of the inbred lines. For other crops, please provide as much information as possible on the genetic background of the variety.

CDC Rosetown//CDC Rosetown//CDC Rosetown/CDC Impact

CDC Impact is a registered cultivar with tolerance to imidazolinone herbicides

In what year was the final cross made? (only applicable to non hybrid and non-composite varieties)

2003

What breeding techniques were used in developing this variety? (i.e. pedigree selection, clonal selection, single seed descent)

Backcrossing and F2-derived family method

What selection criteria were used in developing this variety? In what generation(s) was selection conducted?

Yield, maturity and seed quality in all generations

Tolerance to imidazolinone herbicides imazethapyr and imazamox in all generations

In what generation was breeder seed first bulked?

F6

How many lines were bulked to form this variety?

25

**Varietal Characteristics**

Enclose a description of the variety, using the objective description form (ODF) as a guide, where available (ODFs are not yet available for all crops). Please ensure that all varietal and major identifying characteristics (identified by "#" in the ODF) are included.

Does this variety contain traits that are novel to its species?:

No

Yes, please describe tolerance to imidazolinone herbicides

**Additional Information**

Please refer to the *Procedures for the Registration of Crop Varieties in Canada* for guidelines specific to some crops. The Variety Registration Office may, in addition to information provided in this application form, require that the applicant supply further information that will allow the Registrar to determine the merit and identity of the variety (i.e. more detailed morphological characteristics, history of development information, data to support disease reaction claims, etc.).



**Seed Stocks**

Name and address of institution maintaining breeder seed. (If person maintaining breeder seed is a Canadian agent who is not the owner of the variety, a letter of authorization from the owner is required. The Canadian maintainer must be a plant breeder recognized by the Canadian Seed Growers' Association for crops other than potatoes.):

Crop Development Centre, University of Saskatchewan, 51 Campus Drive  
Saskatoon, Saskatchewan Canada S7N 5A8

Do you wish this variety to be added to the "OECD List of Cultivars"? Unless there are exceptional circumstances, CFIA will only add varieties to the OECD List of Cultivars, for which breeder seed is being maintained in Canada. (Composite canola varieties are not added to the OECD list). Failure to complete the appropriate box will result in the variety not being added to the OECD list. If you are requesting addition of a hybrid, please supply descriptions of the inbred lines as well as the hybrid.

Yes

No

As part of your obligation for the OECD listing of a variety, upon request, you must supply a description and standard sample of the variety to official OECD certifying agencies.

**Canadian Representative**

Name and address of Canadian representative (If the applicant is not the breeder or owner of the variety, a signed statement is required from the breeder or owner authorizing representation):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone #: \_\_\_\_\_ Facsimile #: \_\_\_\_\_

E-mail address: \_\_\_\_\_

**Canadian Distributor**

Name and address of Canadian distributor(s) if different from Canadian representative:

Saskatchewan Pulse Growers

310-111 Research Drive, Saskatoon, SK S7N 3R2

Telephone 306-668-5556

Fax 306-668-5557

**Name of Recommending Committee(s)**

Prairie Registration Recommending Committee for Grain - Special Crops Sub-committee

Year support was granted: 2007

It is the responsibility of the applicant to include a copy of the letter or motion of support, as well as the experimental data used by the recommending committee to support the variety.



**Reference Sample**

For details on procedures for submitting reference samples, please see Section II 5.9 and Appendix II of the *Procedures for the Registration of Crop Varieties in Canada*.

**Contract Registration**

The submission of the proposed quality control system manual for the variety is required under paragraph 68(2)(c) of the *Seeds Regulations*. (See Appendix VI of the *Procedures for the Registration of Crop Varieties in Canada* for more information).

As registrant, I agree that once the variety is registered, upon request, I will provide the Registrar with information relating to the distribution, use and disposition of any seed of the variety or any progeny thereof, and acknowledge that I am responsible for any seed or progeny that is not properly disposed of or accounted for.

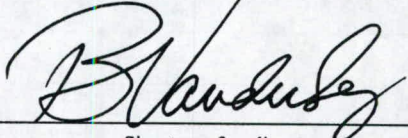
_____	_____
Type or print name	Title
_____	_____
Signature	Date

**Sign above ONLY if you are applying for contract registration**

**ALL APPLICATIONS MUST BE SIGNED HERE**

I certify that the information given in this application form is correct, including that the reference sample is properly drawn and is representative of the variety and meets the purity and germination requirements.

Application completed by: Albert Vandenberg  
Type or print name

  
Signature of applicant

September 12, 2007  
Date

on behalf of Crop Development Centre, Univ. of Sask.  
Breeding Institution/Organization

**NOTE:**

- (i) **The applicant must be a permanent resident in Canada.**
- (ii) **The applicant need not be the breeder or owner of the variety. Unless otherwise specified, once a variety is registered, the applicant is considered to be the registrant. Thus, the applicant/registrant must be in a position to accept full responsibility for compliance with all terms and conditions of a restricted registration.**
- (iii) **For foreign bred varieties, all correspondence with respect to the registration of this variety will be addressed to the Canadian representative.**
- (iv) **A "trademark" includes a trademark, official mark and/or prohibited mark.**
- (v) **The submission of false or misleading information will result in refusal of registration or in subsequent cancellation.**



D3

#201100263

**A. ABOUT THE OBJECTIVE DESCRIPTION FORM**

This objective description form is designed as an aid for the identification of lentil varieties to provide sufficient information for pedigreed seed crop inspection and variety verification purposes. Companion documents include the "Variety Registration Application Form" and the "Procedures for the Registration of Crop Varieties in Canada," both of which are available from the Variety Registration Office.

The objective description form lists characteristics to be used as the basis for developing the description of lentil varieties. It is recommended that the form be completed in as much detail as possible to ensure that an accurate description of the variety be on record. Uniformity and stability must be sufficient to ensure that the genetic purity of the variety has not been compromised during the development of the variety or during the seed multiplication process. However, accurate information on variability within the variety is essential for distinguishing between variants and off-types during the seed multiplication process.

Information on this document may be accessible or protected as required under the provisions of the *Access to Information Act*. Information that could cause you or your organization injury if released is protected from disclosure as defined in Section 20 of the *Access to Information Act*.

**B. CHARACTERISTICS**

1. The candidate variety must be described for all characteristics designated on the form with the pound symbol (#).

2. A rating system of 1-9 provides a scale for describing most characteristics in this form. To rate characteristics, select a value that best corresponds to the state indicated. Characteristics may be rated with intermediate values where the characteristic grades gradually from one extreme to another. For example, where the states for a characteristic are described as: small (3), medium (5), large (7); other values of 1, 2, 4, 6, 8 or 9 may be selected.

3. Each characteristic on this form has been arranged in a tabular format allowing the candidate variety (CV) and up to four reference varieties (R1 to R4) to be described. Information on reference varieties is useful but not required for variety registration. The reference varieties must be registered for sale in Canada.

**C. LEGEND**

(#) Characteristics that must always be included when completing the objective description form, except when the state of expression of a preceding characteristic renders this impossible.

CV	Candidate variety	3110	CDC Imperial
R1 - R4	Reference varieties		
R1		<u>CDC Rose Town</u>	R3 _____
R2		<u>CDC Imperial</u>	R4 _____



**LENTIL OBJECTIVE DESCRIPTION**

**VARIETY NAME:**

**D. LENTIL OBJECTIVE DESCRIPTION**

Applicant (name and address):

ALBERT VANDENBERG  
Crop Development Centre University of Saskatchewan  
~~Saskatoon SK~~ 51 Campus Drive  
Saskatoon SK CANADA S7N 5A8

Telephone: 306-966-8786 Facsimile: 306-966-5015

**1.0 CLASSIFICATION:**

1.1 Botanical name: *Lens culinaris* Medikus

1.2 Proposed variety denomination (name): CDC Impala (3110)

1.3 Utilization:

feed/food     green manure     either

**2.0 PLANT CHARACTERISTICS**

2.1 Plant: growth habit

		CV	R1	R2	R3	R4
prostrate	3					
intermediate	5					
erect	7					

2.2 Plant: height (cm) (measured during late pod filling stage, from the ground to the tip of the extended foliage)

(#)		CV	R1	R2	R3	R4
mean		32	32	31		
range		26-38	26-38	28-35		

**3.0 STEM CHARACTERISTICS**

3.1 Stem: seedling stem pigmentation

(#)		CV	R1	R2	R3	R4
absent	1	9	9	9		
present	9					

3.2 Stem: number of nodes to first flower

(#)		CV	R1	R2	R3	R4
average number of nodes		11-12	11-12	11-12		



**LENTIL OBJECTIVE DESCRIPTION**

**VARIETY NAME:** \_\_\_\_\_

**4.0 LEAF CHARACTERISTICS**

**4.1 Leaf: leaflet width (mm)(measure middle leaflet at the node of the first open flower)**

	CV	R1	R2	R3	R4
small	3				
medium	5				
large	7				

**4.2 Leaf: leaflet length (mm)(measure middle leaflet at the node of the first open flower)**

small	3				
medium	5				
large	7				

**4.3 Leaf: number of pairs of leaflets (no. of pairs of leaflets at the node of the first open flower)**

average number of nodes					
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**4.4 Leaf: pubescence (observe before maturity)**

absent	1				
slight	3				
strong	7				

**4.5 Leaf: tendrils (record from flowering nodes)**

rudimentary	1				
prominent	9				

**5.0 FLOWERING CHARACTERISTICS**

**5.1 Time to flowering (time in days from sowing to when 50% of the plants have started to flower)**

early	3	4	4	4	
medium	5	57d	58d	58d	
late	7		57d	56d	

**5.2 Time to maturity (time in days from sowing to when 90% of the pods are golden brown)**

early	3	4	4	3	
medium	5				
late	7				

**5.3 Flower colour**

white	1	2	2	2	
white with blue veins	2				
blue	3				
violet	4				
pink	5				



**LENTIL OBJECTIVE DESCRIPTION**

#201100263  
VARIETY NAME:

**5.4 Flower: number of flowers per peduncle**

	CV	R1	R2	R3	R4
average number of flowers					

**6.0 POD CHARACTERISTICS**

**6.1 Pod: number per peduncle**

average number of pods					
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**6.2 Pod: colour of ripe pods (#)**

		CV	R1	R2	R3	R4
non-pigmented	1	/	/	/		
pigmented	9					

**6.3 Pod: shattering**

		CV	R1	R2	R3	R4
susceptible	3					
moderate	5					
resistant	7					

**7.0 SEED CHARACTERISTICS**

**7.1 Seed: weight (100 random seeds after air-drying) (#)**

	CV	R1	R2	R3	R4
average 100 seed weight		<del>3.28</del>	<del>3.28</del>	3.0	

**7.2 Seed: diameter (#)**

		CV	R1	R2	R3	R4
small	3	3	3	3		
medium	5					
large	7					

**7.3 Seed: shape (#)**

		CV	R1	R2	R3	R4
globose	1	5	5	4		
flattened	9					

**7.4 Seed: ground colour of testa (#)**

		CV	R1	R2	R3	R4
white	1	4*	4*	4*		
green	2					
grey	3					
brown	4					
black	5					
pink	6					
other	7					

\* brownish grey



**LENTIL OBJECTIVE DESCRIPTION**

**VARIETY NAME:**

#201100263

**7.5 Seed: pattern of testa (#)**

		CV	R1	R2	R3	R4
absent	1	/	/	/		
dotted (speckled)	2					
spotted	3					
mottled (marbled)	4					
complex (combo of 2,3,4)	5					

**7.6 Seed: colour of pattern on testa**

olive-green	1					
grey	2					
violet	3					
brown	4					
black	5					

**7.7 Seed: colour of hilum (#)**

white	1	9	9	9		
dull brown	9					

**7.8 Cotyledon colour (#)**

yellow	3	5	5	5		
orange-red	5					
green	7					

**8.0 AGRONOMIC CHARACTERISTICS**

**8.1 Lodging susceptibility**

low	3					
medium	5					
high	7					

**8.2 Low temperature tolerance**

not tested	1					
poor	3					
fair	5					
good	7					

**9.0 QUALITY CHARACTERISTICS**

**9.1 Protein content**

percentage						
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**9.2 Cooking quality (time of cooking)**

slow	3					
medium	5					
fast	7					



**LENTIL OBJECTIVE DESCRIPTION**

**VARIETY NAME:**

#201100263

**10.0 REACTION TO DISEASES**

- 0 - not tested
- 1 - resistant
- 3 - moderately resistant
- 5 - moderately susceptible
- 7 - susceptible
- 9 - very susceptible

	CV	R1	R2	R3	R4
Ascochyta blight - <i>Ascochyta</i> spp.	2	2			
Anthracnose - <i>Colletotrichum</i> spp. ✓	2	3			
Fusarium root rot - <i>Fusarium</i> spp.					
Other (please specify)					

**11.0 REACTION TO INSECTS**

Rac Ct 1

- 0 - not tested
- 3 - low susceptibility
- 5 - intermediate susceptibility
- 7 - high susceptibility

**List insects**


**12.0** Describe traits of the candidate variety that aid in its identification, e.g. Electrophoresis, RFLP's, etc. Please attach data and corresponding protocol.

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**13.0** Describe any deviant plants, including both off-types and variants observed during seed increase of the candidate variety. The maximum allowable frequency of each variant for each class of pedigree seed must be given.

(#)

none observed.

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**14.0** Indicate which characteristics are more useful in distinguishing the described candidate variety. Use objective description key numbers.

(#)

The main distinguishing character is CDC Impala has tolerance to imidazolinone herbicides. also 5.1 flowers slightly ~~later~~ compared to CDC Rosetown and CDC Imperial.

7.1 seed wt is slightly more than CDC Rosetown and CDC Imperial.



**LENTIL OBJECTIVE DESCRIPTION**

**VARIETY NAME:** \_\_\_\_\_

#201100263

**15.0 Additional characteristics**

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(March 29, 1995/mt)

D4

2471  
✓

Table 1: Agronomic performance summary for lines 3110 and 3114 in the 2005-2006 Clearfield Lentil Registration Recommendation Trial "C" in western Canada

Market class	Line	Years in Trial	[10] Yield		[6] Days to flower	[8] Seed weight g/1000	[3] % seed over 12/64 roundhole screen	[3] % seed over 6/64 slotted screen	Ascochyta ratings 2006		Race Ct1 Anthracnose indoor 2006 (0-5)	
			kg/ha	% of check			Field %	Indoor transformed (%)				
ESR	3110	2	1570	101	56	33	17	60	33	0.2801	15	2.1
ESR	<b>CDC Imperial</b>	2	1555	100	58	30	1	60	44	0.2476	14	1.3
SR	3114	2	1487	104	54	43	82	98	28	0.3292	11	2.7
SR	<b>CDC Impact</b>	2	1434	100	55	39	42	77	19	0.2527	15	3.1
MG	2471	2	1572	97	56	55	97	98	-	0.2607	17	2.2
MG	<b>CDC Meteor</b>	2	1619	100	56	56	98	96	-	0.2722	16	2.8

[ ] indicates number of sites      **Bold** indicates conventional check cultivar  
 Market Classes: ESR - extra small red; SR - small red;  
 Indicates Clearfield lentil check cultivar

#201100263



**Table 2. Two year yield performance summary for lines 3110, 2471 and 3114 in the 2005-2006 Lentil RRT "C" in Western Canada**

		Extra small red		Small red		Medium green	
		CDC Imperial		CDC Impact		CDC Meteor	
Year	Location		3110		3114		2471
2005	Kyle	922	891	1030	598	982	1165
	Elrose	1069	700	1054	635	1017	1226
	SPG	1875	1461	1585	1359	1985	1829
	Davidson	1457	948	1276	1025	1546	1464
	Rouleau	1321	998	1125	782	1190	1246
	Sutherland	1808	1894	1464	1507	1807	1933
	<i>2005 Mean</i>	<i>1409</i>	<i>1149</i>	<i>1256</i>	<i>984</i>	<i>1421</i>	<i>1477</i>
2006	SPG	2317	3121	2069	3044	2609	2191
	Elrose	1252	1706	1588	1944	1811	1790
	Rouleau	1473	1408	1376	1686	1349	1284
	Rosthern	2051	2575	1777	2287	1896	1593
	<i>2006 Mean</i>	<i>1773</i>	<i>2203</i>	<i>1703</i>	<i>2240</i>	<i>1916</i>	<i>1715</i>
2005-2006 Mean		1555	1570	1434	1487	1619	1572
% of CDC Imperial		100	101				
% of CDC Impact				100	104		
% of CDC Meteor						100	97

## Table A.

Saskatchewan Pulse Growers Farm 2006  
Plant height in cm

ENTRY	NAME	SPG
1	CDC Viceroy	51
2	CDC Meteor	49
3	CDC Rosetown	50
4	CDC Rouleau	50
5	CDC Redberry	42
6	1294M-23	53
7	CDC Sedley	49
8	CDC Richlea	50
9	CDC Impact	39
10	CDC Imperial	49
11	LGBC	47
12	2471	44
13	3110	44
14	3113	48
15	3114	41
16	2368	40
17	2377	48
18	3122	42
19	2469	46
20	IBC-112	45
21	IBC-145	56
22	IBC-178	47
23	IBC-12	48
24	IBC-187	44
25	IBC-129	43
26	IBC-188	47
27	IBC-193	46
	GRAND MEAN	46
	CHECK MEAN	-9
	CV	9
	LSD	7
	MSE	17
	SED	4
	ALPHA	0
	REP-MS	131
	REPS	2



Table 13. Agronomic performance summary for entries in the 2006 Lentil Registration Recommendation Trial  
"C" in Western Canada

Market class	Line	Years In Trial	[4] Yield		[3] Days to flower	[1] Days to mature	[1] Lodging (1-5)	[2] Seed weight g/1000	[3] % of seed over			[3] Seed coat green colour score (1-5)	AB field (%)	Disease Ratings		ANT Indoor (0-5)	
			% of MC-C check	% of CL-C check					15/64 round	12/64 round	6/64 slot			AB Indoor Transformed	AB Indoor (%)		
			kg/ha	check	check	flower	mature	(1-5)	g/1000	round	round	slot	score (1-5)	(%)	Transformed	(%)	(0-5)
SG	CDC Viceroy	MC-C	2110	100	NA	58	98	3	31	0	33	58	2.8	35	0.197	22	0.8
SG	2368	1	1857	88	NA	58	97	3	41	0	83	97	3.5	23	0.278	11	2.8
SG	IBC-112	1	1773	84	NA	58	98	3	31	0	38	58	3.0	44	0.209	21	2.5
MG	CDC Meteor	MC-C	1916	100	112	57	98	4	54	10	98	98	3.0	27	0.272	16	2.8
MG	1294M-23	MC-C	2096	109	122	58	98	3	59	58	100	99	1.5	23	0.273	12	2.6
MG	CDC Richlea	MC-C	2018	105	118	58	98	4	55	45	99	93	3.0	42	0.180	25	3.7
MG	2471	2	1715	89	100	56	97	3	53	9	97	96	3.7	38	0.261	17	2.2
MG	IBC-145	1	1922	100	112	58	99	3	58	50	97	97	2.2	19	0.237	17	2.7
MG	IBC-193	1	2141	112	125	59	99	1	48	1	91	96	3.3	30	0.214	21	3.2
LG	CDC Sedley	MC-C	1692	100	92	58	97	3	75	94	98	100	3.2	26	0.261	11	2.5
LG	CDC Improve	CL-C	1843	109	100	57	97	3	73	95	100	100	3.5	45	0.230	17	2.4
LG	2377	1	1700	100	92	58	98	3	70	94	100	98	3.2	31	0.255	13	2.2
LG	3122	1	1517	90	82	58	97	3	66	85	98	95	3.2	14	0.291	12	2.5
LG	2469	1	1374	81	75	58	98	3	68	92	100	92	3.0	28	0.257	16	3.1
ESR	CDC Rosetown	MC-C	2018	100	114	57	98	2	28	0	12	47		37	0.294	11	0.6
ESR	CDC Imperial	CL-C	1774	88	100	56	96	4	27	0	1	60		44	0.248	14	1.3
ESR	3110	2	2203	109	124	59	98	2	28	0	17	60		33	0.280	15	2.1
ESR	IBC-12	1	2080	103	117	58	97	3	29	0	6	49		32	0.286	14	1.0
SR	CDC Rouleau	MC-C	2071	100	122	58	97	3	39	0	67	79		31	0.324	9	2.5
SR	CDC Impact	CL-C	1703	82	100	56	96	3	33	0	42	77		19	0.253	15	3.1
SR	3113	2	1930	93	113	57	97	3	39	0	60	76		14	0.298	12	3.3
SR	CDC Redberry	MC-C	2011	100	118	56	97	2	43	0	88	89		12	0.309	10	1.3
SR	3114	2	2240	111	132	58	96	2	41	0	82	98		28	0.329	11	2.7
SR	IBC-178	1	1767	88	104	60	99	3	47	2	93	93		19	0.272	12	3.0
SR	IBC-187	1	2031	101	119	58	97	3	46	3	95	98		26	0.288	12	2.2
SR	IBC-129	1	1755	87	103	57	97	2	40	0	74	95		18	0.297	10	2.8
FG	IBC-188	1	1847	88	108	58	97	4	37	1	83	77		21	0.271	12	3.9
CV (%)														91	31		37.0
LSD														19	0.06		0.8

[ ] indicates number of sites AB - ascochyta blight; ANT - anthracnose  
 Market Classes: ESR - extra small red; SR - small red; LG - large green; MCGS - small green; FG - French green  
 Seed Coat Green Colour Score: seed coats rated as 1 (best) to 5 (worst).  
 MC - C indicates conventional market class check; Shading and CL-C indicates Clearfield Lentil market class check

#201100263



Table 14. Seed diameter and thickness summary for entries in the 2006 Lentil Registration Recommendation Trial "C" in Western Canada

Market class	Line	Years in Trial	[3] Seed diameter distribution % over 64th roundhole screens											[3] Seed thickness distribution % over 64th slotted screens						
			>18	>17	>16	>15	>14	>13	>12	>11	>10	>9	>8	>8	>7.5	>7	>6.5	>6	>5.5	>5
			SG	CDC Viceroy	MC-C	0	0	0	0	0	2	31	53	11	2	0	0	0	2	24
SG	2368	1	0	0	0	0	2	34	47	15	2	0	0	0	4	23	40	30	3	1
SG	IBC-112	1	0	0	0	0	0	3	35	47	12	3	0	0	0	2	21	35	32	11
MG	CDC Meteor	MC-C	0	0	0	10	47	33	8	2	0	0	0	4	9	32	41	12	2	0
MG	1294M-23	MC-C	0	0	2	56	32	9	1	0	0	0	0	0	6	35	46	12	0	0
MG	CDC Richlea	MC-C	0	0	3	42	40	12	2	1	0	0	0	0	3	14	38	38	6	1
MG	2471	2	0	0	0	9	43	35	10	1	0	0	0	0	7	23	45	21	2	1
MG	IBC-145	1	0	0	10	40	24	16	7	2	0	0	0	1	6	26	45	19	2	0
MG	IBC-193	1	0	0	0	1	22	54	14	6	1	0	0	0	2	22	48	24	2	1
LG	CDC Sedley	MC-C	6	39	36	13	3	1	0	0	0	0	0	9	22	33	30	7	0	0
LG	CDC Improve	CL-C	2	26	47	20	4	1	0	0	0	0	0	3	14	34	36	13	1	0
LG	2377	1	2	17	60	15	4	2	0	0	0	0	0	4	16	40	30	8	1	0
LG	3122	1	1	20	41	23	8	4	1	0	0	0	0	5	9	30	25	26	4	0
LG	2469	1	12	30	32	18	5	2	1	0	0	0	0	1	6	30	31	24	7	0
ESR	CDC Rosetown	MC-C	0	0	0	0	0	0	12	63	20	4	0	0	0	0	12	35	32	21
ESR	CDC Imperial	CL-C	0	0	0	0	0	0	1	28	51	15	4	0	0	2	27	31	26	14
ESR	3110	2	0	0	0	0	0	1	16	55	22	6	0	0	0	2	28	30	27	13
ESR	IBC-12	1	0	0	0	0	0	0	6	60	27	6	1	0	0	0	14	35	36	16
SR	CDC Rouleau	MC-C	0	0	0	0	0	16	51	27	5	1	0	0	1	6	28	44	18	4
SR	CDC Impact	CL-C	0	0	0	0	0	5	37	45	11	2	0	0	0	2	27	48	18	6
SR	3113	2	0	0	0	0	0	11	49	33	6	1	0	0	1	5	26	44	17	7
SR	CDC Redberry	MC-C	0	0	0	0	3	46	39	10	1	0	0	0	2	15	38	34	9	1
SR	3114	2	0	0	0	0	3	35	44	17	1	0	0	0	3	18	44	33	1	1
SR	IBC-178	1	0	0	0	2	25	45	21	6	1	0	0	2	6	23	38	24	5	1
SR	IBC-187	1	0	0	0	3	24	50	18	4	1	0	0	0	6	29	42	21	2	1
SR	IBC-129	1	0	0	0	0	0	17	57	22	3	1	0	0	4	23	43	25	3	1
FG	IBC-188	1	0	0	0	1	8	39	35	14	2	1	0	0	0	6	37	34	19	3

[ ] indicates number of sites

Market Classes: ESR - extra small red; SR - small red; LG - SG - small green; FG - French green

MC - C indicates conventional market class check: Shading and CL-C indicates Clearfield Lentil market class check

#201100263



**Table 15. Yield performance of entries in the 2006 Lentil Registration Recommendation Trial "C" in Western Canada**

Market class	Line	Years	Yield in kg/ha					Mean	Yield % of MC-C	Yield % of CL-C
			Elrose	SPG	Rosthern	Rouleau				
SG	CDC Viceroy	MC-C	1560	2868	2660	1354	2110	100	NA	
SG	2368	1	1778	2238	1776	1637	1857	88	NA	
SG	IBC-112	1	1562	2317	1930	1284	1773	84	NA	
MG	CDC Meteor	MC-C	1811	2609	1896	1349	1916	100	NA	
MG	1294M-23	MC-C	1618	3032	2132	1601	2096	109	NA	
MG	CDC Richlea	MC-C	2020	2511	1965	1578	2018	105	NA	
MG	2471	2	1790	2191	1593	1284	1715	89	NA	
MG	IBC-145	1	1592	2388	1880	1829	1922	100	NA	
MG	IBC-193	1	1722	3082	2386	1375	2141	112	NA	
LG	CDC Sedley	MC-C	1538	2298	1733	1200	1692	100	92	
LG	CDC Improve	CL-C	1773	2496	1593	1511	1843	109	100	
LG	2377	1	1726	2020	1608	1446	1700	100	92	
LG	3122	1	1669	1926	946	1527	1517	90	82	
LG	2469	1	1513	1850	1197	937	1374	81	75	
ESR	CDC Rosetown	MC-C	1629	2467	2685	1289	2018	100	114	
ESR	CDC Imperial	CL-C	1252	2317	2051	1473	1774	88	100	
ESR	3110	2	1706	3121	2575	1408	2203	109	124	
ESR	IBC-12	1	1642	2677	2705	1298	2080	103	117	
SR	CDC Rouleau	MC-C	1833	2579	2110	1760	2071	100	122	
SR	CDC Impact	CL-C	1588	2069	1777	1376	1703	82	100	
SR	3113	2	1588	2609	2064	1459	1930	93	113	
SR	CDC Redberry	MC-C	1450	3056	2172	1368	2011	100	118	
SR	3114	C	1944	3044	2287	1686	2240	111	132	
SR	IBC-178	1	1664	2130	1821	1454	1767	88	104	
SR	IBC-187	1	1958	2576	2066	1525	2031	101	119	
SR	IBC-129	1	1662	2331	1690	1336	1755	87	103	
FG	IBC-188	1	1563	2556	1770	1499	1847	87	NA	
CV (%)			7.3	14.0	11.5	17.0				
LSD (0.05)			166	476	387	337				

Market Classes: SG-small green; MG - medium green; LG - large green ESR - extra small red; SR - small red; FG - French green  
 MC - C indicates conventional market class check: Shading and CL-C indicates Clearfield Lentil market class check

#201100263

Table 16. Two year yield performance summary for entries in the 2005-2006 Lentil RRT "C" in Western Canada

		Yield in kg/ha														
		SG	MG				LG		ESR			SR				
Year	Location	CDC Viceroy	CDC Meteor	1294M-23	CDC Richlea	2471	CDC Sedley	CDC Improve	CDC Roseto	CDC Imperial	3110	CDC Rouleau	CDC Impact	3113	CDC Redber	3114
2005	Kyle		982	1076	1135	1165	1067	1223	1050	922	891	1164	1030	884	863	598
	Elrose		1017	1266	1254	1226	1063	1295	1083	1069	700	1292	1054	781	928	635
	SPG		1985	1868	1888	1829	1523	1647	2064	1875	1461	2170	1585	901	2490	1359
	Davidson		1546	1824	1714	1464	1365	1279	1500	1457	948	1698	1276	581	1788	1025
	Rouleau		1190	1205	1172	1246	1203	1152	1491	1321	998	1609	1125	755	1286	782
	Sutherland		1807	1751	1852	1933	1604	1523	2331	1808	1894	2440	1464	1136	2095	1507
2006	SPG	2868	2609	3032	2511	2191	2298	2496	2467	2317	3121	2579	2069	2609	3056	3044
	Elrose	1560	1811	1618	2020	1790	1538	1773	1629	1252	1706	1833	1588	1588	1450	1944
	Rouleau	1354	1349	1601	1578	1284	1200	1511	1289	1473	1408	1760	1376	1459	1368	1686
	Rosthern	2660	1896	2132	1965	1593	1733	1593	2685	2051	2575	2110	1777	2064	2172	2287
2005-2006 Mean		2111	1619	1737	1709	1572	1459	1549	1759	1555	1570	1866	1434	1276	1750	1487
% of CDC Meteor		134	100	107	106	97	93	99	112	99	100	119	91	81	111	95
% of CDC Improve		136	105	112	110	101	94	100	114	100	101	120	93	82	113	96
% of CDC Imperial		136	104	112	110	101	94	100	113	100	101	120	92	82	113	96
% of CDC Impact		147	113	121	119	110	102	108	123	108	109	130	100	89	122	104

Clearfield Lentil types are highlighted Yield comparisons based on comparisons to Clearfield Lentil checks except for medium green types.  
Market Classes: SG-small green; MG - medium green; LG - large green ESR - extra small red; SR - small red;

#201100263



Table 17. Two year summary of agronomic performance for entries in the 2005-2006 Lentil Registration Recommendation Trial "C" in western Canada

Market class	Line	[10] Yield		[6] Days to flower	[8] Seed Weight (g/1000)	2006 Disease Ratings			
		kg/ha	% of CL-C check			Ascochyta		Anthracnose Indoor (0-5)	
						Field (%)	Indoor Transformed		Indoor (%)
SG	CDC Viceroy	2111	100	58	33	35	0.1968	22	0.8
MG	CDC Meteor	1619	100	56	55	27	0.2722	16	2.8
MG	1294M-23	1737	107	56	60	23	0.2732	12	2.6
MG	CDC Richlea	1709	106	56	57	42	0.1797	25	3.7
MG	2471	1572	97	56	56	38	0.2607	17	2.2
LG	CDC Sedley	1459	99	57	79	26	0.2608	11	2.5
LG	CDC Improve	1549	106	56	75	45	0.2298	17	2.4
ESR	CDC Rosetown	1759	113	57	32	37	0.2941	11	0.6
ESR	CDC Imperial	1555	100	56	30	44	0.2476	14	1.3
ESR	3110	1570	101	58	33	33	0.2801	15	2.1
SR	CDC Rouleau	1866	130	57	39	31	0.3237	9	2.5
SR	CDC Impact	1434	100	56	39	19	0.2527	15	3.1
SR	3113	1276	89	57	38	14	0.2978	12	3.3
SR	CDC Redberry	1750	122	55	46	12	0.3095	10	1.3
SR	3114	1487	104	56	43	28	0.3292	11	2.7

[ ] indicates number of sites      **Bold** indicates conventional check for medium green market class  
Market Classes: SG-small green; MG - medium green; LG - large green ESR - extra small red; SR - small red; FG - French green  
Shading indicates Clearfield Lentil market class check

#201100263

## Exhibit G

Results of herbicide tolerance test for lentil varieties CDC Maxim (3114), CDC Impress (2471) and CDC Impala (3110) conducted by Ag-Quest for BASF, 2007.



# Ag-Quest Inc.

## SOLO/ODYSSEY/CL LENTIL/SELECTIVITY CL LINES

Trial ID: BASFO7MNT101  
Location: MINTO, MANITOBA

Protocol ID: DEV-2007-CA-H74-A-01.0  
Study Director: GLEN FORSTER  
Investigator: David R. S. Rourke

### General Trial Information

<b>Study Director:</b> GLEN FORSTER	<b>Title:</b> STUDY DIRECTOR
<b>Affiliation:</b> BASF CANADA INC.	
<b>Postal Code:</b> S7N 4L8	<b>E-mail:</b> glen.forster@basf.com
<b>Investigator:</b> HAISHENG XIE	<b>Title:</b> SENIOR RA
<b>Affiliation:</b> AG-QUEST, INC.	
<b>Postal Code:</b> ROK 1M0	<b>E-mail:</b> haisheng.xie@agquest.com

### Trial Location

<b>City:</b> MINTO	<b>Trial Status:</b> COMPLETED
<b>State/Prov.:</b> MANITOBA	<b>Trial Reliability:</b> YES
<b>Postal Code:</b> ROK 1M0	<b>Initiation Date:</b> 10/19/07
<b>Country:</b> CANADA	

### Objectives:

1. To generate tolerance data for registration of New Clearfield Lines and illustrate equivalence in tolerance to registered commercial varieties (CDC Impact).
2. To generate tolerance data for registration of both SOLO and ODYSSEY.
3. To illustrate lack of commercial tolerance of non-CL lentil variety (CDC Viceroy) in comparison to CL lentil varieties.

### Cooperator/Landowner

<b>Cooperator:</b> DAVID ROURKE	<b>Country:</b> CANADA
<b>Organization:</b> AG-QUEST, INC.	<b>Phone No:</b> 204-776-556
<b>Address 1:</b> BOX 144	<b>Fax No:</b> 204-776-2250
<b>City:</b> MINTO	
<b>State/Prov:</b> MANITOBA	
<b>Postal Code:</b> ROK 1M0	<b>E-mail:</b> haisheng.xie@agquest.com

### Crop Description

<b>Crop 1:</b> LENCU Lens culinaris	Lentil
<b>Variety:</b> 2471	
<b>BBCH Scale:</b> BDIC	<b>Planting Date:</b> 10/19/07
<b>Planting Method:</b> SEEDED	<b>Rate, Unit:</b> 6 SEEDS/PLOT
<b>Depth, Unit:</b> 2.5 CM	
<b>Soil Moisture:</b> NORMAL	<b>Emergence Date:</b> 10/24/07
<b>Crop 2:</b> LENCU Lens culinaris	Lentil
<b>Variety:</b> 3110	
<b>BBCH Scale:</b> BDIC	<b>Planting Date:</b> 10/19/07
<b>Planting Method:</b> SEEDED	<b>Rate, Unit:</b> 6 SEEDS/PLOT
<b>Depth, Unit:</b> 2.5 CM	
<b>Soil Moisture:</b> NORMAL	<b>Emergence Date:</b> 10/24/07
<b>Crop 3:</b> LENCU Lens culinaris	Lentil
<b>Variety:</b> 3114	
<b>BBCH Scale:</b> BDIC	<b>Planting Date:</b> 10/19/07
<b>Planting Method:</b> SEEDED	<b>Rate, Unit:</b> 6 SEEDS/PLOT
<b>Depth, Unit:</b> 2.5 CM	
<b>Soil Moisture:</b> NORMAL	<b>Emergence Date:</b> 10/24/07
<b>Crop 4:</b> LENCU Lens culinaris	Lentil
<b>Variety:</b> IBC-112	
<b>BBCH Scale:</b> BDIC	<b>Planting Date:</b> 10/19/07
<b>Planting Method:</b> SEEDED	<b>Rate, Unit:</b> 6 SEEDS/PLOT
<b>Depth, Unit:</b> 2.5 CM	
<b>Soil Moisture:</b> NORMAL	<b>Emergence Date:</b> 10/24/07
<b>Crop 5:</b> LENCU Lens culinaris	Lentil
<b>Variety:</b> IBC-188	
<b>BBCH Scale:</b> BDIC	<b>Planting Date:</b> 10/19/07
<b>Planting Method:</b> SEEDED	<b>Rate, Unit:</b> 6 SEEDS/PLOT
<b>Depth, Unit:</b> 2.5 CM	
<b>Soil Moisture:</b> NORMAL	<b>Emergence Date:</b> 10/24/07



# Ag-Quest Inc.

<b>Crop 6:</b> LENCU Lens culinaris <b>Variety:</b> CDC VICEROY <b>BBCH Scale:</b> BDIC <b>Planting Method:</b> SEEDED <b>Depth, Unit:</b> 2.5 CM <b>Soil Moisture:</b> NORMAL	Lentil <b>Planting Date:</b> 10/19/07 <b>Rate, Unit:</b> 6 SEEDS/PLOT <b>Emergence Date:</b> 10/24/07
<b>Crop 7:</b> LENCU Lens culinaris <b>Variety:</b> CDC REDBERRY <b>BBCH Scale:</b> BDIC <b>Planting Method:</b> SEEDED <b>Depth, Unit:</b> 2.5 CM <b>Soil Moisture:</b> NORMAL	Lentil <b>Planting Date:</b> 10/19/07 <b>Rate, Unit:</b> 6 SEEDS/PLOT <b>Emergence Date:</b> 10/24/07
<b>Crop 8:</b> LENCU Lens culinaris <b>Variety:</b> CDC IMPACT <b>BBCH Scale:</b> BDIC <b>Planting Method:</b> SEEDED <b>Depth, Unit:</b> 2.5 CM <b>Soil Moisture:</b> NORMAL	Lentil <b>Planting Date:</b> 10/19/07 <b>Rate, Unit:</b> 6 SEEDS/PLOT <b>Emergence Date:</b> 10/24/07

<b>Plot Width, Unit:</b> 0.1 M	<b>Site and Design</b>
<b>Plot Length, Unit:</b> 0.1 M	<b>Site Type:</b> LABORATORY
<b>Replications:</b> 4	<b>Tillage Type:</b> N/A
	<b>Study Design:</b> Randomized Complete Block
	<b>Soil Drainage:</b> E Excellent

**Application Description**

	<b>A</b>
<b>Application Date:</b>	10/31/07
<b>Time of Day:</b>	15:30 PM
<b>Application Method:</b>	SPRAY
<b>Application Timing:</b>	EAPOCR
<b>Application Placement:</b>	FOLIAR
<b>Applied By:</b>	H. XIE
<b>Air Temperature, Unit:</b>	23.6 C
<b>% Relative Humidity:</b>	39
<b>Wind Velocity, Unit:</b>	0 KPH
<b>Dew Presence (Y/N):</b>	N
<b>Water Hardness:</b>	NO
<b>Soil Temperature, Unit:</b>	21 C
<b>Soil Moisture:</b>	ADEQUATE



## Ag-Quest Inc.

## Crop Stage At Each Application

A	
Crop 1 Code, BBCH Scale:	LENCU BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	4-4.5NOD 100
Height, Unit:	13.5 CM
Height Minimum, Maximum:	13 14.5
Crop 2 Code, BBCH Scale:	LENCU BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	4-4.5NOD 100
Height, Unit:	11.5 CM
Height Minimum, Maximum:	11 12
Crop 3 Code, BBCH Scale:	LENCU BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	4-4.5NOD 100
Height, Unit:	12 CM
Height Minimum, Maximum:	11.5 12.5
Crop 4 Code, BBCH Scale:	LENCU BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	3.5-4NOD 100
Height, Unit:	10 CM
Height Minimum, Maximum:	8.5 10.5
Crop 5 Code, BBCH Scale:	LENCU BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	4-4.5NOD 100
Height, Unit:	10.5 CM
Height Minimum, Maximum:	9.5 11.5
Crop 6 Code, BBCH Scale:	LENCU BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	4-4.5NOD 100
Height, Unit:	12.5 CM
Height Minimum, Maximum:	12 13
Crop 7 Code, BBCH Scale:	LENCU BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	4-4.5NOD 100
Height, Unit:	12 CM
Height Minimum, Maximum:	11.5 12.5
Crop 8 Code, BBCH Scale:	LENCU BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	4-4.5NOD 100
Height, Unit:	12 CM
Height Minimum, Maximum:	11.5 12.5

11/22/07 (BASFO7MNT101)

## Ag-Quest Inc.

### Application Equipment

	A	
Operating Pressure, Unit:	275	KPA
Nozzle Type:	FLAT FAN	
Nozzle Size:	80015VS	
Nozzles/Row:	1	
Boom Height, Unit:	40	CM
Carrier:	WATER	
Spray Volume, Unit:	210	L/HA
Mix Size, Unit:	1	Liters
Propellant:	COMP. AIR	
Tank Mix (Y/N):	N	

### Trial Comments

#### MATERIALS AND METHODS:

In 2007, one lab study was conducted in Minto, Manitoba to determine the tolerance of various lentil varieties to three rates of Solo and Odyssey (1x, 2x and 4x).

On October 19, 2007, the seeds of eight lentil varieties (2471, 3110, 3114, IBC-112, IBC-188, CDC Viceroy, CDC Redberry and CDC Impact) were manually planted with six seeds per pot. Pot size was 10.5 x 10.5 x 11.5 cm, containing Pro-mix professional high porosity growing medium. The plants were grown in a growth chamber equipped with fluorescent and incandescent lighting, and the photoperiod was 16-hour. The temperatures were set at 24 C/12 C day/night. The plants were manually watered and fertilized as necessary. On October 26, 2007, the plants were thinned to four seedlings per pot.

On October 31, 2007, when the plants were at the 4-4.5 node stage, the test substances (TS) were sprayed with an overhead trolley sprayer cabinet. The sprayer was outfitted with a TeeJet XR80015VS nozzle and positioned 40 cm above the top of the plants. The treatments were made by using water as a carrier at a spray volume of 210 L/ha. Solo rates were 20, 40 and 80 g ai/ha, and Odyssey rates were 30, 60 and 120 g ai/ha. All TS solutions contained adjuvant Merge at 0.5% (v/v).

After TS application, the plots were moved back to the growth chamber without wetting for two days. All the plants were moved to a nearby growth room two days after TS application and the plants were kept in the growth room until the final assessment. The growth room was equipped with fluorescent lighting, and the photoperiod was 16-hour. The temperatures were ranged at 28-32 C/18-22 C day/night. The plants were manually watered and fertilized as necessary.

The overall crop phytotoxicity or injury (percent of growth reduction, chlorosis and necrosis) was visually evaluated 9 and 21 days after treatment (DAT), using a scale of 0 to 100%. Unaffected and dead plants had 0 and 100% injury, respectively.

#### RESULTS:

##### 1. 2471:

At 9 DAT, TS treatments resulted in 0-1.3% crop injury. By 21 DAT, all TS treatments resulted in 0% crop injury.

##### 2. 3110:

At 9 DAT, TS treatments resulted in 0.3-1% crop injury. By 21 DAT, all TS treatments resulted in less than 1% crop injury.

##### 3. 3114:

At 9 DAT, TS treatments resulted in 0-1% crop injury. By 21 DAT, all TS treatments resulted in less than 1% crop injury.

##### 4. IBC-112:

At 9 DAT, TS treatments resulted in 0-0.8% crop injury. By 21 DAT, all TS treatments resulted in less than 1% crop injury.

##### 5. IBC-188:

At 9 DAT, TS treatments resulted in 0-1% crop injury. By 21 DAT, all TS treatments resulted in less than 1% crop injury.



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### 6. CDC Viceroy:

At 9 DAT, TS treatments resulted in 43-55% crop injury. By 21 DAT, TS treatments resulted in 61-93% crop injury. For both Solo and Odyssey, higher herbicide rate resulted in greater crop injury.

### 7. CDC Redberry:

At 9 DAT, TS treatments resulted in 50-60% crop injury. By 21 DAT, TS treatments resulted in 70-93% crop injury. For both Solo and Odyssey, higher herbicide rate resulted in greater crop injury.

### 8. CDC Impact:

At 9 DAT, TS treatments resulted in 0.5-3.5% crop injury. By 21 DAT, all TS treatments resulted in less than 2% crop injury.

### CONCLUSION:

Two lentil varieties, CDC Viceroy and CDC Redberry, were susceptible to all herbicide treatments, especially at higher herbicide rates. All other six lentil varieties (2471, 3110, 3114, IBC-112, IBC-188 and CDC Impact) showed excellent tolerance (less than 5% crop injury) to all herbicide treatments. Five new lines of Clearfield lentil (2417, 3110, 3114, IBC-112 and IBC-188) had slightly better crop tolerance than CDC Impact. There was little or no difference in crop safety among five new CL lentil varieties in responding to the same herbicide at the same herbicide application rate. Except susceptible varieties, lentil injury tended to peak out 9 days after the herbicide treatments and diminished with time.

### NOTE:

The pictures were taken at 21 DAT (November 21, 2007) to show the high level of tolerance of CL lentils to Solo and Odyssey.

11/22/07 (BASF07MNT101)

# Ag-Quest Inc.

## SOLO/ODYSSEY/CL LENTIL/SELECTIVITY CL LINES

Trial ID: BASF07MNT101  
Location: MINTO, MANITOBA

Protocol ID: DEV-2007-CA-H74-A-01.0  
Study Director: GLEN FORSTER  
Investigator: David R. S. Rourke

							LENCU	LENCU	LENCU	LENCU	LENCU		
							BDIC	BDIC	BDIC	BDIC	BDIC		
							Lentil	Lentil	Lentil	Lentil	Lentil		
							2471	3110	3114	IBC-112	IBC-188		
							PLANT C	PLANT C	PLANT C	PLANT C	PLANT C		
							11/9/07	11/9/07	11/9/07	11/9/07	11/9/07		
							PHYGEN	PHYGEN	PHYGEN	PHYGEN	PHYGEN		
							PERCENT	PERCENT	PERCENT	PERCENT	PERCENT		
							9 9	9 9	9 9	9 9	9 9		
							9 DAT	9 DAT	9 DAT	9 DAT	9 DAT		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit	Growth Stage	Appl Code	Plot	1	2	3	4	5
1	UNTREATED CHECK (UTC)							101	0.0	0.0	0.0	0.0	0.0
								203	0.0	0.0	0.0	0.0	0.0
								302	0.0	0.0	0.0	0.0	0.0
								404	0.0	0.0	0.0	0.0	0.0
								Mean =	0.0	0.0	0.0	0.0	0.0
2	SOLO MERGE	70 WG		0.02 kg ai/ha		4-5 LF	A	102	0.0	0.0	0.0	0.0	0.0
		100 EC		0.5 % v/v		4-5 LF	A	204	0.0	0.0	1.0	0.0	0.0
								303	0.0	0.0	0.0	0.0	0.0
								405	0.0	1.0	0.0	0.0	0.0
								Mean =	0.0	0.3	0.3	0.0	0.0
3	SOLO MERGE	70 WG		0.04 kg ai/ha		4-5 LF	A	103	0.0	0.0	0.0	0.0	0.0
		100 EC		0.5 % v/v		4-5 LF	A	205	1.0	1.0	1.0	1.0	0.0
								304	0.0	1.0	1.0	1.0	1.0
								406	1.0	0.0	1.0	1.0	1.0
								Mean =	0.5	0.5	0.8	0.8	0.5
4	SOLO MERGE	70 WG		0.08 kg ai/ha		4-5 LF	A	104	1.0	0.0	0.0	0.0	1.0
		100 EC		0.5 % v/v		4-5 LF	A	206	2.0	1.0	1.0	1.0	1.0
								305	1.0	1.0	1.0	1.0	0.0
								407	1.0	1.0	2.0	1.0	2.0
								Mean =	1.3	0.8	1.0	0.8	1.0
5	ODYSSEY 70 DG MERGE	70 WG		0.03 kg ai/ha		4-5 LF	A	105	0.0	0.0	0.0	0.0	0.0
		100 EC		0.5 % v/v		4-5 LF	A	207	0.0	0.0	0.0	0.0	0.0
								306	1.0	0.0	0.0	1.0	0.0
								408	0.0	1.0	0.0	0.0	0.0
								Mean =	0.3	0.3	0.0	0.3	0.0
6	ODYSSEY 70 DG MERGE	70 WG		0.06 kg ai/ha		4-5 LF	A	106	0.0	0.0	0.0	0.0	0.0
		100 EC		0.5 % v/v		4-5 LF	A	208	0.0	0.0	0.0	0.0	0.0
								307	0.0	1.0	1.0	1.0	1.0
								409	0.0	0.0	0.0	1.0	0.0
								Mean =	0.0	0.3	0.3	0.5	0.3
7	ODYSSEY 70 DG MERGE	70 WG		0.12 kg ai/ha		4-5 LF	A	107	0.0	1.0	0.0	0.0	0.0
		100 EC		0.5 % v/v		4-5 LF	A	209	0.0	1.0	0.0	0.0	1.0
								308	1.0	1.0	1.0	1.0	0.0
								410	0.0	1.0	1.0	1.0	1.0
								Mean =	0.3	1.0	0.5	0.5	0.5



11/22/07 (BASF07MNT101)

### Ag-Quest Inc.

Crop Code							LENCU	LENCU	LENCU		
BBCH Scale							BDIC	BDIC	BDIC		
Crop Name							Lentil	Lentil	Lentil		
Crop Variety							CDC VICEROY	CDC REDBERRY	CDC IMPACT		
Part Rated							PLANT C	PLANT C	PLANT C		
Rating Date							11/9/07	11/9/07	11/9/07		
Rating Data Type							PHYGEN	PHYGEN	PHYGEN		
Rating Unit							PERCENT	PERCENT	PERCENT		
Days After First/Last Applic.							9 9	9 9	9 9		
Trt-Eval Interval							9 DAT	9 DAT	9 DAT		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit Unit	Growth Stage	Appl Code	Plot	6	7	8
1	UNTREATED CHECK (UTC)							101	0.0	0.0	0.0
								203	0.0	0.0	0.0
								302	0.0	0.0	0.0
								404	0.0	0.0	0.0
								Mean =	0.0	0.0	0.0
2	SOLO MERGE	70 WG		0.02 kg ai/ha		4-5 LF	A	102	50.0	50.0	0.0
		100 EC		0.5 % v/v		4-5 LF	A	204	40.0	50.0	1.0
								303	40.0	50.0	0.0
								405	50.0	50.0	1.0
								Mean =	45.0	50.0	0.5
3	SOLO MERGE	70 WG		0.04 kg ai/ha		4-5 LF	A	103	50.0	50.0	1.0
		100 EC		0.5 % v/v		4-5 LF	A	205	50.0	50.0	1.0
								304	60.0	60.0	1.0
								406	50.0	50.0	2.0
								Mean =	52.5	52.5	1.3
4	SOLO MERGE	70 WG		0.08 kg ai/ha		4-5 LF	A	104	50.0	60.0	2.0
		100 EC		0.5 % v/v		4-5 LF	A	206	50.0	50.0	2.0
								305	60.0	60.0	5.0
								407	60.0	60.0	5.0
								Mean =	55.0	57.5	3.5
5	ODYSSEY 70 DG MERGE	70 WG		0.03 kg ai/ha		4-5 LF	A	105	40.0	50.0	1.0
		100 EC		0.5 % v/v		4-5 LF	A	207	50.0	50.0	0.0
								306	40.0	50.0	0.0
								408	40.0	60.0	1.0
								Mean =	42.5	52.5	0.5
6	ODYSSEY 70 DG MERGE	70 WG		0.06 kg ai/ha		4-5 LF	A	106	50.0	60.0	1.0
		100 EC		0.5 % v/v		4-5 LF	A	208	50.0	50.0	1.0
								307	50.0	60.0	2.0
								409	50.0	60.0	1.0
								Mean =	50.0	57.5	1.3
7	ODYSSEY 70 DG MERGE	70 WG		0.12 kg ai/ha		4-5 LF	A	107	50.0	50.0	2.0
		100 EC		0.5 % v/v		4-5 LF	A	209	50.0	60.0	2.0
								308	60.0	60.0	2.0
								410	60.0	70.0	2.0
								Mean =	55.0	60.0	2.0

### Ag-Quest Inc.

Crop Code BBCH Scale Crop Name Crop Variety Part Rated Rating Date Rating Data Type Rating Unit Days After First/Last Applic. Trt-Eval Interval								LENCU BDIC Lentil 2471 PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	LENCU BDIC Lentil 3110 PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	LENCU BDIC Lentil 3114 PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	LENCU BDIC Lentil IBC-112 PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	LENCU BDIC Lentil IBC-188 PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage	Appl Code	Plot	9	10	11	12	13
1	UNTREATED CHECK (UTC)							101 203 302 404	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0
								Mean =	0.0	0.0	0.0	0.0	0.0
2	SOLO MERGE	70 WG 100 EC		0.02 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	102 204 303 405	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0
								Mean =	0.0	0.0	0.0	0.0	0.0
3	SOLO MERGE	70 WG 100 EC		0.04 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	103 205 304 406	0.0 0.0 0.0 0.0	0.0 0.0 1.0 0.0	0.0 0.0 0.0 1.0	0.0 0.0 1.0 0.0	0.0 0.0 0.0 1.0
								Mean =	0.0	0.3	0.3	0.3	0.3
4	SOLO MERGE	70 WG 100 EC		0.08 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	104 206 305 407	0.0 0.0 0.0 0.0	0.0 0.0 0.0 1.0	0.0 0.0 0.0 1.0	0.0 0.0 1.0 0.0	0.0 0.0 0.0 1.0
								Mean =	0.0	0.3	0.3	0.3	0.3
5	ODYSSEY 70 DG MERGE	70 WG 100 EC		0.03 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	105 207 306 408	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0
								Mean =	0.0	0.0	0.0	0.0	0.0
6	ODYSSEY 70 DG MERGE	70 WG 100 EC		0.06 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	106 208 307 409	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0
								Mean =	0.0	0.0	0.0	0.0	0.0
7	ODYSSEY 70 DG MERGE	70 WG 100 EC		0.12 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	107 209 308 410	0.0 0.0 0.0 0.0	0.0 0.0 1.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0
								Mean =	0.0	0.3	0.0	0.0	0.0



### Ag-Quest Inc.

								LENCU BDIC Lentil CDC VICEROY PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	LENCU BDIC Lentil CDC REDBERRY PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	LENCU BDIC Lentil CDC IMPACT PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit Unit	Growth Stage	Appl Code	Plot	14	15	16
1	UNTREATED CHECK (UTC)							101 203 302 404	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0
								Mean =	0.0	0.0	0.0
2	SOLO MERGE	70 WG 100 EC		0.02 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	102 204 303 405	70.0 65.0 60.0 65.0	70.0 75.0 70.0 75.0	0.0 1.0 0.0 0.0
								Mean =	65.0	72.5	0.3
3	SOLO MERGE	70 WG 100 EC		0.04 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	103 205 304 406	80.0 80.0 85.0 80.0	80.0 80.0 80.0 80.0	1.0 0.0 1.0 1.0
								Mean =	81.3	80.0	0.8
4	SOLO MERGE	70 WG 100 EC		0.08 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	104 206 305 407	85.0 90.0 95.0 95.0	90.0 90.0 95.0 95.0	1.0 1.0 2.0 2.0
								Mean =	91.3	92.5	1.5
5	ODYSSEY 70 DG MERGE	70 WG 100 EC		0.03 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	105 207 306 408	60.0 65.0 60.0 60.0	70.0 70.0 70.0 70.0	0.0 0.0 0.0 1.0
								Mean =	61.3	70.0	0.3
6	ODYSSEY 70 DG MERGE	70 WG 100 EC		0.06 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	106 208 307 409	85.0 75.0 75.0 70.0	80.0 75.0 85.0 80.0	0.0 0.0 1.0 1.0
								Mean =	76.3	80.0	0.5
7	ODYSSEY 70 DG MERGE	70 WG 100 EC		0.12 kg ai/ha 0.5 % v/v		4-5 LF 4-5 LF	A A	107 209 308 410	90.0 90.0 95.0 95.0	85.0 95.0 90.0 95.0	0.0 0.0 1.0 1.0
								Mean =	92.5	91.3	0.5

### Ag-Quest Inc.

SOLO/ODYSSEY/CL LENTIL/SELECTIVITY CL LINES

Trial ID: BASF07MNT101  
Location: MINTO, MANITOBA

Protocol ID: DEV-2007-CA-H74-A-01.0  
Study Director: GLEN FORSTER  
Investigator: David R. S. Rourke

Crop Code	LENCU	LENCU	LENCU	LENCU	LENCU							
BBCH Scale	BDIC	BDIC	BDIC	BDIC	BDIC							
Crop Name	Lentil	Lentil	Lentil	Lentil	Lentil							
Crop Variety	2471	3110	3114	IBC-112	IBC-188							
Part Rated	PLANT C	PLANT C	PLANT C	PLANT C	PLANT C							
Rating Date	11/9/07	11/9/07	11/9/07	11/9/07	11/9/07							
Rating Data Type	PHYGEN	PHYGEN	PHYGEN	PHYGEN	PHYGEN							
Rating Unit	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT							
Days After First/Last Applic.	9 9	9 9	9 9	9 9	9 9							
Trt-Eval Interval	9 DAT	9 DAT	9 DAT	9 DAT	9 DAT							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Appl Stage	Code	1	2	3	4	5
1	UNTREATED CHECK (UTC)							0.0 b	0.0 c	0.0 b	0.0 b	0.0 a
2	SOLO MERGE	70 WG	100 EC	0.02 kg ai/ha	4-5 LF	A		0.0 b	0.3 bc	0.3 b	0.0 b	0.0 a
3	SOLO MERGE	70 WG	100 EC	0.04 kg ai/ha	4-5 LF	A		0.5 b	0.5 abc	0.8 ab	0.8 a	0.5 a
4	SOLO MERGE	70 WG	100 EC	0.08 kg ai/ha	4-5 LF	A		1.3 a	0.8 ab	1.0 a	0.8 a	1.0 a
5	ODYSSEY 70 DG MERGE	70 WG	100 EC	0.03 kg ai/ha	4-5 LF	A		0.3 b	0.3 bc	0.0 b	0.3 ab	0.0 a
6	ODYSSEY 70 DG MERGE	70 WG	100 EC	0.06 kg ai/ha	4-5 LF	A		0.0 b	0.3 bc	0.3 b	0.5 ab	0.3 a
7	ODYSSEY 70 DG MERGE	70 WG	100 EC	0.12 kg ai/ha	4-5 LF	A		0.3 b	1.0 a	0.5 ab	0.5 ab	0.5 a
LSD (P=.05)								0.59	0.62	0.67	0.51	0.71
Standard Deviation								0.40	0.42	0.45	0.35	0.48
CV								123.95	97.5	115.63	87.83	147.96
Bartlett's X2								0.092	0.098	1.154	0.141	0.798
P(Bartlett's X2)								0.993	0.999	0.886	0.998	0.85
Replicate F								0.825	1.636	2.481	5.900	1.000
Replicate Prob(F)								0.4971	0.2162	0.0940	0.0055	0.4155
Treatment F								5.100	2.727	2.769	3.400	2.474
Treatment Prob(F)								0.0032	0.0460	0.0436	0.0202	0.0636

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)  
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



### Ag-Quest Inc.

							LENCU BDIC Lentil CDC VICEROY PLANT C 11/9/07 PHYGEN PERCENT 9 9 9 DAT	LENCU BDIC Lentil CDC REDBERRY PLANT C 11/9/07 PHYGEN PERCENT 9 9 9 DAT	LENCU BDIC Lentil CDC IMPACT PLANT C 11/9/07 PHYGEN PERCENT 9 9 9 DAT	LENCU BDIC Lentil 2471 PLANT C 11/21/07 PHYGEN PERCENT 21 21 21 DAT	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Appl Stage	Code	6	7	8	9
1	UNTREATED CHECK (UTC)							0.0 d	0.0 d	0.0 d	0.0 a
2	SOLO MERGE	70 100	WG EC	0.02 0.5	kg ai/ha % v/v	4-5 4-5	LF A	45.0 bc	50.0 c	0.5 cd	0.0 a
3	SOLO MERGE	70 100	WG EC	0.04 0.5	kg ai/ha % v/v	4-5 4-5	LF A	52.5 a	52.5 bc	1.3 bc	0.0 a
4	SOLO MERGE	70 100	WG EC	0.08 0.5	kg ai/ha % v/v	4-5 4-5	LF A	55.0 a	57.5 ab	3.5 a	0.0 a
5	ODYSSEY 70 DG MERGE	70 100	WG EC	0.03 0.5	kg ai/ha % v/v	4-5 4-5	LF A	42.5 c	52.5 bc	0.5 cd	0.0 a
6	ODYSSEY 70 DG MERGE	70 100	WG EC	0.06 0.5	kg ai/ha % v/v	4-5 4-5	LF A	50.0 ab	57.5 ab	1.3 bc	0.0 a
7	ODYSSEY 70 DG MERGE	70 100	WG EC	0.12 0.5	kg ai/ha % v/v	4-5 4-5	LF A	55.0 a	60.0 a	2.0 b	0.0 a
LSD (P=.05)							6.94	6.62	1.10	0.00	
Standard Deviation							4.67	4.45	0.74	0.00	
CV							10.9	9.45	57.76	0.0	
Bartlett's X2							0.135	1.276	8.25	0.0	
P(Bartlett's X2)							0.998	0.866	0.083	.	
Replicate F							0.873	2.400	1.554	0.000	
Replicate Prob(F)							0.4735	0.1016	0.2351	1.0000	
Treatment F							69.655	89.640	10.036	0.000	
Treatment Prob(F)							0.0001	0.0001	0.0001	1.0000	

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



### Ag-Quest Inc.

Crop Code							LENCU	LENCU	LENCU	LENCU	LENCU	
BBCH Scale							BDIC	BDIC	BDIC	BDIC	BDIC	
Crop Name							Lentil	Lentil	Lentil	Lentil	Lentil	
Crop Variety							3110	3114	IBC-112	IBC-188	CDC VICEROY	
Part Rated							PLANT C	PLANT C	PLANT C	PLANT C	PLANT C	
Rating Date							11/21/07	11/21/07	11/21/07	11/21/07	11/21/07	
Rating Data Type							PHYGEN	PHYGEN	PHYGEN	PHYGEN	PHYGEN	
Rating Unit							PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
Days After First/Last Applic.							21 21	21 21	21 21	21 21	21 21	
Trt-Eval Interval							21 DAT	21 DAT	21 DAT	21 DAT	21 DAT	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Growth Stage	Appl Code	10	11	12	13	14
1	UNTREATED CHECK (UTC)							0.0 a	0.0 a	0.0 a	0.0 a	0.0 d
2	SOLO MERGE	70	WG	0.02	kg ai/ha	4-5 LF	A	0.0 a	0.0 a	0.0 a	0.0 a	65.0 c
3	SOLO MERGE	100	EC	0.5	% v/v	4-5 LF	A	0.3 a	0.3 a	0.3 a	0.3 a	81.3 b
4	SOLO MERGE	70	WG	0.08	kg ai/ha	4-5 LF	A	0.3 a	0.3 a	0.3 a	0.3 a	91.3 a
5	ODYSSEY 70 DG MERGE	100	EC	0.5	% v/v	4-5 LF	A	0.0 a	0.0 a	0.0 a	0.0 a	61.3 c
6	ODYSSEY 70 DG MERGE	70	WG	0.06	kg ai/ha	4-5 LF	A	0.0 a	0.0 a	0.0 a	0.0 a	76.3 b
7	ODYSSEY 70 DG MERGE	100	EC	0.5	% v/v	4-5 LF	A	0.3 a	0.0 a	0.0 a	0.0 a	92.5 a
LSD (P=.05)								0.48	0.36	0.36	0.36	6.03
Standard Deviation								0.32	0.24	0.24	0.24	4.06
CV								299.79	341.57	341.57	341.57	6.08
Bartlett's X2								0.0	0.0	0.0	0.0	4.04
P(Bartlett's X2)												0.544
Replicate F								1.269	2.400	2.400	2.400	0.072
Replicate Prob(F)								0.3148	0.1016	0.1016	0.1016	0.9741
Treatment F								0.692	1.000	1.000	1.000	245.024
Treatment Prob(F)								0.6589	0.4552	0.4552	0.4552	0.0001

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



### Ag-Quest Inc.

							LENCU	LENCU
							BDIC	BDIC
							Lentil	Lentil
							CDC REDBERRY	CDC IMPACT
							PLANT C	PLANT C
							11/21/07	11/21/07
							PHYGEN	PHYGEN
							PERCENT	PERCENT
							21 21	21 21
							21 DAT	21 DAT
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Growth Unit	Stage	Appl Code	
1	UNTREATED CHECK (UTC)							15
								16
								0.0 d
								0.0 c
2	SOLO MERGE	70	WG	0.02	kg ai/ha	4-5 LF	A	72.5 c
		100	EC	0.5	% v/v	4-5 LF	A	0.3 bc
3	SOLO MERGE	70	WG	0.04	kg ai/ha	4-5 LF	A	80.0 b
		100	EC	0.5	% v/v	4-5 LF	A	0.8 b
4	SOLO MERGE	70	WG	0.08	kg ai/ha	4-5 LF	A	92.5 a
		100	EC	0.5	% v/v	4-5 LF	A	1.5 a
5	ODYSSEY 70 DG MERGE	70	WG	0.03	kg ai/ha	4-5 LF	A	70.0 c
		100	EC	0.5	% v/v	4-5 LF	A	0.3 bc
6	ODYSSEY 70 DG MERGE	70	WG	0.06	kg ai/ha	4-5 LF	A	80.0 b
		100	EC	0.5	% v/v	4-5 LF	A	0.5 bc
7	ODYSSEY 70 DG MERGE	70	WG	0.12	kg ai/ha	4-5 LF	A	91.3 a
		100	EC	0.5	% v/v	4-5 LF	A	0.5 bc
LSD (P=.05)							4.11	0.65
Standard Deviation							2.76	0.44
CV							3.98	81.47
Bartlett's X2							1.099	0.17
P(Bartlett's X2)							0.777	0.999
Replicate F							1.364	3.188
Replicate Prob(F)							0.2857	0.0488
Treatment F							529.052	5.000
Treatment Prob(F)							0.0001	0.0035

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.



U.S. DEPARTMENT OF AGRICULTURE  
 AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

**EXHIBIT E**

**STATEMENT OF THE BASIS OF OWNERSHIP**

1. NAME OF APPLICANT(S) <i>Crop Development Centre University of Saskatchewan</i>		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER <i>3110</i>	3. VARIETY NAME <i>CDC Impala</i>
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) <i>51 Campus Drive Saskatoon SK Canada S7N 5A8</i>		5. TELEPHONE (Include area code) <i>306-966-5855</i>	6. FAX (Include area code) <i>306-966-5015</i>
		7. PVPO NUMBER <i>#201100263</i>	

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain.  YES  NO

9. Is the applicant a U.S. national or a U.S. based entity? If no, give name of country.  YES  NO *CANADA*

10. Is the applicant the original owner?  YES  NO If no, please answer one of the following:

a. If the original rights to 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 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

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

**PLEASE NOTE:**

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 applicant is an owner who is not the original owner, both the original owner and the applicant 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.

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 0.1 hour per response, including the time for reviewing the 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.



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Form Approved OMB NO 0581-0055

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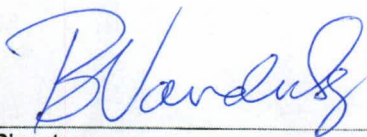
U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY  
PLANT VARIETY PROTECTION OFFICE  
BELTSVILLE, MD 20705

EXHIBIT F

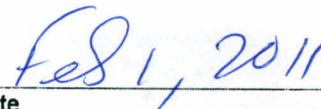
DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S) Crop Development Centre, University of Saskatchewan	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) 51 Campus Drive Saskatoon SK Canada S7N 5A8	TEMPORARY OR EXPERIMENTAL DESIGNATION 3110
		VARIETY NAME #1 CDC Impatq
NAME OF OWNER REPRESENTATIVE (S) Byron Lannoye Pulse USA Inc	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) 1900 Commerce Drive Bismarck ND 58501	FOR OFFICIAL USE ONLY
		PVPO NUMBER #201100263

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.



Signature



Date