No. 201300085

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

University of Idaho

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.)

RAPE

'Durola'

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 sixteenth day of April, in the year* ***two thousand and fifteen.***

Attest:

Commissioner
Plant Variety Protection Office

Secretary of Agriculture

201300085

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

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

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).

1. NAME OF OWNER	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME	3. VARIETY NAME
University of Idaho	06.UI.WH.5.1.09 or 97.WI.128.A27.A4.1	Durola

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*	5. TELEPHONE *(include area code)*	FOR OFFICIAL USE ONLY
University of Idaho, OTT, PO Box 443003 Morrill Hall 414 Moscow, Idaho, 83844-3003	(208) 885 4550 6. FAX *(include area code)* (208) 885 4551	201300085

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*	8. IF INCORPORATED, GIVE STATE OF INCORPORATION	9. DATE OF INCORPORATION
University of Idaho		

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*

~~Jack Brown~~
~~PSES, CALS~~
~~PO Box 442339~~
University of Idaho
Moscow, ID, 83844-~~2339~~

~~Include on all communications: Gaylene Anderson~~
~~OTT~~
~~PO Box 443003~~
~~Morrill Hall 414~~
~~Moscow, ID 83844-3003~~

Karen Stevenson
875 Perimeter Drive, MS3003

FEES RECEIVED — FILING AND EXAMINATION FEE: $ 4382.00 DATE 11/14/2012
CERTIFICATE FEE: $ DATE

11. TELEPHONE (Include area code)	12. FAX (Include area code)	13. E-MAIL
(208) 885 4550 and ~~(208) 885 7078~~	208) 885 4551 and ~~(208) 885 7760~~	karens@uidaho.edu ~~jbrown@uidaho.edu & gaylene@uidaho.edu~~

14. CROP KIND *(Common Name)*	16. FAMILY NAME *(Botanical)*	18. DOES THE VARIETY CONTAIN ANY TRANSGENES? ***(OPTIONAL)***
	Brassicaceae	☐ YES X NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION. _____
15. GENUS AND SPECIES NAME OF CROP	17. IS THE VARIETY A FIRST GENERATION HYBRID?	
Brassica napus L.	☐ YES X NO	

19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)

a. X Exhibit A. Origin and Breeding History of the Variety
b. X Exhibit B. Statement of Distinctness
c. X Exhibit C. Objective Description of Variety
d. X Exhibit D. Additional Description of the Variety *(Optional)*
e. X Exhibit E. Statement of the Basis of the Owner's Ownership
f. X Exhibit F. Declaration Regarding Deposit
g. X 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. ☐ Filing and Examination Fee ($4,382), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

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)*
X YES *(If "yes", answer items 21 and 22 below)* ☐ NO *(If "no", go to item 23)* ☐ UNDECIDED

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?
X YES ☐ NO
IF YES, WHICH CLASSES? X FOUNDATION ☐ REGISTERED X CERTIFIED

22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
X YES NO
IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.
X FOUNDATION ☐ REGISTERED X 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?
X YES ☐ NO
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.)*

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
☐ YES X NO
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)* Jack Brown	NAME *(Please print or type)* GAYLENE ANDERSON
CAPACITY OR TITLE: Professor/Plant breeder — DATE: 11/8/2012	CAPACITY OR TITLE: LICENSING ASSOCIATE — DATE: 11/13/2012

ST-470 (07-01-2009) designed by the Plant Variety Protection Office

dbc 02/05/2014
dbc 02/05/2014
dbc 08/22/2014

(See reverse for instructions and information collection burden statement)

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 initialed 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.)*
No Durola seed has been sold.prior to pVP application.

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).)*

'Durola'
Winter Rapeseed
***Brassica napus* L.**

Exhibit A: Origin and Breeding History

'Durola' is a near-homozygous winter rapeseed [*Brassica napus* L. spp. *oleifera* (Metzg) Sinsk. *f. biennis*] cultivar with industrial rapeseed seed oil and canola-quality (i.e. less than 30 µmol g^{-1} of total seed meal glucosinolates in defatted seed meal) seed meal, selected for high adaptability to the dryland and irrigated regions of the inland Pacific Northwest.

This cultivar was developed from a single plant selection in 2004 from an F_8 population from the cross 'Olsen'//'Gorganski'/'Hero'. The cross Gorganski/Hero was made in 1992. Gorganski is a winter industrial rapeseed cultivar with high erucic acid seed oil and high glucosinolate concentration in the seed meal, developed by L. Daehnfeldt, Inc. Hero is a spring industrial rapeseed cultivar with industrial rapeseed seed oil and canola-quality (i.e. less than 30 µmol g^{-1} of total seed meal glucosinolates in defatted seed meal) seed meal, developed at the University of Manitoba (Scarth *et al.*, 1991) from a cross between a high erucic acid rapeseed line from Sweden and the spring rapeseed cultivar 'Reston'. Progeny from the segregating population derived from Gorganski/Hero were selected for general yield and adaptability, winter hardiness, oil content, low seed meal glucosinolate content and high erucic acid content. An F_6 selection from Gorganski/Hero (coded: 92.SW.76.13.14.2.6) was then crossed to Olsen in 1997. Olsen is a low erucic acid (less than 20 g kg^{-1}), low glucosinolate content cultivar (less than 30µmol g^{-1} of defatted seed meal, developed and released in Denmark in 1994 (EU PP# 15061).

F_1 seeds from the original cross were produced early in 1997, and the F_1 plant generation was increased to F_2 seed in the greenhouse in fall of 1997. Between seasons 1997-1998 and 2000-2001, seed from the original F_2 population were increased to F_5 by four round of natural pollination under field conditions. After each growing season, single plants were selected using a visual assessment of general appearance and pod characteristics. Seed from each single plant were evaluated for oil content, fatty acid profile and glucosinolate content. Seed from plants with high oil content, good fatty acid profiles and low seed glucosinolates, were then bulked together and used to plant the following year's crop.

In the summer of 2002, 10 single plants were selected from the F_5 population based on visual evaluation of plant uniformity. In the fall of 2001, the seed from each selected plant was planted out as head row (Figure 1). Each head-row plot being a single plot with two rows spaced 18 cm apart and 5 m in length. Head-row plots were visually evaluated for fall establishment, winter survival, days to 50% flowering, plant height, lodging and maturity. At harvest in summer of 2003, two of the ten head row plots were identified (coded as 97.WI.128.A and 97.WI.128.B).

Ten single plants were taken from each of the selection and plants were threshed separately. The remainder of the plot was bulked by hand threshing. Seed from the single plant selections were used to

plant 10 head row plots in the fall of 2004 (F_8) while the bulked seed was used to plant a replicated yield trials in the fall of 2004. Seed from each single plant selected were evaluated for oil content, fatty acid profile and glucosinolate content, and any selections with poor quality were discarded. Head row plots and yield trial plots were visually assessed fall establishment, winter survival, days to 50% flowering, plant height, lodging and maturity. At harvest one head row was selected from each of the two families for advancement. From each selected head row a further 10 plants were threshed separately, and these seeds used to plant head-row plots in the fall of 2005. The remainder of the 2004-2005 selected head-row plot was bulk threshed by hand and used to plant another replicated yield trial in the fall of 2005 (Figure A1).

Based on a further round of visual assessment, combined with seed yield and quality information assessed from the yield trials, a single head-row plot was selected in the summer of 2005 (coded as 97.WI.128.A27.A4.1, later coded as 06UIWC.5.09). Twenty single plants were threshed separately from this selected head-row plot. In addition the remainder of the 2-row x 5 m plot was bulk harvested by hand threshing. Seed from the single plant selections were used to plant 20 head-row plots in the fall of 2005. The hand threshed bulk seed was used to plant yield trials planted at locations throughout Idaho, Oregon and Washington (the Pacific Northwest Winter Canola Variety Trial). This pattern of screening head-row plots for visual and quality uniformity, discarding head-row plots which failed to meet uniformity standards. Each year single plants were threshed separately to plant head-row plots the following year while the bulked head-row plot seed was used to plant regional yield trials.

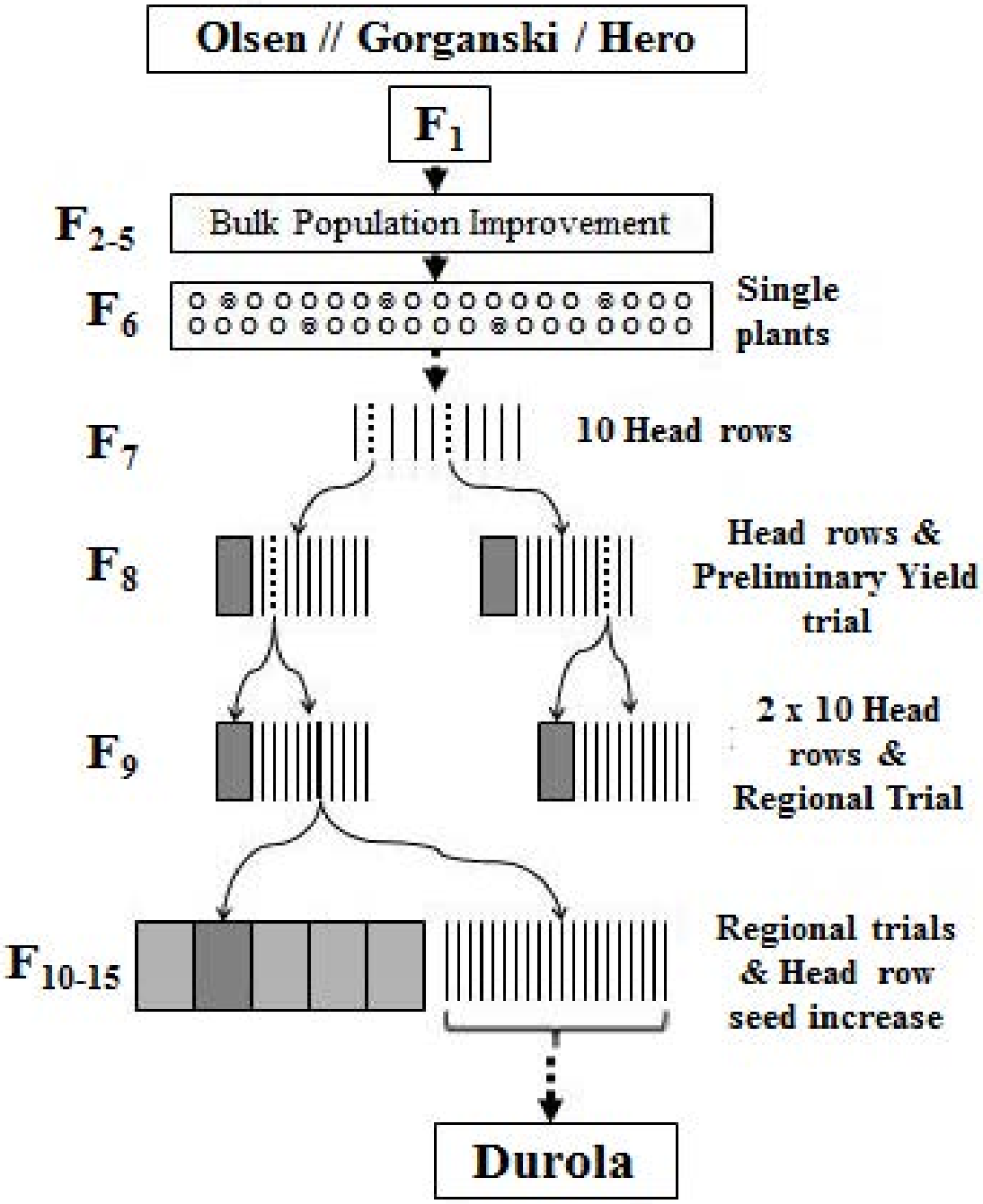
After the fourth year of regional yield trials 2007-2008, 300 seeds were planted in a glasshouse, artificially vernalized and grown to maturity in the glasshouse. Any plants which did not show visual uniformity were discarded. After harvest each plant was threshed separately and the seed tested for oil content, fatty acid profile and glucosinolate content. Seed from plants which showed high oil content, good fatty acid profile and low seed meal glucosinolate content (268 single plants) were planted in the field in the fall of 2009 to produce pre-Breeders seed. Each single plant from the glasshouse increase was used to plant two 2-rows x 5 m plots arranged at random in the Breeders seed increase block. Plots were visually assessed throughout the growing season for uniformity. Any non-uniform plots were removed and the remaining plots were combine harvested to produce Pre-Breeders Seed. Pre-Breeder's seed was planted in the fall of 2010 to produce Breeders seed which was harvested in the summer of 2011. Throughout the later stages of Durola seed increases including pre-Breeders seed, Breeders seed and Foundation seed production, plants were uniform and stable and no variants were observed over this three year period.

References

Lein, K.A., 1970. Methods for quantitative determination of seed glucosinolates of *Brassica* spp. and their application in plant breeding of rape low in glucosinolate content. *Z. Planzenzuecht* 63:137-154.

Scarth, R., McVetty, P.B.E., Rimmer, S.R. and Stefansson, B.R., 1991. Hero summer rape. *Can. J. Plant Sci.* 71:865-866.

Figure A1. Breeding scheme used to develop Durola winter rapeseed.



'Durola'
Winter Canola
***Brassica napus* L.**

Exhibit B: Statement of Distinctness

Very few winter industrial rapeseed cultivars are propagated in the US as most breeding companies have chosen to develop edible (canola) types. Morphologically, Durola is most similar in plant appearance (i.e. leaf shape, plant stature, and color) to the winter canola cultivar Athena. Both Durola and Athena have highly lobbed lower leaves. However, Durola lower leaves have a weaker vein and are more open (Figure B1). Durola middle leaves have less stem attachment compared to Athena, and the upper leaves are wider and shorter and have markedly more leaf serration. Athena leaf color is more blue green compared to stronger green of Durola.

Durola seed oil is significantly higher in erucic acid (575 g kg^{-1}) than any canola cultivar (which must have less than 20 g kg^{-1} of erucic acid to be edible oil). The primary characteristic of distinctness in Durola compared to similar high erucic acid rapeseed cultivars relates to seed meal glucosinolate content. Compared to the only other commercially available winter rapeseed cultivars in the US, Dwarf Essex and Bridger (Auld *et al.*, 1987), Durola has significantly lower total glucosinolate content, 3-butenyl glucosinolate content, 2-hydroxy-3-butenyl glucosinolate content, 4-pentenyl glucosinolate content, and 2-hydroxy-4-pentenyl glucosinolate content than Dwarf Essex or Bridger (Table B1).

In addition, Durola flowers significantly later than Bridger (Table B2), and is significantly taller than Bridger (Table B3).

References

Auld, D.L., K.A. Mahler, B.L. Bettis, and J.C. Crock. 1987. Registration of Bridger rapeseed. *Crop Sci.*, **27**:3101.

Brown, J., D. Wysocki, J.B. Davis, D.A. Erickson, L. Seip, S. Ott, and T. Gosselin. 2004. Registration of 'Athena' winter rapeseed. *Crop Sci* **45**:800-801.

Table B1. Glucosinolate profile from replicated yield trials of Bridger, Dwarf Essex and Durola winter industrial rapeseed grown over locations throughout Idaho, Oregon and Washington. Data presented are from four year sites of the Pacific Northwest Winter Canola Variety Trial 2009-2010 and 2010-2011.

	Seed Meal Glucosinolate Content				
Variety	Butenyl †	Hy-butenyl	Penteny	Hy-Pentenyl	Total
	---------- µmol/g defatted seed meal ----------				
Bridger	16.8 [b]	31.2 [b]	3.0 [b]	0.9 [b]	51.9 [b]
Dwarf Essex	33.2 [a]	77.5 [a]	8.5 [a]	3.8 [a]	122.9 [a]
Durola	4.7 [c]	10.0 [c]	0.6 [c]	0.3 [c]	15.6 [c]
Mean	18.2	39.6	4.0	1.7	63.5
LSD 5%	2.3	5.2	0.5	0.2	8.1

† 3-butenyl glucosinolate; 2-hydroxy-3-butenyl glucosinolate; 4-pentenyl glucosinolate; 2-hydroxy-4-pentenyl glucosinolate.
Means within columns with different superscript letters are significantly different (P<0.05).

Table B2. Julian days to 50% flower bloom of Durola and Bridger winter rapeseed grown at Moscow and Genesee, in northern Idaho, in 2009-2010 and 2010-2011 growing seasons.

		2010-2011		2009-2010	
Cultivar	Average	Moscow	Genesee	Moscow	Genesee
	---------- Julian days to 50% bloom ----------				
Durola	138	141	143	133	135
Bridger	134	138	140	130	130
Significance	**	***	**	*	***
LSD 5%	1.82	1.45	1.98	2.01	1.85

Table B3. Height after flower ending of Durola and Bridger winter rapeseed grown at Moscow and Genesee, in northern Idaho, in 2009-2010 and 2010-2011 growing seasons.

		2010-2011		2009-2010	
Cultivar	Average	Moscow	Genesee	Moscow	Genesee
	---------- cm ----------				
Durola	145	138	146	146	149
Bridger	138	130	140	141	143
Significance	**	**	*	*	**
LSD 5%	3.6	2.7	4.5	3.9	3.1

Figure 2. Lower, middle and upper leaf structure and flowering raceme of Durola winter canola.

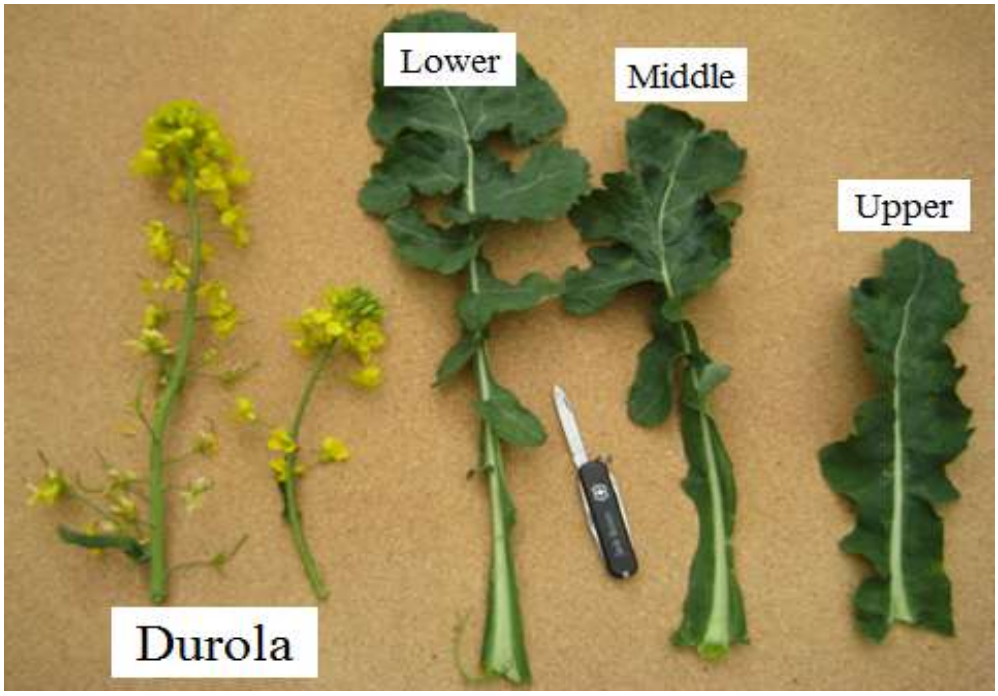
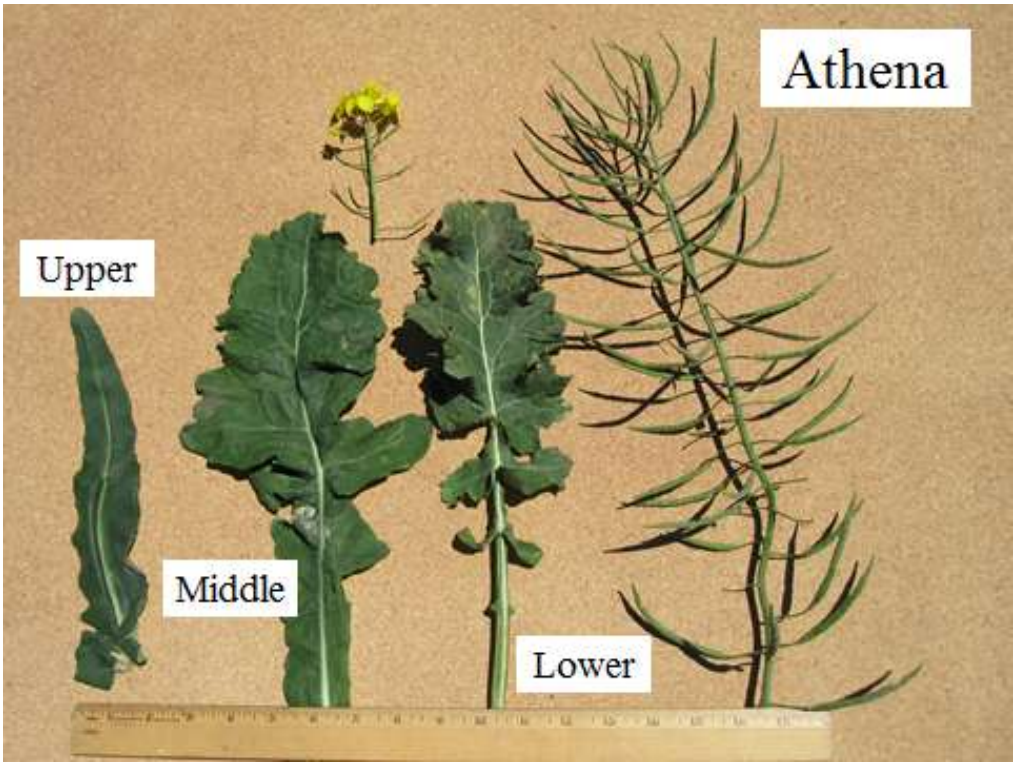


Figure 3. Lower, middle and upper leaf structure and raceme with pods of Athena winter canola.



Replacement 04/11/2014

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

OBJECTIVE DESCRIPTION OF VARIETY
RAPESEED (*Brassica napus* and *B. campestris*)

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
University of Idaho	97.WI.128.A27.A4.1 or 06.UI.WH.5.1.09	Durola

ADDRESS *(Street and No. or RD No., City, State, Zip Code, and Country)*

University of Idaho, PO Box 443003, Morrill Hall 414,

Moscow, Idaho, 83844-3003.

FOR OFFICIAL USE ONLY

PVPO NUMBER

201300085

1. SPECIES

* _X_ Brassica napus ___ Brassica campestris

2. TYPE

* ___ Spring _X_ Winter

3. **PLANT HEIGHT** (at pod maturity)

_1_ _5_ _2_._1_ cm Tall (compare to standard variety below)

___ _9_._3_ cm shorter than Check variety: _Dwarf Essex_

Height same as Check variety: _

___ _15_._2_ cm taller than Check variety: _Bridger_

* Height Class: _4_ Autumn sown ___ Spring sown

1 = Short (Candle) 1 = Short (Erglu)
2 = Medium short ( ) 2 = Medium short ( )
3 = Medium (Jet Neuf) 3 = Medium (Cresus)
4 = Medium tall ( ) 4 = Medium tall (X)
5 = Tall (Dwarf Essex) 5 = Tall (Petranova)

4. STEM ANTHOCYANIN

_1_ 1 = Absent 2 = Weak 3 = Medium 4 = Strong

5. **SEED COTYLEDONS** (maximum width fully developed; mean of 50 graded seeds)

_2_ 1 = Narrow (Erglu) 2 = Medium (Primor) 3 = Broad (Expander)

6. **SEEDLING GROWTH HABIT** (leaf rosette)

_1_ 1 = Upright 2 = Prostrate (short photoperiod)

7. LEAVES

* _3-4_ Margins (serration): 1 = Absent or very weak (Akela) 2 = Weak (Arvor, Jet Neuf) 3 = Medium (Primor) 4 = Strong (Candle, Kentan)

* _4_ Lobing (fully developed leaf on plant or rosette)
1 = Absent or very weak (Akela) 2 = Weak (Arvor) 3 = Medium (Primor)
4 = Medium Strong (Argus) 5 = Strong (Kentan)

* _2_ Leaf Attachment to Stem: 1 = Fully clasping (Candle) 2 = Partial clasping (Jet Neuf) 3 = No Clasping ( )

* _2-3_ Color: 1 = Light green (Arvor) 2 = Medium green (Primor) 3 = Medium dark green (Oro) 4 = Dark green (Brunowski, Rapora)

* _1_ Glaucosity: 1 = Absent 2 = Weak (Span) 3 = Weak to Medium (Gulliver) 4 = Medium (Magnus) 5 = Medium to strong (Oro) 6 = Strong

8. FLOWERS

* _1_ Flower Buds Location 1 = Buds at tip of apical meristem (Jet Neuf) 2 = Buds immediately below apical meristem (Candle)

* _2_ Petal color: 1 = Pale yellow ( ) 2 = Yellow (Jet Neuf, Primor) 3 = Orange ( ) 4 = White ( )

* _1_ Anther dotting (at opening of flower; given percentage %) 1 = Absent ( ) 2 = Few ( ) 3 = Medium (Primor) 4 = Many ( )

* _3_ Flowering class (Autumn sown) _x_ Flowering class (Spring sown)

1 = Very early (Bridger)	1 = Very early (Tower)
2 = Early (Primor)	2 = Early (Kosa)
3 = Medium early (X)	3 = Medium early ( )
4 = Medium late ()	4 = Medium late ( )
5 = Late (Dwarf Essex)	5 = Late (Petranova)
6 = Very late ( )	6 = (Very late)

9. **PODS** (Slique)

* _1_ Pod type: 1 = Bilateral single pod (Jet Neuf) 2 = Other ( )

* _2-3_ Silique beak length: (given length: _12.2_ mm. 1 = Short (Forto) 2 = Medium (Liragold) 3 = Long (Rapol)

* _3_ Pod length; (give length: _69.0_ mm) 1 = Short ( ) 2 = Medium () 3 = Long (x)

* _2_ Pod width; (give width: _6.0_ mm) 1 = Narrow ( ) 2 = Medium (X) 3 = Wide ( )

* _3_ Pod habit: 1 = Erect (Gulliver) 2 = Semi-erect to erect (Oro) 3 = Semi-erect 4 = Horizonal to semi-erect (Brink) 5 = Horizonal

* _2_ Pedicel length: (given length _22.0_ mm) 1 = Very short ( ) 2 = Short (x) 3 = Long ( )

* _2_ Ripening Class (Autum sown): 1 = Very early ( ) 2 = Early (X) 3 = Medium (x) 4 = Late ( ) 5 = Very late ( )

* _207_ Days to Maturity

* _ 5_ Days earlier than Check variety: _Dwarf Essex_

* Maturity same as Check variety: _

* _5_ Days later than Check variety: _Bridger_

10. SEEDS

* _5 . 9_ g/1000 unsized seed

* ___.___ g less than Check variety: _____

* Weight same as Check variety: _Dwarf Essex_

* _0 . 4_ g more than Check variety: _Bridger_

* _4-5_ Weight Class (grams): 1 = less than 3.0 (Candle) 2 = 3.0 – 3.9 ( ) 3 = 4.0 – 5.0 (Jet Neuf) 4 = more than 5.0 (X)

_3_ Seeds Per Pod: (give number: _25.0_ per pod): 1 = Low ( ) 2 = Medium () 3 = High (x)

* _4_ Testa Color: 1 = Black (Jet Neuf) 2 = Red ( )
3 = Yellow (Yellow Sarson) 4 = Dark to black (X)
5 = Reddish-brown to black ( ) 6 = Other _____

11. CHEMICAL COMPOSITION OF SEED

* _3_ Euric Acid: 1 = Low (less than 2%) 2 = Intermediate 3 = High (more than 50%)

* _1_ Glucosinate Content; (give: _1_ _4_ . _7_ µmol/gram of defatted seed meal)
1 = Low – less than 30 µmol/gram of defatted seed meal (Candle) 2 = High – More than 30 µmol/gram of defatted seed meal (Mikado)

* _42_ . _8_ % Oil

___.___ % Protein (oil free meal)

Fatty Acid Composition (%):

Palmitic	Stearic	Oleic	Linoleic	Linolenic	Eicosenoic	Erucic
16:0	18:0	18:1	18:2	18:3	20:1	22:1
* 2.8	0.7	10.2	13.6	8.8	6.4	56.6

12. **FROST TOLERANCE** (Late spring frosts)

* _4+_ Tolerance: 1 = Not hardy – susceptible (Indore) 2 = Moderately suscesptible ( ) 3 = Moderately resistant ( ) 4 = Hardy (Bridger)

13. LODGING RESISTANCE

* _3-4_ Resistance: 1 = Weak (Span) 2 = Moderately weak (Olga) 3 = Moderately strong (Athena) 4 = Strong (Torpe)

14. HERBICIDE RESISTANCE

* _1_ Atrazine: 1 = Susceptible (Jet Neuf) 2 = Resistant ( )

* _1_ Other _Glyphosate & Imaxamox: 1 = Suscept () 4 = Hardy ()

15. **DISEASE RESISTANCE** (0 = Not tested 1 = Susceptible 2 = Low resistance 3 = Moderate resistance 4 = High resistance)

* _0_ Selerotinia Stem Rot (Scerotinia sclerotiorum)

* _0_ Black Let, Stem Canker (*Leptosphaeria maculans*, *Plenodomus lingum*, *Phoma lingam*)

* _0_ White Rust (*Albugo candida*, *A. Cruciferrarum*)

* _0_ Light Leaf Spot (*Pyrenopeziza brassicae*)

* _0_ Downy Mildew (*Peronospora parasitica*)

* _0_ Rhizoctonia Root Rot (*Rhizoctonia solani*)

* _0_ Alternaria Black Spot (*Alternaria brassicicola*)

* _0_ Other _____

16. **COMMENTS** (Please give any additional comments which characterizes the variety)

Glucosinolate composition of seed meal (µmol g^{-1} defatted seed meal

Butenyl	OH Butenyl	Pentenyl	OH Pentenyl
4.3	9.6	0.5	0.3

17. DIRECTIONS

Select the number which characterizes the variety in the features above. Those characteristics marked with an asterisk "*" should be recorded. Any others should be recorded if possible to help establish novelty or uniqueness. Characteristics described, including numerical measurements, should represent those that are typical for the variety. Give test area Regions throughout the Pacific Northwest under conditions or dryland and irrigated agriculture.

'Durola'
Winter Canola
***Brassica napus* L.**

Exhibit D: Additional Description of Variety

After fall seeding, Durola seedlings emerge quickly and produce a good fall stand which was better than Bridger and Dwarf Essex (Table D1). Durola showed significantly better winter-hardiness than Bridger, which tends to have poor winter hardiness. Flower bloom dates of Durola were 125 Julian days, which was significantly later than Bridger and earlier than Dwarf Essex. Durola plants were on average 152 cm tall after flower ending, and were significantly taller than Bridger and shorter than Dwarf Essex. Durola is significantly more resistant to lodging than Dwarf Essex or Bridger (Table D1).

Durola produced a long seed pod and a high seed number per pod (Table D2). Durola pod length is significantly longer than Bridger and Durola produces significantly more seeds pod^{-1} than Bridger.

Durola was evaluated in field trials in Idaho, Washington and Oregon for six growing seasons from 2004-2005 to 2000-2011. All these evaluations trials were part of the Pacific Northwest Winter Canola Variety Trials (Brown *et al.*, 2005, 2006, 2007, 2008, 2009, 2010, and 2011). Durola yield performance was compared to two commercially available winter rapeseed cultivars: Dwarf Essex and Bridger. Over 48 evaluation trials, Durola produced significantly higher seed yield (3,438 kg ha^{-1}), than Dwarf Essex (3,204 kg ha^{-1}) and Bridger (2,677 kg ha^{-1}) (Table D3). Durola produced consistently high seed yield under conventional tillage, direct seeding and under irrigation. Averaged over 46 year-sites of data, Durola produced very high seed oil content (428 g kg^{-1}), which was not significantly different from the high oil content cultivar Bridger (428 g kg^{-1}), but significantly higher than Dwarf Essex (428 g kg^{-1}) (Table D4).

Durola has consistently produce excellent industrial-quality seed oil (Table D5 and D6) with 575 g kg^{-1} or erucic acid content. Erucic acid content of Durola oil was not significantly different than Bridger (557 g kg^{-1}) but significantly higher than Dwarf Essex (501 g kg^{-1}).

Averaged over 4 year-sites of replicated trial data, total glucosinolate content of Durola seed meal was 15.6 µmol g^{-1} of defatted seed meal (Table B1, see Exhibit B: Statement of Distinctness), which was significantly lower than Bridger, and Dwarf Essex. Therefore Durola seed meal will have greater livestock palatability and feed value compared to the other winter rapeseed cultivars. The primary glucosinolate type in Durola seed meal is 2-hydroxy-3-butenyl glucosinolate (65% of total), followed by 3-butenyl (29% of total), with trace amounts of 4-pentenyl and 2-hydroxy-4-pentenyl glucosinolates. Total glucosinolate content and profile of Durola seed meal from harvested Breeders seed is shown in Table D7, and was very similar to the replicated data presented in Table B1.

References

Auld, D.L., K.A. Mahler, B.L. Bettis, and J.C. Crock. 1987. Registration of Bridger rapeseed. *Crop Sci.*, **27**:3101.

Brown, J., D. Wysocki, J.B. Davis, D.A. Erickson, L. Seip, S. Ott, and T. Gosselin. 2004. Registration of 'Athena' winter rapeseed. *Crop Sci* 45:800-801.

Table D1. Fall crop establishment, winter hardiness, days to 50% flower bloom, plant height after flowering and crop lodging of Bridger, Dwarf Essex and Durola winter industrial rapeseed grown over locations throughout Idaho, Oregon and Washington. Data presented are from the Pacific Northwest Winter Canola Variety Trial 2004-2005 through 2010-2011.

Variety	Establi-shment	Winter Hardiness	Flower Start	Plant height	Lodge
Year/sites	12	4	20	11	5
	- 1 to 9 -	- 1 to 9 -	- days -	- inch -	- 1 to 9 -
Bridger	5.4 [c]	4.9 [b]	111 [b]	54[c]	4.4 [b]
Dwarf Essex	6.1 [b]	6.3 [ab]	114 [a]	64 [a]	5.0 [b]
Durola	7.0 [a]	7.6 [a]	115 [a]	60 [b]	7.7 [a]
Mean	6.2	6.3	114.2	60.2	5.8
LSD 5%	0.80	1.60	1.37	2.54	1.69

Means within columns with different superscript letters are significantly different (P<0.05).

Table D2. Pod length, pod width, beak length, pedicel length and seeds/pod of Bridger, Dwarf Essex and Durola winter industrial rapeseed grown over locations throughout Idaho, Oregon and Washington. Data presented are from four year sites of the Pacific Northwest Winter Canola Variety Trial 2009-2010 and 2010-2011.

Variety	Pod Length	Pod width	Beak length	Pedicel length	Seeds/ pod
	--- Based on 50 pods per replicate sample --				
Bridger	60.2 [b]	5.2 [b]	11.1	23.0	18.1 [b]
Durola	69.0 [a]	6.0 [a]	12.2	22.0	25.0 [a]
Mean	66.6	5.5	12.0	22.1	23.1
LSD 5%	1.1	0.7	n.s.	n.s.	1.8

Means within columns with different superscript letters are significantly different (P<0.05).

Table D3. Seed yield of Bridger, Dwarf Essex and Durola winter industrial rapeseed grown over locations throughout Idaho, Oregon and Washington. Data presented are from the Pacific Northwest Winter Canola Variety Trial 2004 through 2011.

Variety	Average	Rank	2004-5	2005-6	2006-7	2007-8	2008-9	2009-10	2010-11
Year/sites	48		8	8	6	9	4	6	7
					kg ha^{-1}				
Bridger	2,677 ^{c}	3	2,017 ^{b}	2,949 ^{b}	2,322 ^{c}	.	3,027 ^{c}	2,743 ^{b}	3,170 ^{c}
Dwarf Essex	3,204 ^{b}	2	3,490 ^{a}	3,033 ^{a}	3,030 ^{b}	2,643 ^{b}	3,624 ^{b}	3,126 ^{a}	3,964 ^{b}
Durola	3,438 ^{a}	1	3,521 ^{a}	3,279 ^{a}	3,404 ^{a}	2,742 ^{a}	4,309 ^{a}	3,108 ^{a}	4,319 ^{a}
Mean	3,127		3,460	3,150	3,081	2,716	3,950	3,158	3,158
LSD 5%	207		178	198	187	97	230	199	185

Means within columns with different superscript letters are significantly different (P<0.05).

Table D4. Seed oil content of Bridger, Dwarf Essex and Durola winter industrial rapeseed grown over locations throughout Idaho, Oregon and Washington. Data presented are from the Pacific Northwest Winter Canola Variety Trial 2004 through 2011.

Variety	Average	Rank	2004-5	2005-6	2006-7	2007-8	2008-9	2009-10	2010-11
Year/sites	46		8	8	6	5	6	6	7
					g kg^{-1}				
Bridger	416 ^{ab}	2	417	410 ^{b}	411 ^{a}	.	420 ^{b}	414 ^{b}	425 ^{b}
Dwarf Essex	413 ^{b}	3	416	409 ^{b}	402 ^{b}	390 ^{b}	420 ^{b}	420 ^{ab}	426 ^{b}
Durola	428 ^{a}	1	417	426 ^{a}	420 ^{a}	405 ^{a}	442 ^{a}	435 ^{a}	449 ^{a}
Mean	418		417	415	411	398	427	423	433
LSD 5%	14		n.s.	11	15	13	14	20	12

Means within columns with different superscript letters are significantly different (P<0.05).

Table D5. Fatty acid profile of 'Durola' winter rapeseed Breeder's seed 2010-2011.

	Palmitic ~~Stearic~~ 16:0†	Stearic ~~Palmitic~~ 18:0	Oleic 18:1	Linoleic 18:2	Linolenic 18:3	Eicoseneic 20:1	Erucic 22:1
	---------- g kg^{-1} ----------						
Mean	28	7	110	136	88	64	566
S.E. Mean	1.7	0.7	10.2	8.8	8.1	6.7	12.5

† ~~16:0=Stearic acid; 18:0=Palmitic acid;~~ 18:1=Oleic acid; 18:2 = linoleic acid; 18:3 = linolenic acid; 20:1 = eicoseneic acid; 22:1 = erucic acid.
Means within columns with different superscript letters are significantly different (P<0.05).

Table D6. Fatty acid profile from replicated yield trials of Bridger, Dwarf Essex and Durola winter industrial rapeseed grown over locations throughout Idaho, Oregon and Washington. Data presented are from four year sites of the Pacific Northwest Winter Canola Variety Trial 2009-2010 and 2010-2011.

Cultivar	Palmitic ~~Stearic~~ 16:0†	Stearic ~~Palmitic~~ 18:0	Oleic 18:1	Linoleic 18:2	Linolenic 18:3	Eicoseneic 20:1	Erucic 22:1
	---------- g kg^{-1} ----------						
Bridger	28	11	140 [a]	110 [b]	69 [b]	86 [b]	557 [a]
Dwarf Essex	32	12	160 [a]	116 [b]	66 [b]	115 [a]	501 [b]
Durola	29	6	99 [b]	143 [a]	93 [a]	54 [c]	575 [a]
Average	30	10	133	123	76	85	544
LSD 5%	n.s.	n.s	23	21	22	28	31

† ~~16:0=Stearic acid; 18:0=Palmitic acid;~~ 18:1=Oleic acid; 18:2 = linoleic acid; 18:3 = linolenic acid; 20:1 = eicoseneic acid; 22:1 = erucic acid.
Means within columns with different superscript letters are significantly different (P<0.05).

Table D7. Glucosinolate profile of Durola' Breeders' Seed 2010-2011.

	Seed Meal Glucosinolate Content				
Cultivar	Total	Butenyl †	Hy-butenyl	Penteny	Hy-Pentenyl
	---------- µmol g^{-1} oil-free seed meal ----------				
Durola	14.7	4.3	9.6	0.5	0.3
s.e. mean	1.09	1.25	2.55	0.12	0.13

† 3-butenyl glucosinolate; 2-hydroxy-3-butenyl glucosinolate; 4-pentenyl glucosinolate; 2-hydroxy-4-pentenyl glucosinolate.

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EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

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)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
University of Idaho		Durola
4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	**5. TELEPHONE** *(Include area code)*	**6. FAX** *(Include area code)*
OTT, PO Box 443003 Morrill Hall 414 Moscow, Idaho, 838443003	208 885 4550	208 885 4551
	7. PVPO NUMBER 201300085	

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

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

10. Is the applicant the original owner? [X] **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.

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SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT F DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S)	ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)*	TEMPORARY OR EXPERIMENTAL DESIGNATION
University of Idaho	University of Idaho, OTT, PO Box 443003 Morrill Hall 414 Moscow, idaho, 83844-3003	VARIETY NAME **Durola**
NAME OF OWNER REPRESENTATIVE (S)	ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)*	FOR OFFICIAL USE ONLY
~~Jack Brown & Gaylene Anderson~~ Karen Stevenson	~~Jack Brown~~ 875 Perimeter Dr. ~~MS 2339~~ PSES Moscow, ID 83844-2339 ~~Gaylene Anderson~~ ~~PO Box 443003~~ Morrill Hall 414 Moscow, ID 83844-3003	PVPO NUMBER 201300085

dbc 02/05/2014

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 11/13/2012