

No.

9700372



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Idaho Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

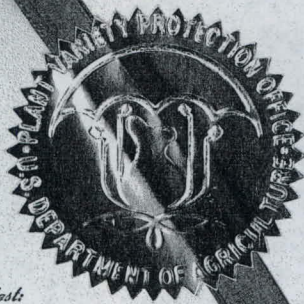
AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS 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 PURPOSE, 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 CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE VARIETY (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

RAPE

'Sterling'

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 twelfth day of September, in the year two thousand one.



Attest:

Paul M. Jankowski

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

W. W. Henderson

Secretary of Agriculture

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

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

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 APPLICANT(S) (as it is to appear on the Certificate) Idaho Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER UI.35.5.15 (PI 597354)	3. VARIETY NAME 'STERLING'
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) IAES, College of Agriculture University of Idaho; <i>Department of Plant, Soil, and Entomological Sciences</i> Moscow ID 83844-2331 <i>Moscow, Idaho 83844-2339 (BT: 10/5/2000)</i>		5. TELEPHONE (include area code) (208) 885-7173	FOR OFFICIAL USE ONLY PVPO NUMBER 9700372 FILING AND EXAMINATION FEE \$ 2450 DATE 12 August 1997 CERTIFICATION FEE \$ 320 DATE June 11, 2001
7. GENUS AND SPECIES NAME Brassica napus L. oleifera		6. FAX (include area code) (208) 885-6654	
8. FAMILY NAME (Botanical) Cruciferae		9. CROP KIND NAME (Common name) Spring Rapeseed	
10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) (Common name) University Experiment Station			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION		12. DATE OF INCORPORATION	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Jack Brown Dept PSES University of Idaho Moscow ID 83844-2339			14. TELEPHONE (include area code) (208) 885-7078 <i>6374</i> <i>(BT: 10/5/2000)</i>
15. FAX (include area code) (208) 885-7760			
16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)			
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 the Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Applicant's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to PVPO)			
17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act?) <input checked="" type="checkbox"/> YES (If "yes," answer items 18 and 19 below) <input type="checkbox"/> NO (If "no," go to item 20)			
18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED	
20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> YES (If "yes," give names of countries and dates) <input checked="" type="checkbox"/> NO			
21. The applicant(s) declare that a viable sample of basic seed of the variety will be 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 applicant(s) is(are) the owner(s) 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 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT (Owner(s)) <i>Richard C. Heimsch</i>		SIGNATURE OF APPLICANT (Owner(s)) <i>Jack Brown</i>	
NAME (Please print or type) RICHARD C. HEIMSCH, DIRECTOR IDAHO AG. EXPERIMENT STATION		NAME (Please print or type) Jack Brown	
CAPACITY OR TITLE DATE <i>0/4/97</i>		CAPACITY OR TITLE DATE Breeder 7/24/97	

Attachment

'STERLING' Spring Industrial Rapeseed (*Brassica napus* L.)

Exhibit A: Origin and History of the Variety

Sterling is a pure-line (near homozygous) spring industrial rapeseed cultivar with high erucic acid content in seed oil and canola-quality seed meal, selected for high adaptability to environments throughout the Pacific Northwest region (Idaho, Oregon, Washington and Montana). This cultivar was developed from a single plant selection in 1994 from a segregating F₄ population derived from the cross 'Jaguar' x 'Hero'. Jaguar is a canola quality cultivar (*i.e.* low erucic acid content (less than 20 g kg⁻¹) and less than 30 μmol g⁻¹ of glucosinolate in the defatted seed meal) that was developed by Maribo Seeds Co., Denmark, and Hero is a spring industrial rapeseed cultivar (*i.e.* high erucic acid content in the seed oil) developed at the University of Manitoba, Canada.

F₁ seed from the original hybridization was produced in the spring of 1992. Progeny from the cross were evaluated in a multivariate cross prediction trial (3) in the greenhouse in 1992 (F₁ to F₂) and field in 1993 (F₂ to F₃). Based on the cross prediction studies, progeny from this cross were identified as having high potential of producing desirable recombinant inbred lines. Seeds from the F₃ population were selected for high erucic acid content in the oil using a half-seed technique and a procedure similar to Downey and Harvey (1) and McGregor (2). Lines from the half-seed analyses with highest erucic acid content were increased from F₃ to F₄ seed over the winter months 1993/94 in the glasshouse and seed used to plant single-plant plots for increase and field assessment trials in 1994. Over the winter of 1994/95, a further greenhouse seed increase was carried out from F₅ to F₆ seed.

Breeders' seed of Sterling was derived from a single plant selected from the F₆ population grown in the greenhouse in 1994/95. Seed from the initial selection was grown as F₆ single-plant plots in 1995. Prior to harvest, 30 single plant selections were identified with desired uniformity, oil and seed meal quality. In 1996, F₇ seed from these 30 plants were grown in single-plant plots. During the growing season, plots were visually inspected and any off-type plants were removed. Before harvest 20 single plant selections were taken from each single-plant plot and evaluated for quality characters. Four hundred single F₈ plants were retained and combined to plant foundation seed in 1997.

Exhibit B: Statement of Distinctness

Sterling is a medium maturity spring rapeseed cultivar with high erucic acid content in the seed oil. Sterling is similar in plant height, plant morphology, and maturity to the spring rapeseed (canola) cultivar 'Legend'. Oil quality of Sterling is significantly different from Legend, with Sterling having high erucic acid content (>45%) and Legend having less than 1% erucic acid content in seed oil. Fatty acid profile of Sterling is similar to that of the cultivar 'Hero'. However, Sterling is significantly shorter than Hero. Sterling also has a more prostrate seedling

habit, less leaf lobing, less leaf margin serration, and less leaf glaucosity compared to Hero.

Additional information: Fatty Acid Profile

Cultivar	Year	16:1	18:0	18:1	18:2	18:3	20:1	22:1
		----- % -----						
Sterling	1994	3.4	0.9	19.9	14.5	7.2	11.2	43.6
	1996	3.3	1.2	16.0	12.9	7.0	9.7	44.9
	1997	2.9	1.1	15.4	12.4	6.9	7.5	47.7
	1998	2.8	1.1	15.2	12.2	6.7	8.8	47.2

References and notes

1. Downey, R.K. and B.L. Harvey. 1963. Methods of breeding for oil quality in rape. *Can. J. Plant Sci.* 43:271-275.
2. McGregor, D.I. 1974. A rapid and sensitive spot test for linolenic acid levels in rapeseed. *Can. J. Plant Sci.* 54:211-213.
3. Pooni, H.S. and J.L. Jinks, 1978. Predicting the properties of recombinant lines derived by single seed descent for two or more characters simultaneously. *Heredity* 54:397-411.

U.S. DEPARTMENT OF AGRICULTURE
PLANT VARIETY PROTECTION OFFICE, AMS, USDA
NATIONAL AGRICULTURAL LIBRARY Bldg., Rm. 500
10301 BALTIMORE Blvd.
BELTSVILLE, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY

RAPESEED

(*Brassica napus* and *B. campestris*)

Name of Applicants(s) Idaho Agricultural Experiment Station	Temporary Designation UI.35.5.15 (PI 597354)	Variety Name 'STERLING'
Address (Street and No., or R.F.D. No., City, State, & Zip Code) IAES, College of Agriculture University of Idaho; Dept. of PSES Moscow ID 83844-2331 2339 (BT: 10/5/2000)	Official Use Only PVPO Number 9700372	

1. SPECIES:

* *Brassica napus* *Brassica campestris*

2. TYPE:

* Spring Winter

3. PLANT HEIGHT (at pod maturity):

104.0 cm Tall (compare to standard variety below)

6.0 cm shorter than Check variety: HERO

Height same as Check variety: _____

 cm taller than Check variety: _____

*Height Class: 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 ()
 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):

2 1 = Upright ② = Prostrate (short photoperiod)

7. LEAVES:

- * 1 Margins (serration): ①= Absent or very weak (Akela) 2 = Weak (Arvor, Jet Neuf)
3 = Medium (Primor) 4 = Strong (Candle, Kentan)
- * 1 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 Color: 1 = Light green (Arvor) 2 = Medium green (Primor)
3 = Medium dark green (Oro) 4 = Dark green (Brunowski, Rapora)
- * 1 Glaucoisity: ①= Absent 2 = Weak (Span) 3 = Weak to medium (Gulliver)
4 = Medium (Magnus) 5 = Medium to strong (Oro) 6 = Strong

8. FLOWERS:

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- * 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; give percentage: 0 %)
①= Absent () 2 = Few () 3 = Medium (Primor) 4 = Many ()
 - * Flowering class (Autumn sown): 2-3 Flowering class (Spring sown):
1 = Very early (Arvor) 1 = Very early (Tower)
2 = Early (Primor) ②= Early (Kosa)
3 = Medium early () ③= Medium early ()
4 = Medium late () 4 = Medium late ()
5 = Late (Marcus) 5 = Late (Petranova)
6 = Very late () 6 = Very late ()

9. PODS (Sliques):

- * 1 Pod type: ①= Bilateral single pod (Jet Neuf) 2 = Other ()
- * 2 Siliques beak length: ^{13.17mm} 1 = Short (Forto) ②= Medium (Liragold) 3 = Long (Rapol)
- * 3 Pod length; (give length: 72.23 mm) 1 = Short () 2 = Medium () ③= Long ()
- * 2 Pod width; (give width: 4.16 mm) 1 = Narrow () ②= Medium () 3 = Wide ()
- * 4 Pod habit: 1 = Erect (Gulliver) 2 = Semi-erect to erect (Oro) 3 = Semi-erect
④= Horizontal to semi-erect (Brink) 5 = Horizontal
- * 2 Pedicel length: ^{21.77mm} 1 = Very short () ②= Short () 3 = Long ()
- * N/A Ripening Class (Autumn sown): 1 = Very early () 2 = Early () 3 = Medium ()
4 = Late () 5 = Very late ()

9. PODS (Continued):

- * 98 days to maturity:
- * days earlier than Check variety:
- * maturity same as Check variety: HERO
- * days later than Check variety:

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10. SEEDS:

- * 3.5 g/1000 unsized seed:
- * 0.3 g less than Check variety: Westar
- * weight same as Check variety:
- * g more than Check variety:
- * 2 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 ()
- * 3 Seeds Per Pod: (give number: 26.37 per pod) 1 = Low () 2 = Medium () 3 = High ()
- * 5 Testa Color: 1 = Black (Jet Neuf) 2 = Red ()
3 = Yellow (Yellow Sarson) 4 = Dark brown to black ()
⑤ = Reddish-brown to black () 6 = Other

11. CHEMICAL COMPOSITION OF SEED:

- * 3 Erucic Acid 1 = Low (less than 2%)
2 = Intermediate
③ = High (more than 50%)
- * 1 Glucosinate Content; (give: 10.66 ^{micro}moles/g, mg/g)
① = Low - Less than 30 ~~milli~~mg/g (Candle)
2 = High - More than 30 ~~milli~~mg/g (Mikado)
- * 40.16 % Oil 35.4 % Protein (oil free meal)

Fatty Acid Composition (%):

Palmitic 16:0	Stearic 18:0	Oleic 18:1	Linoleic 18:2	Linolenic 18:3	Eicosenoic 20:1	Erucic 22:1
<u>3.1</u>	<u>1.1</u>	<u>15.4</u>	<u>13.4</u>	<u>9.0</u>	<u>8.5</u>	<u>50.4</u>

12. FROST TOLERANCE (Late spring frosts):

- * 3 Tolerance: 1 = Not hardy - susceptible (Indore) 2 = Moderately susceptible ()
③ = Moderately resistant () 4 = Hardy (Bridger)

13. LODGING RESISTANCE:

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

14. HERBICIDE RESISTANCE:

- * 1 Atrazine: ① = Susceptible (Jet Neuf) 2 = Resistant ()
- Other: SU
① = Susceptible
2 = Resistant

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

- * 0 Sclerotinia Stem Rot (*Sclerotinia sclerotiorum*)
- * 0 Black Leg, Stem Canker (*Leptosphaeria maculans*, *Plenodomus lingam*)
(*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 _____

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16. COMMENTS: Please give any additional comments which characterizes the variety.

Glucosinolate Profile and Total ($\mu\text{mol}/\text{gram}$)

Total	But	OH.But	Pent	OH.Pent
10.7 \pm 0.47	2.2 \pm 0.04	0.3 \pm 0.03	7.2 \pm 0.11	0.2 \pm 0.09

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 _____ conditions _____.

'STERLING'
Spring Industrial Rapeseed
(Brassica napus L.)

9700372

Submitted to
Foundation Seed Stocks
Committee

University of Idaho

Jack Brown
Department of Plant, Soil
and Entomological Sciences
University of Idaho
Moscow, ID 83844-2339

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Boise, Idaho
December 6, 1996

REGISTRATION OF STERLING SPRING INDUSTRIAL RAPESEED

'Sterling' spring industrial rapeseed (*Brassica napus* L. spp. *oleifera* (Metzg) Sinsk. *f. annua*) [Reg. no. 97712] [PI. 597354] was developed for use as an industrial oil-quality cultivar by the Idaho Agricultural Experiment Station, Moscow, ID 83844. This cultivar is protected by U.S. Plant Variety Protection (PVP _____). 9700372

Sterling is a pure-line (near homozygous) spring industrial rapeseed cultivar with high erucic acid content in seed oil and canola-quality seed meal, selected for high adaptability to environments throughout the Pacific Northwest region (Idaho, Oregon, Washington and Montana). This cultivar was developed from a single plant selection in 1994 from a segregating F₄ population derived from the cross 'Jaguar' x 'Hero'. Jaguar is a canola quality cultivar (*i.e.* low erucic acid content (less than 20 g kg⁻¹) and less than 30 μmol g⁻¹ of glucosinolate in the defatted seed meal) that was developed by Maribo Seeds Co., Denmark, and Hero is a spring industrial rapeseed cultivar (*i.e.* high erucic acid content in the seed oil) developed at the University of Manitoba, Canada.

F₁ seed from the original hybridization was produced in the spring of 1992. Progeny from the cross were evaluated in a multivariate cross prediction trial (4) in the greenhouse in 1992 (F₁ to F₂) and field in 1993 (F₂ to F₃). Based on the cross prediction studies, progeny from this cross were identified as having high potential of producing desirable recombinant inbred lines. Seeds from the F₃ population were selected for high erucic acid content in the oil using a half-seed technique and a procedure similar to Downey and Harvey (2) and McGregor (3). Lines from the half-seed analyses with highest erucic acid content were increased from F₃ to F₄ seed over the winter months 1993/94 in the glasshouse and seed used to plant single-plant plots for increase and field assessment trials in 1994. Over the winter of 1994/95, a further greenhouse seed increase was carried out from F₅ to F₆ seed.

Agronomic performance of Sterling was compared to the performance of the three control cultivars, Hero, 'Reston' and 'R.500', over three years (1994, 1995 and 1996) in trials grown in Idaho, Montana, Washington and Oregon. The 1996 trials were the Pacific Northwest Canola Variety Trials (PNWCVT) (1). Hero and Reston are high erucic acid cultivars developed at the University of Manitoba, Canada. R.500 is a *B. rapa* (yellow sarson) high erucic acid cultivar with high seed glucosinolate content that shows very poor adaptation to conditions in the Pacific Northwest. R.500 was included as a control in the 1994 and 1995 trials since it is the only spring-type high erucic acid cultivar available commercially to U.S. farmers.

Averaged over 12 year/sites, seed yield of Sterling was 1658 kg ha⁻¹. Seed yield over years was relatively consistent (1274, 1901 and 1753 kg ha⁻¹ from 1994, 1995 and 1996, respectively). Sterling produced seed yields 24%, 77% and 492% higher than the control cultivars Hero, Reston and R.500, respectively. Sterling produced greater seed yield than the highest yielding control cultivar (Hero) at all 12 sites evaluated.

Sterling has high oil content with high erucic acid content and very low glucosinolate content. Over 12 year/sites, oil content of Sterling was 404 g kg⁻¹, and not significantly different from Hero (403 g kg⁻¹), the highest oil content control. Averaged over all field plot trials, erucic acid content of Sterling (463 g kg⁻¹) was significantly higher than Hero (423 g kg⁻¹) or Reston (398 g kg⁻¹). Total seed glucosinolate content of Sterling is consistently low, averaging 10.7 μmol g⁻¹ of defatted meal.

Sterling plants are short in stature (99 cm, 6 cm shorter than Hero). Plants begin flowering medium-early (approximately 54 days after planting) and reach maturity 98 days after planting. Seed size is medium with average 1000 seed weight at 3.5 g, 0.3 g lighter than the spring canola cultivar 'Westar'. Sterling is moderately resistant to spring frost, is resistant to lodging and is susceptible to triazine class and other broad-leaf herbicides.

Breeders' seed of Sterling was derived from a single plant selected from the F₆ population grown in the greenhouse in 1994/95. Seed from the initial selection was grown as F₆ single-plant plots in 1995. Prior to harvest, 30 single plant selections were identified with desired uniformity, oil and seed meal quality. In 1996, F₇ seed from these 30 plants were grown in single-plant plots. During the growing season, plots were visually inspected and any off-type plants were removed. Before harvest 20 single plant selections were taken from each single-plant plot and evaluated for quality characters. Four hundred single F₈ plants were retained and combined to plant foundation seed in 1997. 9700372

Seed increases of Sterling are limited by Plant Variety Protection [PVP _____] to foundation and certified seed classes. Requests for seed of Sterling for either experimental or commercial production can be made to the Idaho Agricultural Experiment Station, University of Idaho, Moscow, ID 83844-2331.

J. Brown, J.B. Davis, A.P. Brown, D.A. Erickson and L. Seip (5)

References and notes

1. Brown, J., J.B. Davis, D. Wysocki, J. Simms, D. Wichman and A. Hang. 1996. Pacific Northwest Canola Variety Trial (PNWCVT) Results 1996. *In: Proceeding Pacific Northwest Canola Meeting, Great Falls, MT, November 1996.*
2. Downey, R.K. and B.L. Harvey. 1963. methods of breeding for oil quality in rape. *Can. J. Plant Sci.* 43:271-275.
3. McGregor, D.I. 1974. A rapid and sensitive spot test for linolenic acid levels in rapeseed. *Can. J. Plant Sci.* 54:211-213.
4. Pooni, H.S. and J.L. Jinks, 1978. Predicting the properties of recombinant lines

derived by single seed descent for two or more characters simultaneously.
Heredity 54:397-411.

5. Assistant Professor, Plant Breeding and Genetics and Research Associates, respectively. Plant, Soil and Entomological Sciences, University of Idaho, Moscow, ID 83844-2339.

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Table 1. Seed yield (lb/acre) of Sterling and three high erucic acid control cultivars in 1994, 1995 and 1996.

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Cultivar	Mean	Rank	1994 3 sites	1995 2 sites	1996 8 sites
Hero	1193	(2)	927	1012	1359
Reston	835	(3)	570	1028	1039
R.500	250	(4)	*	250	*
Sterling	1479	(1)	1137	1696	1564
s.e. mean	164		164	229	148
LSD 5%	322		324	453	415

Table 2. Oil content (%) of Sterling and three high erucic acid control cultivars in 1994, 1995 and 1996.

Cultivar	Mean	Rank	1994 3 sites	1995 2 sites	1996 8 sites
Hero	40.3	(2)	36.4	42.6	41.3
Reston	36.9	(4)	34.5	42.6	36.3
R.500	38.6	(3)	*	38.6	*
Sterling	40.4	(1)	36.6	42.9	41.3
s.e. mean	0.76		1.06	0.91	0.59
LSD 5%	1.47		2.10	1.81	1.64

Table 3. Erucic acid content (%) of Sterling and three high erucic acid control cultivars in 1994 in 1995 and in 1996.

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Cultivar	Mean	Rank	1994 2 sites	1995 2 sites	1996 2 sites
Hero	42.3	(3)	49.1	44.2	42.5
Reston	39.8	(4)	42.2	37.5	*
R.500	56.7	(1)	58.2	55.2	*
Sterling	46.3	(2)	43.6	50.4	44.9
s.e. mean	0.83		1.22	1.02	0.25
LSD 5%	1.63		2.41	2.03	0.50

Table 4. Glucosinolate profile and total glucosinolates ($\mu\text{mol}/\text{gram}$ of defatted meal) of 'Sterling' Breeders' seed lot. Also shown is the profile and total of the winter rapeseed cultivar 'Bridger' (PvP 8500171).

Cultivar	Total	3-but ¹	OH-But	4-pent	OH-pent
Bridger	25.57±0.86	8.08±0.16	1.96±0.09	14.76±0.13	0.77±0.17
Sterling	10.7±0.47	2.25±0.04	0.35±0.03	7.24±0.11	0.21±0.09

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

Table 5. Seedling establishment (1 to 9 scale with 9 = good establishment), days from planting to flower start, plant height (cm), days from planting to maturity, lodging resistance (1 to 9 scale with 9 = no lodge), and test weight (kg/ha) of 'Sterling' and three control cultivars. Data presented are weighted averages from two locations in 1994, the 1995 Pacific Northwest Canola Variety Trial (9 locations), and the 1996 Pacific Northwest Canola Variety Trial (8 locations).

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	Establ- ishment (1-9)	Flower start (days)	Plant height (cm)	Maturity ¹ (days)	Lodge ¹ (1-9)	Test ² Weight (kg/ha)
Hero	5.8	54	104	98	9.0	64.6
Reston	3.9	59	114	105	8.5	64.1
R.500	3.5	56	80	*	*	*
Sterling	5.5	54	99	98	9.0	64.4
s.e. mean	0.93	1.12	4.47	0.86	0.62	0.20
LSD 5%	1.83	2.19	8.77	1.70	1.21	0.39

¹ Only averaged over eight 1996 sites. ² data from only a single location

Table 6. Seed yield (lb/acre) of Sterling and three high erucic acid control cultivars grown at the Parker Farm, Moscow (Mosc), ID and two trials at the Kambitsch Farm, Genesee (Gen.1 and Gen.2), in 1994 and 1995.

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	Weighted mean	1994			1995	
		Mosc	Gen.1	Gen.2	Mosc	Gene
Hero	961	880	819	1082	778	1246
Reston	753	685	499	527	1032	1024
R.500	250	*	*	*	114	386
Sterling	1263	932	912	1568	1522	1381
s.e. mean	190	222	160	111	193	266
LSD 5%	382	440	317	220	388	535

Table 7. Oil content (%) of Sterling and three high erucic acid control cultivars grown at the Parker Farm, Moscow (Mosc), ID and two trials at the Kambitsch Farm, Genesee (Gen.1 and Gen.2), in 1994 and 1995.

	Weighted mean	1994			1995	
		Mosc	Gen.1	Gen.2	Mosc	Gene
Hero	38.9	33.9	37.9	37.3	42.7	42.6
Reston	37.8	32.7	35.7	35.2	42.4	42.9
R.500	38.5	*	*	*	37.1	40.0
Sterling	39.1	34.1	37.9	37.9	42.6	43.1
s.e. mean	1.00	1.27	1.21	0.71	0.99	0.84
LSD 5%	1.93	2.51	2.39	1.41	1.99	1.69

Table 8. Plant establishment (1 to 9 scale with 9 = good establishment), days from planting to flower start and plant height (cm) averaged over three trials in 1994 and two locations in 1995.

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Cultivar	1994			1995		
	Estab- lishment	Flower Start	Height	Estab- lishment	Flower Start	Height
Hero	6.1	55.5	91.0	5.5	57.6	140.0
Reston	4.7	60.7	111.0	4.5	62.5	155.0
R.500	*	*	*	3.5	56.5	80.0
Sterling	7.0	56.5	98.0	5.0	58.0	120.0
s.e. mean	0.62	0.86	1.17	0.68	0.81	1.71
LSD 5%	1.23	1.70	2.31	1.37	1.63	3.44

Table 9. Plant establishment (1 to 9 scale with 9 = good establishment), days from planting to flower start, plant height (cm), days from planting to final maturity, lodging (1 to 9 scale 9 = no lodge), and seed test weight (kg/ha) averaged over six trials in 1996.

	Establ- ishment	Flower Start	Height	Maturity	Lodge	Test Weight
Hero	5.7	52.7	99.2	137	9.0	64.6
Reston	3.5	57.3	105.5	141	8.5	64.1
Sterling	5.0	52.2	94.0	137	9.0	65.2
s.e. mean	0.61	0.72	0.28	0.01	0.00	0.20
LSD 5%	1.70	2.01	0.78	0.03	0.00	0.56

Table 10. Seed yield (lb/acre) of Sterling and two high erucic acid control cultivars grown at the Parker Farm, Moscow (Mosc), ID; Kambitsch Farm, Genesee (Gene), ID; Potlatch (Potl), ID; Colfax (Colf), WA; Dayton (Dayt), WA; Prosser (Pros), WA; Pendleton (Pend), OR; Moccasin (Mocc), MT; and Bozeman (Boze), MT, in 1996.

	Mean	Rank	Mosc ID	Gene ID	Potl ID	Colf WA	Dayt WA	Pros WA	Pend OR
Hero	1359	(2)	1183	1469	611	1655	1716	2169	710
Reston	1039	(3)	995	1084	*	*	*	*	*
Sterling	1564	(1)	1246	2045	614	1910	2119	2053	961
s.e. mean	148		151	127	98	258	114	123	164
LSD 5%	415		422	354	274	736	320	345	458

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Table 11. Oil content of Sterling and two high erucic acid control cultivars grown at the Parker Farm, Moscow (Mosc), ID; Kambitsch Farm, Genesee (Gene), ID; Potlatch (Potl), ID; Colfax (Colf), WA; Dayton (Dayt), WA; Prosser (Pros), WA; Pendelton (Pend), OR; Moccasin (Mocc), MT; and Bozeman (Boze), MT, in 1996. Also shown is the oil content obtained from the Breeders' seed lot.

	Mean	Mosc ID	Gene ID	Potl ID	Colf WA	Dayt WA	Pros WA	Breeders Seed
Hero	41.3	41.8	43.3	41.3	40.2	43.4	38.0	*
Reston	36.3	31.6	41.0	*	*	*	*	*
Sterling	41.3	41.4	43.6	41.9	39.9	42.4	38.4	40.16±0.116
s.e. mean	0.59	0.64	0.46	0.77	0.52	0.55	0.58	-
LSD 5%	1.64	1.80	1.29	2.15	1.45	1.55	1.63	-

Table 12. Fatty acid profile of Sterling and three high erucic acid control cultivars grown in 1994 (average of two locations), 1995 (average of two locations) and in 1996 based on 2 x 10 samples from the Breeders seed lot.

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1994	16:0	18:0	18:1	18:2	18:3	20:1	22:1
Hero	2.8	1.0	17.0	12.3	7.5	10.4	49.1
Reston	3.4	1.4	19.0	15.1	5.6	13.2	42.2
R.500	1.7	1.1	12.7	12.6	8.4	5.3	58.2
Sterling	3.4	0.9	19.9	14.5	7.2	11.2	43.6
s.e. mean	0.61	0.26	0.69	0.97	0.98	0.59	1.22
LSD 5%	1.21	0.52	1.38	1.92	1.94	2.16	2.41
1995	16:0	18:0	18:1	18:2	18:3	20:1	22:1
Hero	3.1	1.3	18.0	13.1	9.4	10.7	44.2
Reston	3.2	1.5	26.7	14.4	9.2	12.2	37.5
R.500	1.9	1.1	14.4	12.8	8.9	5.6	55.2
Sterling	3.1	1.1	15.4	13.4	9.0	8.5	50.4
s.e. mean	0.70	0.34	1.07	1.47	0.27	0.78	1.02
LSD 5%	1.39	0.67	2.12	2.92	0.54	1.55	2.03
1996	16:0	18:0	18:1	18:2	18:3	20:1	22:1
Hero	3.4	1.2	17.4	12.7	8.4	10.0	42.5
Sterling	3.3	1.2	16.0	12.9	7.0	9.7	44.9
s.e. mean	0.03	0.04	0.13	0.06	0.06	0.08	0.25
LSD 5%	0.06	0.08	0.26	0.12	0.12	0.16	0.50

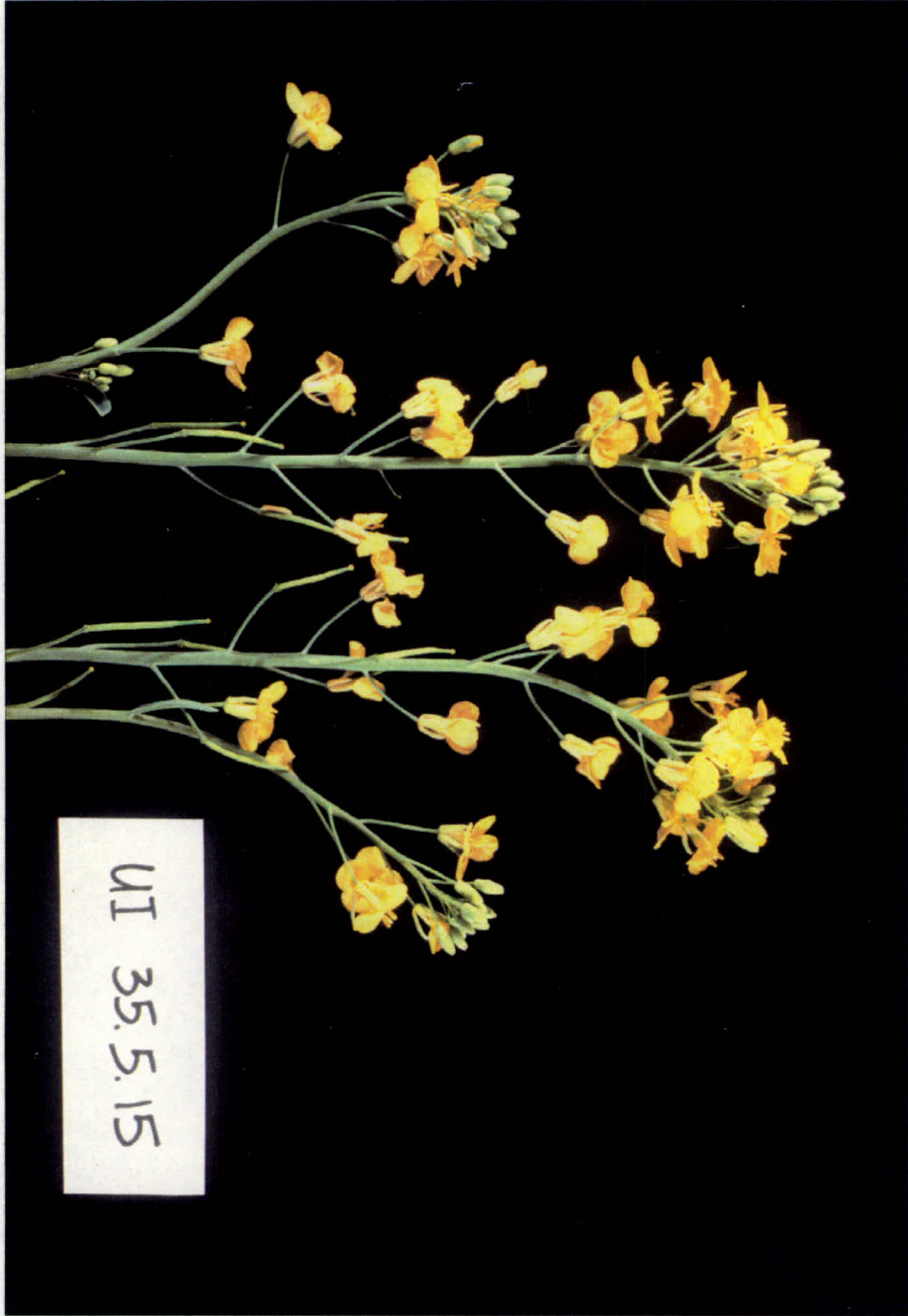
¹ 16:0 = palmitic acid; 18:0 = stearic acid; 18:1 = oleic acid; 18:2 = linoleic acid; 18:3 = linolenic acid; 20:1 = eicosenoic acid; 22:1 = erucic acid.

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'Sterling'



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'Sterling'



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

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EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) Idaho Agricultural Experiment Station	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER UI.35.5.15 (PI 597354)	3. VARIETY NAME 'STERLING'
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) IAES, College of Agriculture University of Idaho Department of Plant, Soil and Entomological Sciences Moscow ID 83844-2337	5. TELEPHONE (include area code) (208) 885-7173	6. FAX (include area code) (208) 885-6654 7. PVPO NUMBER 9700372

(BT:10/5/00)
2339

6274 (BT:10/5/00)
885-7760 BT (10/5/00)

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

YES NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? If no, give name of country

YES NO

10. Is the applicant the original breeder? If no, please answer the following:

a. If original rights to variety were owned by individual(s):
Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country

YES NO

b. If original rights to variety were owned by a company:
Is the original breeder(s) U.S. based company? If no, give name of country

YES NO

11. Additional explanation on ownership (If needed, use reverse for extra space):

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of 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 breeder, both the original breeder and the applicant must meet one of the above criteria.

The original breeder may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

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