No. 200300202

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 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. 2401 ET SEQ.)

MUSTARD, INDIA

'Pacific Gold'

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

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

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

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: Idaho Agricultural Experiment Station

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME: UI.BJ.18.Y.11

3. VARIETY NAME: Pacific Gold

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*: University of Idaho, Moscow, Idaho, 83844-2331

5. TELEPHONE *(include area code)*: (208) 885 7173

6. FAX *(include area code)*: (208) 885 6654

FOR OFFICIAL USE ONLY: #200300202

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*: Agricultural Experiment Station

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)*

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

Include on all communications: Gaylene Anderson
Office of Technology Transfer
PO Box 443003
Morrill Hall 414
Moscow, ID 83844-3003

FEES RECEIVED

FILING AND EXAMINATION FEE: $3,652.00
DATE: 3/25/2003

CERTIFICATE FEE: $ 768.00
DATE 11/18/2010

11. TELEPHONE (Include area code): (208) 885 7078

12. FAX (Include area code): (208) 885 7760

13. E-MAIL: jbrown@uidaho.edu & gaylene@uidaho.edu

14. CROP KIND *(Common Name)*: India mustard

16. FAMILY NAME *(Botanical)*: Brassicaceae

15. GENUS AND SPECIES NAME OF CROP: *Brassica juncea* L.

17. IS THE VARIETY A FIRST GENERATION HYBRID? ☐ YES ☒ NO

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (***OPTIONAL***)
☐ YES ☒ 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)

a. ☒ Exhibit A. Origin and Breeding History of the Variety
b. ☒ Exhibit B. Statement of Distinctness
c. ☒ Exhibit C. Objective Description of Variety
d. ☒ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☒ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☒ Exhibit F. Declaration Regarding Deposit
g. ☒ 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*)
☒ 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?
☒ YES ☐ NO
IF YES, WHICH CLASSES? ☒ FOUNDATION ☐ REGISTERED ☒ CERTIFIED

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

SIGNATURE OF OWNER:

NAME *(Please print or type)*: Jack Brown

NAME *(Please print or type)*:

CAPACITY OR TITLE: Professor/Plant breeder

DATE: 3/6/2003

CAPACITY OR TITLE:

DATE:

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

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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

#200300202

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.)*

Amount of seed sold (9,000 lb) in June 2002 to determine export potential

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).)*

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 1.4 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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'Pacific Gold'
Condiment India Mustard
(*Brassica juncea* L.)

Exhibit A: Origin and Breeding History

Pacific Gold is a pure-line (near homozygous) condiment India mustard cultivar that was selected for high adaptability to dryland farming regions of northern Idaho and eastern Washington. This cultivar was developed from a single plant selection in 1993 from an F_4 population from the cross 'Cutlass'/J.89.102. Cutlass is an India mustard cultivar developed by Agriculture and Agri-Food Canada, Saskatoon, SK. J.89.102 is an India condiment mustard accession from the University of Idaho germplasm collection which was identified as having high adaptability and yield potential to environmental conditions of northern Idaho.

F_1 seed from the original cross was produced in spring 1992 and the F_1 plant generation and F_2 plant generation was increased in a greenhouse in the fall of 1992 and spring of 1993, respectively. Bulked F_3 seed (derived by open pollination of 8 F_2 plants in a greenhouse) was grown in bulk progeny yield trials in 1994. At harvest, 20 single plants were selected from the bulk progeny and threshed separately to initiate seed increase and increase homozygosity. From the F_5 stage (1995) through to the F_8 stage (1998) a modified-pedigree-bulk breeding scheme (2) was used. At each evaluation stage, 20 single plant plots were planted for seed increase and bulk progeny were evaluated in replicated yield trials. Throughout the growing season, the single plant plots were visually inspected for uniformity and homogeneity. A further 20 single plants were selected from the "best" single plant plot. Thereafter, the remainder of the single plant plot was bulk harvested and hand threshed, and the seed used to plant the following year's yield trials. This operation was repeated for three generations (F_5 to F_6, F_6 to F_7, and F_7 to F_8).

In 1999, 400 single plant selections were made from the F_9 single plant multiplication plots and each plant threshed separately. The selections were made by visually inspecting each plant to have the same general plant morphology (i.e. same plant height, leaf shape, etc.) Over winter 1999-2000, two seeds from each plant were planted into 15 cm plots and grown to maturity in a greenhouse. Prior to flowering, each plant was bagged to minimize cross pollination. At harvest, each plant was harvested separately and evaluated for seed color. Seeds from plants with uniformly yellow/orange seed were retained and used to plant single plant plots in spring 2000. The growth characteristics of the single plant plots were monitored throughout the growing season to identify any variants. At harvest, all plots were harvested in bulk as Breeder's seed. Foundation seed was planted from this Breeder's seed stock in 2000 and used to plant Certified seed in 2001.

Pacific Gold has been observed in yield trial between 1996 and 2002, and since 1999, has been entered into the Pacific Northwest Mustard Variety Trials (1999 through 2010).

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This cultivar also has been grown in a number of on-farm studies and was produced on over 2,000 acres in 2002 to produce sufficient seed to determine export potential to Pacific Rim countries. Throughout this period Pacific Gold has been found to be very stable and uniform in performance. Throughout the later stages of seed increases including pre-Breeders seed, Breeders seed, Foundation seed and Certified seed production no variants were observed over this four year period.

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'Pacific Gold'
Condiment India Mustard
(*Brassica juncea* L.)

Exhibit B: Statement of Distinctness

Glucosinolate content in condiment mustard is directly related to pungency and a high pungency is required for a '*hotter*' tasting product which is desired in Pacific Rim and other countries. High seed meal glucosinolate content (more correctly high allyl (2-propenyl) glucosinolate content) is a major quality characteristic of Indian condiment mustard cultivars.

Pacific Gold is most similar to the India condiment mustard cultivar 'Cutlass'. Averaged over two locations in two years, allyl (2-propenyl) seed meal glucosinolate content of Pacific Gold seed is significantly higher (307.2 μmol $gram^{-1}$ of defatted seed meal) than Cutlass (213.7 μmol $gram^{-1}$ of defatted seed meal) (Table 1). The primary glucosinolate in Pacific Gold seed meal is 2-propenyl glucosinolate, accounting for over 99% of the total glucosinolate content (Table 2).

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Table 1. 2-propenyl glucosinolate of defatted seed meal from Pacific Gold and Cutlass grown at Moscow, Idaho and Genesee, Idaho, planted in 2003 and 2004.

		2004		2003	
Cultivar	Average	Moscow	Genesee	Moscow	Genesee
	---------- μmol gram^{-1} defatted seed meal ----------				
Pacific Gold	307.2	309.4	306.5	300.4	312.6
Cutlass	213.7	206.6	215.6	209.5	223.0
LSD 5%	3.08	3.97	1.48	12.37	2.17

Table 2. Seed meal glucosinolate profile and total glucosinolate content of Pacific Gold Foundation Seed. Values presented were based on 50 different seed samples taken from the Foundation Seed lot.

Cultivar	Allyl†	But	Pent	Hybut	Hypent	Phen	Total
	---------- μmoles gram^{-1} defatted seed meal ----------						
Pacific Gold	300.9	1.3	0.1	0.1	0.3	0.2	302.9
s.e. mean	4.53	0.26	0.00	0.00	0.14	0.43	4.79

† Allyl = 2-propenyl glucosinolate; But = 3-butenyl glucosinolate; Pent = 4-pentenyl glucosinolate; Hybut = 2-hydroxy-3-butenyl glucosinolate; Hypent = 2-hydroxy-4-pentenyl glucosinolate; Phen = 2

Table 3a. Seed yield of Pacific Gold and Cutlass evaluated from replicated field trials conducted between 1996 and 2002. The number of locations (sites) where cultivars were evaluated in each of the years is shown in parenthesis.

Cultivar	Grand Mean	2002 (7 sites)	2001 (8 sites)	2000 (8 sites)	1999 (9 sites)	1998 (2 sites)	1997 (2 sites)	1996 (2 sites)
	---------- kg ha^{-1} ----------							
Pacific Gold	1974	1499	2182	1833	2114	1749	3802	2128
Cutlass	1795	1159	2017	1686	1907	1571	3603	1980
LSD 5%	108.3	111.8	93.6	161.9	87.3	131.1	108.4	77.7

Table 3b. Seed yield of Pacific Gold and Cutlass evaluated from replicated field trials conducted between 2003 and 2009. The number of locations (sites) where cultivars were evaluated in each of the years is shown in parenthesis.

Cultivar	Grand Mean	2009 (10 sites)	2008 (11 sites)	2007 (9 sites)	2006 (9 sites)	2005 (11 sites)	2004 (12 sites)	2003 (8 sites)
	---------- kg ha^{-1} ----------							
Pacific Gold	1,802	1,965	1,518	1,971	1,950	1,910	2,077	1,071
Cutlass	1,559	1,684	1,352	1,808	1,684	1,719	1,673	876
LSD 5%	87.3	125.6	112.3	100.8	98.6	63.2	69.3	103.6

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

OBJECTIVE DESCRIPTION OF VARIETY INDIAN MUSTARD (*Brassica juncea*)

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
Idaho Agricultural Experiment Station	UI.BJ.18.Y.11	Pacific Gold

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

University of Idaho

Moscow, Idaho, 83844-2339

FOR OFFICIAL USE ONLY

PVPO NUMBER

#200300202

1. SPECIES

Brassica juncea L.

2. TYPE

* X Spring type ____ Winter type

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

1 4 9 . 9 cm Tall (compare to standard variety below)

___ ___.___ cm shorter than Check variety: _____/_____

Height same as Check variety: _____/_____

___ 4 . 2 cm taller than Check variety: Cutlass

* Height Class: 4

1 = Short ( )
2 = Medium short ( )
3 = Medium ( )
4 = Medium tall (X)
5 = Tall ( )

4. STEM ANTHOCYANIN

1 1 = Absent (1) 2 = Weak ( ) 3 = Medium ( ) 4 = Strong ( )

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

3 1 = Narrow ( ) 2 = Medium ( ) 3 = Broad ( )

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

1 1 = Upright 2 = Prostrate (short photoperiod)

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7. LEAVES

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

* 5 Lobing (fully developed leaf on plant or rosette)
  1 = Absent or very weak ( ) 2 = Weak ( ) 3 = Medium ( )
  4 = Medium Strong ( ) 5 = Strong ( )

* 3 Leaf Attachment to Stem: 1 = Fully clasping ( ) 2 = Partial clasping ( ) 3 = No Clasping (X)

* 2 Color: 1 = Light green ( ) 2 = Medium green (X) 3 = Medium dark green ( ) 4 = Dark green ( )

* 1 Glaucosity: 1 = Absent (X) 2 = Weak ( ) 3 = Weak to Medium ( ) 4 = Medium ( ) 5 = Medium to strong ( ) 6 = Strong ( )

8. FLOWERS

* 1 Flower Buds Location 1 = Buds at tip of apical meristem (X) 2 = Buds immediately below apical meristem ( )

* 2 Petal color: 1 = Pale yellow ( ) 2 = Yellow (X) 3 = Orange ( ) 4 = White ( )

1 Anther Dotting (at opening of flower; given as percentage:____)
1 = Absent (X) 2 = Few ( ) 3 = Medium ( ) 4 = Many ( )

* 3 Flowering class (Spring sown)
  1 = Very early ()
  2 = Early ()
  3 = Medium early (X)
  4 = Medium late ( )
  5 = Late ()
  6 = (Very late)

9. **PODS** (Slique)

* 1 Pod type: 1 = Bilateral single pod (X) 2 = Other ( )

* 2 Silique beak length: 1 = Short ( ) 2 = Medium (X) 3 = Long ( )

* 2 Pod length; (give length: 37.8 mm) 1 = Short ( ) 2 = Medium (X) 3 = Long ( )

* 2 Pod width; (give width: 4.2 mm) 1 = Narrow ( ) 2 = Medium (X) 3 = Wide ( )

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

* 2 Pedicel length: 1 = Very short ( ) 2 = Short (X) 3 = Long ( )

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

* 105 Days to Maturity

* / Days earlyier than Check variety: _____ / _____

* Maturity same as Check variety: _____ / _____

* 2 Days later than Check variety: Cutlass

10. SEEDS

* 2.6 g/1000 unsized seed

* 0.3 g less than Check variety: Cultass

* Weight same as Check variety: _____ / _____

* / g more than Check variety: _____ / _____

* 3 Weight Class (grams): 1 = less than 2.0 ( ) 2 = 2.0 – 2.5 ( ) 3 = 2.5-3.0 (X) 4 = more than 3.0 ( )

* 2 Seeds Per Pod: (give number: 16.1 per pod): 1 = Low ( ) 2 = Medium (X) 3 = High ( )

* 4 Testa Color: 1 = Brown () 2 = Reddish-brown ( )
  3 = Yellow ( ) 4 = Orange/yellow (X)
  5 = Other _____

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11. CHEMICAL COMPOSITION OF SEED

* 2 Euric Acid: 1 = Low (less than 2%) 2 = Intermediate (2-50%) 3 = High (more than 50%): (given as 250 gram/kg of seed oil)

* 3 Glucosinate Content; (give: 302.9 µmol/gram defatted seed meal)
  1 = Low – less than 30 µmol/gram defatted seed meal ( ) 2 = Moderatly high 30-150 µmol/gram defatted seed meal;
  3 = High – More than 150 µmol/gram defatted seed meal

* 35.0 % Oil

29.8 % 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
* 2	3	17	22	13	12	25

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

* 4 Tolerance: 1 = Not hardy – susceptible ( ) 2 = Moderately suscesptible ( ) 3 = Moderately resistant (X) 4 = Hardy ( )

13. LODGING RESISTANCE

* 4 Resistance: 1 = Weak ( ) 2 = Moderately weak ( ) 3 = Moderately strong ( ) 4 = Strong ( )

14. HERBICIDE RESISTANCE

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

* ___ Other _____: 1 = Suscept ( ) 4 = Hardy ( )

* X None

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)

Pacific Gold is the first Indian mustard (*B. juncea*) PVP application in the USA. The major distinguishing characteristic of this cultivar is high seed meal glucosinolate (mainly allyl glucosinolate) content in the seed meal which gives Pacific Gold a quality advantage over other cultivars.

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 _____.

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'Pacific Gold'
Condiment India Mustard
(*Brassica juncea* L.)

Exhibit D: Additional Description of Variety

Pacific Gold seedlings have small-medium size cotyledons and a semi-upright seedling growth habit at the rosette stage. Leaves are light-mid green in color with very slight glaucosity. Leaves are pointed and leaf margins have a strong serration. Fully developed leaves have moderate to strong lobing, and leaf attachment to the main stem shows no clasping (Figure 1). Flower buds appear at the tip of the aprical meristem (Figure 1). Flowers open medium-early (54 days after planting). Petals are bright yellow, and anther dotting is absent. Bilateral single pods (siliques) are semi-erect to erect. Pod length and width is short-medium (37.8 mm long and 4.1 mm wide) with long pedicel length (13.5 mm) and short pod beak (8.48 mm). Pods contain a low number (16.12 seeds pod^{-1}) of bright yellow/orange seeds.

Plants of Pacific Gold emerge quickly after planting and crop establishment is rapid. Pacific Gold plants reached 50% bloom on average 54 days after planting. After flower end, Pacific Gold plants were 150 cm tall. Pacific Gold is highly resistant to lodging and seed shatter at maturity. Plants are mature on average 105 days after planting. Pacific Gold seeds were 2.602 g 1000 seed $weight^{-1}$ and contained 350 g kg^{-1} oil. Pacific Gold is moderately resistant to cabbage flea beetle (*Phyllotreta cruciferae* (*Phyllotreta cruciferae* (Goeze) (Coleoptera: Chrysomelidae)) and cabbage seedpod weevil (*Ceutorhynchus assimilis* Paykull), and diamondback moth (*Plutella xylostella* L.).

Pacific Gold was evaluated in replicated field trials grown throughout the dryland agricultural regions of northern Idaho, eastern Washington, and eastern Oregon between 1996 and 2002, and since PVP submission has continued to be evaluated throughout the inland northwest region in the Pacific Northwest Mustard Variety Trials from 2003 to 2010. Pacific Gold is the first condiment India condiment mustard (*Brassica juncea* L.) to be developed for the Pacific Northwest region and no local cultivars are available for comparison. Pacific Gold is also the first India mustard cultivar to apply for PVP protection in the USA. Performance of Pacific Gold was compared to the Canadian cultivar Cutlass. Cutlass has not been grown commercially in the Pacific Northwest region of the USA. However, this cultivar represents the majority of the Canadian India mustard acreage and is predominant in this mustard class worldwide.

Seed yield potential of Pacific Gold in the inland Pacific Northwest region is excellent. In field trials between 1996 and 2002, Pacific Gold average seed yield over 38 sites/years was 1,974 kg ha^{-1}, which was significantly higher than Cutlass (1,795 kg ha^{-1}) (Table 6a). Seed yield of Pacific Gold since 2002 continued to be exceptional. When compared at 70

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year/sites between 2003 and 2010 Pacific Gold seed yield was 1,802 kg ha^{-1}, which was significantly higher than that for Cutlass (1,559 kg ha^{-1}).

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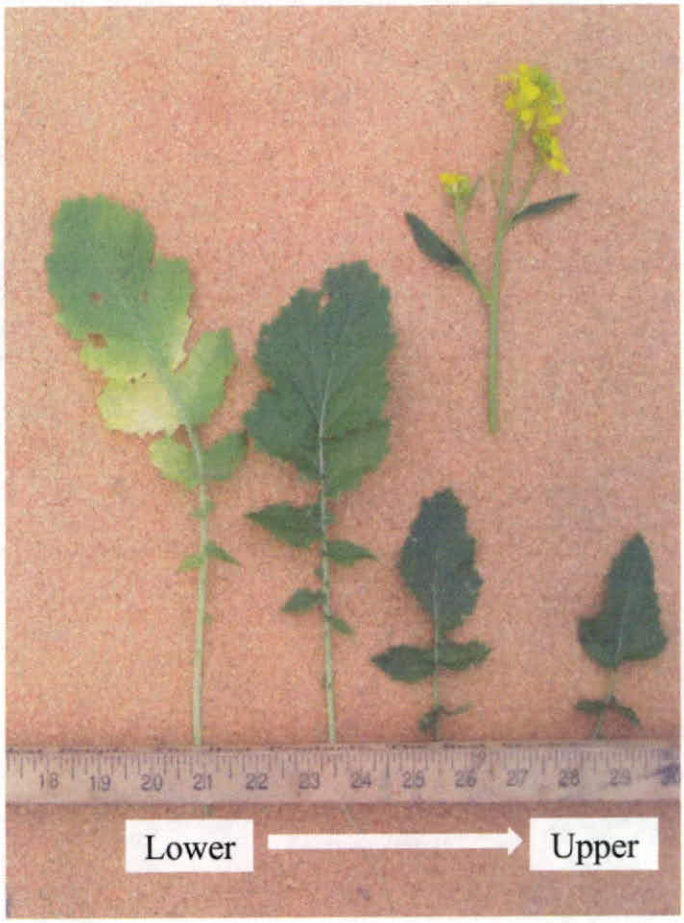
Figure 1. Leaves from lower to upper part of the plant and flowers and flower buds from Pacific Gold.



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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

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
Idaho Agricultural Experiment Station	UI.BJ.18.Y.11	Pacific Gold
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)*
University of Idaho Moscow, Idaho 83844-2339	(208) 885-7173	(208) 885-6654
(bt: 8/6/2010)	**7. PVPO NUMBER** 200300202	

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

200300202

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? **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)?
[X] 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?
[X] 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)*:

This cultivar was developed entirely at the University of Idaho.

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 USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provide and employer.

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