

No.



201400312

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

The U.S. Government, as represented by  
the Secretary of Agriculture

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.)

CHICKPEA

'Nash'

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 thirtieth day of March, in the year two thousand and fifteen.*

Attest:

REPRODUCED LOCALLY. Includes form number and date on all reproductions.

Form Approved - OMB No. 0591-0015

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  The U. S. Government as represented by the Secretary of Agriculture		2. TEMPORARY DESIGNATION OR  CA04900843C	3. VARIETY NAME  Nash
4. ADDRESS (Street and No., or R. F.D. No., City, State, and ZIP Code, and Country)  1400 Independence Ave., SW Washington D.C. 20250		5. TELEPHONE (include area code)  (301) 504- 6905	FOR OFFICIAL USE ONLY  PVPO NUMBER  201400312
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) U.S. Government		9. IF INCORPORATED, GIVE STATE OF INCORPORATION  N/A	FILING DATE  4/30/2014
		6. FAX (include area code)  (301)504-5060	
		8. DATE OF INCORPORATION  N/A	

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

George Vandemark  
USDA/ARS  
Grain Legume  
Genetics and  
Physiology Unit  
305 Johnson Hall  
Washington State  
University Pullman,  
WA 99164

Mojdeh Bahar  
USDA, ARS, OTT

6601 Sunnyside Ave.  
Beltsville, MD 20705-5131

FILING AND EXAMINATION FEES:


F	
E	
S	\$
R	DATE
E	
C	CERTIFICATION FEE:
E	\$
I	
V	DATE
E	
D	

11. TELEPHONE (include area code) 1-609-335-7728	12. FAX (include area code) 1-509-335-7892	13. E-MAIL George.vandemark@ars.usda.gov
14. CROP KIND (Common Name) Chickpea	16. FAMILY NAME (Botanica) Fabaceae	18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) 0 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 Cicer ardentinum L	17. IS THE VARIETY A FIRST GENERATION HYBRID? 0 YES X NO	20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD 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) X NO (If "no", go to item 23)
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow Instructions on reverse)		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? 0 YES x NO IF YES, WHICH CLASSES? 0 FOUNDATION 0 REGISTERED 0 CERTIFIED
<input checked="" type="checkbox"/> X Exhibit A. Origin and Breeding History of the Variety <input checked="" type="checkbox"/> X Exhibit B. Statement of Distinctness <input checked="" type="checkbox"/> X Exhibit C. Objective Description of Variety <input checked="" type="checkbox"/> X Exhibit D. Additional Description of the Variety (Optional) <input checked="" type="checkbox"/> X Exhibit E. Statement of the Basis of the Owner(s) Ownership <input checked="" type="checkbox"/> X Exhibit F. Declaration Regarding Deposit <input type="checkbox"/> Voucher Sample (3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) <input type="checkbox"/> Filing and Examination Fee (\$4,382), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? 0 YES x NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS 0 FOUNDATION 0 REGISTERED 0 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? 0 YES X 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)? 0 YES X NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)

MAH  
8-18-2014

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 Mojdeh Bahar	NAME (Please print or type)

REPRODUCED LOCALLY. Include form number and date on all reproductions.

Form Approved - OMB No. 0511-0035

CAPACITY OR TITLE Assistant Administrator, ARS	DATE	CAPACITY OR TITLE DATE
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(See reverse for instructions and information collection burden statement)

ST-410 (02-06) designed by the Plant Variety Protection Office using Word 2003.



**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.*)

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).*)

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*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.*

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

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

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ST-470 (02-06) designed by the Plant Variety Protection Office using Word 2003.

## Exhibit A. Origin and Breeding History of Nash

### 1. The genealogy and breeding method.

Nash was developed using a modified bulk-pedigree system of breeding. It is derived from a F<sub>5</sub> selection from the cross HB-19/CA9783142 (cross # X00C015). HB-19 is a fern-leaf type chickpea that has resistance to *Ascochyta* blight and CA9783142 is a simple-leaf type kabuli chickpea breeding line that flowers early and produces large seed. The cross was made in the greenhouse in 2000. A single F<sub>1</sub> plant was grown in the field in 2001 and all the seed from this plant was harvested as a single F<sub>2</sub> bulk. The F<sub>3</sub> and F<sub>4</sub> bulk populations were produced in the field during 2002 and 2003, respectively. Harvested F<sub>3</sub> and F<sub>4</sub> seed was cleaned using a 24/64 round-holed top screen and a 14/64 round-holed bottom screen to remove foreign matter and inferior seed. Single seeds from the F<sub>4</sub> bulk were grown in the greenhouse during 2003-2004. Each plant was harvested separately and the F<sub>5</sub> progeny rows were grown in the field at Pullman, WA in 2004. Plot number 0843C was selected in the field based on its large seed size and was assigned selection number CA04900843C.

### 2. Details of subsequent selection and multiplication.

Nash was grown in the F<sub>6</sub> and F<sub>7</sub> generation as a single plot in a non-replicated observation trial in 2005 and 2006 at the Washington State University Spillman Research Farm located in Pullman, WA. In 2007 Nash was grown in a replicated preliminary yield trial at the Washington State University Spillman Research Farm. It has been evaluated in replicated yield trials that have included advanced breeding lines and check cultivars in Washington and Idaho during 2008 through 2013. It was evaluated for reaction to *Ascochyta* blight in a disease nursery at Pullman,

WA during 2008-2013. A range of agronomic traits including seed size, days to maturity, plant height, and days to 50% flower were determined for Nash and other chickpea breeding lines and cultivars by measuring these traits across replicated plots contained in yield trials conducted during 2008-2013 in Pullman, WA.

### 3. Evidence of uniformity and stability.

Nash has been observed to be uniform and stable. From the F<sub>9</sub> generation (2008) through its release as a variety in 2013, uniformity and stability were evaluated each year in replicated yield trials conducted across multiple locations each year. Nash was evaluated in 30 yield trials in WA and ID during 2008-2013 and found to be uniform and stable over these trials, for a total of six generations.

### 4. Type and frequency of variants.

During the 2013 growing season plots of Nash sown in several locations in WA and ID were examined and no plants with simple leaves (off-type) were detected. Agronomic traits and yield of Nash varied across locations, although this is not unexpected for an indeterminate species such as chickpea, and metric traits are invariably conditioned in part by components of environmental variance.

## Exhibit B

## Statement of Distinctness of Nash

Nash is a café kabuli chickpea that has compound leaves and produces exceptionally large seed. Nash is most similar to the cultivars Sierra, and Sawyer. Results from six years of field evaluations (2008-2013) demonstrate that Nash produces larger seed than either Sierra or Sawyer, with 100 seeds of Nash weighing significantly more than 100 seeds of either cultivar (Table 1). The concentrations in seed of several important dietary minerals was determined for ARS advanced chickpea breeding lines and popular chickpea cultivars over three different field environments per year for two years (2010 and 2011). These results indicate that Nash has significantly higher seed concentration of Calcium (Ca) than Sierra and Sawyer (Table 2). Genetic diversity among ARS advanced chickpea breeding lines and popular chickpea cultivars was determined using publically disclosed and cited simple sequence repeat (SSR, microsatellite) primers (Table 3) to generate molecular polymorphisms (Table 4). These results indicated that Nash has different genotypes for several SSR loci than Sierra and Sawyer.

Table 1. Means comparisons between Nash, Sierra, and Sawyer for weight (g) of 100 seeds over six years of field trials (2008-2012) conducted at the Washington State University Spillman Research Farm (Pullman, WA).

Entry	100 Seed Weight (g) <sup>†</sup>					
	2008	2009	2010	2011	2012	2013
Nash	62.7 a	60.7 a	52.4 a	67.4 a	58.3 a	56.6 a
Sierra	53.6 b	52.6 b	49.2 ab	54.1 b	54.5 b	49.8 b
Sawyer	44.2 c	42.4 c	43.5 b	44.5 c	43.6 c	41.6 c
LSD ( $\alpha = 0.05$ )	2.1	4.4	7.9	3.3	3.5	6.4

<sup>†</sup>For each plot (3 plots entry<sup>-1</sup> year<sup>-1</sup>) 100 seeds were counted and weighed.



Table 2. Means comparisons between Nash, Sierra, and Sawyer for seed concentrations of Calcium (Ca)<sup>†</sup>.

Entry	2010			2011		
	Kendrick, ID	Genesee, ID	Pullman, WA	Kendrick, ID	Genesee, ID	Pullman, WA
Nash	1.21 a	0.97 a	1.21 a	1.44 a	1.53 a	1.45 a
Sierra	0.88 b	0.86 a	0.82 b	0.82 b	1.08 b	0.95 b
Sawyer	0.90 b	0.96 a	0.90 b	0.90 b	1.05 b	1.00 b
LSD <sub><math>\alpha=0.05</math></sub>	0.23	NS <sup>‡</sup>	0.17	0.19	0.23	0.16

<sup>†</sup>Mineral concentrations were determined for a 50 g sample from each plot (3 plots entry<sup>-1</sup> location<sup>-1</sup>).

Results are based on field trials conducted at Kendrick, ID, Genesee, ID, and Pullman, WA in 2010 and 2011 (six location-years).

<sup>‡</sup>NS = Not significant.

Table 3. Characteristics of primer pairs used to amplify polymorphic SSR loci in kabuli chickpea breeding lines and cultivars.

SSR Locus	Forward Primer (5'→3')	Reverse Primer (5'→3')	Repeat	Citation
TA113	TCTGCAAAAACCTATTA CGTTAATACCA	TCTGCAAAAACCTATTAC GTTAATACCA	(TAA) <sub>26</sub>	Winter et al. 1999. <sup>†</sup>
TA116	AATTCAATGACGAATT TTTATAAGGG	AAAAAGAAAAGGGAAA AGTAGGTTTTA	(TAA) <sub>5</sub> TT(A) <sub>3</sub> (TAA) <sub>20</sub>	Winter et al. 1999.
TR2	GGCTTAGAGTTCAAA GAGAGAA	AACCAAGATTGGAAGTT GTG	(TTA) <sub>36</sub>	Winter et al. 1999.
TAA58	CATTGCTTAAGAACCA AAATGCAA	TTTACATCGACGTGTG C	(AAT) <sub>41</sub>	Winter et al. 1999.
NCPGR12	CCTTGTTAGTGTGTAT AGGT	GTAATGACCAAGTGAAC A	(CT) <sub>35</sub>	Sethy et al. 2003 <sup>‡</sup> .

<sup>†</sup>Winter et al. 1999. Characterization and mapping of sequence-tagged microsatellite sites in the chickpea (*Cicer arietinum* L.) genome. Mol. Gen. Genet. 262:90-101.

<sup>‡</sup>Sethy et al. 2003. Isolation and characterization of sequence-tagged microsatellite sites markers in chickpea (*Cicer arietinum* L.) Mol. Ecol. Notes 3:428-430.

Table 4. Genotypes<sup>†</sup> of Nash, Sierra and Sawyer at polymorphic SSR loci.

SSR Locus	Nash	Sierra	Sawyer
TA113	226//226	223//223	Not determined
TA116	201//201	164//201	Not determined
TR2	246//252	243//246	246//246
TAA58	309//309	333//333	287//287
NCPGR12	278//278	248//248	248//248

<sup>†</sup>Numbers refer to the length (bp) of amplicons generated with each SSR primer pair.

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

Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY

~~Pea (*Pisum sativum* L.)~~ Chickpea (*Cicer arrietinum*)

NAME OF APPLICANT (S) <b>George J. Vandemark</b>	TEMPORARY OR EXPERIMENTAL DESIGNATION <b>CA04900843C</b>	VARIETY NAME <b>Nash</b>
ADDRESS (Street and No. or RD No., City, State, Zip Code and Country) 303 Johnson Hall Washington State University Pullman, WA 99164  Email:		FOR OFFICIAL USE ONLY  PVPO NUMBER  <b>201400312</b>

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g.,  or ) when the number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: \_\_\_\_\_ . Please answer all questions for your variety; lack of response may delay progress of your application.

1. TYPE:

1 = Garden      2 = Field      3 = Edible-pod      4 = Other (Specify) \_\_\_\_\_

2. MATURITY:

Node Number of First Bloom:       No. of Days Processing       Heat Units

No. of Days Earlier Than       }      1 = Alaska      2 = Thomas Laxton WR      3 = Little Marvel

Days Same As       }      4 = Wando      5 = Alderman WR      6 = Australian Winter

No. of Days Later Than       }      7 = Other (Specify) Sierra

3. PLANT HEIGHT:

cm High

cm Shorter Than       Name of Check Cultivar Sierra

Same As       Same as Check Cultivar \_\_\_\_\_

cm Taller Than       Name of Check Cultivar \_\_\_\_\_

4. VINE:

Habit:      1 = Determinate      2 = Indeterminate

Branching:      1 = None (Alaska)      2 = 1-2 Branches (Little Marvel)      3 = More than 2 Branches (Dwarf Gray Sugar)

Internodes:      1 = Straight      2 = Zig Zag

Stockiness:      1 = Slim (Alaska)      2 = Medium (Thomas Laxton WR)      3 = Heavy (Alderman)

Total Number of Nodes

5. LEAFLETS:

2 Color: 1 = Light Green (Alaska WR) 2 = Medium Green (Thomas Laxton WR) 3 = Dark Green (Alderman)  
4 = Other (Specify) \_\_\_\_\_ 5 = Blue Green 6 = Yellow Green 0 = Not Applicable

1 Wax: 1 = None 2 = Light 3 = Medium 4 = Heavy 0 = Not Applicable

1 Molding: 1 = Not Marbled 2 = Marbled (Alaska) 0 = Not Applicable

1 Number of Leaflet Pairs: 1 = Not Paired 2 = One 3 = Two 4 = Three or More 0 = Not Applicable

4 Leaflet Type: 1 = Leafless 2 = Semi 3 = Normal 4 = Pinnate

6. STIPULES:

2 1 = Lacking 2 = Present  1 1 = Not Clasping 2 = Clasping  1 1 = Not Marbled 2 = Marbled

1 Size (Compared with Leaflets): 1 = Smaller 2 = Same 3 = Larger 0 = Not Applicable

2 Color (Compared with Leaflets): 1 = Lighter 2 = Same 3 = Darker 0 = Not Applicable

0 Color: 1 = Light Green 2 = Medium Green 3 = Dark Green 4 = Blue Green 5 = Yellow Green 0 = Not Applicable

Color Chart Value: \_\_\_\_\_ Select the Color Chart Used to Determine the Values:  
 Royal Horticulture Society Colour Chart  
 Munsell Color Chart  
 Other \_\_\_\_\_

Stipule Size: 1 = Small 2 = Medium 3 = Large

Please Provide Comparative Varieties (Check Varieties) and Stipule Color

	Variety (1)	Variety (2)	Variety (3)
Variety Name:	_____	_____	_____
Stipule Size:	_____	_____	_____
Color:	_____	_____	_____
Color Chart Value:	_____	_____	_____

7. FLOWER COLOR:

1 Venation  1 Standard  1 Wing  1 Keel

1 = White 2 = Greenish 3 = Lavender 4 = Purple 5 = Red 6 = Other (Specify) \_\_\_\_\_

8. PODS:

1 Shape: 1 = Straight 2 = Slightly Curved 3 = Curved

2 End: 1 = Pointed (Alderman) 2 = Blunt (Alaska)

1 Color: 1 = Light Green (Alaska WR) 2 = Medium Green 3 = Dark Green (Alderman)  
4 = Other (Specify) \_\_\_\_\_ 5 = Blue 6 = Purple 7 = Yellow

2 Surface: 1 = Smooth 2 = Rough  2 Surface: 1 = Shiny 2 = Dull

1 Borne: 1 = Single 2 = Double 3 = Single and Double 4 = Single, Double & Triple 5 = Double & Triple  
6 = Triple 7 = Other (Specify) \_\_\_\_\_ 8 = Quad, Single, Double, Triple 9 = Quad

0 3 cm Length  1 5 mm Width (Between Sutures)  0 1 No. Seeds Per Pod

9. SEEDS: (95-100 Tenderometer)

4 Color: 1 = Light Green 2 = Green 3 = Dark Green 4 = Other (Specify) Beige  
5 = Yellow 6 = Brown 7 = Yellow Green

Seive: %

	1	2	3	4	5	6	7	8	Average
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



9. SEEDS: (cont.) (Dry-Mature)

- 4 Shape: 1 = Flattened 2 = Angular 3 = Oval 4 = Rounded
- 2 Surface: 1 = Smooth 2 = Dimpled 3 = Wrinkled 2 Luster: 1 = Shiny 2 = Dull
- 1 Color Pattern: 1 = Monocolor 2 = Mottled 3 = Striped 4 = Dotted
- 1 Primary Color: } 1 = Creamy White 2 = Cream & Green 3 = Light Green 4 = Medium Green  
14 Secondary Color: } 5 = Dark Green 6 = Blue Green 7 = Yellow 8 = Brown  
 9 = Red 10 = Gray 11 = Black 12 = Salmon  
 13 = Purple 14 = Tan 15 = White 16 = Pink  
 17 = Yellow Green
- 2 Hilum Color: 1 = White 2 = Tan 3 = Black
- 2 Cotyledon Color: 1 = Green 2 = Yellow 3 = Orange 4 = Cream
- 6 0 Grams per 100 Seeds

10. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Moderately Resistant, 4 = Moderately Susceptible, 5 = Tolerant)

- |   |   |
|---|---|
| <input type="checkbox"/> 0 Fusarium Wilt – Race 1 | <input type="checkbox"/> 0 Fusarium Wilt (Near Wilt) – Race 2 |
| <input type="checkbox"/> 3 Ascochyta Blight       | <input type="checkbox"/> 0 Common Mosaic                      |
| <input type="checkbox"/> 0 Bacterial Blight       | <input type="checkbox"/> 0 Pea Enation Mosaic Virus           |
| <input type="checkbox"/> 0 Downy Mildew           | <input type="checkbox"/> 0 Seedborne Mosaic Virus             |
| <input type="checkbox"/> 0 Powdery Mildew         | <input type="checkbox"/> 0 Yellow Bean Mosaic Virus           |
| <input type="checkbox"/> 0 Other (Specify) _____  | <input type="checkbox"/> 0 Leaf Roll Virus                    |
| <input type="checkbox"/> 0 Other (Specify) _____  | <input type="checkbox"/> 0 Other (Specify) _____              |

11. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Moderately Resistant, 4 = Moderately Susceptible, 5 = Tolerant)

- 0 Aphids 0 Other (Specify) \_\_\_\_\_

12. Additional information on any item above, or general comments that may aid in identification:

1. Seed size of Nash is significantly larger than Sierra based on two different measures of seed size. The 100 seed weight of Nash across five years of yield trials was 59.7 g, which was significantly ( $P = .05$ ) greater than Sierra (52.3 g). It was also found using two years of data collected across six location-years that 39% of seed of Nash would stay on top of a 9.9 mm round-hole screen, which was significantly greater ( $P = .05$ ) than Sierra (23%).

2. Nash has pinnate ('fern-type' or 'compound') leaves that have pairs of toothed leaflets along the rachis, similar to the great majority of chickpea accessions, lines, and cultivars, unlike Sierra, which has unifoliate ('simple') leaves that do not have any defined rachis or leaflets.

## Exhibit D. Additional Description of Nash.

Table 1. Seed yields (kg ha<sup>-1</sup>) of Nash, Sierra, and Sawyer and trial means for 18 yield trials conducted by the USDA-ARS across five years (2008-2013) in Idaho and Washington.

Year	Location	Nash	Sierra	Sawyer	± Trial Mean <sup>1</sup>	± LSD <sub>(0.05)</sub>
2008	Genesee, ID	1149	730	1192	960	738
2008	Waitsburg, WA	1344	1522	1626	1420	528
2008	Pullman, WA	1820	1530	1287	1491	379
2009	Genesee, ID	1544	1132	1488	1258	639
2009	Kendrick, ID	1520	1328	1527	1469	279
2009	Pullman, WA	1742	1404	1509	1549	411
2010	Genesee, ID	896	631	930	763	204
2010	Kendrick, ID	1637	1262	1416	1444	216
2010	Pullman, WA	1039	836	995	923	233
2011	Genesee, ID	2194	1947	2232	2296	661
2011	Kendrick, ID	1905	1789	1953	1906	239
2011	Pullman, WA	3116	2397	2610	2770	528
2012	Dayton, WA	1424	627	1075	1028	462
2012	Genesee, ID	2251	2094	2374	2547	592
2012	Kendrick, ID	1692	1308	1199	1509	319
2012	Pullman, WA	1982	1985	1901	1860	453
2013	Dayton, WA	1456	1256	1533	1291	323
2013	Pullman, WA	2280	1998	2206	2271	367
	Grand Mean	1722	1432	1597	1598	

<sup>1</sup>Mean grain yield for all entries that were in each trial.

REPRODUCE LOCALLY. Include form number and edition date on all reproductions.

FORM APPROVED - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

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

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

1. NAME OF APPLICANT(S)

The U. S. Government as represented by The Secretary of Agriculture

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

CA04900843C

3. VARIETY NAME

Nash

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)

7. PVPO NUMBER

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

YES

NO

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

YES

NO

10. Is the applicant the original owner?

YES

NO

If no, please answer one of the following:

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

YES

NO

If no, give name of country

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

YES

NO

If no, give name of country

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

**PLEASE NOTE:**

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

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S.-based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

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

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3772 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

ST470-E (07-09) designed by the Plant Variety Protection Office

**REPRODUCE LOCALLY.** Include form number and date on all reproductions. Form Approved OMB NO 0581-0055  
 According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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

**EXHIBIT F  
 DECLARATION REGARDING DEPOSIT**

NAME OF OWNER (S)  The U. S. Government as represented by The Secretary of Agriculture	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country)	TEMPORARY OR EXPERIMENTAL DESIGNATION CA04900843C
		VARIETY NAME Nash
NAME OF OWNER REPRESENTATIVE (S)	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country)	FOR OFFICIAL USE ONLY
		PVPO NUMBER

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.

George Vandenberg  
Signature

4/14/14  
Date