

No.

8900190



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**Rogers NK Seed Co.**

Whereas, THERE HAS BEEN PRESENTED TO THE  
**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED 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 *eighteen* 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 USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BEAN

'D83043'

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 28th day of February in the year of our Lord one thousand nine hundred and ninety-two.

Attest:

*Kenneth Evans*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*Edward Madigan*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0681-0065

**APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE**

(Instructions 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)<br>Rogers <del>Brothers</del> Seed Company   |  | 2. TEMPORARY DESIGNATION<br>D83043             | 3. VARIETY NAME<br>Hunter<br>D83043   |
| 4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code)<br>P.O. Box 4727<br>Boise, Idaho 83711                          |  | 5. PHONE (Include area code)<br>(208) 322-7272 | FOR OFFICIAL USE ONLY<br>VPPO NUMBER<br>8900190   |
| 6. GENUS AND SPECIES NAME<br>Phaseolus vulgaris  | 7. FAMILY NAME (Botanical)<br>Leguminosae  |  | FILING DATE<br>Apr 19, 1989<br>TIME<br><input type="checkbox"/> A.M. <input type="checkbox"/> P.M.                                    |
| 8. KIND NAME<br>Dry Edible Bean  | 9. DATE OF DETERMINATION<br>September 1988 |  | FEE RECEIVED<br>AMOUNT FOR FILING<br>\$ 1800.00<br>DATE<br>Apr 18, 1989<br>AMOUNT FOR CERTIFICATE<br>\$ 200.00<br>DATE<br>Dec 9, 1991 |
| 10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.)<br>Corporation |  |  | 12. DATE OF INCORPORATION<br>Feb. 25, 1975  |
| 11. IF INCORPORATED, GIVE STATE OF INCORPORATION<br>Delaware   |  |  |   |

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS  
Dr. Ronald Shellenberger  
Rogers Brothers Seed Company  
P.O. Box 4727  
Boise, Idaho 83711  
PHONE (Include area code): (208) 322-7272

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

- a.  Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- b.  Exhibit B, Novelty Statement.
- c.  Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)
- d.  Exhibit D, Additional Description of Variety.
- e.  Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) 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.)  
 Yes (If "Yes," answer items 16 and 17 below)  No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?  
 Yes  No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?  
 Foundation  Registered  Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?  
 Yes (If "Yes," give date)  
 No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?  
Sale of product for field trials only.  
 Yes (If "Yes," give names of countries and dates)  
 No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.  
The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is 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<br>Ronald Shellenberger - Pulse Marketing Dir. | DATE<br>3/30/89 |
| SIGNATURE OF APPLICANT<br>Allen E. Hill, V. PRES                      | DATE<br>3-31-89 |

**DRY EDIBLE BEAN**

**D83043**

**EXHIBIT A**

**ORIGIN AND BREEDING HISTORY**

The Navy bean D83043 was derived from the following cross pollination in the greenhouse during the spring of 1977:

W-95-4 x 7383-2-3-1

Details of selection and multiplication:

| <u>Year</u> | <u>Generation</u> | <u>Field Number</u> | <u>Bulk Harvest</u> | <u>No. of Single Plant Selections</u> |
|-------------|-------------------|---------------------|---------------------|---------------------------------------|
| Summer 1977 | F <sub>1</sub>    | D77-2163            | 90 g                |                                       |
| Summer 1978 | F <sub>2</sub>    | D78-1802            | 1,532 g             |                                       |
| Summer 1979 | F <sub>3</sub>    | D79-1533            |                     | 3                                     |
| Summer 1980 | F <sub>4</sub>    | D80-1064            |                     | 8                                     |
| Winter 1980 | F <sub>5</sub>    | GH 80-545           | 50 g                |                                       |
| Summer 1981 | F <sub>6</sub>    | D81-0990            |                     | 2                                     |
| Summer 1982 | F <sub>7</sub>    | D82-0974            | 880 g               | 2                                     |
| Summer 1983 | F <sub>8</sub>    | D83-0599            | 787 g               |                                       |
| Summer 1984 | F <sub>9</sub>    | D84-3033            | 62 lbs.             |                                       |
| Summer 1985 | F <sub>10</sub>   | D85-2433            | 574 lbs.            |                                       |
| Summer 1986 | F <sub>11</sub>   | D86-3120            | 770 lbs.            |                                       |

D83043 has been observed to be stable and uniform since the F<sub>8</sub> generation.

Stock D86-3120 has been increased to commercial size quantities. Seed Stock will be monitored for purity.

**DRY EDIBLE BEAN****D83043****EXHIBIT B****NOVELTY STATEMENT**

Our variety D83043 is most nearly like the variety Seafarer, however, it differs in the following areas:

1. D83043 has a Type IIB plant habit, whereas Seafarer has a Type IA plant habit.
2. D83043 has a longer pod and pod beak than Seafarer.
3. D83043 averages more seeds per pod than Seafarer.
4. D83043 has a taller plant than Seafarer.

POD LENGTHD83043

112 mm.  
107 mm.  
112 mm.  
114 mm.  
104 mm.  
113 mm.  
115 mm.  
104 mm.  
114 mm.  
116 mm.  
112 mm.  
114 mm.  
113 mm.  
99 mm.  
114 mm.  
110 mm.  
100 mm.  
106 mm.  
108 mm.  
101 mm.  
109.40

SEAFARER

92 mm.  
93 mm.  
88 mm.  
88 mm.  
93 mm.  
92 mm.  
78 mm.  
85 mm.  
87 mm.  
86 mm.  
92 mm.  
81 mm.  
80 mm.  
88 mm.  
88 mm.  
79 mm.  
83 mm.  
78 mm.  
85 mm.  
90 mm.  
86.30

Data file PVP83043  
 Title: PVP D83043 VS. SEAFARER

Function: ANOVA-1  
 Data case no. 1 to 40  
 Without selection

One way ANOVA grouped over variable 1  
 VARIETY  
 with values from 1 to 2

Variable 3  
 POD LENGTH

A N A L Y S I S   O F   V A R I A N C E   T A B L E

|         | Degrees of Freedom | Sum of Squares | Error Mean Square | F-value | Prob. |
|---------|--------------------|----------------|-------------------|---------|-------|
| Between | 1                  | 5336.1000      | 5336.10           | 195.54  | .000  |
| Within  | 38                 | 1037.0000      | 27.29             |         |       |
| Total   | 39                 | 6373.1000      |                   |         |       |

Coefficient of Variation= 5.34%

| Var.   | V A R I A B L E |          | No.     | 3     |      |
|--------|-----------------|----------|---------|-------|------|
| 1      | Number          | Sum      | Average | SD    | SE   |
| 1      | 20.00           | 2188.000 | 109.40  | 5.38  | 1.17 |
| 2      | 20.00           | 1726.000 | 86.30   | 5.06  | 1.17 |
| Total  | 40.00           | 3914.000 | 97.85   | 12.78 | 2.02 |
| Within |                 |          |         | 5.22  |      |

Bartlett's Test

Chi-square = 7.197975E-02  
 Number of Degrees of Freedom = 1  
 Approximate Significance = .7884

SEEDS PER POD

D83043

SEAFARER

5  
7  
8  
8  
6  
7  
7  
6  
7  
8  
7  
8  
7  
6  
6  
7  
6  
7  
7  
7  
6.85

6  
7  
1  
6  
6  
7  
5  
7  
6  
6  
5  
4  
5  
6  
6  
5  
5  
0  
3  
4  
5.00

Data file PVP83043  
 Title: PVP D83043 VS. SEAFARER

Function: ANOVA-1  
 Data case no. 1 to 40  
 Without selection

One way ANOVA grouped over variable 1  
 VARIETY  
 with values from 1 to 2

Variable 5  
 SEED PER POD

A N A L Y S I S    O F    V A R I A N C E    T A B L E

|         | Degrees of Freedom | Sum of Squares | Error Mean Square | F-value | Prob. |
|---------|--------------------|----------------|-------------------|---------|-------|
| Between | 1                  | 34.2250        | 34.22             | 16.56   | .000  |
| Within  | 38                 | 78.5500        | 2.07              |         |       |
| Total   | 39                 | 112.7750       |                   |         |       |

Coefficient of Variation= 24.27%

| Var.   | V A R I A B L E | No.     | 5       |      |      |
|--------|-----------------|---------|---------|------|------|
| 1      | Number          | Sum     | Average | SD   | SE   |
| 1      | 20.00           | 137.000 | 6.85    | 0.81 | 0.32 |
| 2      | 20.00           | 100.000 | 5.00    | 1.86 | 0.32 |
| Total  | 40.00           | 237.000 | 5.93    | 1.70 | 0.27 |
| Within |                 |         |         | 1.44 |      |

Bartlett's Test

Chi-square = 11.51129  
 Number of Degrees of Freedom = 1  
 Approximate Significance = .0006

POD BEAK LENGTHD83043SEAFARER

10 mm.

5 mm.

9 mm.

8 mm.

6 mm.

4 mm.

9 mm.

5 mm.

9 mm.

4 mm.

7 mm.

4 mm.

10 mm.

5 mm.

8 mm.

7 mm.

7 mm.

6 mm.

9 mm.

5 mm.

5 mm.

7 mm.

8 mm.

4 mm.

10 mm.

7 mm.

5 mm.

6 mm.

9 mm.

7 mm.

4 mm.

4 mm.

8 mm.

6 mm.

8 mm.

3 mm.

8 mm.

5 mm.

9 mm.5 mm.

7.90

5.35

Data file PVPB3043  
 Title: PVP D83043 VS. SEAFARER

Function: ANOVA-1  
 Data case no. 1 to 40  
 Without selection

One way ANOVA grouped over variable 1  
 VARIETY  
 with values from 1 to 2

Variable 6  
 SPUR LENGTH

A N A L Y S I S   O F   V A R I A N C E   T A B L E

|         | Degrees of<br>Freedom | Sum of<br>Squares | Error<br>Mean Square | F-value | Prob. |
|---------|-----------------------|-------------------|----------------------|---------|-------|
| Between | 1                     | 65.0250           | 65.02                | 26.76   | .000  |
| Within  | 38                    | 92.3500           | 2.43                 |         |       |
| Total   | 39                    | 157.3750          |                      |         |       |

Coefficient of Variation= 23.53%

| Var.   | V A R I A B L E |         |         | No.  | 6    |  |
|--------|-----------------|---------|---------|------|------|--|
| 1      | Number          | Sum     | Average | SD   | SE   |  |
| 1      | 20.00           | 158.000 | 7.90    | 1.74 | 0.35 |  |
| 2      | 20.00           | 107.000 | 5.35    | 1.35 | 0.35 |  |
| Total  | 40.00           | 265.000 | 6.63    | 2.01 | 0.32 |  |
| Within |                 |         |         | 1.56 |      |  |

Bartlett's Test

Chi-square = 1.212234  
 Number of Degrees of Freedom = 1  
 Approximate Significance = .2708

**OBJECTIVE DESCRIPTION OF VARIETY**  
 Dry Edible Bean (*Phaseolus vulgaris* L.)

|   |                   |                              |
|---|-------------------|------------------------------|
| NAME OF APPLICANT(S)<br>Rogers Brothers Seed Company  | EXPERIMENTAL NAME | VARIETY NAME<br>D83043       |
| ADDRESS (Street and No. or R.F.D. No., City, State, ZIP)<br>P.O. Box 4727<br>Boise, Idaho 83711 |                   | <b>FOR OFFICIAL USE ONLY</b> |
|   |                   | PVPO NO.<br><br>8900190      |

Provide data for all characters unless indicated as "optional." Place numbers in the boxes for the characters or numerical values which best describe this variety. Measured data should be the mean of an appropriate number of well spaced (15-20 cm) plants. The Royal Horticulture Society or any recognized color standard may be used to determine plant color. Designate the color system used below.

|   |  |   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|---|--|---|--------------|--|----------------|----------|--|-----------------|--------|--|-----------|----------|--|-----------|--------|--|--------------------|-------|--|---------------|-------|--|----------|------|--|---------------|-------|--|---------------------|----------|--|-----------------------|----------|--|-----------------|---------|--|----------------------|--|--|---|--|--|---|---|---|--|--|--|---|---|---|--|--|--|---|---|---|
| COLOR SYSTEM USED   | LOCATION OF THE TEST(S) TO EVALUATE THIS VARIETY<br>Twin Falls, Idaho  |   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
| <b>1. MARKET CLASS</b><br><br><table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">1</td> <td style="padding: 2px;"><b>CLASS</b></td> <td style="padding: 2px;"><b>CHECK</b></td> </tr> <tr> <td></td> <td>1 = Navy (Pea)</td> <td>Seafarer</td> </tr> <tr> <td></td> <td>2 = Small White</td> <td>Aurora</td> </tr> <tr> <td></td> <td>3 = Black</td> <td>Midnight</td> </tr> <tr> <td></td> <td>4 = Pinto</td> <td>UI-114</td> </tr> <tr> <td></td> <td>5 = Great Northern</td> <td>UI-59</td> </tr> <tr> <td></td> <td>6 = Small Red</td> <td>NW-59</td> </tr> <tr> <td></td> <td>7 = Pink</td> <td>Viva</td> </tr> <tr> <td></td> <td>8 = Cranberry</td> <td>UI-50</td> </tr> <tr> <td></td> <td>9 = Dark Red Kidney</td> <td>Montcalm</td> </tr> <tr> <td></td> <td>10 = Light Red Kidney</td> <td>Redkloud</td> </tr> <tr> <td></td> <td>11 = Yellow Eye</td> <td>Steuben</td> </tr> <tr> <td></td> <td>12 = Other (specify)</td> <td></td> </tr> </table> | 1  | <b>CLASS</b>  | <b>CHECK</b> |  | 1 = Navy (Pea) | Seafarer |  | 2 = Small White | Aurora |  | 3 = Black | Midnight |  | 4 = Pinto | UI-114 |  | 5 = Great Northern | UI-59 |  | 6 = Small Red | NW-59 |  | 7 = Pink | Viva |  | 8 = Cranberry | UI-50 |  | 9 = Dark Red Kidney | Montcalm |  | 10 = Light Red Kidney | Redkloud |  | 11 = Yellow Eye | Steuben |  | 12 = Other (specify) |  | <b>2. MATURITY</b><br><br><table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">2</td> <td colspan="2">1 = Early (80-90 days); 2 = Medium (90-100 days); 3 = Late (&gt;100 days)</td> </tr> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">9</td> <td style="border: 1px solid black; width: 30px; text-align: center;">7</td> <td>Days from planting to harvest maturity 6 year average</td> </tr> <tr> <td colspan="3">Physiological maturity (90% pods dry &amp; buckskin)</td> </tr> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">1</td> <td style="border: 1px solid black; width: 30px; text-align: center;">5</td> <td style="border: 1px solid black; width: 30px; text-align: center;">9</td> </tr> <tr> <td colspan="3">Heat units from planting to harvest maturity (optional). Specify base temperature used: 50°F</td> </tr> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">8</td> <td style="border: 1px solid black; width: 30px; text-align: center;">2</td> <td>Days from planting to harvest maturity of check variety (use check appropriate to market class shown in item 1)</td> </tr> </table> | 2 | 1 = Early (80-90 days); 2 = Medium (90-100 days); 3 = Late (>100 days) |  | 9 | 7 | Days from planting to harvest maturity 6 year average | Physiological maturity (90% pods dry & buckskin) |  |  | 1 | 5 | 9 | Heat units from planting to harvest maturity (optional). Specify base temperature used: 50°F |  |  | 8 | 2 | Days from planting to harvest maturity of check variety (use check appropriate to market class shown in item 1) |
| 1   | <b>CLASS</b>   | <b>CHECK</b>  |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 1 = Navy (Pea)   | Seafarer  |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 2 = Small White  | Aurora  |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 3 = Black  | Midnight  |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 4 = Pinto  | UI-114  |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 5 = Great Northern   | UI-59   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 6 = Small Red  | NW-59   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 7 = Pink   | Viva  |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 8 = Cranberry  | UI-50   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 9 = Dark Red Kidney  | Montcalm  |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 10 = Light Red Kidney  | Redkloud  |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 11 = Yellow Eye  | Steuben   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
|   | 12 = Other (specify)   |   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
| 2   | 1 = Early (80-90 days); 2 = Medium (90-100 days); 3 = Late (>100 days) |   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
| 9   | 7  | Days from planting to harvest maturity 6 year average   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
| Physiological maturity (90% pods dry & buckskin)  |  |   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
| 1   | 5  | 9   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
| Heat units from planting to harvest maturity (optional). Specify base temperature used: 50°F  |  |   |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |
| 8   | 2  | Days from planting to harvest maturity of check variety (use check appropriate to market class shown in item 1) |              |  |                |          |  |                 |        |  |           |          |  |           |        |  |                    |       |  |               |       |  |          |      |  |               |       |  |                     |          |  |                       |          |  |                 |         |  |                      |  |  |   |  |  |   |   |   |  |  |  |   |   |   |  |  |  |   |   |   |

|  |   |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|--|---|---|--|---|--|---|--|---|--|---|--|--|--|--|--|---|--|--|---|---|---|--|---|---|---|---|---|--|---|--|--|---|--|--|
| <b>3. PLANT HABIT</b><br><br><table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">4</td> <td style="padding: 2px;"><b>TYPE</b></td> </tr> <tr> <td></td> <td>1 = Ia Bush-determinate, strong and erect stem and branches</td> </tr> <tr> <td></td> <td>2 = Ib Bush-determinate, weak stem and branches</td> </tr> <tr> <td></td> <td>3 = IIa Erect growth habit-indeterminate, guides (runners) short or not developed</td> </tr> <tr> <td></td> <td>4 = IIb Erect growth habit-indeterminate, guides medium to long, with no ability to climb</td> </tr> <tr> <td></td> <td>5 = IIIa Vine-indeterminate, short guides with no ability to climb</td> </tr> <tr> <td></td> <td>6 = IIIb Vine-indeterminate, long guides with ability to climb</td> </tr> <tr> <td></td> <td>7 = IVa Indeterminate climbing, pods distributed throughout the plant</td> </tr> <tr> <td></td> <td>8 = IVb Indeterminate climbing, pods concentrated on the upper part of the plant</td> </tr> </table> | 4   | <b>TYPE</b>   |  | 1 = Ia Bush-determinate, strong and erect stem and branches |  | 2 = Ib Bush-determinate, weak stem and branches |  | 3 = IIa Erect growth habit-indeterminate, guides (runners) short or not developed |  | 4 = IIb Erect growth habit-indeterminate, guides medium to long, with no ability to climb |  | 5 = IIIa Vine-indeterminate, short guides with no ability to climb |  | 6 = IIIb Vine-indeterminate, long guides with ability to climb |  | 7 = IVa Indeterminate climbing, pods distributed throughout the plant |  | 8 = IVb Indeterminate climbing, pods concentrated on the upper part of the plant | <table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">8</td> <td style="border: 1px solid black; width: 30px; text-align: center;">1</td> <td>Average height of mature plant, in cm.</td> </tr> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">4</td> <td style="border: 1px solid black; width: 30px; text-align: center;">1</td> <td>Average height of check variety, in cm. (use same check as above)</td> </tr> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">3</td> <td colspan="2">Pod Position: 1 = Low (lower pods touching soil surface)<br/>2 = High (lower pods not touching soil surface)<br/>3 = Scattered (not concentrated high or low)</td> </tr> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">1</td> <td colspan="2">Adaptability to machine harvest: 1 = Adapted 2 = Not Adapted</td> </tr> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">2</td> <td colspan="2">Lodging resistance: 1 = Good 2 = Fair 3 = Poor</td> </tr> </table> | 8 | 1 | Average height of mature plant, in cm. | 4 | 1 | Average height of check variety, in cm. (use same check as above) | 3 | Pod Position: 1 = Low (lower pods touching soil surface)<br>2 = High (lower pods not touching soil surface)<br>3 = Scattered (not concentrated high or low) |  | 1 | Adaptability to machine harvest: 1 = Adapted 2 = Not Adapted |  | 2 | Lodging resistance: 1 = Good 2 = Fair 3 = Poor |  |
| 4  | <b>TYPE</b>   |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|  | 1 = Ia Bush-determinate, strong and erect stem and branches   |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|  | 2 = Ib Bush-determinate, weak stem and branches   |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|  | 3 = IIa Erect growth habit-indeterminate, guides (runners) short or not developed   |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|  | 4 = IIb Erect growth habit-indeterminate, guides medium to long, with no ability to climb   |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|  | 5 = IIIa Vine-indeterminate, short guides with no ability to climb  |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|  | 6 = IIIb Vine-indeterminate, long guides with ability to climb  |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|  | 7 = IVa Indeterminate climbing, pods distributed throughout the plant   |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
|  | 8 = IVb Indeterminate climbing, pods concentrated on the upper part of the plant  |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
| 8  | 1   | Average height of mature plant, in cm.                            |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
| 4  | 1   | Average height of check variety, in cm. (use same check as above) |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
| 3  | Pod Position: 1 = Low (lower pods touching soil surface)<br>2 = High (lower pods not touching soil surface)<br>3 = Scattered (not concentrated high or low) |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
| 1  | Adaptability to machine harvest: 1 = Adapted 2 = Not Adapted  |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |
| 2  | Lodging resistance: 1 = Good 2 = Fair 3 = Poor  |   |  |   |  |   |  |   |  |   |  |  |  |  |  |   |  |  |   |   |   |  |   |   |   |   |   |  |   |  |  |   |  |  |

**4. LEAFLET MORPHOLOGY (Use terminal leaflet of a fully expanded trifoliolate)**

|   |  |   |   |  |   |   |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
|---|--|---|---|--|---|---|--------------|--|--|---|---|--|---|---|---|---|------------------|-----------|---------------|---------------|------------|--|--|---|---|---|---|---|---|------------------|------------|-------------|-------------|-------------|---------------|--|--|---|---|---|---|---|----|
| <table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">2</td> <td>1 = Smooth; 2 = Wrinkled</td> </tr> </table>   | 2  | 1 = Smooth; 2 = Wrinkled  | <table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">1</td> <td>1 = Dull; 2 = Glossy; 3 = Semiglossy; 4 = Variable</td> </tr> </table> | 1  | 1 = Dull; 2 = Glossy; 3 = Semiglossy; 4 = Variable                                    |   |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
| 2   | 1 = Smooth; 2 = Wrinkled                           |   |   |  |   |   |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
| 1   | 1 = Dull; 2 = Glossy; 3 = Semiglossy; 4 = Variable |   |   |  |   |   |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
| <table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">1</td> <td>SHAPE:</td> <td style="padding: 2px;">1 = Ovate</td> <td style="padding: 2px;">2 = Lanceolate</td> <td style="padding: 2px;">3 = Deltoid</td> <td style="padding: 2px;">4 = Cordate</td> <td style="padding: 2px;">5 = Rhomboid</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | 1  | SHAPE:  | 1 = Ovate   | 2 = Lanceolate   | 3 = Deltoid   | 4 = Cordate   | 5 = Rhomboid |  |  |  |  |  |  |  | <table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">2</td> <td>APEX OF LEAFLET:</td> <td style="padding: 2px;">1 = Acute</td> <td style="padding: 2px;">2 = Acuminate</td> <td style="padding: 2px;">3 = Cuspidate</td> <td style="padding: 2px;">4 = Obtuse</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | 2 | APEX OF LEAFLET: | 1 = Acute | 2 = Acuminate | 3 = Cuspidate | 4 = Obtuse |  |  |  |  |  |  | <table style="width:100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 30px; text-align: center;">1</td> <td>BASE OF LEAFLET:</td> <td style="padding: 2px;">1 = Obtuse</td> <td style="padding: 2px;">2 = Oblique</td> <td style="padding: 2px;">3 = Cordate</td> <td style="padding: 2px;">4 = Cuneate</td> <td style="padding: 2px;">5 = Attenuate</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | 1 | BASE OF LEAFLET: | 1 = Obtuse | 2 = Oblique | 3 = Cordate | 4 = Cuneate | 5 = Attenuate |  |  |  |  |  |  |  | 10 |
| 1   | SHAPE:   | 1 = Ovate   | 2 = Lanceolate  | 3 = Deltoid  | 4 = Cordate   | 5 = Rhomboid  |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
|   |  |  |    |  |  |  |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
| 2   | APEX OF LEAFLET:                                   | 1 = Acute   | 2 = Acuminate   | 3 = Cuspidate  | 4 = Obtuse  |   |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
|   |  |  |    |   |  |   |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
| 1   | BASE OF LEAFLET:                                   | 1 = Obtuse  | 2 = Oblique   | 3 = Cordate  | 4 = Cuneate   | 5 = Attenuate   |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |
|   |  |  |    |   |  |  |              |  |  |   |   |  |   |   |   |   |                  |           |               |               |            |  |  |   |   |   |   |   |   |                  |            |             |             |             |               |  |  |   |   |   |   |   |    |

5. FLOWER COLOR AND DAYS TO BLOOM

1 COLOR OF STANDARD: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

1 COLOR OF KEEL: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

1 COLOR OF WINGS: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

5  2 Days to <sup>1st</sup> 50% bloom

6. POD MORPHOLOGY (Green pod morphology optional)

Green Mature

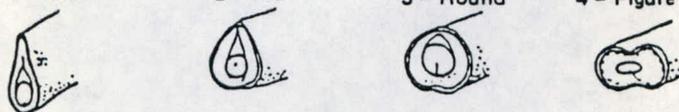
1  1 COLOR PATTERN: 1 = Solid; 2 = Striped; 3 = Blotched; 4 = Mottled; 5 = Other \_\_\_\_\_

3  4 PRIMARY COLOR: <sup>Physiological maturity</sup> 1 = Purple; 2 = Red; 3 = Green; 4 = Yellow; 5 = Tan; 6 = Brown; 7 = Other \_\_\_\_\_

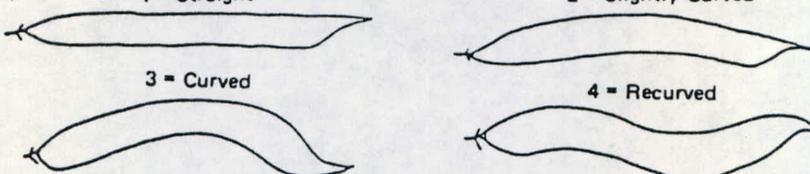
1  1 COLOR MODIFIER: 1 = Light; 2 = Light Medium; 3 = Medium; 4 = Medium Dark; 5 = Dark

SECONDARY COLOR: 1 = Purple; 2 = Red; 3 = Green; 4 = Yellow; 5 = Tan; 6 = Brown; 7 = Other \_\_\_\_\_

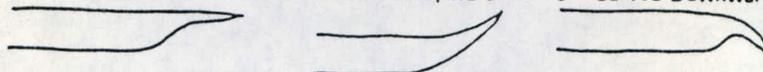
1  1 CROSS SECTION SHAPE: 1 = Flat 2 = Pear 3 = Round 4 = Figure Eight



2  2 POD CURVATURE: 1 = Straight 2 = Slightly Curved 3 = Curved 4 = Recurved



3  3 POD BEAK ORIENTATION: 1 = Straight 2 = Curved Upward 3 = Curved Downward 4 = Variable Average beak length, in cm. .79



3  3 CONSTRICTIONS: 1 = None; 2 = Slight; 3 = Deep

6.  8 Average number of seeds per pod

7. SEED COLOR

1 1 = Shiny; 2 = Dull; 3 = Semishiny; 4 = Variable

1 1 = Monochrome; 2 = Polychrome

1 PRIMARY COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other \_\_\_\_\_

SECONDARY COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other \_\_\_\_\_

1 COLOR PATTERN: 1 = Solid; 2 = Splashed; 3 = Mottled; 4 = Striped; 5 = Flecked; 6 = Dotted

1 HILAR RING: 1 = Absent; 2 = Present

HILAR RING COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other \_\_\_\_\_

8. SEED SHAPE AND WEIGHT

2 SHAPE OF SEED TAKEN FROM MIDDLE OF POD: 1 = Round 2 = Oval 3 = Cuboid 4 = Kidney 5 = Truncate Fastigiate



1  6 16.5 g/100 seeds  
Dry seed weight in g/100g seeds (adjusted to 12% moisture)

9. ANTHOCYANIN PIGMENTATION

1 = ABSENT  
2 = PRESENT

|   |  |   |   |
|---|--|---|---|
| <input checked="" type="checkbox"/> Flowers | <input checked="" type="checkbox"/> Stems    | <input checked="" type="checkbox"/> Pods      | <input checked="" type="checkbox"/> Seeds |
| <input checked="" type="checkbox"/> Leaves  | <input checked="" type="checkbox"/> Petioles | <input checked="" type="checkbox"/> Peduncles | <input checked="" type="checkbox"/> Nodes |

10. KNOWN DISEASE REACTION

DISEASES - COMMON NAME: Anthracnose, Rust, Powdery mildew, Fusarium root rot, Pythium root rot, Rhizoctonia root rot, Pythium wilt, Sclerotinia white mold, Angular leaf spot, Bacterial wilt, Halo blight, Fuscous blight, Common bacterial blight, Red node virus, Pod mottle virus, Bean common mosaic virus, Bean yellow mosaic virus, Curly top virus, Bacterial brown spot, Bean southern mosaic virus, Other (specify) \_\_\_\_\_

REACTION: 1 = Susceptible; 2 = Resistant; 3 = Tolerant; 4 = Avoidance

(Give the common name (CN), scientific name (SN), and race(s), where applicable)

DISEASE: CN Bean Common Mosaic Virus ; SN Marmor phaseoli ; Race(s) NY 15 & BV 1

DISEASE: CN Anthracnose ; SN Colletotrichum linde- ; Race(s) Delta  
muthranum

DISEASE: CN Fusarium Root Rot ; SN Fusarium solani ; Race(s) \_\_\_\_\_  
f.sp. phaseoli

DISEASE: CN White Mold ; SN Sclerotinia sclerotiorum ; Race(s) \_\_\_\_\_

DISEASE: CN Rust ; SN \_\_\_\_\_ ; Race(s) See Appendix 1

DISEASE: CN \_\_\_\_\_ ; SN \_\_\_\_\_ ; Race(s) \_\_\_\_\_

11. KNOWN INSECT/NAMATODE RESISTANCE

PESTS - COMMON NAME: Aphids, Bean pod weevil, Bruchid beetle, Corn earworm, Flea beetle, Leaf hopper, Lesion nematode, Lygus, Mexican bean beetle, Root knot nematode, Corn seed maggot, Spider mites, Thrips, Weevils, Western bean cutworm, Other (specify) \_\_\_\_\_

REACTION: 1 = Susceptible; 2 = Resistant; 3 = Tolerant; 4 = Avoidance

(Give the common name (CN), scientific name (SN), and biotype, where applicable)

PEST: CN \_\_\_\_\_ ; SN \_\_\_\_\_ ; Biotype \_\_\_\_\_

PEST: CN \_\_\_\_\_ ; SN \_\_\_\_\_ ; Biotype \_\_\_\_\_

PEST: CN \_\_\_\_\_ ; SN \_\_\_\_\_ ; Biotype \_\_\_\_\_

12. KNOWN PHYSIOLOGICAL STRESS REACTION

1 = Susceptible; 2 = Resistant; 3 = Tolerant; 4 = Avoidance

Heat  Cold  Drought  Air Pollution

Nutrient toxicity or deficiency (specify nutrient) \_\_\_\_\_

Other \_\_\_\_\_

13. COMMENTS

**DRY EDIBLE BEAN****D83043****EXHIBIT D****BOTANICAL DESCRIPTION**

Navy bean D83043 is a fairly upright, wide profile, semi-vine variety with good yield potential. It has a Type IIB plant habit. Almost all of its pods are held off the ground.

D83043 matures in 97 days (7 year average) in Twin Falls, Idaho, compared to 82 days for Seafarer (maturity defined as 90% of pods turned from green to buckskin).

D83043 has resistance to the NY 15 and BV 1 strains of Bean Common Mosaic Virus. It has shown some tolerance to Fusarium root rot in our laboratory screening in Twin Falls, Idaho. It is susceptible to the Delta strain of Anthracnose and does not carry the ARE gene for resistance. It shows good tolerance to white mold.

The seed size of D83043 averages 2755 seeds per pound compared to Seafarer at 2394 seeds per pound. In canning tests, D83043 produces canned product comparable to Seafarer's quality.

D83043 has out yielded Seafarer by an average of 1035 pounds per acre in Twin Falls, Idaho, for the years 1982-1986.

D83043 has shown adaptability in the production areas of Idaho, Washington, North Dakota and Michigan.

PLAN HEIGHTD83043

78 cm.  
78 cm.  
106 cm.  
79 cm.  
94 cm.  
89 cm.  
85 cm.  
85 cm.  
70 cm.  
66 cm.  
78 cm.  
88 cm.  
66 cm.  
90 cm.  
108 cm.  
63 cm.  
72 cm.  
81 cm.  
66 cm.  
88 cm.  
81.50

SEAFARER

47 cm.  
37 cm.  
45 cm.  
46 cm.  
33 cm.  
49 cm.  
43 cm.  
41 cm.  
31 cm.  
30 cm.  
37 cm.  
44 cm.  
40 cm.  
49 cm.  
38 cm.  
34 cm.  
47 cm.  
49 cm.  
40 cm.  
41 cm.  
41.05

Data file PVP83043  
 Title: PVP D83043 VS. SEAFARER

Function: ANOVA-1  
 Data case no. 1 to 40  
 Without selection

One way ANOVA grouped over variable 1  
 VARIETY  
 with values from 1 to 2

Variable 7  
 PLANT HEIGHT

A N A L Y S I S    O F    V A R I A N C E    T A B L E

|         | Degrees of<br>Freedom | Sum of<br>Squares | Error<br>Mean Square | F-value | Prob. |
|---------|-----------------------|-------------------|----------------------|---------|-------|
| Between | 1                     | 16362.0250        | 16362.02             | 167.14  | .000  |
| Within  | 38                    | 3719.9500         | 97.89                |         |       |
| Total   | 39                    | 20081.9750        |                      |         |       |

Coefficient of Variation= 16.15%

| Var.   | V A R I A B L E |          | No.     | 7     |      |
|--------|-----------------|----------|---------|-------|------|
| 1      | Number          | Sum      | Average | SD    | SE   |
| 1      | 20.00           | 1630.000 | 81.50   | 12.62 | 2.21 |
| 2      | 20.00           | 821.000  | 41.05   | 6.05  | 2.21 |
| Total  | 40.00           | 2451.000 | 61.28   | 22.69 | 3.59 |
| Within |                 |          |         | 9.89  |      |

Bartlett's Test

Chi-square = 9.22179  
 Number of Degrees of Freedom = 1  
 Approximate Significance = .0023

APPENDIX I  
REACTION TO UROMYCES APPENDICULATUS (RUST)  
BY  
NAVY D83043

| <u>RACE</u> | <u>REACTION</u>        |
|-------------|------------------------|
| 40          | Moderately susceptible |
| 44          | Highly resistant       |
| 46          | Susceptible            |
| 49          | Moderately susceptible |
| 51          | Susceptible            |
| 53          | Moderately susceptible |
| 58          | Moderately susceptible |
| 67          | Susceptible            |

**DRY EDIBLE BEAN****D83043****EXHIBIT E****APPLICANT'S OWNERSHIP**

Variety D83043 was developed by Ronald Shellenberger, Ph.D., a Rogers Brothers Seed Company plant breeder, with Rogers Brothers Seed Company funding the development of the variety. By agreement between employees and Rogers Brothers Seed Company, all rights to any variety developed by employees are assigned to the Company. No rights to such varieties are retained by employees.

*State of Delaware*  
*Office of the Secretary of State*

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I, WILLIAM T. QUILLEN, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THAT THE SAID "ROGERS NK SEED CO.", FILED A CERTIFICATE OF AMENDMENT, CHANGING ITS NAME TO "ROGERS SEED CO.", THE FIFTH DAY OF MAY, A.D. 1994, AT 9 O'CLOCK A.M.



*William T. Quillen*  
\_\_\_\_\_  
William T. Quillen, Secretary of State

0810041 8320

AUTHENTICATION: 7120759

944080001

DATE: 05-16-94

**CERTIFICATE OF AMENDMENT**  
**OF**  
**CERTIFICATE OF INCORPORATION**  
**OF**  
**ROGERS NK SEED CO.**

Adopted in accordance with the provisions  
of Section 242 of the General Corporation  
Law of the State of Delaware

EFFECTIVE DATE: June 1, 1994

We, Willem van Overschot, President, and Richard B. Geller, Secretary, of Rogers NK Seed Co., a corporation existing under the laws of the State of Delaware, do hereby certify as follows:

FIRST: The Certificate of Incorporation of the corporation was filed on 2/27/75.

SECOND: The Certificate of Incorporation of said corporation has been amended as follows:

By striking out the whole of Article I thereof as it now exists and inserting in lieu and instead thereof, a new Article I, reading as follows:

ARTICLE I

Name

The name of the Corporation is ROGERS SEED CO.

THIRD: Such amendment has been duly adopted in accordance with the provisions of the General Corporation Law of the State of Delaware, by the unanimous written consent of all of the stockholders entitled to vote in accordance with the provisions of Section 228 of the General Corporation Law of the State of Delaware.

FOURTH: See attached Written Consent of Sole Shareholder and Board of Directors' Resolution.

IN WITNESS WHEREOF, we have signed this certificate this 13<sup>th</sup> day of April, 1994.

Willem van Overschot  
Willem van Overschot, President

Richard B. Geller  
Richard B. Geller, Secretary

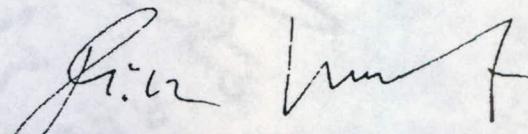
ROGERS NK SEED CO.

WRITTEN CONSENT OF SOLE SHAREHOLDER

SANDOZ CORPORATION, owner of all of the issued and outstanding shares of ROGERS NK SEED CO., hereby consents, pursuant to Section 228 of the Delaware General Corporation Law, to the adoption of the following resolution as and for the act of the shareholder:

RESOLVED, that SANDOZ CORPORATION, as sole shareholder, approves the amendment to Article I of the Certificate of Incorporation of ROGERS NK SEED CO., changing its name to **ROGERS SEED CO.**

Dated: April 22, 1994

  
\_\_\_\_\_  
Heinz P. Imhof,  
Chief Executive Officer  
Sandoz Corporation

ROGERS NK SEED CO.

**RESOLUTION**

RESOLVED, that according to Section 242 of the General Corporation Law of the State of Delaware, that Article I of the Certificate of Incorporation be amended, effective June 1, 1994, to read as follows: The name of the Corporation is **ROGERS SEED CO.**; and, further,

RESOLVED, that the appropriate officers of Rogers NK Seed Co. be, and they hereby are, authorized to take any and all further action and execute and deliver any and all further documents that may be necessary or desirable in order to carry out and effectuate fully the purposes set forth in the foregoing resolution.

ADOPTED UNANIMOUSLY BY THE BOARD  
MARCH 31, 1994

Richard B. Geller  
Richard B. Geller, Secretary

*State of Delaware*  
*Office of the Secretary of State* PAGE 1

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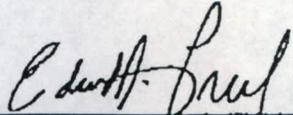
I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"ROGERS SEED CO.", A DELAWARE CORPORATION,  
WITH AND INTO "NOVARTIS SEEDS, INC." UNDER THE NAME OF  
"NOVARTIS SEEDS, INC.", A CORPORATION ORGANIZED AND EXISTING  
UNDER THE LAWS OF THE STATE OF DELAWARE, AS RECEIVED AND FILED  
IN THIS OFFICE THE TWENTY-FIFTH DAY OF JUNE, A.D. 1997, AT 9  
O'CLOCK A.M.

A CERTIFIED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO  
THE NEW CASTLE COUNTY RECORDER OF DEEDS FOR RECORDING.



0829320 8100M  
971211787

  
Edward J. Freel, Secretary of State

AUTHENTICATION: 8531908  
06-26-97

DATE:

STATE OF DELAWARE  
SECRETARY OF STATE  
DIVISION OF CORPORATIONS  
FILED 09:00 AM 06/25/1997  
971211787 - 0829320

**CERTIFICATE OF MERGER  
OF  
ROGERS SEED CO.  
INTO  
NOVARTIS SEEDS, INC.**

The undersigned corporation organized and existing under and by virtue of the General Corporation Law of Delaware,

**DOES HEREBY CERTIFY:**

**FIRST:** That the name and state of incorporation of each on the constituent corporations of the merger is as follows:

| <b>NAME</b>          | <b>STATE OF INCORPORATION</b> |
|----------------------|-------------------------------|
| Novartis Seeds, Inc. | Delaware                      |
| Rogers Seed Co.      | Delaware                      |

**SECOND:** That an Agreement and Plan of Merger between the parties to the merger has been approved, adopted, certified, executed and acknowledged by each of the constituent corporations in accordance with the requirements of section 251 of the General Corporation Law of Delaware

**THIRD:** That the name of the surviving corporation is Novartis Seeds, Inc.

**FOURTH:** That the Certificate of Incorporation of Novartis Seeds, Inc., a Delaware corporation which will survive the merger, shall be the Certificate of Incorporation of the surviving corporation.

**FIFTH:** That the executed Agreement and Plan of Merger is on file at the principal place of business of the surviving corporation, the address of which is 7500 Olson Memorial Highway, Golden Valley, MN 55427.

**SIXTH:** That a copy of the Agreement and Plan of Merger will be furnished by the surviving corporation, on request and without cost, to any stockholder of any constituent corporation.

**SEVENTH:** That this Certificate of Merger shall be effective on July 1, 1997.

Dated June 23, 1997

**NOVARTIS SEEDS, INC.**

By: Edward C. Resler  
Name: Edward C. Resler  
Title: Vice President & General Counsel