THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Syngenta Seeds, Inc.

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 HEREBINTO 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, (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BEAN, FIELD

'ROG331'

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 twentieth day of September, in the year two thousand two.

[Signature]

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

[Signature]

Secretary of Agriculture
**APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE**

**Instructions and information collection burden statement on reverse**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NAME OF OWNER</td>
<td>Novartis Seeds, Inc.</td>
</tr>
<tr>
<td>2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME</td>
<td>RO5 331</td>
</tr>
<tr>
<td>3. VARIETY NAME</td>
<td>RO5 331</td>
</tr>
<tr>
<td>4. ADDRESS</td>
<td>600 N. Armstrong Place, Boise, Idaho 83704</td>
</tr>
<tr>
<td>5. TELEPHONE (include area code)</td>
<td>208 322 7272</td>
</tr>
<tr>
<td>6. FAX (include area code)</td>
<td>208 322 1436</td>
</tr>
<tr>
<td>7. IF THE OWNER NAMED IS NOT A &quot;PERSON&quot;, GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corp</td>
<td></td>
</tr>
<tr>
<td>8. IF INCORPORATED, GIVE STATE OF INCORPORATION</td>
<td>Delaware</td>
</tr>
<tr>
<td>9. DATE OF INCORPORATION</td>
<td>2-25-75</td>
</tr>
<tr>
<td>10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers)</td>
<td>Charleen Orthel, Po Box 4188, Boise, Idaho 83711-4188</td>
</tr>
<tr>
<td>11. TELEPHONE (include area code)</td>
<td>208 327 7246</td>
</tr>
<tr>
<td>12. FAX (include area code)</td>
<td>208 322 1436</td>
</tr>
<tr>
<td>13. EMAIL</td>
<td>charleen.orthel@seeds novartis.com</td>
</tr>
<tr>
<td>14. CROP KIND (Common Name)</td>
<td>Field Bean</td>
</tr>
<tr>
<td>15. GENUS AND SPECIES NAME OF CROP</td>
<td>Phaseolus vulgaris L.</td>
</tr>
<tr>
<td>16. FAMILY NAME (botanical)</td>
<td>Fabaceae</td>
</tr>
<tr>
<td>17. IS THE VARIETY A FIRST GENERATION HYBRID?</td>
<td>NO</td>
</tr>
<tr>
<td>18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)</td>
<td></td>
</tr>
<tr>
<td>a. Exhibit A. Origin and Breeding History of the Variety</td>
<td></td>
</tr>
<tr>
<td>b. Exhibit B. Statement of Distinctness</td>
<td></td>
</tr>
<tr>
<td>c. Exhibit C. Objective Description of Variety</td>
<td></td>
</tr>
<tr>
<td>d. Exhibit D. Additional Description of the Variety (Optional)</td>
<td></td>
</tr>
<tr>
<td>e. Exhibit E. Statement of the Basis of the Owner's Ownership</td>
<td></td>
</tr>
<tr>
<td>f. Voucher Sample (2,500 viable unrooted seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)</td>
<td></td>
</tr>
<tr>
<td>g. Filing and Examination Fee ($2,450), made payable to &quot;Treasurer of the United States&quot; (Mail to the Plant Variety Protection Office)</td>
<td></td>
</tr>
<tr>
<td>19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED?</td>
<td>NO</td>
</tr>
<tr>
<td>(See Section 83(a) of the Plant Variety Protection Act)</td>
<td></td>
</tr>
<tr>
<td>20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?</td>
<td>YES</td>
</tr>
<tr>
<td>21. IF &quot;YES&quot; TO ITEM 20, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?</td>
<td></td>
</tr>
<tr>
<td>FOUNDATION</td>
<td>☑</td>
</tr>
<tr>
<td>REGISTERED</td>
<td>☑</td>
</tr>
<tr>
<td>CERTIFIED</td>
<td>☑</td>
</tr>
<tr>
<td>22. 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?</td>
<td>YES</td>
</tr>
<tr>
<td>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.)</td>
<td></td>
</tr>
<tr>
<td>23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHTS (PLANT BREEDER'S RIGHT OR PATENT)?</td>
<td>YES</td>
</tr>
<tr>
<td>IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)</td>
<td></td>
</tr>
<tr>
<td>24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, and for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.</td>
<td></td>
</tr>
<tr>
<td>The undersigned owner(s)(are) the owner of this sexually reproduced or tuber propagated plant variety, and believes 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.</td>
<td></td>
</tr>
<tr>
<td>Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.</td>
<td></td>
</tr>
</tbody>
</table>

**Signature of Owner**

Charleen Orthel

**Signature of Owner**

Charleen Orthel
GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Complete application—from signed by the owner; (2) completed exhibits A, B, C, E; (3) a request for breeders variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties 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; (4) check drawn on a U.S. bank for $2,450 applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfiled. Mail application and other requirements to Plant Variety Protection Office, Ameus 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705. 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 $300 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office
Telephone: (301) 504-5518
FAX: (301) 504-5291

ITEM

18a. 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.

18b. 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 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.

18c. 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.

18d. 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.

18e. 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.

19. 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 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).

22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.

23. See Section 5.5 of the Act for instructions on obtaining the benefit of an earlier filing date.

**CONTINUED FROM FRONT**
(Provide the date of the first sale, disposition, transfer, or use for which country and the circumstances, if the variety containing 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.)

USA April 1997 TRIAL
CAN May 1997 TRIAL

**CONTINUED FROM FRONT**
(Provide 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).)

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. There is no charge for filing a change of address. The fee for filing a change of 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(b) of the Regulations and Rules of Practice.)

avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, building 306, Beltsville Agricultural Research Center—East, Beltsville, MD 20705. Telephone: (301) 504-6089.
Dry Edible Navy Bean

'ROG331'

Exhibit A

Origin and Breeding History

Novartis Seeds, Inc. variety 'ROG331' in the navy market class of dry edible field beans was derived from the following cross pollination in the greenhouse during the winter of 1987-88:

\[
\begin{align*}
\text{ROG331} & \quad \text{C-20} \\
& \quad \text{D83043} \\
& \quad \text{W-95-4 (USDA breeding line)} \\
& \quad \text{7883-2-3-1} \\
& \quad \text{Aurora} \\
& \quad \text{SW 95 (PI282057)}
\end{align*}
\]

Details of the selection and multiplication are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Gen.</th>
<th>Plot</th>
<th>lbs.</th>
<th>No. SPS</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>1</td>
<td>88-GH-203</td>
<td></td>
<td></td>
<td>Bulk</td>
</tr>
<tr>
<td>1989</td>
<td>2</td>
<td>89-WNO217</td>
<td></td>
<td></td>
<td>Generation advance</td>
</tr>
<tr>
<td>1989</td>
<td>3</td>
<td>89-ID0203</td>
<td></td>
<td></td>
<td>Generation advance</td>
</tr>
<tr>
<td>1990</td>
<td>4</td>
<td>89-WN-303</td>
<td></td>
<td></td>
<td>Generation advance</td>
</tr>
<tr>
<td>1990</td>
<td>5</td>
<td>90-8511</td>
<td>23</td>
<td></td>
<td>SPS's based on pod load, plant architecture, maturity, and seed quality</td>
</tr>
<tr>
<td>1991</td>
<td>6</td>
<td>91-3701</td>
<td>3</td>
<td></td>
<td>SPS's based on pod load, plant architecture, maturity, and seed quality</td>
</tr>
<tr>
<td>1992</td>
<td>7</td>
<td>92-6564</td>
<td>2.5</td>
<td></td>
<td>Bulk, evaluation based on above characteristics</td>
</tr>
<tr>
<td>1993</td>
<td>8</td>
<td>93-IDPNA32</td>
<td>10.7</td>
<td></td>
<td>Yield test</td>
</tr>
<tr>
<td>1994</td>
<td>9</td>
<td>94-9050</td>
<td>28</td>
<td>20</td>
<td>Seed increase &amp; SPS's for pureline evaluation</td>
</tr>
<tr>
<td>1995</td>
<td>10</td>
<td>95-IDN8095</td>
<td>3.2</td>
<td></td>
<td>Purelines to compare for above characteristics</td>
</tr>
<tr>
<td>1996</td>
<td>11</td>
<td>QD6711.5-6</td>
<td>345</td>
<td></td>
<td>Best pureline increase based on seed quality &amp; maturity</td>
</tr>
<tr>
<td>1997</td>
<td>12</td>
<td>QD7711</td>
<td>934</td>
<td></td>
<td>Permanent breeder stock</td>
</tr>
</tbody>
</table>

The line was tested as X88403-15-2 and ROG331.

ROG331 has been observed to be uniform and stable since the F10 generation and has remained uniform and stable through the F13. Stock QD7711 has been increased to commercial size quantities. Seed stock will be monitored for purity. No variants have been observed.
Dry Edible Navy Bean

'ROG331'

Exhibit B

Novelty Statement

Syngenta Seeds, Inc. variety 'ROG331' is most like the variety 'Seafarer', but differs in the following ways:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Units</th>
<th>ROG331</th>
<th>Seafarer</th>
<th>Probability</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maturity(90%)</td>
<td>days</td>
<td>93</td>
<td>86</td>
<td>NS</td>
<td>6</td>
</tr>
<tr>
<td>Flowering(50%)</td>
<td>days</td>
<td>51</td>
<td>44</td>
<td>0.0066</td>
<td>6</td>
</tr>
<tr>
<td>Plant ht.</td>
<td>cm.</td>
<td>90.5</td>
<td>57.0</td>
<td>0.0000</td>
<td>20</td>
</tr>
<tr>
<td>Pod length</td>
<td>mm.</td>
<td>98.1</td>
<td>83.8</td>
<td>0.0000</td>
<td>20</td>
</tr>
<tr>
<td>Beak length</td>
<td>mm.</td>
<td>7.05</td>
<td>6.4</td>
<td>0.0239</td>
<td>20</td>
</tr>
<tr>
<td>Pod width</td>
<td>mm.</td>
<td>8.0</td>
<td>9.6</td>
<td>0.0000</td>
<td>20</td>
</tr>
<tr>
<td>Pod depth</td>
<td>mm.</td>
<td>10.27</td>
<td>9.7</td>
<td>0.0297</td>
<td>20</td>
</tr>
<tr>
<td>Seeds/pod</td>
<td>no.</td>
<td>6.4</td>
<td>5.85</td>
<td>0.0051</td>
<td>20</td>
</tr>
<tr>
<td>Seeds/lb</td>
<td>no.</td>
<td>2458</td>
<td>2150</td>
<td>0.0056</td>
<td>5</td>
</tr>
</tbody>
</table>

ROG331 flowers 7 days later than Seafarer (51 vs. 44 days).

ROG331 is taller than Seafarer (90.5 vs. 57 cm), has a longer pod (98.1 vs. 83.8 mm), and a longer beak (7.05 vs. 6.4 mm).

ROG331 has a narrower pod than Seafarer (8.0 vs. 9.6 mm), and a deeper pod (10.27 vs. 9.7 mm).

ROG331 has more seeds/pod than Seafarer (6.4 vs. 5.85), and smaller seed (2458 vs. 2150 seeds/lb.).
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER

Function: T-TEST

SAMPLE ONE: ROG331
-------------
Variable 8 : DAYS TO FLOWER
Cases 1 through 6
Mean: 51.17
Variance: 10.57
Standard Deviation: 3.25

SAMPLE TWO: SEAFARER
-------------
Variable 8 : DAYS TO FLOWER
Cases 7 through 12
Mean: 44.33
Variance: 13.47
Standard Deviation: 3.67

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 1.2744
Numerator degrees of freedom: 5
Denominator degrees of freedom: 5
Probability: 0.7966

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Pooled s squared: 12.0167
Variance of the difference between the means: 4.0056
Standard Deviation of the difference: 2.0014
t Value: 3.4143
Degrees of freedom: 10
Probability of t: 0.0066

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
6.833 plus or minus 4.459  (2.374 through 11.293)
Data file: 331 PVP
Title: PVP--ROG331 vs. SEAFARER 1997 & 1996 COMBINED

Function: T-TEST

SAMPLE ONE: ROG331

Variable 1: PLANT HEIGHT(cm)
Cases 1 through 40
Mean: 90.53
Variance: 434.20
Standard Deviation: 20.84

SAMPLE TWO: SEAFARER

Variable 1: PLANT HEIGHT(cm)
Cases 41 through 80
Mean: 57.05
Variance: 69.95
Standard Deviation: 8.36

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 6.2077
Numerator degrees of freedom: 39
Denominator degrees of freedom: 39
Probability: 0.0000

Result: Significant F - Reject the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Variance of the difference between the means: 12.6038
Standard Deviation of the difference: 3.5502
t' Value: 9.4291
Effective degrees of freedom: 51
Probability of t': 0.0000

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
33.475 plus or minus 7.127 (26.348 through 40.602)
Data file: 331 PVP
Title: PVP--ROG331 vs. SEAFARER 1996

Function: T-TEST

SAMPLE ONE: ROG331
-------------
Variable 1: PLANT HEIGHT (cm)
Cases 21 through 40
Mean: 94.30
Variance: 331.48
Standard Deviation: 18.21

SAMPLE TWO: SEAFARER
-------------
Variable 1: PLANT HEIGHT (cm)
Cases 61 through 80
Mean: 61.60
Variance: 68.15
Standard Deviation: 8.26

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"
---------------------------------------------------------
F Value: 4.8642
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.0012

Result: Significant F - Reject the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"
---------------------------------------------
Variance of the difference between the means: 19.9816
Standard Deviation of the difference: 4.4701
t' Value: 7.3153
Effective degrees of freedom: 26
Probability of t': 0.0000

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
32.700 plus or minus 9.188 (23.512 through 41.888)
Data file: 331 PVP
Title: PVP -- ROG331 vs. SEAFARER 1997

Function: T-TEST

SAMPLE ONE: ROG331

Variable 1: PLANT HEIGHT(cm)
Cases 1 through 20
Mean: 86.75
Variance: 529.78
Standard Deviation: 23.02

SAMPLE TWO: SEAFARER

Variable 1: PLANT HEIGHT(cm)
Cases 41 through 60
Mean: 52.50
Variance: 31.84
Standard Deviation: 5.64

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 16.6376
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.0000

Result: Significant F - Reject the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Variance of the difference between the means: 28.0809
Standard Deviation of the difference: 5.2991
t' Value: 6.4633
Effective degrees of freedom: 21
Probability of t': 0.0000

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
34.250 plus or minus 11.020 (23.230 through 45.270)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1997 & 1996 COMBINED
Function: T-TEST

SAMPLE ONE: ROG331
-----------------
Variable 2 : POD LENGTH (mm)  
Cases 1 through 40  
Mean: 98.10  
Variance: 29.53  
Standard Deviation: 5.43

SAMPLE TWO: SEAFARER
-----------------
Variable 2 : POD LENGTH (mm)  
Cases 41 through 80  
Mean: 83.80  
Variance: 25.81  
Standard Deviation: 5.08

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"
-----------------------------------------------
F Value: 1.1443  
Numerator degrees of freedom: 39  
Denominator degrees of freedom: 39  
Probability: 0.6760

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"
-----------------------------------------------
Pooled s squared: 27.6667  
Variance of the difference between the means: 1.3833  
Standard Deviation of the difference: 1.1762  
t Value: 12.1583  
Degrees of freedom: 78  
Probability of t: 0.0000

Result: Significant t - Reject the Hypothesis  
Confidence limits for the difference of the means (for alpha=0.05):  
14.300 plus or minus 2.342  
(11.958 through 16.642)
Data file: 331_PVP
Title: PVP-ROG331 vs. SEAFARER 1996

Function: T-TEST

SAMPLE ONE: ROG331
-------------
Variable 2: POD LENGTH (mm)
Cases 21 through 40
Mean: 100.05
Variance: 34.68
Standard Deviation: 5.89

SAMPLE TWO: SEAFARER
-------------
Variable 2: POD LENGTH (mm)
Cases 61 through 80
Mean: 85.95
Variance: 23.84
Standard Deviation: 4.88

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"
---------------------------------------------
F Value: 1.4548
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.4214

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"
---------------------------------------------
Pooled s squared: 29.2605
Variance of the difference between the means: 2.9261
Standard Deviation of the difference: 1.7106
T Value: 8.2429
Degrees of freedom: 38
Probability of t: 0.0000

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
14.100 plus or minus 3.463  (10.637 through 17.563)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1997

Function: T-TEST

SAMPLE ONE: ROG331

Variable 2 : POD LENGTH(mm)
Cases 1 through 20
Mean: 96.15
Variance: 17.92
Standard Deviation: 4.23

SAMPLE TWO: SEAFARER

Variable 2 : POD LENGTH(mm)
Cases 41 through 60
Mean: 81.65
Variance: 19.40
Standard Deviation: 4.40

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 1.0822
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.8651

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Pooled s squared: 18.6605
Variance of the difference between the means: 1.8661
Standard Deviation of the difference: 1.3660
 t Value: 10.6147
Degrees of freedom: 38
Probability of t: 0.0000

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
14.500 plus or minus 2.765 (11.735 through 17.265)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1997 & 1996 COMBINED

Function: T-TEST

SAMPLE ONE: ROG331
----------
Variable 3 : BEAK LENGTH(mm)
Cases 1 through 40
Mean: 7.05
Variance: 1.89
Standard Deviation: 1.37

SAMPLE TWO: SEAFARER
----------
Variable 3 : BEAK LENGTH(mm)
Cases 41 through 80
Mean: 6.40
Variance: 1.27
Standard Deviation: 1.13

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

<table>
<thead>
<tr>
<th>F Value:</th>
<th>1.4839</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerator degrees of freedom:</td>
<td>39</td>
</tr>
<tr>
<td>Denominator degrees of freedom:</td>
<td>39</td>
</tr>
<tr>
<td>Probability:</td>
<td>0.2223</td>
</tr>
</tbody>
</table>

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

| Pooled s squared: | 1.5795 |
| Variance of the difference between the means: | 0.0790 |
| Standard Deviation of the difference: | 0.2810 |
| t Value: | 2.3041 |
| Degrees of freedom: | 78 |
| Probability of t: | 0.0239 |

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05): 0.648 plus or minus 0.559 (0.088 through 1.207)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1996

Function: T-TEST

SAMPLE ONE: ROG331

------------------
Variable 3: BEAK LENGTH (mm)
Cases 21 through 40
Mean: 6.75
Variance: 2.20
Standard Deviation: 1.48

SAMPLE TWO: SEAFARER

------------------
Variable 3: BEAK LENGTH (mm)
Cases 61 through 80
Mean: 6.50
Variance: 1.53
Standard Deviation: 1.24

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

-----------------------------------------------
F Value: 1.4397
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.4344

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

-----------------------------------------------
Pooled s squared: 1.8618
Variance of the difference between the means: 0.1862
Standard Deviation of the difference: 0.4315
t Value: 0.5794
Degrees of freedom: 38
Probability of t: 0.5657

Result: Non-Significant t - Accept the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
0.250 plus or minus 0.874 (-0.624 through 1.124)
Data file: 331_PVP  
Title: PVP--ROG331 vs. SEAFARER 1997

Function: T-TEST

SAMPLE ONE: ROG331

<table>
<thead>
<tr>
<th>Variable 3: BEAK LENGTH(mm)</th>
<th>Cases 1 through 20</th>
<th>Mean:</th>
<th>Variance:</th>
<th>Standard Deviation:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>7.35</td>
<td>1.49</td>
<td>1.22</td>
</tr>
</tbody>
</table>

SAMPLE TWO: SEAFARER

<table>
<thead>
<tr>
<th>Variable 3: BEAK LENGTH(mm)</th>
<th>Cases 41 through 60</th>
<th>Mean:</th>
<th>Variance:</th>
<th>Standard Deviation:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>6.30</td>
<td>1.06</td>
<td>1.03</td>
</tr>
</tbody>
</table>

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

| F Value: | Numerator degrees of freedom: 19 | Denominator degrees of freedom: 19 | Probability: 0.4689 |

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

| Pooled s squared: | Variance of the difference between the means: 0.1277 | Standard Deviation of the difference: 0.3573 | t Value: 2.9248 | Degrees of freedom: 38 | Probability of t: 0.0058 |

Result: Significant t - Reject the Hypothesis

Confidence limits for the difference of the means (for alpha = 0.05):
1.045 plus or minus 0.723 (0.322 through 1.768)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1997 & 1996 COMBINED

Function: T-TEST

SAMPLE ONE: ROG331

Variable 4 : POD WIDTH(mm)
Cases 1 through 40
Mean: 8.00
Variance: 0.20
Standard Deviation: 0.44

SAMPLE TWO: SEAFARER

Variable 4 : POD WIDTH(mm)
Cases 41 through 80
Mean: 9.60
Variance: 1.12
Standard Deviation: 1.06

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 5.7092
Numerator degrees of freedom: 39
Denominator degrees of freedom: 39
Probability: 0.0000

Result: Significant F - Reject the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Variance of the difference between the means: 0.0328
Standard Deviation of the difference: 0.1811
t' Value: -8.8464
Effective degrees of freedom: 52
Probability of t': 0.0000

Result: Significant t - Reject the Hypothesis

Confidence limits for the difference of the means (for alpha=0.05):
1.602 plus or minus 0.363 (1.239 through 1.966)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1996

Function: T-TEST

SAMPLE ONE: ROG331
-----------
Variable 4 : POD WIDTH(mm)
Cases 21 through 40
Mean: 7.95
Variance: 0.26
Standard Deviation: 0.51

SAMPLE TWO: SEAFARER
---------
Variable 4 : POD WIDTH(mm)
Cases 61 through 80
Mean: 8.70
Variance: 0.33
Standard Deviation: 0.57

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"
-----------------------------------------------
F Value: 1.2525
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.6285

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"
-----------------------------------------------
Pooled s squared: 0.2934
Variance of the difference between the means: 0.0293
Standard Deviation of the difference: 0.1713
t Value: -4.3784
Degrees of freedom: 38
Probability of t: 0.0001

Result: Significant t - Reject the Hypothesis

Confidence limits for the difference of the means (for alpha=0.05):
0.750 plus or minus 0.347  (0.403 through 1.097)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1997
Function: T-TEST

SAMPLE ONE: ROG331

Variable 4: POD WIDTH(mm)
Cases 1 through 20
Mean: 8.04
Variance: 0.14
Standard Deviation: 0.37

SAMPLE TWO: SEAFARER

Variable 4: POD WIDTH(mm)
Cases 41 through 60
Mean: 10.50
Variance: 0.26
Standard Deviation: 0.51

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 1.9154
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.1657

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Pooled s squared: 0.1987
Variance of the difference between the means: 0.0199
Standard Deviation of the difference: 0.1410
t Value: -17.4174
Degrees of freedom: 38
Probability of t: 0.0000

Result: Significant t - Reject the Hypothesis

Confidence limits for the difference of the means (for alpha=0.05):
2.455 plus or minus 0.285 (2.170 through 2.740)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1997 & 1996 COMBINED

Function: T-TEST

SAMPLE ONE: ROG331
-------------
Variable 5: POD DEPTH(mm)
Cases 1 through 40
Mean: 10.27
Variance: 0.51
Standard Deviation: 0.71

SAMPLE TWO: SEAFARER
-------------
Variable 5: POD DEPTH(mm)
Cases 41 through 80
Mean: 9.70
Variance: 2.12
Standard Deviation: 1.46

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 4.1598
Numerator degrees of freedom: 39
Denominator degrees of freedom: 39
Probability: 0.0000

Result: Significant F - Reject the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Variance of the difference between the means: 0.0657
Standard Deviation of the difference: 0.2563
t' Value: 2.2140
Effective degrees of freedom: 56
Probability of t': 0.0297

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
0.568 plus or minus 0.513 (0.054 through 1.081)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1996

Function: T-TEST

SAMPLE ONE: ROG331
---------
Variable 5 : POD DEPTH(mm)
Cases 21 through 40
Mean: 10.55
Variance: 0.37
Standard Deviation: 0.60

SAMPLE TWO: SEAFARER
---------
Variable 5 : POD DEPTH(mm)
Cases 61 through 80
Mean: 11.00
Variance: 0.63
Standard Deviation: 0.79

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 1.7266
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.2429

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Pooled s squared: 0.4987
Variance of the difference between the means: 0.0499
Standard Deviation of the difference: 0.2233
t Value: -2.0151
Degrees of freedom: 38
Probability of t: 0.0510

Result: Non-Significant t - Accept the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
0.450 plus or minus 0.452 (-0.002 through 0.902)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1997

Function: T-TEST

SAMPLE ONE: ROG331

Variable 5: POD DEPTH (mm)
Cases 1 through 20
Mean: 9.99
Variance: 0.51
Standard Deviation: 0.72

SAMPLE TWO: SEAFARER

Variable 5: POD DEPTH (mm)
Cases 41 through 60
Mean: 8.41
Variance: 0.17
Standard Deviation: 0.42

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

<table>
<thead>
<tr>
<th>F Value:</th>
<th>2.9725</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerator degrees of freedom:</td>
<td>19</td>
</tr>
<tr>
<td>Denominator degrees of freedom:</td>
<td>19</td>
</tr>
<tr>
<td>Probability:</td>
<td>0.0220</td>
</tr>
</tbody>
</table>

Result: Significant F - Reject the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

| Variance of the difference between the means: | 0.0344 |
| Standard Deviation of the difference: | 0.1854 |
| t' Value: | 8.5472 |
| Effective degrees of freedom: | 30 |
| Probability of t': | 0.0000 |

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
1.585 plus or minus 0.379  (1.206 through 1.964)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER 1997 & 1996 COMBINED

Function: T-TEST

SAMPLE ONE: ROG331
-------------
Variable 6: SEEDS/POD
Cases 1 through 40
Mean: 6.40
Variance: 0.71
Standard Deviation: 0.84

SAMPLE TWO: SEAFARER
-------------
Variable 6: SEEDS/POD
Cases 41 through 80
Mean: 5.85
Variance: 0.75
Standard Deviation: 0.86

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"
--------------------------------------------------------
F Value: 1.0543
Numerator degrees of freedom: 39
Denominator degrees of freedom: 39
Probability: 0.8696

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"
--------------------------------------------------------
Pooled s squared: 0.7269
Variance of the difference between the means: 0.0363
Standard Deviation of the difference: 0.1906
t Value: 2.8849
Degrees of freedom: 78
Probability of t: 0.0051

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
0.550 plus or minus 0.380 (0.170 through 0.930)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFarer 1996

Function: T-TEST

SAMPLE ONE: ROG331

Variable 6: SEEDS/POD
Cases 21 through 40
Mean: 6.20
Variance: 0.59
Standard Deviation: 0.77

SAMPLE TWO: SEAFarer

Variable 6: SEEDS/POD
Cases 61 through 80
Mean: 6.20
Variance: 0.59
Standard Deviation: 0.77

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

<table>
<thead>
<tr>
<th>F Value</th>
<th>1.0000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerator degrees of freedom</td>
<td>19</td>
</tr>
<tr>
<td>Denominator degrees of freedom</td>
<td>19</td>
</tr>
<tr>
<td>Probability</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

<table>
<thead>
<tr>
<th>Pooled s squared:</th>
<th>0.5895</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance of the difference between the means:</td>
<td>0.0589</td>
</tr>
<tr>
<td>Standard Deviation of the difference:</td>
<td>0.2428</td>
</tr>
<tr>
<td>t Value:</td>
<td>0.0000</td>
</tr>
<tr>
<td>Degrees of freedom:</td>
<td>38</td>
</tr>
<tr>
<td>Probability of t:</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Result: Non-Significant t - Accept the Hypothesis

Confidence limits for the difference of the means (for alpha=0.05):
0.000 plus or minus 0.492 (-0.492 through 0.492)
Data file: 311_PVP
Title: PVP--ROG331 vs. SEAFARER 1997

Function: T-TEST

SAMPLE ONE: ROG331

Variable 6: SEEDS/POD
Cases 1 through 20
Mean: 6.60
Variance: 0.78
Standard Deviation: 0.88

SAMPLE TWO: SEAFARER

Variable 6: SEEDS/POD
Cases 41 through 60
Mean: 5.50
Variance: 0.68
Standard Deviation: 0.83

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"

F Value: 1.1385
Numerator degrees of freedom: 19
Denominator degrees of freedom: 19
Probability: 0.7804

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"

Pooled s squared: 0.7316
Variance of the difference between the means: 0.0732
Standard Deviation of the difference: 0.2705
t Value: 4.0669
Degrees of freedom: 38
Probability of t: 0.0002

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
1.100 plus or minus 0.548 (0.552 through 1.648)
Data file: 331_PVP
Title: PVP--ROG331 vs. SEAFARER

Function: T-TEST

SAMPLE ONE: ROG331
----------
Variable 9: SEED COUNT
Cases 1 through 5
Mean: 2457.60
Variance: 9580.80
Standard Deviation: 97.88

SAMPLE TWO: SEAFARER
----------
Variable 9: SEED COUNT
Cases 6 through 10
Mean: 2150.20
Variance: 23945.20
Standard Deviation: 154.74

F-TEST FOR THE HYPOTHESIS "VARIANCE 1 = VARIANCE 2"
--------------------------
F Value: 2.4993
Numerator degrees of freedom: 4
Denominator degrees of freedom: 4
Probability: 0.3966

Result: Non-Significant F - Accept the Hypothesis

T-TEST FOR THE HYPOTHESIS "MEAN 1 = MEAN 2"
--------------------------
Pooled s squared: 16763.0000
Variance of the difference between the means: 6705.2000
Standard Deviation of the difference: 81.8853
t Value: 3.7540
Degrees of freedom: 8
Probability of t: 0.0056

Result: Significant t - Reject the Hypothesis
Confidence limits for the difference of the means (for alpha=0.05):
307.400 plus or minus 188.828 (118.572 through 496.228)
**OBJECTIVE DESCRIPTION OF VARIETY**

*Dry Edible Bean (Phaseolus vulgaris L.)*

**NAME OF APPLICANT(S)**

Novartis Seeds, Inc. Syngenta Seeds, Inc.

**EXPERIMENTAL NAME**

ROG331

**VARIETY NAME**

ROG331

**ADDRESS (Street and No. or R.F.D. No., City, State, ZIP)**

P.O. Box 4188
Boise, Idaho 83711

**PVPO NO.**

9900263

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

1. **MARKET CLASS**

<table>
<thead>
<tr>
<th>CLASS</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Navy (Pea)</td>
<td>Seafarer</td>
</tr>
<tr>
<td>2 = Small White</td>
<td>Aurora</td>
</tr>
<tr>
<td>3 = Black</td>
<td>Midnight</td>
</tr>
<tr>
<td>4 = Pinto</td>
<td>UI-114</td>
</tr>
<tr>
<td>5 = Great Northern</td>
<td>UI-59</td>
</tr>
<tr>
<td>6 = Small Red</td>
<td>NW-59</td>
</tr>
<tr>
<td>7 = Pink</td>
<td>Viva</td>
</tr>
<tr>
<td>8 = Cranberry</td>
<td>UI-50</td>
</tr>
<tr>
<td>9 = Dark Red Kidney</td>
<td>Montcalm</td>
</tr>
<tr>
<td>10 = Light Red Kidney</td>
<td>Redklood</td>
</tr>
<tr>
<td>11 = Yellow Eye</td>
<td>Steuben</td>
</tr>
<tr>
<td>12 = Other (specify)</td>
<td></td>
</tr>
</tbody>
</table>

2. **MATURETY**

<table>
<thead>
<tr>
<th>LOCATION OF THE TEST(S) TO EVALUATE THIS VARIETY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nampa, Idaho</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 = Early (80-90 days); 2 = Medium (90-100 days); 3 = Late (&gt;100 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days from planting to harvest maturity</td>
</tr>
<tr>
<td>Heat units from planting to harvest maturity (optional). Specify base temperature used:</td>
</tr>
<tr>
<td>Days from planting to harvest maturity of check variety (use check appropriate to market class shown in item 1)</td>
</tr>
</tbody>
</table>

### PLANT HABIT

3. **TYPE**

<table>
<thead>
<tr>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 =Bush-determinate, strong and erect stem and branches</td>
</tr>
<tr>
<td>2 =Bush-determinate, weak stem and branches</td>
</tr>
<tr>
<td>3 =Erect growth habit-indeterminate, guides (runners) short or not developed</td>
</tr>
<tr>
<td>4 =Erect growth habit-indeterminate, guides medium to long, with no ability to climb</td>
</tr>
<tr>
<td>5 =Vine-indeterminate, short guides with no ability to climb</td>
</tr>
<tr>
<td>6 =Vine-indeterminate, long guides with ability to climb</td>
</tr>
<tr>
<td>7 =Indeterminate climbing, pods distributed throughout the plant</td>
</tr>
<tr>
<td>8 =Indeterminate climbing, pods concentrated on the upper part of the plant</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>SHAPE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 =Ovate</td>
</tr>
<tr>
<td>2 =Lanceolate</td>
</tr>
<tr>
<td>3 =Deltoid</td>
</tr>
<tr>
<td>4 =Cordate</td>
</tr>
<tr>
<td>5 =Rhomboid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APEX OF LEAFLET:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 =Acute</td>
</tr>
<tr>
<td>2 =Acuminate</td>
</tr>
<tr>
<td>3 =Cuspidate</td>
</tr>
<tr>
<td>4 =Obluse</td>
</tr>
<tr>
<td>5 =Attenuate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BASE OF LEAFLET:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 =Obtuse</td>
</tr>
<tr>
<td>2 =Oblique</td>
</tr>
<tr>
<td>3 =Cordate</td>
</tr>
<tr>
<td>4 =Cuneate</td>
</tr>
<tr>
<td>5 =Attenuate</td>
</tr>
</tbody>
</table>
6. POD MORPHOLOGY (Green pod morphology optional)

[Color Patterns
1. Solid
2. Striped
3. Bloshed
4. Mottled
5. Other]

[Primary Colors
1. Purple
2. Red
3. Green
4. Yellow
5. Tan
6. Brown
7. Other]

[Color Modifiers
1. Light
2. Light Medium
3. Medium
4. Medium Dark
5. Dark]

[Secondary Colors
1. Purple
2. Red
3. Green
4. Yellow
5. Tan
6. Brown
7. Other]

[CROSS SECTION SHAPE
1. Flat
2. Pear
3. Round
4. Figure Eight]

[POD CURVATURE
1. Straight
2. Slightly Curved
3. Curved
4. Recurved]

[POD BEAK ORIENTATION
1. Straight
2. Curved Upward
3. Curved Downward
4. Variable

Average beak length, in cm. 0.705]

[CONSTRUCTIONS
1. None
2. Slight
3. Deep]

[6. Number of seeds per pod
1. Average]

7. SEED COLOR

[1. Shiny
2. Dull
3. Semishiny
4. Variable
5. Monochrome
6. Polychrome]

[Primary Colors
1. White
2. Yellow
3. Buff
4. Tan
5. Brown
6. Pink
7. Red
8. Purple
9. Blue
10. Black
11. Other]

[Secondary Colors
1. White
2. Yellow
3. Buff
4. Tan
5. Brown
6. Pink
7. Red
8. Purple
9. Blue
10. Black
11. Other]

[Color Patterns
1. Solid
2. Splashed
3. Mottled
4. Striped
5. Flecked
6. Dotted]

[Hilar Ring
1. Absent
2. Present]

[Hilar Ring Colors
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

[Shape of Seed Taken from Middle of Pod
1. Round
2. Oval
3. Cuboid
4. Kidney
5. Truncate Fastigiate]

[1. Dry seed weight in g/100g seeds (adjusted to 12% moisture) 2.8]
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, Fuscos 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)

2 DISEASE: CN Bean Common Mosaic Virus ; SN ______________ ; Race(s) NL3, NL8, NY15

3 DISEASE: CN Anthracnose ; SN C. lindemuthianum ; Race(s) Alpha

2 DISEASE: CN Anthracnose ; SN C. lindemuthianum ; Race(s) 7

1 DISEASE: CN Anthracnose ; SN C. lindemuthianum ; Race(s) 73

1 DISEASE: CN Common Bacterial Blight ; SN X. campestris pv. phaseoli ; 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 ______________

3. COMMENTS
Dry Edible Navy Bean

'ROG331'

Exhibit D

Botanical Description

Dry edible navy bean 'ROG331' is a mid season variety that matures in 93 days in Idaho. It has an upright, medium vine plant habit (type IIB, CIAT classification) and flowers in 51 days. It has good branching and pod set is scattered up the plant.

The leaves are somewhat smooth, dull, ovate with acuminate apices, and mostly obtuse leaf bases. Flowers are white, and pods are green which turn tan at maturity. The seeds are round, shiney white in color and average 18.5 g per 100 seeds. ROG331 has pods averaging 98 mm in length and 6.4 seeds per pod.

ROG331 is susceptible to Common Bacterial Blight. It is resistant to Bean Common Mosaic Virus strains NY15, NL8, NL3 (hypersensitive). ROG331 is resistant to Anthracnose race 07, susceptible to race 73, and tolerant to race alpha.

ROG331 is adapted to the growing areas of Michigan, Minnesota, North Dakota and Manitoba, Canada.
| **EXHIBIT E** |
| STATEMENT OF THE BASIS OF OWNERSHIP |

| 1. NAME OF APPLICANT(S) | Syngenta NOVARTIS SEEDS, INC. |
| 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER | ROG331 |
| 4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) | P.O. Box 4188 \nBoise, Idaho 83711 |
| 5. TELEPHONE (include area code) | 208-327-7246 |
| 6. FAX (include area code) | 208-378-6625 |
| 7. PVPO NUMBER | 9900263 |

<table>
<thead>
<tr>
<th>8. Does the applicant own all rights to the variety? Mark an &quot;X&quot; in appropriate block. If no, please explain.</th>
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<th>9. Is the applicant (individual or company) a U.S. national or U.S. based company?</th>
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<th>10. Is the applicant the original owner?</th>
</tr>
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<tbody>
<tr>
<td>X</td>
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</tbody>
</table>

If no, please answer one of the following:

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

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<th></th>
<th>YES</th>
<th>NO</th>
</tr>
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</table>

If no, give name of country.

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

<table>
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<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

If no, give name of country.

---

Additional explanation on ownership (if needed, use reverse for extra space):

The dry edible navy bean ROG331 was bred and developed by plant breeders employed by Novartis Seeds, Inc. By agreement between the employee and Novartis Seeds, Inc. all rights to any invention, discovery, or development made by the employee while employed by Novartis Seeds, Inc. were assigned to Novartis Seeds, Inc. with no rights retained by the employee.

---

LEASE NOTE:

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

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.

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.

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 final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

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Dry Edible Navy Bean

'ROG331'

Exhibit E

Statement of the Basis for the Applicant's Ownership

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