No. 8200007

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Agrigenetics Corporation
Vegetable Products Group

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

BEAN

'Shannon'

PLANT VARIETY PROTECTION OFFICE · U.S. DEPARTMENT OF AGRICULTURE

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 *this* 28th *day of* April *in the year of our Lord one thousand nine hundred and* eighty-three.

Attest:

Kenneth [illegible]

Acting
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

John R Block

Secretary of Agriculture

INSTRUCTIONS

GENERAL: Send an original copy of the application and exhibits, at least 2,500 viable seeds, and $500 fee ($250 filing fee and $250 examination fee) to U.S. Dept. of Agriculture, Agricultural Marketing Service, Livestock, Poultry, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

5 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.

13a 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) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.

13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one 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 differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as, plant habit, plant color, disease resistance, etc.

14a 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 his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "NO," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)

15a See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

FORM APPROVED
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY: 9400	1b. VARIETY NAME: SHANNON RJS	FOR OFFICIAL USE ONLY — PV NUMBER: 8200007
2. KIND NAME: Snapbean	3. GENUS AND SPECIES NAME: Phaseolus vulgaris	FILING DATE: 10/22/81 — TIME: 3:00 A.M. (P.M.)
4. FAMILY NAME (BOTANICAL): Leguminosae	5. DATE OF DETERMINATION: July 1978	FEE RECEIVED: $ 500.00 — DATE: 10/22/81; $ 250.00 — 4/8/83
6. NAME OF APPLICANT(S): AGRIGENETICS CORPORATION Vegetable Products Group	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*: P.O. Box 1438 Hollister, Ca 95023	8. TELEPHONE AREA CODE AND NUMBER: 408-687-5782
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)* Corporation	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION: New Mexico	11. DATE OF INCORPORATION: 1/9/81

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS: ~~Dr. Albert E. Braun~~, Agrigenetics Corporation ~~9870 Fairview Road, P.O. Box 1438 Hollister, Ca 95023~~ Dr. Keith Zary 1120 220th Street Farmington, Minn. 55024 cw

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [x] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [x] 13B. Exhibit B, Novelty Statement.
- [x] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [x] 13D. Exhibit D, Additional Description of the Variety.

14a. 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). (If "Yes," answer 14B and 14C below.)* [ ] YES [x] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? [ ] YES [x] NO

14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED? [ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [x] YES [ ] NO *(If "Yes," give name of countries and dates.)*

United Kingdom 1980

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [x] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [x] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed 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 Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

9/25/81 (DATE) — Albert E. Braun (SIGNATURE OF APPLICANT)

(DATE) — (SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

APPLICATION FOR PLANT VARIETY PROTECTION

Bush Bean ~~9400~~ SHANNON

Exhibit 13a

Origin and Breeding History of the Variety

'SHANNON' ~~9400~~ originated from a hand pollinated cross between 'Cascade' and 'Chicobel' and four backcrosses to Cascade. Backcrosses were completed in 1976.

In the S-1 and S-2 there was segregation of long and short pods. After selection of long straight pods produced in center of plant the S-3 to S-4 were uniform. Pure line selections were made in the S-5 based on compact plant, pods set high in the plant and concentrated, straight pods, and even maturity.

The genetic makeup of the variety appeared stabilized in the S-5. Larger population in the S-6 and S-7 were similar, except that the flat pod rouge was present at a frequency of 1 in 4200 and will require roguing to maintain purity.

Cascade was developed by Keystone Seed Co. from a cross of Tendercrop x Geneva breeding line 154-40-1-1-1. It has had worldwide acceptance for processing. It is a Tendercrop type with pods scattered in the plant. Pod curvature at times leads to a snipping problem. Cascade carries resistance to Bean Common Mosaic and Summer Death virus.

Chicobel was developed in Holland by Royal Sluis. The plant is a medium sized bush and pods are scattered in the plant. The pods are straight, short (7-8cm) and peak at 3 sieve size. Chicobel carries resistance to Bean Common mosaic, roll mosaic. Anthracnose and Summer Death virus.

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~~AVX 9400~~ 'SHANNON' R/S

Exhibit 13B

Data Indicative of Novelty

'SHANNON' ~~AVX 9400~~ most closely resembles 'Cascade'. Primary differences between ~~9400~~ 'SHANNON' and 'Cascade' are:

1. Maturity is 3 days <u>later</u> than 'Cascade'.
2. 'SHANNON' ~~AVX 9400~~ produces more pods per plant than 'Cascade'.
3. Pods are straighter than 'Cascade'.

Data to support statements 1 and 3 are presented below.

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1.) Maturity of ~~AVX 9400~~ 'SHANNON' is 3 days later than 'Cascade':

Days to maturity (30% 5 sieve) of ~~AVX 9400~~ 'SHANNON' and 'Cascade' during two growing seasons and two years at Farmington, MN.

Year	Season[1].	Days to 30% 5 Sieve[2]. ~~9400~~ SHANNON	Cascade	t(.01)[3].	t(df=98)
1981	Spring	61	58	2.64	3.35*
	Fall	59	57	2.64	12.50*
1982	Spring	62	59	2.64	18.75*
	Fall	59	61	2.64	9.65*

1. Spring plantings were May 14, 1981 and May 24, 1982. Fall plantings were July 6, 1981 and July 7, 1982.

2. Commercial harvest of snapbeans in the mid-west is at a designated sieve size maturity. In other words, when for example 30% of the crop reaches the 5th sieve the processor harvests the field. Using this type of standard, we calculate days to maturity in our yield trials at Farmington, MN. We use 30% 5 sieves as peak maturity. Data on maturity was collected from 10 plants in each of 5 replications for each variety and/or line.

3. t tests were calculated according to Steele and Torre Principles and Procedures of Statistics p. 433.

8200007

3.) Pods are Straighter than 'Cascade':

Comparison of degree of curvature for 5 sieve pods of ~~AVX 9400~~ 'SHANNON' and 'Cascade' during two growing seasons and two years at Farmington, MN and during one season and one year at Hollister, CA.

Year	Season[1.]	% Pods Greater than 15% Curvature		t).01)[3.]	t(df=98)
		~~9400~~ SHANNON	Cascade		
		Farmington, MN			
1981	Spring	11	18	2.64	3.87*
	Fall	7	15	2.64	6.51*
1982	Spring	9	18	2.64	11.27*
	Fall	6	13	2.64	4.51*
		Hollister, CA			
1981	Spring	9	15	2.64	6.39*

1. Spring plantings were May 14, 1981 and May 24, 1982. Fall plantings were July 6, 1981 and July 7, 1982.

2. % Pod curvature was measured as described in the original application. Five sieve pods from 10 plants and from 5 replications were used in all years seasons and locations.

3. t tests were calculated according to Steele and Torre Principles and Procedures of Statistics p. 433.

APPLICATION FOR PLANT VARIETY PROTECTION

Bush Bean ~~9400~~ 'SHANNON' RJS

Exhibit 13b

Data Indicative of Novelty

Novelty is based on the unique combination of the following characters.

SHANNON ~~9400~~ most closely resembles Cascade, except that:

(1) Maturity is 3 days later.

(2) More pods per plant.

(3) Pods are straighter.

(1) Maturity of SHANNON ~~9400~~ to fresh market stage is 3 days later than Cascade.

Sieve size distribution at Hollister, Ca. at 1302 Heat Unit and 76 days.

sieve size	9400 %	Cascade %
2	8	7
3	13	10
4	41	25
5	31	33
6	7	25

At 1357 Heat Units and 79 days, the distribution approximates Cascade at 1302 Heat Units in the larger sizes.

sieve size	9400 %
2	0.6
3	4.6
4	40
5	33
6	20

(2) When grown at Hollister,Ca. the number of pods per plant is greater for 9400.

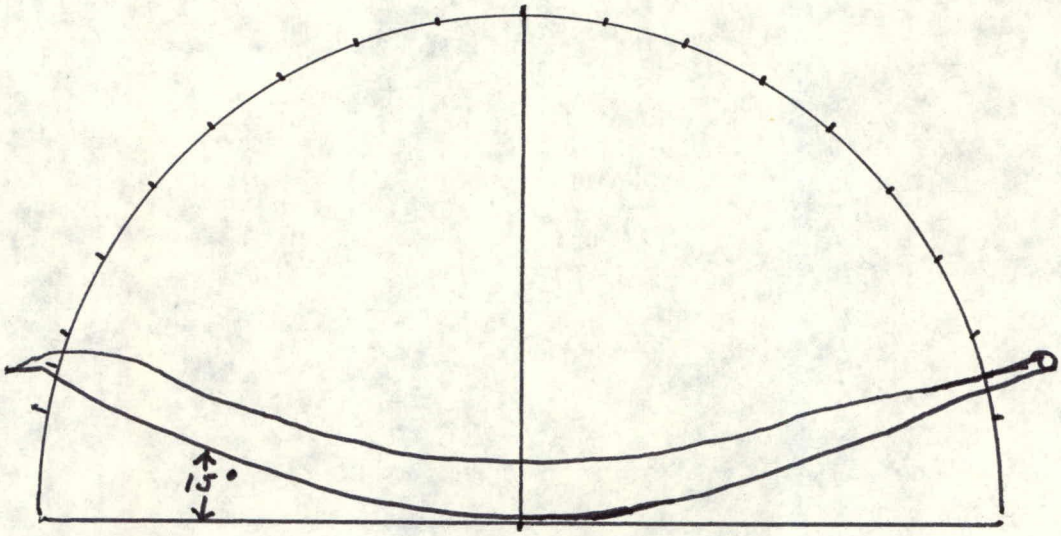
	SHANNON ~~9400~~	Cascade
mean pods/pl.	26	21
Range	14-37	15-29

t = 2.10 t(.05) req. for significence is 2.06

(3) Pods are straighter.

In comparison, when grown side by side, pods of ~~9400~~ 'SHANNON' show 9% with 15 degrees of curvatiure or more as compared to Cascade with 15% of 15 degrees or more.

Method of measurement



FORM APPROVED: OMB NO. 40-R3822

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Bean)

OBJECTIVE DESCRIPTION OF VARIETY

BEAN (Phaseolus vulgaris L.)

NAME OF APPLICANT(S)
AGRIGENETICS CORPORATION VEGETABLE PRODUCTS GROUP

ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*
9870 Fairview Road
Hollister, Ca 95023

FOR OFFICIAL USE ONLY
PVPO NUMBER 8200007
VARIETY NAME OR TEMPORARY DESIGNATION <94007 'SHANNON'

Place numbers in the boxes (e.g. [0 8 9]) for the characters that best describe this variety. Measured data should be for SPACED PLANTS. Ranges may also be given. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____. The location of test area is Hollister California. Please answer questions appropriate for your variety if the information is available.

1. TYPE:

[2] 1 = Field *(dry-edible)* 2 = Garden

2. MARKET MATURITY:

[7 6] Days to edible pods

[ ] Days to green shells

[1 0 5] Days to dry seeds

[1 3 0 2] Heat units to edible pods

[ ] Heat units to green shells

[1 7 8 0] Heat units to dry seeds

[ ] No. days earlier than ..... [ ]

..... Same as .. [1]

[0 3] No. days later than ..... [8]

1 = Tendercrop
2 = Kentucky Wonder
3 = Kinghorn Wax
4 = White Kidney
5 = Michelite 62
6 = Dwarf Horticultural
7 = Bush Blue Lake 290
8 = Other (specify below) Cascade

3. PLANT:

[1] 1 = Determinate 2 = Indeterminate

[0 4 8] cm height

[0 7] cm shorter than ..... [1]

Same as .. [8]

[ ] cm taller than ..... [ ]

comparison variety from above

[4 4] cm spread

[0 0 3] Number primary branches near base

[0 2] cm narrower than ..... [1]

width same as ... [ ]

[0 2] cm wider than ..... [8]

comparison variety from above

[1] Branching habit: 1 = compact 2 = open

[1] Main stalk: 1 = brittle 2 = wirey

[1] 1 = stout 2 = thin

8

3. PLANT: (Cont'd)

[2] Pod position: 1 = low 2 = high 3 = scattered

[4] Bush form (illustrated below):

1 = spherical bush form 2 = stem bush form 3 = wide bush form 4 = high bush form

5 = other (specify) _____

4. LEAVES:

[2] 1 = smooth 2 = wrinkled

[1] 1 = dull 2 = glossy

[3] Size: 1 = small (Earliwax) 2 = medium 3 = large (Tendercrop)

[2] Color: 1 = light green (as light or lighter than Bountiful) 2 = medium green
3 = dark green (as dark or darker than Bush Blue Lake 290)

5. FLOWERS:

[1] Color: 1 = white 2 = cream 3 = pink 4 = lilac 5 = purple 6 = Other (specify)_____

[5 2] Days to 50% bloom

6. FRESH PODS: (Edible maturity, average for 20 pods)

[2] Exterior color: 1 = light green (as light or lighter than Bountiful)
2 = medium green
3 = dark green (as dark or darker than Bush Blue Lake 290)
4 = light yellow (Brittlewax)
5 = golden yellow (Cherokee Wax)
6 = green-red variagated (Horticultural)
7 = other (specify)

_____

% Sieve size distribution at optimum maturity for non-flat pods

Note:
1 = 4.76 mm to 5.76 mm
2 = 5.76 mm to 7.34 mm
3 = 7.34 mm to 8.34 mm
4 = 8.34 mm to 9.53 mm
5 = 9.53 mm to 10.72 mm
6 = 10.72 mm or larger

1	2	3	4	5	6
	8	13	41	31	7

3 sieve	[0 8] cm length	[0 8] mm width	[0 8] mm thickness
4 sieve	[1 3] cm length	[0 9] mm width	[0 9] mm thickness
5 sieve	[1 5] cm length	[1 0] mm width	[1 0] mm thickness
6 sieve	[1 6] cm length	[1 0] mm width	[1 1] mm thickness

9

6. FRESH PODS: (Cont'd)

[3] Cross section pod shape: 1 = flat 2 = oval 3 = round 4 = heart

[2] Creaseback: 1 = present 2 = absent

[2] Pubescence: 1 = none 2 = sparse 3 = considerable

[2] Spur: 1 = straight 2 = slightly curved 3 = curved

[1] Constrictions: 1 = none 2 = slight 3 = deep

[2] Pod flesh: 1 = light 2 = medium 3 = dark

[1][0] mm spur length

[1] Fiber: 1 = none 2 = sparse 3 = considerable

[7] Number of seeds per pod

[1] Surface: 1 = smooth 2 = rough

[2] Suture string: 1 = present 2 = absent

[1] Seed development (Snap Bean): 1 = slow 2 = medium 3 = fast

[1] Machine harvest: 1 = adapted 2 = not adapted

[1] Pod flavor:
(1) Standard (Tendercrop)
(2) Mild Blue Lake (BBL 274)
(3) Strong Blue Lake (Pole FM1)
(4) Mild Romano (Roma)
(5) Strong Romano (Pole Romano)
(6) Other (specify) _____

7. SEED COAT COLOR:

[1] 1 = Monochrome 2 = Polychrome [ ] 1 = shiny 2 - dull

CBB per letter of 7/22/82 from K. Hary

[1] Primary color: 1 = white 2 = yellow 3 = buff 4 = tan

[ ] Secondary color: 5 = brown 6 = pink 7 = red 8 = purple 9 = blue 10 = black 11 = other (specify) _____

[ ] Color Pattern: 1 = none 2 = splashed 3 = mottled 4 = striped 5 = flecked 6 = dotted

[ ] Secondary color location: 1 = hilar ring 2 = ventral surface 3 = sides 4 = dorsal surface 5 = not restricted to any area 6 = combination of location (specify below) _____

[ ] Hilar ring on colored seeds: 1 = absent 2 = narrow 3 = butterfly shaped

8. SEED SHAPE AND SIZE:

[1] Hilum view: 1 = elliptical 2 = oval 3 = round

[2] Cross section: 1 = elliptical 2 = oval 3 = cordate 4 = round

[1] Side view:


1 = oval to oblong


2 = round


3 = reniform

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8. SEED SHAPE AND SIZE: (Cont'd)

[2] 1 = truncate ends 2 = rounded ends

[3 4] gm/100 seed

[3.3] gm/100 seed lighter than ..... [1]

gm/100 seed same as .... [ ]

[3.8] gm/100 seed heavier than ..... [8]

comparison variety from page one

9. ANTHOCYANIN: (1 = absent 2 = present)

[1] Flowers [1] Stems [1] Pods [1] Seeds [1] Leaves

10. DISEASE RESISTANCE (0 = not tested 1 = susceptible 2 = resistant):

[0] Anthracnose (specify race below) _____

[0] Rust (specify race below) _____

[0] Powdery mildew

[1] Fusarium root rot

[0] Pythium root rot

[1] Rhizoctonia root rot

[0] Pythium wilt

[0] Angular leaf spot

[0] Bacterial wilt

[1] Halo blight (specify race below) Race 1&2

[0] Fuscous blight

[0] Red node virus

[0] Pod mottle virus

[2] Bean common mosaic virus (specify strain below) Type & NY15 strains CRB

2 [X] Mosaic mottle

[ ] Black root

[1] Bean yellow mosaic virus

[0] Curly top

2 [1] Other (specify below) Summer Death Virus CRB

11. INSECT RESISTANCE: (0 = not tested 1 = susceptible 2 = resistant)

[0] Aphids

[0] Leaf hopper

[0] Lygus

[0] Pod borer

[0] Root knot nematode

[0] Seed corn maggot

[0] Thrips

[0] Weavils

[0] Other (specify below) _____

12. PHYSIOLOGICAL RESISTANCE: (0 = not tested 1 = susceptible 2 = resistant)

[0] Heat [0] Cold [0] Drought [0] Air pollution

13. COMMENTS:

11

APPLICATION FOR PLANT VARIETY PROTECTION

Exhibit 13d

Bush Bean ~~9400~~ SHANNON RJS

Additional Description of the Variety

When grown at Hollister, Ca, ~~9400~~ SHANNON is similar to Cascade in size of plant, leaflet size, color of pods, pubescence on foliage, stem structure and root system.

Plant size	~~9400~~ SHANNON (95% Conf.level)	Cascade(95% Conf.level)
mean height	48.8 cm ± 5.4	48.0 cm ± 7.0
mean width	44.7 cm ± 4.8	42.3 cm ± 3.4

The size of the center leaflet of the mature plant is the same as Cascade.

	~~9400~~ SHANNON	Cascade
mode 10 cm.		10 cm.
mode 7 cm.		7 cm.

The color of the raw and blanched 4 sieve pod is slightly brighter in Cascade as shown by the Y values, however dominant wave length is the same. For the raw pod, dominant wave length is 569 nm. and for the blanced pod 558 nm. for both varieties.

The tristimulus value and trichromatic coefficients are as follows for the raw pod.

	~~9400~~ SHANNON	Cascade
X	17.88	20.33
Y	20.43	23.08
Z	11.01	11.93
x	.362	.367
y	.414	.417

For blanched pod.

X	12.46	15.12
Y	15.18	17.88
Z	11.38	13.06
x	.319	.320
y	.388	.388

Trials in Oregon and in Minnesota gave comparable results in relative maturity.

Oregon harvest in 72 days

Sieve size	~~9400~~ SHANNON % by cut	Cascade % by cut
2	13	12
3	29	14
4	43	38
5	15	28
6	0	8

Minnesota harvest at 1381 H.U.

Sieve size		
2	7	0
3	14	8
4	22	17
5	29	32
6	28	43

Pods of ~~9400~~ SHANNON are concentrated from center to high in the plant, rarely pods touch the ground. In Cascade pod set is usually more scattered.

~~9400~~ SHANNON is resistant to Bean Common mosaic and N.Y. 15 virus. Isolates for testing were obtained from Dr. R. Hampton, U.S.D.A. Oregon State University. Type for for Bean Common mosaic was from the variety Double Witte and for N.Y. from Sanilac. Both types were active on Sutter Pink but not on ~~9400~~ SHANNON.

~~9400~~ SHANNON is also resistant to Summer Death virus according to test results as reported by Arthur Yates and Co. in Australia.

References:

Color: Principles of Color Technology
Billmeyer and Saltzman
Bausch and Lomb Operations Manual

Statistics: Statistical Procedures
Alder and Roessler, U. of Calif.

sunseeds® From Technology To Life

P.O. Box 1438, 2320 Technology Parkway, Building 11 Suite A, Hollister, CA 95024-1438 USA 408/636-9505 TWX 910-3720254

June 7, 1988

Kenneth H. Evans, Commissioner
Plant Variety Protection Office
National Agriculture
Library Building, Room 500
Beltsville, MD 20705

Re: Change of Assignment.

Dear Mr. Evans:

This letter is in reference to your correspondence to me, dated July 14, 1987. I wish to make it clear that this change of assignment is to indicate a name change only, from U.F. Genetics, Inc. to Sunseeds Genetics, Inc.

Also, in reference to 'Mystro' tomato, have Item 1 read Sunseeds Genetics, Inc. and issue the certificate to Sunseeds Genetics, Inc.

Enclosed please find a check in the amount of $170.00 to cover the cost of changing the certificates.

Title	Certificate No.	Date
Empress	7900045	4/15/82
9014	Ap8100174	9/28/81
9293	Ap8100175	9/28/81
9400	Ap8200007	10/22/81
Paymaster	7600058	12/7/77
Lakeland	7600059	1/26/78
Triumph	7600061	12/30/77
Broker's Choice	8100175	4/28/83
Profit Maker	8100174	4/28/83
Shannon	8200007	4/28/83
Sunrise	7100029	6/24/74
Lake Shasta	7100030	8/12/74
Lake Erie	7100031	8/12/74
Rebel	7100033	9/30/74
Lake Superior	7100034	5/21/74

Title	Certificate No.	Date
Miami	7100036	2/28/74
Lake Geneva	7200068	5/21/74
Scanion	7300001	11/15/74
Picoverde	7300016	4/10/73
Raider	7400069	7/26/74
Lake Largo	7400104	9/30/74
Lake Seneca	7500096	11/24/75
Chaparral	7600052	5/16/77
Costaverde	7600053	8/24/77
Gustoverde	7600054	8/24/77
Mesaverde	7600055	5/32/77
Conquest	7700058	7/26/77
Commander	7900067	7/26/79
Keygold	8000111	10/16/80
Snapbean, Exp. 163	7600058	12/7/77
Snapbean, Exp. 195	7600059	1/6/78
'Green Genes' Bean	7600060	12/7/77
Snapbean, Exp. 116-0	7600061	12/30/77
Mikado (AVX 450)	Ap8400037	12/30/83

Sincerely,

Gene Hookstra

Gene Hookstra
Vice President, Research

GH/mo

enc: Check
Copy of Correspondence from K.H. Evans

8200007

BILL OF SALE AND ASSIGNMENT

FOR VALUE RECEIVED, Sunseeds Genetics Inc, a Delaware Corporation, with its principal offices at 2320 Technology Parkway, Hollister, California, ("Sun") does hereby sell, transfer, assign and convey to Rogers Brothers Seed Company, a Delaware Corporation with principal offices at 1755 Westgate Drive, Boise, Idaho, ("Rogers") the following:

1. All Suns intangible assets relating to its pea, snap pea, garden bean, runner bean, cow pea, dry bean, and lima bean business ("Products").

2. All plant variety protection rights and all plant variety protected materials along with the rights to use the names thereof including all varieties listed on Schedule A attached hereto and incorporated herein by this reference.

3. All proprietary plant varieties and all other proprietary information relating thereto which are related to Products.

4. All patents, patent application and patent applications relating to the Products.

5. All research property relating to Products including notebooks, findings, pedigrees, records of experiments and their results, seed stocks, know how, techniques, all other proprietary information in whatever form stored, germ plasm, the germ plasm uses, seed samples and their coding and indexing methods.

6. All trademarks, trade names, service marks and copyrights which apply to the Products excluding any name which includes the corporate name of Sun and its affiliates.

7. Any and all other intangible assets and property rights relating to Products not specifically mentioned herein.

SUNSEEDS GENETICS, INC.
PLANT VARIETY PROTECTION - USA
AS OF 8/10/88

Variety	Cert #	Issued	Expires	Issued To
Peas				
Alpine	8500101	09/27/85	09/27/03	Sunseeds, A Div. of Agri.
Blizzard	8700022	06/30/87	06/30/05	Sunseeds Genetics, Inc.
Mendota	AP 8500163	05/30/85		
Polaris	AP 8600017	11/12/85		
Sunset	8300074	04/30/84	04/30/02	Agrigenetics Corporation
Titania	AP 8200008	10/26/81		
Beans				
Brokers Choice	8100175	04/28/83	04/28/01	Agrigenetics Corporation
Conquest	7700058	07/26/77	07/26/94	Keystone Seed Co., Inc.
Empress	7900045	04/15/82	04/15/00	Agrigenetics Corporation
Green Genes	7600060	12/07/77	12/07/94	Northrup King
Keygold	8000111	10/16/80	10/16/97	Keystone Seed Co., Inc.
Lake Erie	7100031	08/12/74	08/12/91	Keystone Seed Co., Inc.
Lake Geneva	7200068	05/21/74	05/21/91	Keystone Seed Co., Inc.
Lake Largo	7400104	09/30/74	09/30/91	Keystone Seed Co., Inc.
Lake Seneca	7500096	11/24/75	11/24/92	Keystone Seed Co., Inc.
Lake Shasta	7100030	08/12/74	08/12/91	Keystone Seed Co., Inc.
Lake Superior	7100034	05/21/74	05/21/91	Keystone Seed Co., Inc.
Lakeland	7600059	01/26/78	01/26/95	Agrigenetics Corporation
Miami	7100036	02/28/74	02/28/91	Keystone Seed Co., Inc.
Mikado (AVX 450)	8400037	03/31/87	03/31/05	Sunseeds Genetics, Inc.
Paymaster	7600058	12/07/77	12/07/94	Agrigenetics Corporation
Profit Maker	8100174	04/28/83	04/28/01	Agrigenetics Corporation
Raider	7400069	07/26/74	07/26/91	Keystone Seed Co., Inc.
Rebel	7100033	09/30/74	09/30/91	Keystone Seed Co., Inc.
Shannon	8200007	04/28/83	04/28/01	Agrigenetics Corporation
Sunrise	7100029	06/24/74	06/24/91	Keystone Seed Co., Inc.
Triumph	7600061	12/30/77	12/30/94	Agrigenetics Corporation

AP = PVP applied for

SCHEDULE A

DATED this the 26 day of May, 1989.

SUNSEEDS GENETICS INC:

BY [signature]
its: Executive Vice President

ATTEST:

[signature]

State of CALIFORNIA)
)ss
County of SAN BENITO)

On this 26th day of May, 1989, before me, the undersigned Notary Public, personally appeared WILLIAM FRAZIER and ROBERT VAN MARTER known to me to be the EXECUTIVE V.P. and V.P. OF FINANCE respectively of the corporation that executed the instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal, the day and year in this certificate first above written.

OFFICIAL SEAL
CINDY J. ACTIS
NOTARY PUBLIC - CALIFORNIA
SAN BENITO COUNTY
My Comm. Expires Aug. 7, 1991

Cindy J Actis
Notary Public
Residing at: Hollister, CA
My commission expires: 8/7/91

State of Delaware

Office of Secretary of State

I, MICHAEL HARKINS, SECRETARY OF STATE OF THE STATE OF DELAWARE DO HEREBY CERTIFY THAT "ROGERS BROTHERS SEED COMPANY", FILED A CERTIFICATE OF AMENDMENT, CHANGING ITS CORPORATE TITLE TO "ROGERS NK SEED CO.", ON THE TWENTY-SIXTH DAY OF DECEMBER, A.D. 1990, AT 10:01 O'CLOCK A.M.

DEPARTMENT OF STATE
OFFICE OF THE SECRETARY OF STATE
1835 1970
1793
DELAWARE

Michael Harkins, Secretary of State

AUTHENTICATION: M. Magnuson

DATE: 10/08/1991

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DO NOT WRITE IN THIS SPACE

AMENDED
STATEMENT AND DESIGNATION
BY
FOREIGN CORPORATION

ROGERS NK SEED CO.

_____, a corporation

organized and existing under the laws of Delaware, and which is presently qualified for the transaction of intrastate business in the State of California, makes the following statements and/or designation:

That the name of the corporation has been changed to that hereinabove set forth

and that the name relinquished at the time of such change was _____

ROGERS BROTHERS SEED COMPANY

ROGERS NK SEED CO.
(Name of Corporation)

William B. Albers
(Signature of corporate officer)

William B. Albers, President
(Typed name and title of officer signing)

INSTRUCTIONS:

1. If this Amended Statement shows a change of corporate name, there must be attached to this Amended Statement a certificate of an authorized public official of the state or place of incorporation, that such change of name was made in accordance with the laws of that state or place.

2. For filing this Amended Statement there is a fee of $15.00.

(CALIF. - 1320 - 3/27/87)

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State of Delaware

Office of the Secretary of State

I, WILLIAM T. QUILLEN, SERCRETARY 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, Secretary of State

0810041 8320

944080001

AUTHENTICATION: 7120759

DATE: 05-16-94

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STATE OF DELAWARE
SECRETARY OF STATE
DIVISION OF CORPORATIONS
FILED 09:00 AM 05/05/1994
944080001 - 810041

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 of 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 13th day of April, 1994.

Willem van Overschot

Willem van Overschot, President

Richard B. Geller

Richard B. Geller, Secretary

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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

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.

Edward J. Freel, Secretary of State

0829320 8100M
971211787

AUTHENTICATION: 8531908

DATE: 06-26-97

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STATE OF DELAWARE
SECRETARY OF STATE
DIVISION OF CORPORATIONS
FILED 09:00 AM 06/25/1997
971211767 – 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:

NAME	***STATE OF INCORPORATION***
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

PLANT VARIETY PROTECTION CERTIFICATE

ASSIGNMENT

The Sunseeds Division of Agrigenetics Corporation, a Delaware corporation having a place of business at 3575 Mitchell Lane, Boulder, Colorado 80301 ("Agrigenetics"), represents that it is the owner of the entire right, title and interest in and to the plant variety protection certificates and applications for plant variety protection certificates shown below.

For good and valuable consideration, receipt of which is hereby acknowledged, Agrigenetics hereby assigns to UF Genetics, Inc., a Delaware corporation having a place of business at 9800 Fairview Road, Hollister, California 95024, Agrigenetics' entire right, title and interest in and to the following plant variety protection certificates and applications therefore, together with all Agrigenetics' rights to the sexually reproduced plants that are the subject of such certificates and applications:

I. Registered Certificates

Title	Certificate Number	Date
Empress	7900045	4/15/82
9014	Ap8100174	9/28/81
9293	Ap8100175	9/28/81
9400	Ap8200007	10/22/81
Paymaster	7600058	12/7/77
Lakeland	7600059	1/26/78
Triumph	7600061	12/30/77
Broker's Choice	8100175	4/28/83
Profit Maker	8100174	4/28/83
Shannon	8200007	4/28/83
Sunrise	7100029	6/24/74
Lake Shasta	7100030	8/12/74
Lake Erie	7100031	8/12/74
Rebel	7100033	9/30/74
Lake Superior	7100034	5/21/74
Miami	7100036	2/28/74
Lake Geneva	7200068	5/21/74
Scanion	7300001	11/15/74
Picoverde	7300016	4/10/73
Raider	7400069	7/26/74

Lake Largo	7400104	9/30/74
Lake Seneca	7500096	11/24/75
Chaparral	7600052	5/16/77
Costaverde	7600053	8/24/77
Gustoverde	7600054	8/24/77
Mesaverde	7600055	5/31/77
Conquest	7700058	7/26/77
Commander	7900067	7/26/79
Keygold	8000111	10/16/80
Snapbean, Exp. 163	7600058	12/7/77
Snapbean, Exp. 195	7600059	1/6/78
'Green Genes' Bean	7600060	12/7/77
Snapbean, Exp. 116-0	7600061	12/30/77
Mikado (AVX 450)	Ap8400037	12/30/83
Mystro	8500064	4/16/85

II. Pending Certificate Applications

Title	Application Number	Filing Date
Cajun Queen	Pending	--
Mendota	Pending	--
Sunset	Pending	--
Alpine	Pending	--
Polaris	Pending	--

AGRIGENETICS CORPORATION

By: Murray Polinsin

Title: Executive Vice President

COMMONWEALTH OF MASSACHUSETTS)

County of Suffolk)

On this 30th day of April, 1986, before me appeared Wesley Johnson, the person who signed this instrument, who acknowledged that he signed it as a free act on behalf of Agrigenetics Corporation.

Susan M. Hately

Notary Public
My Commission Expires: 11/21/91