

No.

920069



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

BEAN

'Foxfire'



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 30th day of September in the year of our Lord one thousand nine hundred and ninety-two.

Attest:

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

*Edward Madison*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

# 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) (as it is to appear on the Certificate) Rogers Nk Seed Company		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. RB88702		3. VARIETY NAME Foxfire	
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) P. O. Box 4188 Boise, Idaho 83711-4188		5. PHONE (Include area code) (208) 322-7272		FOR OFFICIAL USE ONLY PVPO NUMBER 9200069	
6. GENUS AND SPECIES NAME Phaseolus vulgaris		7. FAMILY NAME (Botanical) Leguminosae			
8. CROP KIND NAME (Common Name) Dry Edible Bean		9. DATE OF DETERMINATION August 1990		Filing and Examination Fee: \$ 2150.00	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation		11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware		Date January 17, 1992 Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.	
12. DATE OF INCORPORATION		13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Jim McConnell Rogers Nk Seed Co. P. O. Box 4188 Boise, ID 83711-4188		Filing and Examination Fee: \$ 250.00 Date Jan. 17, 1992 Certificate Fee: \$ 250.00 Date Sept. 8, 1992	
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)		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.)		16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement. c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety. d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety. e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership. f. <input type="checkbox"/> Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office _____ g. <input type="checkbox"/> Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."		<input type="checkbox"/> YES (If "YES," answer items 16 and 17 below) <input checked="" type="checkbox"/> NO (If "NO," skip to item 18 below)		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?		18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?		19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?	
<input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED		<input type="checkbox"/> YES (If "YES," through _____ ) <input checked="" type="checkbox"/> NO		<input type="checkbox"/> YES (If "YES," give names of countries and dates) <input checked="" type="checkbox"/> NO     Sale of product for field trials only	
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 (Owner(s)) 		CAPACITY OR TITLE Marketing Director		DATE 3-10-92	
SIGNATURE OF APPLICANT (Owner(s))		CAPACITY OR TITLE		DATE	

## INSTRUCTIONS

**GENERAL:** To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed Exhibits A,B,C,E; (3) at least 2,500 viable untreated seeds; (4) check, drawn on a U.S. bank, payable to "Treasurer of the United States" in the amount of \$2,150 (\$250 filing fee and \$1,900 examination fee). (See section 180.175 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for 30 days, then returned to the applicant as unfiled. Mail application and other requirements to: Plant Variety Protection Office, AMS, USDA, Rm. 500, NAL Building, 10301 Baltimore Blvd., Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the Application are self-explanatory unless noted below. Corrections on the Application form and Exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a Certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$250 for issuance of the Certificate.

Plant Variety Protection Office  
Telephone: 301/344-2518

### ITEM

9. Give the date when there has been at least a tentative determination that the variety has been sexually reproduced with recognized characteristics, whether or not the novelty of those characteristics has been determined. [See section 41(d) of the Plant Variety Protection Act (Act).]
- 14a. 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. (See sections 41 and 52 of the Act.)
- 14b. 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 are clear differences; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons which clearly indicate novelty.
- 14c. Exhibit C forms are available from the PVPO; specify crop kind. Fill in the Exhibit C (Objective Description of Variety form) to describe your variety.
- 14d. 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.
- 14e. Section 52(4) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. The applicant may be the actual breeder, the employer of the breeder, the owner through purchase or inheritance, etc.
15. 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 either been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified the applicant may change the choice. (See section 180.16 of the Regulations and Rules of Practice.)
19. See sections 41 (i, j) and 42 of the Act and section 180.7 of the Regulations and Rules of Practice for eligibility requirements.

### NOTES:

It is the responsibility of the applicant/owner to keep the PVPO informed of any change of address or change of ownership or assignment 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 is \$25. [See section 101 of the Act, and sections 180.130, 180.131, 180.132, and 180.175(h) of the Regulations and Rules of Practice.]

To avoid conflict with other variety names in use, the applicant should check the variety names proposed by contacting: Seed Branch, AMS, USDA, Rm. 213, Building 306, Beltsville Agricultural Research Center -- East, Beltsville, MD 20705. Telephone: 301/344-2089.

DRY EDIBLE BEAN

9200069

FOXFIRE

EXHIBIT A

ORIGIN AND BREEDING HISTORY

The light red kidney bean 'Foxfire' was derived from the following cross pollination in the greenhouse during the fall of 1978.

Red Kloud x Sacramento

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>
Winter 1978	F1	78-GH-403	57 g	
Summer 1978	F2	78-2086	908 g	
Summer 1982	F3	82-NY-47		3
Winter 1983	F4	83-GH-885	85 g	
Summer 1983	F5	83-NY-164		1
Summer 1984	F6	84-NY-054		6
Summer 1985	F7	85-NY-053	774 g	
Summer 1986	F8	86-NY-031	917 g	
Summer 1987	F9	87-4702	1,182 g	
Winter 1988	F10	88-IN3231	6 lbs	
Summer 1988	F11	RD98452	93 lbs	
Summer 1989	F12	89-DB-700	1,420 lbs	

Foxfire was tested as LK78403-2H, LK88702 and RB88702.

Foxfire has been observed to be stable and uniform since the F7 generation. Stock number 89-DB-700 has been increased to commercial size quantities. Seed stock will be monitored for purity.

**AMENDMENTS PV#9200069**

**Dry Bean "Foxfire"  
Rogers NK Seed Co.**

Dry Edible Bean

"Foxfire"

Exhibit B

Novelty Statement

Our variety "Foxfire" is most similar to "Red Kloud". Foxfire differs from Red Kloud in the following ways:

- 1) Foxfire has pink flowers where as Red Kloud's are white.
- 2) Foxfire develops systemia necrosis in response to Bean Common Mosaic Virus strain NL3 (IIBC1bc1) where as Red Kloud only develops local necrotic lesions. (Drifhout's mosaic has T group 9 vs 10, respectively).
- 3) Foxfire has a longer pod than Red Kloud (2 years).
- 4) Foxfire has a deeper pod than Red Kloud (2 Years).
- 5) Foxfire averages more seeds per pod than Red Kloud (2 years).
- 6) Foxfire matures in 89 day (864.7°C H.U.) vs 95 days (921.7°C H.U.) for Red Kloud in Idaho (3 year average).

9200069

POD LENGTH

FOXFIRE

13.5 cm

15 cm

14.5 cm

13 cm

14 cm

13 cm

15 cm,

14.5 cm

13.5 cm

13 cm

15 cm

13.5 cm

15 cm

13.5 cm

14 cm

13 cm

14 cm

14 cm

15 cm

14 cm

$\bar{X} = 14.025$

RED KLOUD

12.5 cm

11 cm

14 cm

14.5 cm

11.5 cm

12 cm

12 cm

14 cm

13 cm

15 cm

14 cm

15 cm

12 cm

12 cm

12 cm

12 cm

11 cm

11 cm

13 cm

13 cm

$\bar{X} = 12.725$

POD DEPTHFOXFIRE

8 mm  
9 mm  
8 mm  
9 mm  
8 mm  
7 mm  
9 mm  
10 mm  
8 mm  
9 mm  
8 mm  
8 mm  
9 mm  
10 mm  
8 mm  
7 mm  
8 mm  
9 mm  
9 mm  
8 mm  
X = 8.45

RED KLOUD

6 mm  
6 mm  
7 mm  
6 mm  
7 mm  
7 mm  
6 mm  
7 mm  
6 mm  
8 mm  
6 mm  
7 mm  
6 mm  
6 mm  
6 mm  
7 mm  
6 mm  
6 mm  
8 mm  
8 mm  
X = 6.55

9200069

SEEDS/POD

FOXFIRE

5  
6  
6  
5  
6  
5  
6  
6  
5  
4  
5  
6  
5  
5  
4  
4  
5  
5  
6  
5

$\bar{X} = 5.2$

RED KLOUD

5  
4  
6  
5  
5  
4  
4  
5  
5  
4  
5  
4  
4  
4  
5  
4  
4  
4  
5

$\bar{X} = 4.6$

Data file: **FOXFIRE**

Title: PVP FOXFIRE VS. RED KLOUD

Function: ANOVA-1

Data case no. 1 to 40

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

Variable 8 (SEEDS/POD)

## ANALYSIS OF VARIANCE TABLE

	Degrees of Freedom	Sum of Squares	Mean Square	F-value	Prob.
Between	1	3.600	3.600	8.550	0.0058
Within	38	16.000	0.421		
Total	39	19.600			

Coefficient of Variation = 13.24%

Var. 1	VARIABLE Number	No. 8 Sum	Average	SD	SE
1	20.00	104.000	5.200	0.70	0.15
2	20.00	92.000	4.600	0.60	0.15
Total	40.00	196.000	4.900	0.71	0.11
Within				0.65	

Bartlett's test

Chi-square = 0.421

Number of Degrees of Freedom = 1

Approximate significance = 0.516

9200069

Data file: **FOXFIRE**  
Title: PVP FOXFIRE VS. RED KLOUD

Function: ANOVA-1  
Data case no. 1 to 40

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

Variable 7 (POD DEPTH (MM))

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	Mean Square	F-value	Prob.
Between	1	36.100	36.100	52.965	0.0000
Within	38	25.900	0.682		
Total	39	62.000			

Coefficient of Variation = 11.01%

Var. 1	V A R I A B L E Number	No. 7 Sum	Average	SD	SE
1	20.00	169.000	8.450	0.83	0.18
2	20.00	131.000	6.550	0.83	0.18
Total	40.00	300.000	7.500	1.26	0.20
Within				0.83	

Bartlett's test

Chi-square = 0.000  
Number of Degrees of Freedom = 1  
Approximate significance = 1.000

Data file: **FOXFIRE**Title: PVP **FOXFIRE** VS. **RED KLOUD**

# 1

# 2

Function: ANOVA-1

Data case no. 1 to 40

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

Variable 4 (POD LENGTH (CM))

## ANALYSIS OF VARIANCE TABLE

	Degrees of Freedom	Sum of Squares	Mean Square	F-value	Prob.
Between	1	16.900	16.900	15.300	0.0004
Within	38	41.975	1.105		
Total	39	58.875			

Coefficient of Variation = 7.86%

Var. 1	VARIABLE Number	No. 4 Sum	Average	SD	SE
1	20.00	280.500	14.025	0.72	0.24
2	20.00	254.500	12.725	1.30	0.24
Total	40.00	535.000	13.375	1.23	0.19
Within				1.05	

Bartlett's test

Chi-square = 6.271

Number of Degrees of Freedom = 1

Approximate significance = 0.012

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

NAME OF APPLICANT(S) Dr. Ronald Shellenberger	EXPERIMENTAL NAME RB88702	VARIETY NAME Foxfire
ADDRESS (Street and No. or R.F.D. No., City, State, ZIP) Rogers NK Seed Company P.O. Box 4188 Boise, Idaho 83711-4188		<b>FOR OFFICIAL USE ONLY</b>
		PVPO NO. 9200069

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
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**1. MARKET CLASS**

1	0	<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	Redcloud
		11 = Yellow Eye	Steuben
		12 = Other (specify)	

**2. MATURITY**

1 = Early (80-90 days); 2 = Medium (90-100 days); 3 = Late (>100 days)

1

8 7

Days from planting to harvest maturity

8 7 6

Heat units from planting to harvest maturity (optional). Specify base temperature used: 10° C

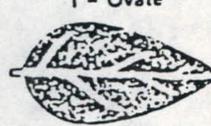
9 6

Days from planting to harvest maturity of check variety (use check appropriate to market class shown in item 1)

**3. PLANT HABIT**

<p style="text-align: center;">1</p> <p style="text-align: center;"><b>TYPE</b></p> <p>1 = Ia Bush-determinate, strong and erect stem and branches</p> <p>2 = Ib Bush-determinate, weak stem and branches</p> <p>3 = IIa Erect growth habit-indeterminate, guides (runners) short or not developed</p> <p>4 = IIb Erect growth habit-indeterminate, guides medium to long, with no ability to climb</p> <p>5 = IIIa Vine-indeterminate, short guides with no ability to climb</p> <p>6 = IIIb Vine-indeterminate, long guides with ability to climb</p> <p>7 = IVa Indeterminate climbing, pods distributed throughout the plant</p> <p>8 = IVb Indeterminate climbing, pods concentrated on the upper part of the plant</p>	<p style="text-align: center;">6 7</p> <p>Average height of mature plant, in cm. <math>\bar{X}</math> of 20 plants</p> <p style="text-align: center;">6 5</p> <p>Average height of check variety, in cm. (use same check as above)</p> <p style="text-align: center;">3</p> <p>Pod Position: 1 = Low (lower pods touching soil surface) also 1 2 = High (lower pods not touching soil surface) 3 = Scattered (not concentrated high or low)</p> <p style="text-align: center;">1</p> <p>Adaptability to machine harvest: 1 = Adapted 2 = Not Adapted</p> <p style="text-align: center;">1</p> <p>Lodging resistance: 1 = Good 2 = Fair 3 = Poor</p>
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**4. LEAFLET MORPHOLOGY** (Use terminal leaflet of a fully expanded trifoliolate)

<p style="text-align: center;">2</p> <p>1 = Smooth; 2 = Wrinkled</p>	<p style="text-align: center;">1</p> <p>1 = Dull; 2 = Glossy; 3 = Semiglossy; 4 = Variable</p>		
<p style="text-align: center;">1</p> <p>SHAPE:</p> <p style="text-align: center;">1 = Ovate</p>  <p style="text-align: center;">2 = Lanceolate</p>  <p style="text-align: center;">3 = Deltoid</p>  <p style="text-align: center;">4 = Cordate</p>  <p style="text-align: center;">5 = Rhomboid</p> 	<p style="text-align: center;">2</p> <p>APEX OF LEAFLET:</p> <p style="text-align: center;">1 = Acute</p>  <p style="text-align: center;">2 = Acuminate</p>  <p style="text-align: center;">3 = Cuspidate</p>  <p style="text-align: center;">4 = Obtuse</p> 	<p style="text-align: center;">1</p> <p>BASE OF LEAFLET:</p> <p style="text-align: center;">1 = Obtuse</p>  <p style="text-align: center;">2 = Oblique</p>  <p style="text-align: center;">3 = Cordate</p>  <p style="text-align: center;">4 = Cuneate</p>  <p style="text-align: center;">5 = Attenuate</p> 	

2. FLOWER COLOR AND DAYS TO BLOOM

(lavendar)

9200069 (lavendar)

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

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

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

Days to 50% bloom

3. POD MORPHOLOGY (Green pod morphology optional)

Green Mature

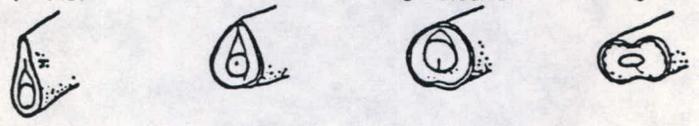
COLOR PATTERN: 1 = Solid; 2 = Striped; 3 = Blotched; 4 = Mottled; 5 = Other \_\_\_\_\_

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

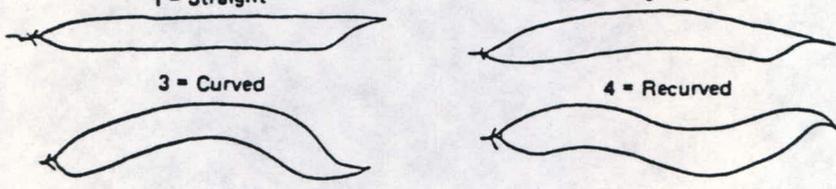
COLOR MODIFIER: 1 = Light; 2 = Light Medium; 3 = Medium; 4 = Medium Dark; 5 = Dark

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

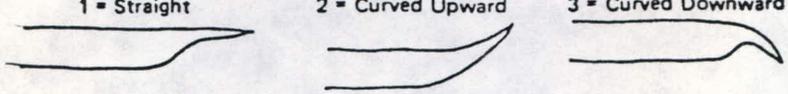
CROSS SECTION SHAPE: 1 = Flat 2 = Pear 3 = Round 4 = Figure Eight



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. \_\_\_\_\_



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

Average number of seeds per pod

SEED COLOR

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

1 = Monochrome; 2 = Polychrome

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 \_\_\_\_\_

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

Rose to light reddish brown

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 \_\_\_\_\_

SEED SHAPE AND WEIGHT

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



Dry seed weight in g/1000g seeds (adjusted to 12% moisture)

3. ANTHOCYANIN PIGMENTATION

1 = ABSENT  
2 = PRESENT

<input checked="" type="checkbox"/> Flowers	<input type="checkbox"/> Stems	<input type="checkbox"/> Pods	<input type="checkbox"/> Seeds
<input type="checkbox"/> Leaves	<input type="checkbox"/> Petioles	<input type="checkbox"/> Peduncles	<input 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 \_\_\_\_\_; Race(s) I gene NY IS, BV I

DISEASE: CN White mold; SN Sclerotium Sclerotiorum; Race(s) \_\_\_\_\_

DISEASE: CN Bean Rust; SN Uromyces Appediculatus; Race(s) \_\_\_\_\_

DISEASE: CN Curly Top; SN Ruga Verrucosus; Race(s) \_\_\_\_\_

DISEASE: CN Common Blight; SN Xanthomonas Campestris; Race(s) \_\_\_\_\_  
PV Phaseoli

DISEASE: CN Halo Blight; SN Pseudomonas Syringae; Race(s) \_\_\_\_\_  
PV Phaseolicola

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****FOXFIRE****EXHIBIT D****BOTANICAL DESCRIPTION**

Foxfire is an early maturing, upright variety with a medium size plant. It has a type IA plant habit.

Foxfire matures in 87 days, which is 9 days earlier than Red Kloud for the same years (maturity defined as 90% of pods turned from green to buckskin). It also has good dry down, which helps in the ability to harvest.

Foxfire has the dominant I gene conferring resistance to Bean Common Mosaic Virus. Foxfire is tolerant to Common and Halo Blight, but susceptible to Curly Top Virus. It is resistant to undetermined races of Bean Rust. Because of its upright plant habit, Foxfire avoids most white mold problems.

The seed size of Foxfire averages 920 seeds per pound, which is smaller than Red Kloud at 883 seeds per pound. In canning tests, Foxfire produces a canned produce comparable to Red Kloud's quality.

Foxfire has shown adaptability in the production areas of Idaho, New York, Colorado and North Dakota.

**EXHIBIT E****Statement of the Basis of Applicant's Ownership**

Foxfire was derived from a hand-pollinated cross made by Dr. Ronald Shellenberger in 1978. Its parents are Red Kloud, which was a variety from Cornell University, and Sacramento, which was a variety owned by Sacramento Valley Milling Company. All selections and increases have been made by Rogers NK Seed Co. and are owned by said Company.

State of Delaware

Office of the Secretary of State

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PAGE 1

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

944080001

AUTHENTICATION: 7120759

DATE: 05-16-94

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**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.

1  
Willem van Overschot  
Willem van Overschot, President

Richard B. Geller  
Richard B. Geller, Secretary

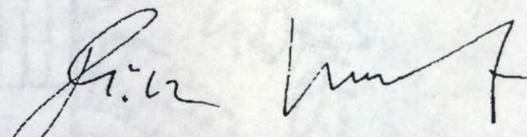
ROGERS NK SEED CO.

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

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*

Edward J. Freel, Secretary of State

0829320 8100M  
971211787

AUTHENTICATION: 8531908  
06-26-97

DATE:

19

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:

<b><u>NAME</u></b>	<b><u>STATE OF INCORPORATION</u></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