No. 7400082

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Asgrow Seed Company

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

BEAN

'Checkmate'

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* 26th *day of* July *in the year of our Lord one thousand nine hundred and* seventy-four

Attest:

S. A. Rollin

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Earl L. Butz

Secretary of Agriculture

FORM GR-470
(12-15-72)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

FORM APPROVED
OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1. VARIETY NAME OR TEMPORARY DESIGNATION	2. KIND NAME	FOR OFFICIAL USE ONLY	
~~XP-B46~~ Checkmate R/S	Garden Bean	PV NUMBER 7400082	
3. GENUS AND SPECIES NAME	4. FAMILY NAME *(Botanical)*	FILING DATE 4.3.74	TIME 8 A.M. ~~P.M.~~
Phaseolus vulgaris	Leguminosae	FEE RECEIVED	BALANCE DUE
	5. DATE OF DETERMINATION	$ 250	$ —
		$ 250	$ —
	1971	$ 250	$ —
6. NAME OF APPLICANT(S)	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*		8. TELEPHONE AREA CODE AND NUMBER
Asgrow Seed Company	Kalamazoo, Michigan 49001		(616) 382-4000

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*	10. STATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Delaware	22 March, 1968

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

Allen R. Trotter
Asgrow Seed Company
Kalamazoo, Michigan 49001

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, Botanical Description of the Variety
- [X] 13C. Exhibit C, Objective Description of the Variety
- [X] 13D. Exhibit D, Data Indicative of Novelty
- [X] 13E. Exhibit E, Statement of the Basis of Applicant's Ownership

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

The applicant declares that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) of this sexually-reproduced novel plant variety believes 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 is informed that false representation herein can jeopardize protection and result in penalties.

April 8, 1974
(DATE)

Allen Trotter
(SIGNATURE OF APPLICANT)

1

(DATE)

(SIGNATURE OF APPLICANT)

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and $250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, 6525 Belcrest Road, Hyattsville, Maryland 20782. (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 Insert the date the applicant determined that he had a new variety based on the definition in Section 41 (a) of the Act and decision is made to increase the seed.

13a First, give the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method. Second, give the details of subsequent stages of selection and multiplication. Third, indicate the type and frequency of variants during reproduction and multiplication and state how these variants may be identified. Fourth, provide evidence on stability.

13b First, give any special characteristics of the seed and of the plant as it passes through the seedling stage, flowering stage and the fruiting stage. Second, describe the mature plant and compare it with a similar commercial variety grown under the same conditions, and indicate the differences.

13c A supplemental form will be furnished by the PVPO to describe in detail a variety for each kind of seed.

13d Provide complete data indicative of novelty. Seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty may be submitted. Seeds submitted may be sterile.

13e Indicate whether applicant is the actual breeder, the employer of the breeder, the owner through purchase or inheritance, etc.

J.D.Atkin
March 25, 1974

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF ~~XP-B46~~ 'CHECKMATE' R/S

AMENDED

Application #7400082

1962	Original cross Roundup x BBL 274
1963	F_1 was grown.
1963	F_2 grown in winter.
1964	F_3 was grown and single plant selections were made.
1965	F_4 was grown and single plant selections were made.
1966	F_5 was grown and single plant selections were made.
1967	F_6 was grown and single plant selections were made.
1968	F_7 was grown as a small increase.
1969	Observation and yield trials.
1970	Yield trials Increase and mass selection.
1971	Yield trials. Increase and mass selection.
1972	Designated ~~XP-B46~~ 'CHECKMATE' R/S
1972	To present - trials Increase and mass selection.

This variety appears to be very stable but does have the normal mutations to flat and stringy pods. These two mutations probably occur in all round podded, stringless varieties.

EXHIBIT B

BOTANICAL DESCRIPTION OF ~~XP-B46~~ 'CHECKMATE' RDS

'CHECKMATE'
~~XP-B46~~ is a medium sieve Tendercrop type bean which is widely adapted. The season of maturity is late being about four days later than Tendercrop. The plant is large and more upright than most of the other Tendercrop varieties.

The fresh pods are medium to dark green in color, average about 14 cm in length and are somewhat creaseback. Seed and fiber development are slow and the pods are practically fiberless at all stages of development. The pods are nearly straight, smooth and stringless. The plants are tall and generally upright and the pods are borne well up in the plant so that the variety appears to be very well adapted to mechanical harvest.

The seed color is white, kidney shaped, and medium in size. The 100 seed weight is approximately 28 grams. There is no anthocyanin in the seeds or any plant parts.

CHECKMATE
~~XP-B46~~ is resistant to Common Bean Mosaic and N. Y. 15 Bean Mosaic but has not been tested for resistance to other diseases.

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-12
(10-2-72)

EXHIBIT C
(Bean)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF VARIETY

BEAN (*PHALEOLUS VULGARIS*)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)
ASGROW SEED COMPANY

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

FOR OFFICIAL USE ONLY

PVPO NUMBER 74-82

VARIETY NAME OR TEMPORARY DESIGNATION
~~XP-B46~~ CHECKMATE RJS.

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. TYPE:

[1] 1 = SNAPBEAN 2 = GREEN SHELL 3 = DRY EDIBLE 4 = MULTIPURPOSE

2. SEASON AND REGION OF ADAPTABILITY IN THE U.S.:

[2] Grows best during: 1 = SPRING 2 = SUMMER 3 = FALL 4 = WINTER

[6] Best adapted in: 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST 5 = SOUTHWEST 6 = MOST REGIONS

3. MATURITY (*Days from seeding to first harvest*):

[7][3] GREEN PODS [ ][ ] GREEN SHELLS [ ][ ] DRY SEEDS

[ ][ ] NO. DAYS EARLIER THAN --------- [ ]
[0][4] NO. DAYS LATER THAN ---------- [1]

1 = TENDERCROP 2 = KENTUCKY WONDER 3 = KINGHORN WAX
4 = WHITE KIDNEY 5 = MICHELITE 62 6 = DWARF HORTICULTURAL
7 = BUSH BLUE LAKE 8 = OTHER (*Specify*)

4. PLANT:

[1] 1 = DETERMINATE, ERECT BUSH 2 = DETERMINATE, SPRAWLING BUSH 3 = DETERMINATE, SEMIPOLE 4 = INDETERMINATE, POLE

[0][5][2] CM. HEIGHT OR LENGTH OF VINE FROM PRIMARY LEAF NODE

[0][0][4] NUMBER PRIMARY BRANCHES PER MAIN STALK

[6][0] CM. SPREAD

[0][4] NUMBER INTERNODES ON MAIN STALK BETWEEN PRIMARY LEAF AND BASE OF TERMINAL INFLORESCENCE

[1] Branching habit: 1 = COMPACT 2 = OPEN

[0][2] CM. LENGTH OF FIRST INTERNODE ABOVE PRIMARY LEAF

[0][8] MM. STALK DIAMETER ABOVE FIRST TRIFOLIATE LEAF

[2] Main stalk: 1 = BRITTLE 2 = WIREY [1] 1. STOUT 2. THIN

[2] Flower position:
[2] Pod Position:
1 = LOW, CONCENTRATED 2 = HIGH, CONCENTRATED 3 = SCATTERED

5. LEAVES:

[2] 1 = SMOOTH 2 = WRINKLED [1] 1 = DULL 2 = GLOSSY [2] Thickness: 1 = THIN 2 = MEDIUM 3 = THICK

[3] Size: 1 = SMALL (*Earliwax*) 2 = MEDIUM 3 = LARGE (*Tendercrop*) [10] CM. PETIOLE LENGTH (*To basal leaflets of first trifoliate leaf*)

[2] Tip shape of center leaflet: 1 = ROUNDED 2 = TAPER POINTED 3 = SHARP POINTED

[2] PUBESCENCE - Dorsal:
[2] PUBESCENCE - Ventral:
1 = NONE 2 = SLIGHT 3 = CONSIDERABLE

[2] Color: 1 = LIGHT GREEN (*Bountiful*) 2 = MEDIUM GREEN 3 = DARK GREEN (*Bush Blue Lake*)

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'CHECKMATE' RJS
~~XP-B46~~

6. FLOWERS:

[1] Color: 1 = WHITE 2 = CREAM 3 = PINK 4 = LILAC 5 = PURPLE 6 = OTHER *(Specify)*_____

[2] Racemes: 1 = LONG 2 = MEDIUM 3 = SHORT [5] NUMBER FLOWERS PER RACEME

7. FRESH PODS: *(Edible maturity, averages for 10 pods)*

[2] Color: 1 = LIGHT GREEN *(Bountiful)* 2 = MEDIUM GREEN *(Tendergreen)* 3 = DARK GREEN *(Wade)* 4 = LIGHT YELLOW *(Brittlewax)* 5 = GOLDEN YELLOW *(Cherokee Wax)* 6 = GREEN-RED VARIAGATED *(Horticultural)* 7 = OTHER *(Specify)* _____

[1 4] CM. LENGTH [0 9] MM. WIDTH *(Between sutures)* [1 0] MM. THICKNESS [0 9] WIDTH/THICKNESS X 10

[3] Cross section pod shape: 1 = FLAT 2 = OVAL 3 = CREASEBACK 4 = ROUND

[2] Curvature: 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = CURVED

[1] Constrictions: 1 = NONE 2 = SLIGHT 3 = DEEP

[2] Surface: 1 = SHINY 2 = DULL

[2] Pod flesh: 1 = LIGHT 2 = DARK

[15] MM. SPUR LENGTH

[2] Fiber: 1 = NONE 2 = SPARSE 3 = CONSIDERABLE

[6] NUMBER OF SEEDS PER POD

[ ] NUMBER MARKETABLE PODS PER PLANT *(Once over harvest)*

[2] Pubescence: 1 = NONE 2 = SPARSE 3 = CONSIDERABLE

[2] Spur: 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = CURVED

[1] Surface: 1 = SMOOTH 2 = BLISTERED

[1] Pod flesh: 1 = FIRM 2 = WATERY

[2] Suture string: 1 = PRESENT 2 = ABSENT

[1] Seed development: 1 = SLOW 2 = MEDIUM 3 = FAST

[ ] NUMBER PODS PER PLANT *(Once over harvest)*

[1] Machine harvest: 1 = ADAPTED 2 = NOT ADAPTED

8. SEED COAT COLOR:

[1] 1 = MONOCHROME 2 = POLYCHROME

[1] 1 = SHINY 2 = DULL

[1] Primary color: [-] Secondary color: 1 = WHITE 2 = YELLOW 3 = BUFF 4 = TAN 5 = BROWN 6 = PINK 7 = RED 8 = PURPLE 9 = BLUE 10 = BLACK 11 = OTHER *(Specify)*_____

[-] Color pattern: 1 = SPLASHED 2 = MOTTLED 3 = STRIPED 4 = FLECKED 5 = DOTTED

[-] Secondary color location: 1 = HILAR RING 2 = HILAR SURFACE 3 = STROPHIOLE 4 = MICROPYLE 5 = SIDES 6 = DORSAL SURFACE 7 = NOT RESTRICTED TO ANY AREA 8 = COMBINATION OF LOCATIONS *(Specify)*_____

[1] Hilar ring: 1 = NOT PRESENT 2 = NARROW 3 = BUTTERFLY SHAPED

[2] Vein-like under coat pattern: 1 = ABSENT 2 = PRESENT

9. SEED SHAPE AND SIZE:

[1] Hilum view: 1 = ELLIPTICAL 2 = OVAL 3 = ROUND

[3] Side view: 1 = OVAL 2 = ROUND 3 = KIDNEY 4 = TRUNCATE ENDS

[4] Cross section: 1 = ELLIPTICAL 2 = OVAL 3 = CORDATE 4 = ROUND

[28] GM. WEIGHT PER 100 SEEDS

[4] Classification: 1 = PEA 2 = MEDIUM 3 = MARROW 4 = KIDNEY 5 = PINTO

[0 5] MM. WIDTH *(Dorsal to ventral)*

[0 5] MM. THICKNESS *(Side to side)*

[1 2] MM. LENGTH

[0 1 0] WIDTH/THICKNESS X 10

'CHECKMATE' R/S
~~XP-B46~~

10. ANTHOCYANIN: *(1 = Absent 2 = Present):*

[1] FLOWERS [1] STEMS [1] PODS [1] SEEDS [1] LEAVES

11. DISEASE RESISTANCE *(0 = Not tested; 1 = Susceptible; 2 = Resistant):*

[0]	RUST *(Specify race)* _____	[0]	ANGULAR LEAF SPOT
[0]	BACTERIAL WILT	[2]	COMMON BEAN MOSAIC
[0]	ANTHRACNOSE	[0]	YELLOW BEAN MOSAIC
[0]	SOUTHERN BEAN MOSAIC	[0]	FUSARIUM ROOT ROT
[0]	CURLY TOP	[2]	N.Y. 15 BEAN MOSAIC
[0]	POWDERY MILDEW	[0]	BEAN MOSAIC VIRUS 4
[0]	HALO BLIGHT	[0]	FUSCOUS BLIGHT
[0]	ALFALFA MOSAIC VIRUS	[0]	ALFALFA MOSAIC VIRUS 2
[0]	POD MOTTLE VIRUS	[0]	RED NODE VIRUS
[0]	ROOT KNOT NEMATODE	[0]	OTHER *(Specify)* _____

12. INSECT RESISTANCE: *(0 = Not tested; 1 = Susceptible; 2 = Resistant)*

[0]	APHIDS	[0]	LEAF HOPPERS
[0]	POD BORER	[0]	LYGUS
[0]	THRIPS	[0]	WEAVILS
[0]	SEED CORN MAGGOT	[0]	OTHER *(Specify)* _____

13. PHYSIOLOGICAL RESISTANCE: *(0 = Not tested; 1 = Susceptible; 2 = Resistant)*

[0] HEAT [0] COLD [0] DROUGHT [0] OTHER *(Specify)* _____

REFERENCES: The following publications may be used as a reference in completing this form:

1. Beans of New York. Vol. 1 Part II of Vegetables of New York. U.P. Hedrick et al. J. B. Lyon Company, Albany, N.Y. 1931.
2. Yarnell, S. H., Cytogenetics of the Vegetable Crops IV. Legumes. Bot. Rev. 31:247 - 330. 1965.
3. USDA Yearbook of Agriculture. 1937.

COLOR: Nickerson's or any recognized color fan may be used to determine the colors.

EXHIBIT D

PROOF OF NOVELTY

'CHECKMATE' RJS ~~XP B46~~ most nearly resembles the variety Eagle. The general plant type, leaf type, etc., of the two varieties are quite similar, but they differ in the following characteristics:

1. 'CHECKMATE' RJS ~~XP B46~~ is larger sieve.
2. XP B46 has a shorter pod.
3. XP B46 has darker processed pod color.

The darker color was determined by visual observation and we do not have numerical data, but following are data collected in 1972 and 1973 at Twin Falls, Idaho, from periodic harvests which illustrates the difference in sieve size and pod length. Each figure is the average of 10 pods.

Harvest Date	Length of 5 Sieve Pods in MM		% 5 Sieve and over	
	Eagle	'CHECKMATE' ~~XP B46~~	Eagle	'CHECKMATE' ~~XP B46~~
8/2/72	156	136	16	24
8/4/72	146	142	24	34
8/7/72	162	142	39	56
8/9/72	156	150	49	60
Average	155	142	32	43
8/11/73	153	142	17	34
8/13/73	156	138	19	40
8/15/73	152	137	33	51
8/17/73	146	134	35	56
8/20/73	152	147	46	68
8/22/73	155	138	62	78
Average	152	139	35	54
Two year average	153	141	34	50

It should be noted that maturity as measured by seed size and fiber development was very nearly identical for the two varieties at the different harvest dates.

Early Gallatin is somewhat similar to 'CHECKMATE' ~~XP B46~~ but the varieties are really quite distinct:

1. 'CHECKMATE' ~~XP B46~~ produces a larger more upright plant. The plants are very different.
2. 'CHECKMATE' ~~XP B46~~ was approximately 1 or 2 days later in 1972 but 4 or 5 days later in 1973 at Twin Falls, Idaho.
3. 'CHECKMATE' ~~XP B46~~ has a somewhat longer pod. The two year comparable averages are 'CHECKMATE' ~~XP B46~~ 141 mm and Early Gallatin 135 mm.

'CHECKMATE' R/S

~~XP B46~~ is also similar to XP B47 in that both are late maturing and have erect "Tendercrop" type plants. XP B46 differs from XP B47 in several respects:

1. 'CHECKMATE' ~~XP B46~~ may be characterized as having a Tendercrop type pod, i.e., round, fleshy, with low fiber and slow seed development. XP B47 has a "Blue Lake" type pod as determined by Asgrow personnel, USDA bean breeders, and processors, i.e., color, flavor, and ability to stand on a steam table without separating into halves.

2. XP B47 pods are more 'CHECKMATE' nearly perfectly round and longer than those of ~~XP B46~~. Data collected from periodic harvests at Twin Falls, Idaho, in 1972 and 1973 are presented. Each figure in the table is the average of 10 pods.

Harvest Date	Pod Length in mm of 5 Sieve Pods		Width Thickness Index	
	'CHECKMATE' ~~XP B46~~	XP B47	'CHECKMATE' ~~XP B46~~	XP B47
8/2/72	136	144	.95	.97
8/4/72	142	153	.91	.98
8/7/72	142	149	.86	.93
8/9/72	150	146	.89	.92
Average	142	148	.90	.95
8/11/73	142	149	.98	.97
8/13/73	138	147	.94	.95
8/15/73	137	147	.92	.97
8/17/73	134	144	.90	.99
8/20/73	147	141	.89	.93
8/22/73	138	141	.91	.92
Average	139	145	.92	.96
Two year aver.	141	146	.91	.95

EXHIBIT E

STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

Bean ~~XP-B46~~ 'CHECKMATE' R/S.

Bean ~~XP-B46~~ 'CHECKMATE' was originated by Dr. W. H. Pierce and was reselected and further developed by Dr. C. G. Briggs and Dr. John Atkin. All three were Asgrow plant breeders. By agreement between employee and Asgrow Seed Company, all rights to any invention, discovery, or development made by an employee are assigned to the company. No rights to such invention, discovery, or development are retained by the employee.