No. 7200052

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

World Seeds, Incorporated

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. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS IFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'World Seeds 1616'

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* fifth *day of* March *in the year of our Lord one thousand nine hundred and* seventy-six

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

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Earl L Butz

Secretary of Agriculture

FORM GR-470
(2-12-71)

UNITED STATES DEPARTMENT OF AGRICULTURE
CONSUMER AND 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 WORLD SEEDS 1616	2. KIND NAME Hard Red Spring Wheat	FOR OFFICIAL USE ONLY PVPO NUMBER 72052
3. GENUS AND SPECIES NAME Triticum aestivum	4. FAMILY NAME *(Botanical)* Gramineae	FILING DATE 11/1/71 — TIME 1:45 A.M. (P.M.)
	5. DATE OF DETERMINATION August, 1969	FEE RECEIVED $750.00 — CHARGES —
6. NAME OF APPLICANT(S) WORLD SEEDS, INC.	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)* 2605 Oceanside Blvd. Oceanside, Calif. 92054	8. TELEPHONE AREA CODE AND NUMBER Area Code 714 757-5647
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)* Corporation	10. STATE OF INCORPORATION Illinois	11. DATE OF INCORPORATION Jan. 17, 1966

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

~~Virgil R. Smith~~ Alfredo Garcia
~~John E. Long,~~ President
World Seeds, Inc.
~~Oceanside Blvd~~ ~~Mt. Morris~~
~~2605 Oceanside Blvd.~~ ~~MN 55987~~
Oceanside, ~~California 92054~~ ~~Winona~~
~~Rte~~

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [X] 12A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52, P.L. 91-577)*
- [X] 12B. Exhibit B, Botanical Description of the Variety
- [X] 12C. Exhibit C, Objective Description of the Variety
- [X] 12D. Exhibit D, Data Indicative of Novelty
- [X] 12E. Exhibit E, Statement of the Basis of Applicant's Ownership

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. *(See Section 52, P.L. 91-577).*

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), P.L. 91-577) (If "Yes," answer 14B and 14C below.)* [X] YES [ ] NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations? [X] YES [ ] NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed?
Foundation, Registered and Certified

Applicant is informed that false representation herein can jeopardize protection and result in penalties.

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 (P.L. 91-577).

October 28, 1971
(DATE)

(SIGNATURE OF APPLICANT)
(Alfredo Garcia) Vice President - Research

(DATE)

(SIGNATURE OF APPLICANT)
(John E. Long) President

FORM GR-470 (REVERSE)

RECEIVED
JUL 25 1972
U.S. DEPARTMENT OF AGRICULTURE
AMS, GRAIN DIV.
PVPO

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and $50.00 fee to U.S. Dept. of Agriculture, Consumer and Marketing Service, Grain Division, Hyattsville, Maryland 20782. Retain one copy for your files. All items on the face of the form are self-explanatory unles noted below.

ITEM

5 Insert the date the applicant determined that he had a new variety.

12a 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.

12b 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.

12c A supplemental form will be furnished by the PVPO to describe in detail a variety for each kind of seed.

12d Provide complete data indicative of novelty. Seed and plant specimens may be submitted and seeds submitted may be sterile. Where possible, include photographs of plant comparisons, chemical tests, etc.

12e Indicate whether applicant is the actual breeder, the employer of the breeder, the owner through purchase or inheritance, etc.

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12A.

Origin and Breeding History of World Seeds 1616

This hard red spring bread wheat variety originated from the cross of an F5 line introduced from Mexico and Nainari 60. The cross was made in the following direction:

(Sonora 64 x Tezanos Pintos Precoz) x Nainari 60

The kernels obtained in handmade crosses were space-planted in order to obtain healthy F1 plants. The seed resulting from the F1 plants were bulked to secure enough F2 seeds. The pedigree method of selection was followed from the F3 through the F5 generations. Original seed stock was secured in Grand Forks, North Dakota, in 1967 by bulking in the fifth generation three relatively homozygous rows which came from a single F4 plant. Individual rows were 20 feet long and 22 inches wide. The history from the F2 through the F6 generations is outlined below:

Generation	Planted in:	Generation Harvested	Quality Evaluation
F2	Grand Forks, N. D., 1964	F3, August 1964	
F3	California, 1966	F4, January 1967	
F4	California, 1967	F5, May 1967	
F5	Grand Forks, N. D., 1967	F6 Bulk, Sept. 1967	Preliminary

The pedigree of World Seeds 1616 is as follows:

6W01616-23-19-113-2B
F2 F3 F4 F5 F6 Bulk

Exhibit A

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12A. (1) Types and frequency of variants during reproduction and multiplication.

World Seeds 1616 is very stable for field agronomic characteristics such as heading, maturity and height. Any off-types found within World Seeds 1616 should represent either mechanical mixtures or natural hybrids with other wheat varieties.

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Botanical Description of World Seeds 1616

I. Plant Character:

1. Heading, ripening and height of World Seeds 1616 and standard varieties grown under irrigation in Holtville, California, during 1969-1970 and 1970-1971.

Variety	Heading in Days	Ripening in Days	Height in Cm.	Height in Inches
World Seeds 1616	103	160	91	36*
World Seeds 1651	108	180	90	35
Inia 66	96	160	90	35
Siete Cerros 66	104	180	103	41

*Height: Short, 36 inches tall under irrigation and 18 inches tall when grown under dry-land farming in Grand Forks, North Dakota. World Seeds 1616 has a single major gene for dwarfness.

2. Habit of growth: Spring habit, day-length insensitive.

II. Stem Character:

1. Color: White

2. Strength: Strong

3. Hollowness: Hollow

III. Spike Character:

1. Awnedness: Awned, the awnlets are from 5 to 100 mm. long.

2. Shape: Oblong

3. Density: Mid-dense

4. Position: Erect

5. Shattering: Very Resistant

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IV. Glume Character (glabrous):

1. Color: White
2. Length: Long
3. Width: Mid-wide

V. Shoulder Character:

1. Width: Narrow
2. Shape: From Wanting to Oblique

VI. Beak Character:

1. Width: Narrow
2. Shape: Acuminate
3. Length: 4 mm. average (2.5 mm. minimum; 6 mm. maximum)

VII. Kernel Character:*

1. Color: Red class, light brown
2. Length: Short to Mid-Long
3. Texture: Hard
4. Shape: Ovate

VIII. Germ Character:

1. Size: Small

*Kernel characteristics are based on observations made on the central one-third of a spike from which smaller kernels had been removed.

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IX. Crease Characters:

1. Width: Wide

2. Depth: Mid-deep

X. Cheek Characters:

1. Shape: Rounded

(1) References consulted:

BRIGGLE, L. W. and L. P. REITZ, 1963. Classification of Triticum species and of Wheat Varieties Grown in the United States. Technical Bulletin 1278, U.S.D.A.

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18. DISEASE:

a. STEM RUST, P. graminis var. tritici.

World Seeds 1616 has been resistant to non-identified race(s), prevalent in the Grand Forks, North Dakota area from 1967 thru 1971. It has also been resistant to race(s) present in several locations of Lower Rio Grande Valley of Texas from 1967 thru 1972 with the exception of a non-identified strain(s) present in McAllen, Texas in 1967-1968 to which W. S. 1616 was susceptible.

b. LEAF RUST, P. recondita.

World Seeds 1616 has been resistant to all races present in the Grand Forks area from 1967 thru 1971. Its reaction to the races present in the Lower Rio Grande area of Texas has been resistant with the following exceptions; It was susceptible to a non-identified strain(s) found in McAllen, Texas in 1967-1968 and was segregating (0-S) to an unknown race(s) present in Edinburg, Texas in 1968-1969.

c. POWDERY MILDEW, Erysiphe graminis var. tritici.

World Seeds was susceptible to field race(s) of mildew present in Royal Slope, Washington in 1969-1970 and moderately susceptible to field races present in Saddlebow (Norfolk), England in 1971, and again susceptible in the following Canadian locations: Winnipeg, Manitoba; Taber, Alberta, Ladner, B. Columbia. The only time that W. S. 1616 was found resistant was in Encinitas, California in 1968-1969.

'World Seeds 1616', Wheat, Application No. 72052

12D. (12) Novelty.

World Seeds 1616 is most similar to Inia 66 than any other spring wheat variety grown in the United States at the present time. Their contrasting characters from seedling through maturity are listed below:

Characters	World Seeds 1616	Inia 66
1. Plant color at booting	Yellow-green	Green
2. Auricles (Anthocyanin)	Absent	Present
3. Head		
a. Glume width	Medium	Wide
b. Position	Erect	Inclined
c. Shattering	Very resistant	Moderately susceptible
d. Beak length, in mm.:		
Minimum	2.5	3.0
Average	4.0	3.35
Maximum	6.0	4.0
4. Seed		
a. Crease width	Wide	Narrow
b. Crease depth	Mid-deep	Deep
c. Germ size	Small	Mid-sized

FORM GR-470-6
(7-3-72)

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

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY

WHEAT *(TRITICUM SPP.)*

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
World Seeds, Inc. (Alfredo Garcia)

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
2605 Oceanside Blvd.
Oceanside, CA. 92054

FOR OFFICIAL USE ONLY

PVPO NUMBER
72052

VARIETY NAME OR TEMPORARY DESIGNATION
World Seeds 1616

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. KIND:

[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

[1] 1 = SPRING 2 = WINTER 3 = OTHER *(Specify)* _____

[2] 1 = SOFT 2 = HARD 3 = OTHER *(Specify)* _____

[2] 1 = WHITE 2 = RED 3 = OTHER *(Specify)* _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

[0][5][1] FIRST FLOWERING

[0][6][1] LAST FLOWERING

4. MATURITY *(50% Flowering)*:

[ ][ ] NO. OF DAYS *EARLIER* THAN .....

[0][1] NO. OF DAYS *LATER* THAN .....

[ ] [3] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT *(From soil level to top of head)*:

[0][4][8] CM. HIGH

[ ][ ] CM. TALLER THAN .....

[3][3] CM. SHORTER THAN .....

[ ] [3] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING *(See reverse)*:

[1] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:

[1] 1 = YELLOW 2 = PURPLE

8. STEM:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

[4][ ] NO. OF NODES *(Originating from node above ground)*

[2] Waxy bloom: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[1][8] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[1] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

[2] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER *(Specify)*: _____

[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

[1][4] MM. LEAF WIDTH *(First leaf below flag leaf)*

[2] Flag leaf: 1 = NOT TWISTED 2 = TWISTED

[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

[2][1] CM. LEAF LENGTH *(First leaf below flag leaf)*:

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11. HEAD:

[3] Density: 1 = LAX 2 = DENSE 3 = Middense

[4] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER *(Specify)* Oblong

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[1] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER *(Specify)*: _____

[1 0] CM. LENGTH [1 1] MM. WIDTH

12. GLUMES AT MATURITY:

[3] Length: 1 = SHORT *(CA. 7 mm.)* 2 = MEDIUM *(CA. 8 mm.)* 3 = LONG *(CA. 9 mm.)*

[2] Width: 1 = NARROW *(CA. 3 mm.)* 2 = MEDIUM *(CA. 3.5 mm.)* 3 = WIDE *(CA. 4 mm.)*

[1-2] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[3] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[1] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[4] Phenol reaction *(See instructions)*: 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[1] Embryo size: 1 = SMALL *(Lemhi)* 2 = MEDIUM *(Scout)* 3 = LARGE *(Arthur)*

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER *(Specify)* _____

[0 6] MM. LENGTH [0 3] MM. WIDTH [0 3.5] GM. PER 100 SEEDS

17. SEED CREASE:

[3] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[2] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' (Equal to) 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

* [1-2] STEM RUST *(Races)* _____ * [1-2] LEAF RUST *(Races)* _____ * [2] STRIPE RUST *(Races)* _____ [0] LOOSE SMUT

* [1] POWDERY MILDEW [0] BUNT [ ] OTHER *(Specify)* _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[1] SAWFLY [0] APHID *(Bydv.)* [0] GREEN BUG [0] CEREAL LEAF BEETLE

[ ] OTHER *(Specify)* _____

HESSIAN FLY RACES: [0] GP [ ] A [ ] B [ ] C [0] D [ ] E [ ] F [ ] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering		Seed size	
Leaf size		Seed shape	
Leaf color		Coleoptile elongation	
Leaf carriage		Seedling pigmentation	

* See additional information.

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. *(See attachment.)*

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

7200052

12E. Exhibit E, Statement of the Basis of Applicant's Ownership.

The applicant is the employer of the breeder.