No. 7400006

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

James E. Grundman
and
Jack W. DeWit

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

RICE

'Terso'

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* April *in the year of our Lord one thousand nine hundred and* seventy-six

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

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 Terso	2. KIND NAME Rice (Medium Grain)	FOR OFFICIAL USE ONLY PVPO NUMBER 7400006
3. GENUS AND SPECIES NAME Oryza sativa, L.	4. FAMILY NAME *(Botanical)* Japonica 5. DATE OF DETERMINATION October, 1969	FILING DATE 8.14.73 TIME 3:00 ~~A.M.~~ P.M. FEE RECEIVED $ 250.00 CHARGES
6. NAME OF APPLICANT(S) James E. Grundman and Jack W. DeWit	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)* 10101 New Hope Rd., Galt, CA 95632	8. TELEPHONE AREA CODE AND NUMBER (209) 745-2830
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*	10. STATE OF INCORPORATION	11. DATE OF INCORPORATION

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

James E. Grundman
10101 New Hope Rd.
Galt, CA 95632

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
- [ ] 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? [ ] YES [X] NO

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

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).

July 30, 1973
(DATE)

James E. Grundman
(SIGNATURE OF APPLICANT)

7-30-73
(DATE)

Jack W. DeWit
(SIGNATURE OF APPLICANT)

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

"TERSO" VARIETY RICE

Submitted to: United States Department of Agriculture
Consumer and Marketing Service
Grain Division

July 1973

12A. Exhibit A, Origin and Breeding History of TERSO.

TERSO (Oryza sativa, L.) is a pureline medium-grain selection from Kokuho Rose variety rice. Kokuho Rose is a proprietary variety which is currently grown on a limited acreage in California and is not recognized by the California Crop Improvement Association or other cereal registries and does not have a Cereal Index number.

The initial selections of TERSO were made in 1968-69 from fields near Oakdale in San Joaquin County, California, by James E. Grundman.

SEED INCREASES

In 1970, 18 ten-foot panicle rows were planted at Robbins, in Sutter County, California, and further selections were made by James Grundman and Jack DeWit. In 1971, 26 ten-foot panicle rows, 29 six-foot by six-foot plots for yield data and approximately 1/4 acre were planted in test plots in Sutter and San Joaquin Counties.

The 1972 plantings consisted of 284 ten-foot panicle rows, 30 small plots for yield data and approximately 15 acres for

seed increase.

1973 plantings of TERSO include 150 12-foot panicle rows to provide Breeder[1] quality seed; 1/5 acre of Foundation quality seed, six acres of Registered quality seed, and yield trial plots in the Sacramento and San Joaquin Valley areas of the State; also it is included in various trials conducted by County Farm Advisors.

VARIANT & OFF-TYPE plants

Variant and off-type plants have not occurred in panicle row plantings during 1971 or subsequent crop years.

SEED PRODUCTION

All classes of TERSO variety seed shall be produced on a proprietary basis according to the established procedures of the California Crop Improvement Association.

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(1) The genetic purity of the seed classes of Breeder Seed, Foundation Seed, Registered Seed and Certified Seed, as described by the International Crop Improvement Association and the California Crop Improvement Association has been recognized and pursued. The 1973 crop TERSO variety production has been so designated for the purposes of clarity and convenience, although at the date of this application, official CCIA recognition of TERSO is on a "Pending" basis.

12B. Exhibit B, Botanical Description of TERSO Variety Rice

TERSO PLANT

The TERSO plant type is tall in stature, measuring approximately 110-120 cm. at the time of heading (the same approximate height as Calrose) measuring from the soil to the tip of fully exserted panicle. Kokuho Rose height is from 120 to 130 cm. to tip of exserted panicle. The second leaf from top at boot stage ranges from 35 to 50 cm. in length and from 11 to 14 mm. wide compared to 30 to 45 cm. and 9 to 12 mm. respectively for Calrose. The leaf measurements for Kokuho Rose are 40 to 50 cm. in length and 10 to 13 mm. in width. The leaves of TERSO, Kokuho Rose, and Calrose are all dark green in color.

TERSO has a glabrous leaf blade, lemma and palea, except some hairs are found on the leaf blade margins and on the lemma keel bow. Under high fertility conditions, the grain on many TERSO plants will be awned, as often will be the grain from late tillers and plants grown under stressed conditions.

TERSO GRAIN

The TERSO kernel is bolder (longer but not narrower) than the standard California grown medium-grain varieties. The milled kernel measures 6.3 mm. in length, 2.6 mm. in width, compared to 5.6 mm. and 2.6 mm. respectively for Calrose. Kokuho Rose measures 6.3 mm. and 2.6 mm. TERSO kernels are translucent in appearance with a notable absence of the opaque chalky centers which predominate in existing California medium-grain types of rice.

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

James E. Grundman and Jack W. DeWit, applicants for Plant Variety Protection Certificate on TERSO Variety rice, are jointly, the actual breeders and developers of the TERSO Variety rice.

TERSO Variety Rice

No. 740006

Exhibit D

Novelty Statement

Characteristic	Rice Varieties			
	Calrose	CSM-3	Kokuho Rose	TERSO
Leaf Blade	Pubescent	Glabrous	Pubescent	Glabrous
Lemma & Palea	Pubescent	Glabrous, Except lemma keel bow	Pubescent	Glabrous, except lemma keel bow
White Milled Grain Appearance	Chalky, opaque centers	Chalky, opaque centers	Translucent	Translucent
Milled Grain size	5.6mm x 2.6mm	5.6mm x 2.6mm	6.3mm x 2.6mm	6.3mm x 2.6mm
x Plant Height	105 - 115 cm	105 - 115 cm	115 - 125 cm	110 - 120 cm
x Leaf Width	9 - 12 mm.	9 - 12 mm.	10 - 15 mm.	10 - 15 mm.

x Oct 14, 1975 omit according to letter Oct 8, 1975

FORM GR-470 (REVERSE)

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.

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-17
(1-2-73)

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

EXHIBIT C
(Rice)

OBJECTIVE DESCRIPTION OF VARIETY

RICE (*ORYZA SATIVA*)

REFERENCES: *See Reverse.*

NAME OF APPLICANT(S)
James E. Grundman and Jack W. De Wit

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)
10101 New Hope Road
Galt, California 95632

FOR OFFICIAL USE ONLY

PVPO NUMBER 740006

VARIETY NAME OR TEMPORARY DESIGNATION Terso

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. MATURITY (Seeding to 50% Heading):

LOCATION California AVERAGE DATE SEEDED May 7

[3] Season: 1 = VERY EARLY (85 days or less) 2 = EARLY (86 - 100) 3 = MIDSEASON (101 - 115) 4 = LATE (115 - or more)

[1][1][4] NUMBER OF DAYS

[0][3] NO. OF DAYS EARLIER THAN . . . [5]

[ ][ ] NO. OF DAYS LATER THAN . . . . . [ ]

1 = BELLE PATNA 2 = BLUEBELLE 3 = NATO
4 = STARBONNET 5 = CALROSE 6 = REXORO

2. PLANT HABIT (Tiller Angle from Perpendicular at the Early Jointing Stage):

[2] 1 = SPREADING (more than 60°) 2 = INTERMEDIATE 3 = ERECT (less than 30°)

3. STEMS (Full Heading):

[1][1][5] CM. TALL (Soil level to tip of extended panicle on main culm)

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

[0][5] CM. TALLER THAN. . . . . [5]

1 = BELLE PATNA 2 = BLUEBELLE 3 = NATO
4 = STARBONNET 5 = CALROSE 6 = REXORO

[1][1] NUMBER OF NODES

[2] INTERNODE COLOR (Outside)

[2] SEPTUM COLOR (Inside Node)

1 = LIGHT YELLOW 2 = CREAM 3 = GOLD
4 = GREEN 5 = REDDISH 6 = LIGHT PURPLE
7 = PURPLE 8 = DARK PURPLE 9 = OTHER (Specify) _____

[2] Tillering Ability (number of culms): 1 = 10 OR LESS (Belle Patna) 2 = 11 - 20 (Bluebonnet) 3 = ABOVE 20 (Century Patna)

[3] Strength: 1 = STURDY (Starbonnet) 2 = INTERMEDIATE (Belle Patna) 3 = WEAK

4. LEAF BLADE (First Leaf Below Flag Leaf):

[4][2] CM. LENGTH [1][2] MM. WIDTH

[3] Color: 1 = PALE GREEN (Starbonnet) 2 = MEDIUM GREEN (Bluebelle) 3 = DARK GREEN (Calrose)
4 = PURPLE 5 = RED 6 = OTHER (Specify) _____

[1] Pubescence: 1 = GLABROUS 2 = INTERMEDIATE 3 = PUBESCENT

[2] Flag Leaf Angle: 1 = HORIZONAL 2 = ASCENDING 3 = ERECT

[2][6] CM. LENGTH OF FLAG LEAF (Booting Stage)

[1][5] MM. WIDTH (widest point) OF FLAG LEAF (Booting Stage)

5. LEAF SHEATH (First Leaf Below Flag Leaf):

[2] Ligule Length: 1 = NONE 2 = 20 MM. OR LESS 3 = 21 - 34 MM. 4 = MORE THAN 34 MM.

Color:

[2] SHEATH (Outside)

[2] SHEATH (Inside)

[2] SHEATH (Seedling)

[2] COLLAR

[1] LIGULE

[1] AURICLE

1 = COLORLESS 2 = GREEN 3 = RED
4 = PURPLE 5 = OTHER (Specify) _____

TERSO

6. PANICLE:

[2] Type: 1 = OPEN 2 = INTERMEDIATE 3 = COMPACT

[1] Habit: 1 = DROOPING 2 = INTERMEDIATE 3 = ERECT

[2 0] CM. LENGTH

[3] Exsertion: 1 = LESS THAN 90% 2 = 90 - 99% 3 = 100% EXSERTION

7. SPIKELET:

[2] Stigma Color: 1 = COLORLESS (White) 2 = YELLOW 3 = PURPLE 4 = RED

8. LEMMA AND PALEA:

[0 5] Color at Maturity

[0 5] Apiculus color at maturity

[0 2] Apiculus color at anthesis

01 = COLORLESS (White) 02 = GREEN 03 = YELLOW
04 = TAWNY 05 = STRAW 06 = GOLD
07 = BROWN FURROWS 08 = RED 09 = PURPLE
10 = PIEBALD 11 = BLACK 12 = OTHER (Specify) _____

[2] Pubescence: 1 = GLABROUS 2 = PUBESCENT ONLY ON LEMMA KEEL 3 = PUBESCENT

[3] Awn: 1 = AWNLESS 2 = TERMINAL SPIKELETS AWNED 3 = AWNED AND AWNLESS 4 = ALL SPIKELETS AWNED

[1 0] MM. AWN MAXIMUM LENGTH

9. SEED:

[2] Non-pigmented coat (Pericarp) ("Brown Rice" color): 1 = LIGHT 2 = MEDIUM 3 = DARKER

[4] Pigmented coat (Pericarp): 1 = GOLD 2 = PURPLE 3 = RED 4 = BROWN 5 = SPECKLED BROWN

[1] Scent: 1 = NONSCENTED (Common) 2 = LIGHTLY SCENTED (Sadri) 3 = SCENTED (Popcorn aroma - Della)

[1] Endosperm: 1 = NON-WAXY (common) 2 = WAXY (glutinous)

[1] Endosperm: 1 = TRANSLUCENT, FEW CHALKY SPOTS 2 = CHALKY GERMTIP 3 = WHITE BELLY 4 = LARGE CHALKY CORE 5 = OPAQUE

[2] Shattering (Threshability): 1 = DIFFICULT THRESHING (Conway) 2 = THRESHES READILY 3 = SHATTERS

[2] Dormancy: 1 = LOW (0 days) 2 = MEDIUM (30 days) 3 = HIGH (90 days or more)

10. GRAIN:

[2] Paddy shape (length/width Ratio): 1 = SHORT (less than 2.2:1) 2 = MEDIUM (2.2:1 to 3.4:1) 3 = LONG (greater than 3.4:1)

MEASUREMENTS:

Grain Form	Length (mm.)	Width (mm.)	Thickness (mm.)	L/W Ratio	1000 Grains (Grams)
Paddy	0 8 4	3 2	2 1	2 6	2 7 3
Brown	0 6 4	2 8	1 9	2 4	2 2 5
Milled	0 6 3	2 6	1 8	2 4	2 0 8

MILLING QUALITY

[1 8] % HULLS

[6 8] % TOTAL MILLED RICE

11. RESISTANCE TO LOW TEMPERATURE:

[3] Germination & Seedling vigor: 1 = LOW (Bluebelle) 2 = MEDIUM (Nato) 3 = HIGH (Caloro)

[3] Flowering (Spikelet fertility): 1 = LOW (Bluebelle) 2 = MEDIUM (Caloro) 3 = HIGH (Calrose)

12. RESISTANCE TO:

[2] Salinity: 1 = LOW (Bluebonnet) 2 = MEDIUM (Blue Rose) 3 = HIGH

[2] Alkalinity: 1 = LOW (Bluebelle) 2 = MEDIUM (Dawn) 3 = HIGH (Arkrose)

13. RESPONSE TO PHOTOPERIOD:

[2] 1 = NON-SENSITIVE (Belle Patna) 2 = WEAKLY SENSITIVE (Blue Rose) 3 = STRONGLY SENSITIVE (Caloro)

TERSO

14. PYRICULARIA ORYZAE RESISTANCE (International races found under References, items 2 and 4 below.)
(0 = Not Tested; 1 = Susceptible; 2 = Resistant):

GROUP	IA	IB				IC			ID				IE		IG		IH				
NUMBER	109	1	33	49	54	1	17	19	1	8	13	14	1	3	1	2	1				
RESISTANCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

15. DISEASE RESISTANCE (0 = Not Tested; 1 = Susceptible; 2 = Resistant):

0 CERCOSPORA ORYZAE	0 ENTYLOMA ORYZAE	0 FUSARIUM PANICLE BLIGHT
0 HELMINTHOSPORIUM ORYZAE	0 HOJA BLANCA VIRUS	0 LEPTOSPHAERIA SALVINII
0 PYTHIUM SEEDLING BLIGHT	0 RHIZOCTONIA ORYZAE	0 STRAIGHTENED
0 TILLETIA BARCLAYANA	0 WHITE TIP NEMATODE	0 OTHER (Specify)

16. INSECT RESISTANCE (0 = Not Tested; 1 = Susceptible; 2 = Resistant)

0 GRASS HOPPER	0 LEAF HOPPER	0 RICE HISPA
0 RICE MIDGE	0 STEM BORER	0 STINK BUG
0 SWARM CATERPILLAR	0 WATER WEEVIL	0 OTHER (Specify)

17. INDICATE A VARIETY WHICH MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Tillering	Calrose	Seed Shape	Kokuho Rose
Lodging	Calrose	Endosperm Transp.	Kokuho Rose
Leaf Angle	Calrose	Milling Quality	Kokuho Rose
Leaf Color	Calrose	Cook & Proc. Quality	Kokuho Rose

18. GIVE THE FOLLOWING AVERAGE DATA FOR SUBMITTED AND A SIMILAR VARIETY

VARIETY	PARBOIL CANNING STABILITY (% Loss)	PROTEIN * (%)	AMYLOSE ** (%)	ALKALI REACTION *** 1.7	ALKALI REACTION *** 2.0	GELATINIZATION TEMPERATURE (°C)
SUBMITTED		10.15	18.87		7.0	LOW
SIMILAR		9.31	19.15		7.0	LOW
NAME OF SIMILAR VARIETY		Calrose	Calrose		Calrose	Calrose

*Hulled Rice - Dry Wt. **Milled Rice 11 - 12% Moisture ***Average spreading value in 1.7% and 2.0% KOH Solution.

REFERENCES

1. C. R. Adair et al, 1972. Rice in the United States: Varieties and Production. USDA Handbook No. 289 (Rev.), 124 pp.
2. J. G. Atkins, et al, 1967. An International Set of Rice Varieties for Differentiating Race of Pyricularia Oryzae. Phytopath. 57:297-301.
3. Te-Tzu Chang, 1965. The Morphology and Varietal Characteristics of the Rice Plant. IRRI Los Banos, Philippines Tech. Bulletin 4.
4. K. C. Ling and S. H. Ou, 1969. Standardization of the International Race Numbers of Pyricularia Oryzae. Phytopath. 59:339-342.
5. B. D. Webb et al, 1968. Characteristics of Rice Varieties in the USDA Collection. Crop Sci. 8:361-365.
6. Nickerson's or any recognized color fan may be used to determine plant colors of the described variety.

COMMENTS: