No. 7200028

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

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

AGROTRICUM

'290M'

U.S. 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* fifth *day of* March *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

RECD AUG 19 1971

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 290M	2. KIND NAME Agrotricum	FOR OFFICIAL USE ONLY PVPO NUMBER 72028
3. GENUS AND SPECIES NAME Triticum aestivum X Agropyron elongatum derivative	4. FAMILY NAME *(Botanical)* Gramineae	FILING DATE 8.30.71 / TIME 3:30 ~~A.M.~~ P.M.
	5. DATE OF DETERMINATION June, 1967	FEE RECEIVED $ 750.00 / CHARGES
6. NAME OF APPLICANT(S) DeKalb AgResearch, Inc.	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)* Sycamore Road DeKalb, Illinois 60115	8. TELEPHONE AREA CODE AND NUMBER 815-758-3461 Ext. 256

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)* Corporation - Delaware	10. STATE OF INCORPORATION Delaware	11. DATE OF INCORPORATION Mar. 24, 1938

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

Mr. Richard F. Holland
Agronomic Research Director
DeKalb AgResearch, Inc.
Sycamore Road
DeKalb, Illinois 60115

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.)* [ ] YES [X] 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? 3 - Breeder, Foundation, Registered, 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).

8/17/71
(DATE)

DeKalb AgRes. Inc. by R F Holland
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

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.

U.S. DEPARTMENT
RECEIVED
AUG 26 1971
HYATTSVILLE, MD.

72028

EXHIBIT A

The germplasm of 290M traces back to a U.S.D.A. bulk Agrotricum Composite that originated from crosses made presumably between a diverse array of hexaploid wheats and Agropyron elongatum by Sando. The composite breeding material was obtained from the U.S.D.A. in 1961 by DeKalb. The composite was grown every year thereafter in various places in Kansas and Texas, to allow a population shift toward more winter hardy types. In 1967, a considerable number of phenotypically identical plants, were mass selected in a small nursery plot at Wichita, Kansas. These plants were increased in research plots in 1968 and 1969. Stocks were transferred to DeKalb Foundation in 1970.

290M appears to have 56 chromosomes-based on segregating populations resulting from crossing to a 42 chromosome wheat. These extra chromosomes appear to be a complete genome of Agropyron elongatum.

A field of 290M appears very uniform as to plant height and type. However, close observation will reveal that up to 20 plants per 10,000 are off types. The off types are: (1) a longer-awned wheat-like form that has the free threshing character of wheat (presumably this is an out-cross type and is the most prevalent of the off type forms); (2) a slightly shorter form having a clavate head type that possibly is a result of meiotic instability; (3) a type of the same height, but having awnletted head type.

The relative genome stability of 290M may not be quite as good as 42 chromosome wheats, but the line can be perpetuated in a pure form with limited rogueing of off types.

EXHIBIT B

290M is distinguished by the following: plant winter habit, very late, tall; stem white, strong; spike awned, fusiform, lax, erect to inclined; glumes glabrous, white, midlong, midwide; shoulders midwide, square to elevated; beaks midwide, acuminate, 1.5 to 3 mm. long; awns white, 1/2 to 2 cm. long on basal part of spike and 2 to 5 cm. long on terminal part of spike; kernels red, midlong to long, soft, ovate to elliptical; germ midsized; crease wide, middeep; cheeks rounded; brush large, midlong.

FORM GR-470-3
(9-1-72)

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

EXHIBIT C
(Agrotricum)

OBJECTIVE DESCRIPTION OF VARIETY
AGROTRICUM

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S): DEKALB AgResearch, Incorporated

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*: Sycamore Road, DeKalb, IL 60115

FOR OFFICIAL USE ONLY
PVPO NUMBER: 72028
VARIETY NAME OR TEMPORARY DESIGNATION: 290M

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 = WHEAT-LIKE 2 = GRASS-LIKE

2. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

[ ][ ][ ] FIRST FLOWERING — not appropriate for winter types planted at varying latitudes.

[ ][ ][ ] LAST FLOWERING — Est. 4-5 days later than [illegible]

3. MATURITY:

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

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

WHEAT VARIETIES
1 = CHEYENNE 2 = ARTHUR 3 = SCOUT
4 = CHRIS 5 = LEMHI 6 = NUGAINES
7 = LEEDS 8 = OTHER *(Specify)* _____

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

[1][4][0] CM. HIGH under [illegible] conditions

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

[2][0] CM. TALLER THAN. [illegible] ..... [1]

WHEAT VARIETIES
1 = CHEYENNE 2 = ARTHUR 3 = SCOUT
4 = CHRIS 5 = LEMHI 6 = NUGAINES
7 = LEEDS 8 = OTHER *(Specify)* _____

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

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

6. ANTHER COLOR:

[1] 1 = YELLOW 2 = PURPLE 3 = OTHER *(Specify)* _____

7. STEM:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

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

[2] Hairiness of Last Internode of Rachis: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[ ][3] NUMBER OF NODES *(Originating from node above ground)* generally - not including rachis nodes

[2][5] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW — estimated average

8. AURICLES:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[1] Hairiness: 1 = ABSENT 2 = PRESENT

9. LEAF:

[1] Hairs of First Leaf Sheath: 1 = ABSENT 2 = PRESENT

[1] Leaf Texture: 1 = SMOOTH 2 = ROUGH

[1][0] MM. LEAF WIDTH *(First leaf below flag leaf)* average

[3][1] CM. LEAF LENGTH *(First leaf below flag leaf)* average

[ ] Waxy Bloom of Flag Leaf Sheath: 1 = ABSENT 2 = PRESENT

10. HEADS:

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

5

[1][0] CM. HEAD LENGTH

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

[1] Color at Maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BRONZE 6 = BROWN 7 = BLACK 8 = OTHER *(Specify)* _____

72028

11. GLUMES AT MATURITY:

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

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

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

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

12. COLEOPTILE COLOR:

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

13. SEEDLING ANTHOCYANIN: [illegible]

[1] 1 = ABSENT 2 = PRESENT

14. JUVENILE PLANT GROWTH HABIT:

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

15. SEED:

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

[2] Cheek: 1 = ROUNDED 2 = ANGULAR

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

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

[3] Brush Area: 1 = SMALL 2 = MEDIUM 3 = LARGE

[2] Embryo Size: 1 = SMALL 2 = MEDIUM 3 = LARGE

[3] Phenol Reaction: 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

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

[8] MM. LONG [3] MM. WIDE [27] GM. PER 1000 SEEDS

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

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

[2] POWDERY MILDEW [0] BUNT [ ] OTHER (Specify) _____

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

[0] SAWFLY [0] APHID (Bydv.) [12] GREEN BUG [0] CEREAL LEAF BEETLE

[ ] OTHER (Specify) _____

HESSIAN FLY RACES: [1] GP [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

18. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering		Seed size	
Plant carriage		Seed shape	
Leaf color		Coleoptile elongation	
Leaf carriage		Coleoptile pigmentation	
Leaf width		Root structure	

INSTRUCTIONS

GENERAL: Foliage characteristics should be recorded at the booting stage of the plant.

The following publications may be used as a reference aid for completing this form:

(a) E. L. Smith, E. E. Sebesta, A. M. Schlehuber, and H. C. Young, Jr., 1960, Association of Certain Characters in a Collection of Wheat and Wheat Grass Hybrids, Technical Bulletin T-82, Oklahoma State University.

(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.

(c) 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.

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

See letter of July 23, 1975

EXHIBIT D

This variety has an unusual regrowth character and under some management and environmental schemes can produce a grain crop in the spring and fall. It does not behave however, as a perennial when grown in areas having hot and dry summers.

290M is a very late maturing Agrotricum and is difficult to thresh upon combining. However, with special effort the grain can be threshed out with a combine. It does not have high grain yield.

The variety has resistance to leaf rust, stem rust, stripe rust, Septoria and wheat streak mosaic virus. It also has significant tolerance to drought and high temperature.

Plant and seed samples are enclosed. Also included are photographs of a field of 290M and comparison with a 49 chromosome wheat hybrid.

Application No. 72028
Agrotricum - '290M'

The distinguishing characteristic of '290M' is its resistance to stem rust, leaf rust, stripe,rust, powdery mildew, and wheat streak mosaic. '290M' is also ten days later maturing and 20 cm. taller than 'Cheyenne' common wheat under ideal conditions. The leaves are smooth and yellow green. The stems are hollow, non-waxy and lacking anthocyanin. The heads are white, lax and fusiform. The glumes are long, medium width, and have elevated shoulders and acuminate beaks. The seeds are red and elliptical, with medium size embryo and brush. There are no commercial varieties to compare with '290M'.

R. DeKalb AgRes. by R. O. Holland, V.P.
(Signature)

EXHIBIT E

290M is a mass selection composite of plant types that are very uniform and different from the original bulk in a number of genotypic and phenotypic characteristics. The gene frequency of the original population was shifted through adaptation and visual selection. Therefore, it is a distinct variety when compared to the mediocre population that was in hand at the start of the selection program.

This variety was selected by plant breeders employed by DEKALB AgResearch, Incorporated. Dr. J. A. Wilson,stationed at Wichita, Kansas, was the leader of the plant breeding group that selected this variety. Dr. Wilson and other key employees have signed ownership rights to DEKALB AgResearch, Incorporated for any development which they might produce.

ASSIGNMENT

KNOW ALL MEN BY THESE PRESENTS, that Hybrid Wheat, Inc., a Delaware corporation ("Grantor"), for good and valuable consideration, the receipt, adequacy and sufficiency of which are hereby acknowledged, does hereby sell, convey, assign, transfer and deliver to Monsanto Flavor/Essence, Inc. ("MFE"), a Delaware corporation, its successors and assigns, all of the rights, obligations, privileges and benefits which Grantor has or may have under the Plant Variety Protection Act in connection with wheat and agrotricum, including, without limitation, the rights, obligations, privileges and benefits evidenced by those Certificates of Plant Variety Protection attached hereto, the particulars of which are as follows:

PRODUCT	VARIETY NAME	CERT. NO.	DATE FILED	DATE GRANTED
Wheat	Bonanza	7100023	02-02-71	03-19-74
Agrotricum	290M	7200028	08-30-71	03-05-76
Wheat (hard red winter)	R36	7300050	01-29-73	02-26-74
Wheat	DEKALB 582M	7400045	12-17-73	10-17-75
Wheat	DEKALB 581M	7400044	12-17-73	11-24-75
Wheat	R158	7600068	04-28-76	03-18-77

Included in this Assignment are all of Grantor's rights of recovery and enforcement against any past infringers.

Grantor represents and warrants that the foregoing rights, privileges and benefits are free and clear of any and all liens, mortgages, pledges, charges, security interests or other encumbrances, or any claims or rights of or suits by or obligations to any other person or entity.

Dated this 15th day of March, 1982.

GRANTOR: HYBRID WHEAT, INC.

By: _____

Its: VICE PRESIDENT

ATTEST:

M. E. Pratt

Secretary

STATE OF ILLINOIS)
) ss.
COUNTY OF DEKALB)

On the 15th day of March, 1982, before me Julie Cronauer, a Notary Public in and for said County, personally appeared John H. Witmer, Jr. and M. E. Pesut, to me personally known who acknowledged that they were the Vice President and Secretary, respectively, of Hybrid Wheat, Inc., a corporation, and that they, as such officers, being authorized to do so, had executed the foregoing Assignment for the purposes therein contained, by signing the name of the corporation by themselves as such officers.

WITNESS my hand and official seal this 15th day of March, 1982.

Julie Cronauer
Notary Public

My Commission Expires:
1-7-86

State of DELAWARE

Office of SECRETARY OF STATE

I, Glenn C. Kenton *Secretary of State of the State of Delaware, do hereby certify* that the "MONSANTO FLAVOR/ESSENCE, INC.", filed a Certificate of Amendment, changing its corporate title to "Hybritech Seed International, Inc.", on the twenty-ninth day of June, A.D. 1982, at 10 o'clock A.M.

In Testimony Whereof, *I have hereunto set my hand and official seal at Dover this* twenty-ninth *day of* June *in the year of our Lord one thousand nine hundred and* eighty-two.

Glenn C. Kenton

Glenn C. Kenton, Secretary of State

FORM 122

ASSIGNMENT

KNOW ALL MEN BY THESE PRESENTS, that DEKALB AgResearch, Inc., a Delaware corporation ("Grantor"), for good and valuable consideration, the adequacy and receipt of which is hereby acknowledged, does hereby assign, transfer, convey and deliver to Hybrid Wheat, Inc., a Delaware corporation, its successors and assigns, all of the rights, obligations, privileges and benefits which Grantor may have under the Plant Variety Protection Act as evidenced by those Certificates of Plant Variety Protection attached hereto, the particulars of which are as follows:

PRODUCT	VARIETY NAME	DATE FILED
Wheat	Bonanza	February 2, 1971
Agrotricum	290M	August 30, 1971
Wheat (hard red winter)	R36	January 29, 1973
Wheat	DEKALB 582M	December 17, 1973
Wheat	DEKALB 581M	December 17, 1972
Wheat	R158	April 28, 1976

Dated this 7th day of January 1982.

GRANTOR: DEKALB AgResearch, Inc.

By: James L. Herbert, Jr.
James L. Herbert, Jr.,
Vice President

ATTEST:

Doris J. Riippi
ASSISTANT SECRETARY

STATE OF ILLINOIS)
) SS
COUNTY OF DE KALB)

On the 7th day of January 1982, before me Denise J. McCabe, A Notary Public in and for said County personally appeared James L. Herbert, Jr., and Doris J. Riippi to me personally known who acknowledged that they were the Vice President and Assistant Secretary, respectfully, of DEKALB AgResearch, Inc., a corporation, and that they, as such officers, being authorized to do so, had executed the foregoing Assignment for the purposes therein contained, by signing the name of the corporation by themselves as such officers.

WITNESS my hand and official seal this 7th day of January, 1982.

Denise J. McCabe
Notary Public

My Commission Expires:

October 19, 1983