No. 7400044

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

DeKalb AgResearch, Inc.

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.)

WHEAT

'DeKalb 581M'

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* 24th *day of* November *in the year of our Lord one thousand nine hundred and* seventy-five

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 DeKalb 581M	2. KIND NAME Wheat	FOR OFFICIAL USE ONLY PVPO NUMBER 7400044
3. GENUS AND SPECIES NAME Triticum aestivum	4. FAMILY NAME *(Botanical)* Gramineae	FILING DATE 12-17-73 / TIME 11:00 A.M.
	5. DATE OF DETERMINATION May, 1967	FEE RECEIVED $ 750 / 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

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

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

R. F. Holland
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? [ ] YES [ ] 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).

12-11-73
(DATE)

DeKalb AgRes. Inc. by R F Holland
V-P Agron Res.
(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
DEC 17 1973
AMS, Grain Div.
PVPO

7400044

Exhibit A

Origin and Breeding History of The Variety

DeKalb 581M was bred and selected by the DeKalb AgResearch Project at Wichita, Kansas, under the direction of James A. Wilson.

Triticum timopheevi was the female parent in crosses to Iowin. The hybrid was backcrossed to Iowin and then selfed and selected for fertility. This stock was then used as the female in two crosses to Quivira. In subsequent generations the stock was selected for plant type, disease resistance and pollen fertility.

In 1967, an F5 row of the stock, Triticum timopheevi/Iowin^2//Quivira^2 was bulked and subsequently increased as DeKalb 581. At the time of bulking the F5 row, a hybrid progeny test row was grown and found to be pollen and seed fertile. Thus, 581M was established as an effective pollen-restoring line. Thereafter, 581M was tested in hybrids and as a pure line and promoted to field increase plots.

This line appears to be quite stable and is probably as uniform as most currently grown wheat varieties in the Southern Plains.

Exhibit B (Amended 3/9/76)

PVP #7400044
WHEAT, DEKALB 581M
August 15, 1975

Botanical Description of the Variety

DEKALB 581M is a hard red winter wheat having a prostrate growth habit in the fall and early spring. It can be distinguished from its parent variety Quivira in having stronger gluten and restores fertility to hybrids having Timopheevi cytoplasm. It can be distinguished from its DEKALB 582M sib by having (1) pubescent glumes, (2) weaker straw, (3) stronger gluten and (4) greater winterhardiness. It is 3 days later in heading than Scout wheat.

DEKALB 581M is midtall; stem white, midstrong; spike oblong to fusiform, inclined to nodding, middense; glumes pubescent, white, midlong, midwide; shoulders narrow to midwide, wanting to oblique; beaks midwide, acuminate, 2-5 mm. long; awns white, 2-8 cm. long; kernels red, midlong, hard, ovate to elliptical; germ small to midsize; crease midwide, middeep; cheeks rounded; brush short to midlong.

This line is moderately resistant to leaf rust but susceptible to stem rust, soil borne mosaic, powdery mildew and wheat streak mosaic.

DEKALB 581M milling properties are similar to Parker, a derivative of Quivira, except DEKALB 581M has significantly higher flour ash content. The mixing time of DEKALB 581M is consistently longer than Quivira, Parker and DEKALB 582M. Loaf volume of DEKALB 581M is superior to Parker but the crumb grains are similar.

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-6
(2-15-73)

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

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY

DeKalb 581M

WHEAT *(TRITICUM SPP.)*

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
DeKalb AgResearch, Inc.

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

FOR OFFICIAL USE ONLY
PVPO NUMBER 7400044
VARIETY NAME OR TEMPORARY DESIGNATION

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:

[2] 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:

[ ][ ][ ] FIRST FLOWERING — Not applicable to winter wheat with variable fall planting dates.

[ ][ ][ ] LAST FLOWERING

4. MATURITY *(50% Flowering)*:

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

[0][3] NO. OF DAYS *LATER* THAN .....

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

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

[1][0][8] CM. HIGH

[0][7] CM. TALLER THAN .....

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

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

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

[2] 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

[0][4] NO. OF NODES *(Originating from node above ground)*

[ ] Waxy bloom: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[3][0] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

[ ] 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

[0][7] MM. LEAF WIDTH *(First leaf below flag leaf)*

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

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

[2][5] CM. LEAF LENGTH *(First leaf below flag leaf)*:

Exhibit D (Amended 3/9/76)

Data Indicative of Novelty

PVP #7400044
WHEAT, DEKALB 581M
August 15, 1975

Novelty of DEKALB 581M is based upon the following characteristics:

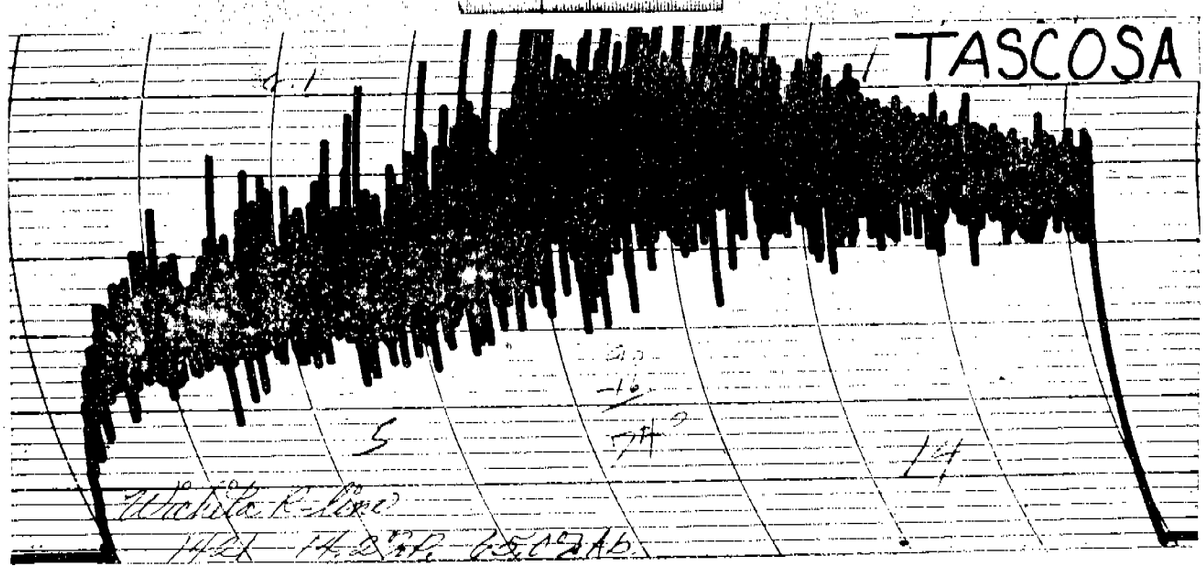
DEKALB 581M is most similar to DEKALB 582M except it has (1) pubescent glumes, (2) weaker straw, (3) stronger gluten and (4) greater winterhardiness.

Of formerly established varieties, it is most similar to Quivira, (described in Tech. Bul. No. 459 - "Classification of Wheat Varieties Grown in the United States"), except it has (1) Timopheevi cytoplasm, (2) stronger gluten, (3) restores fertility to hybrids having Timopheevi cytoplasm.

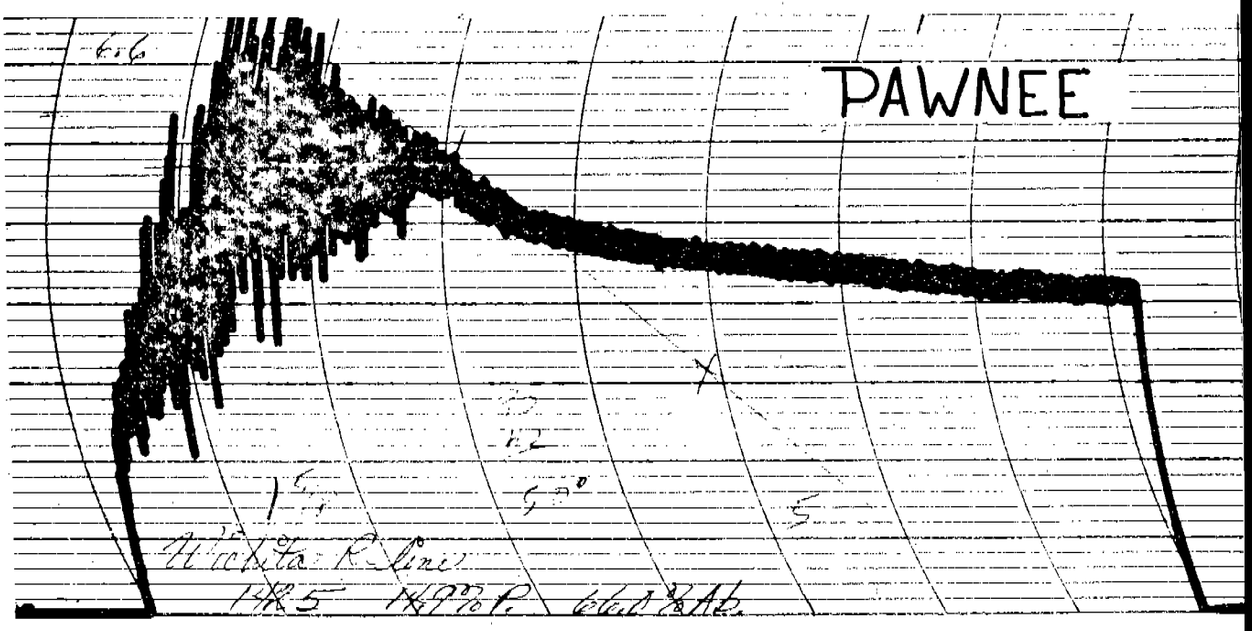
7400044

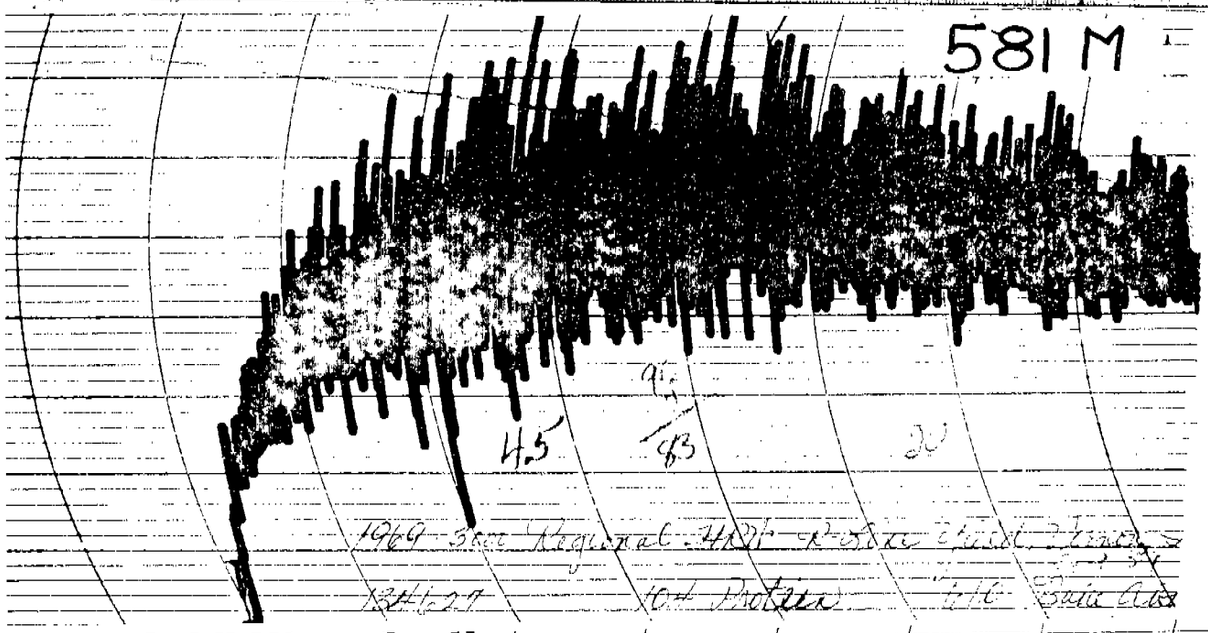
Exhibit E

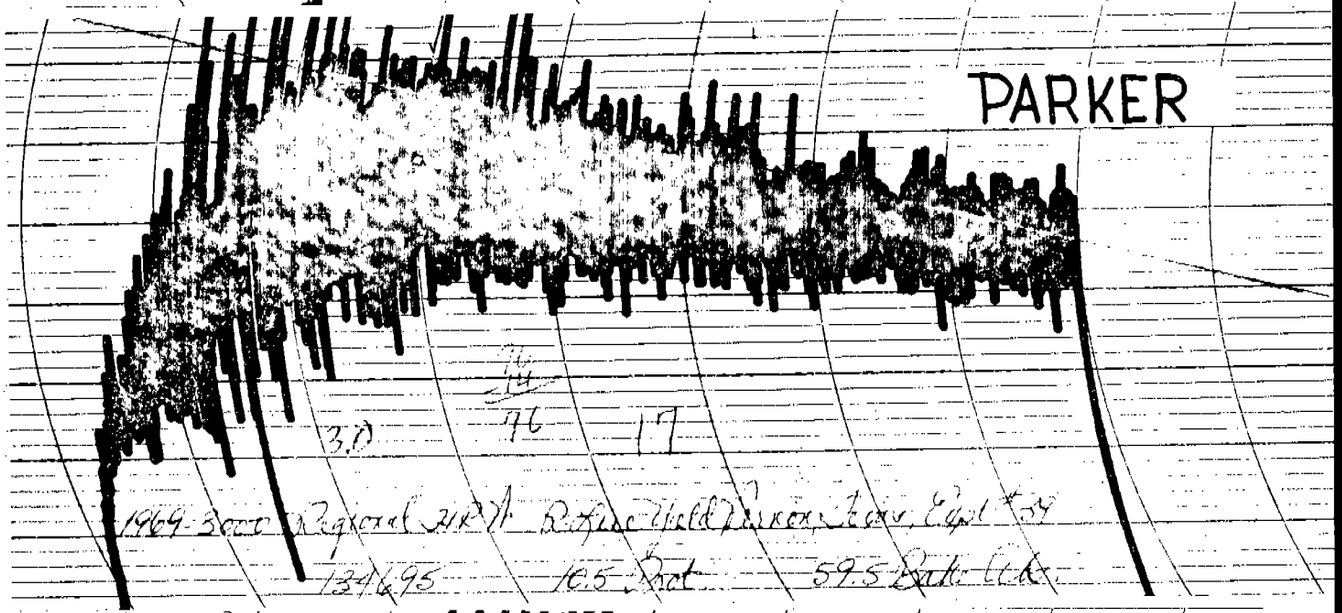
DeKalb AgResearch, Inc. of DeKalb, Illinois, believes it is the sole, original and first breeder of DeKalb 581M for which it solicits a certificate of protection.

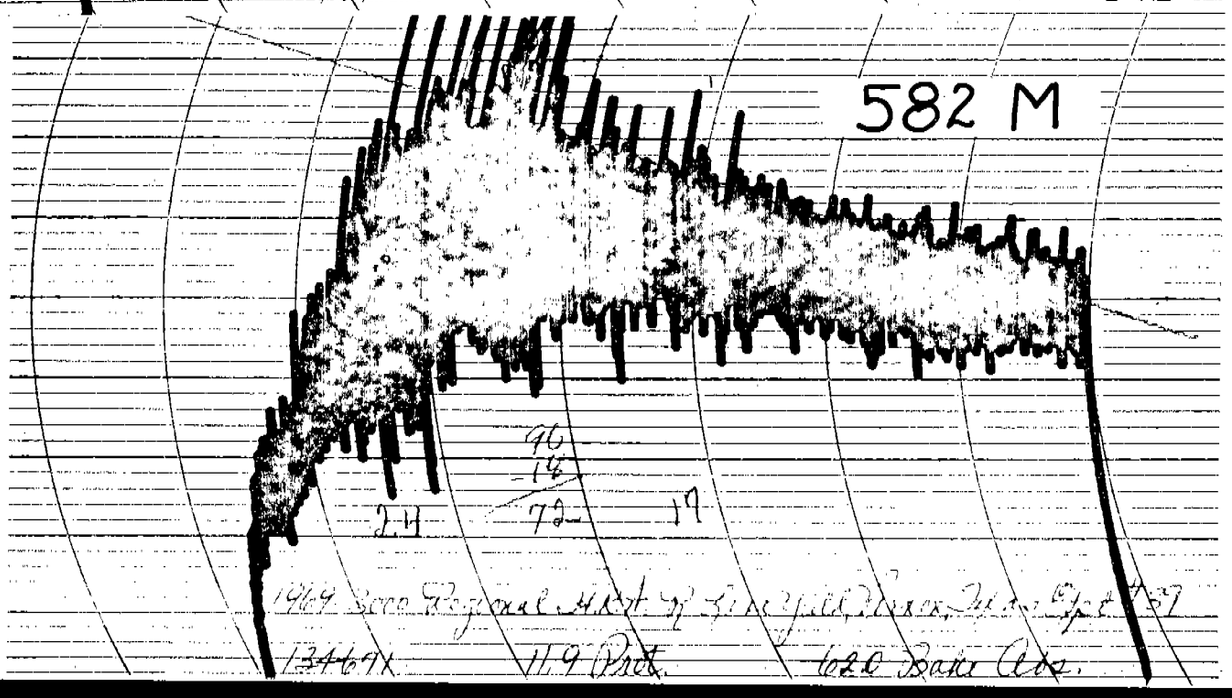

TASCOSA
Wichita R-line

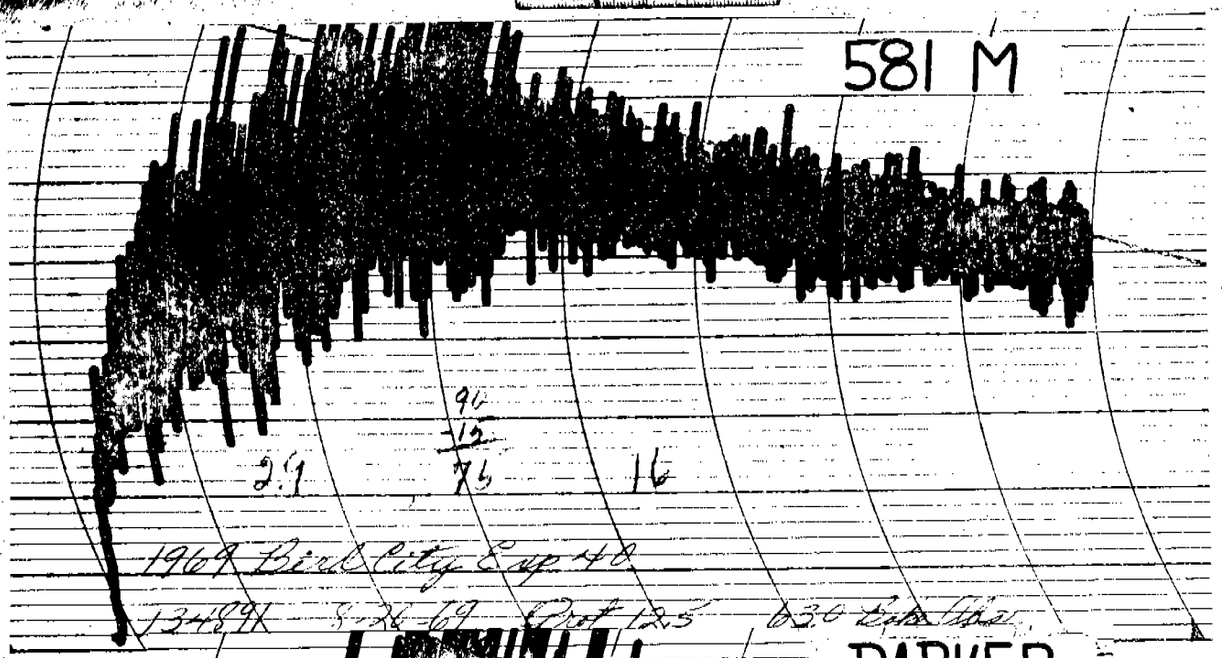
QUIVERA
Wichita R-line

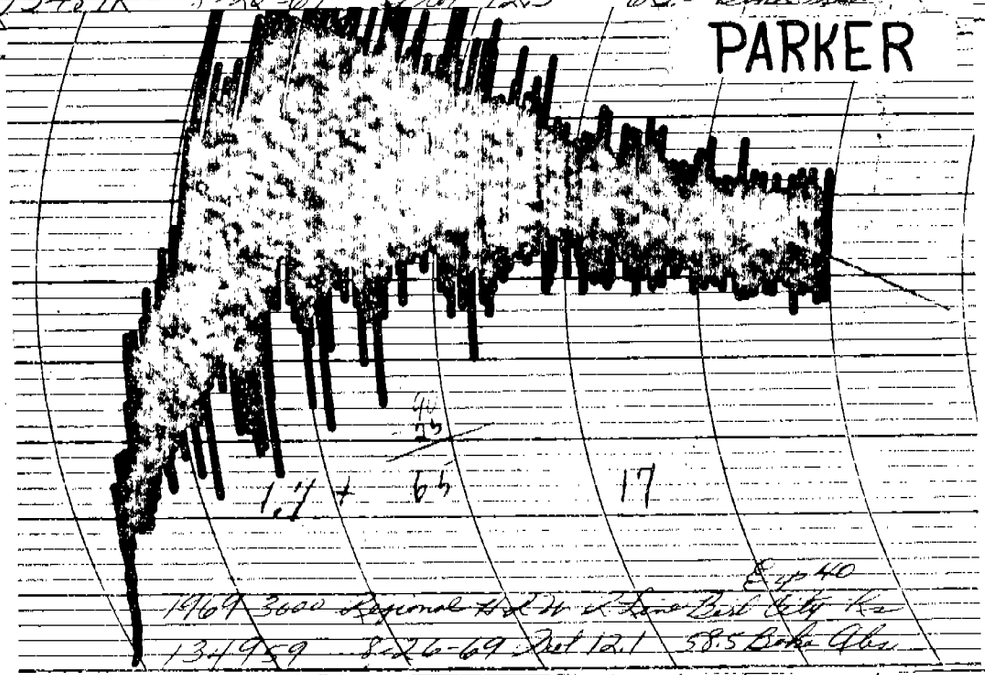

PAWNEE
Wichita R-line

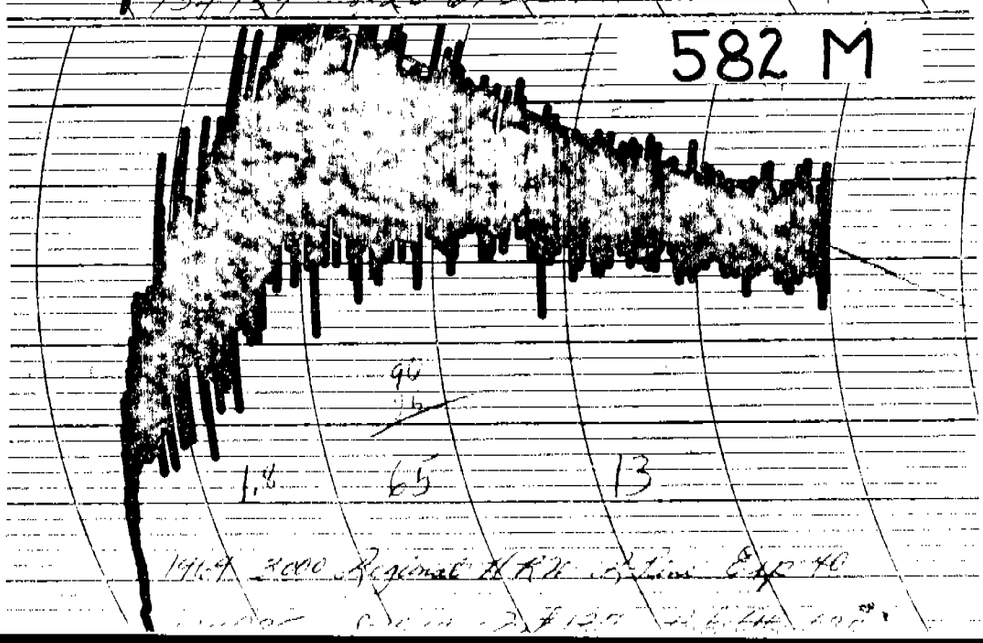

581 M
4.5
83
1969 3000 Regional HRW
1346.27
10.4 Protein
Bake Abs


PARKER
3.0
76
17
1969 3000 Regional HRW
1346.95
10.5 Prot.
59.5 Bake Abs.


582 M
96
18
2.4
72
17
1969 3000 Regional HRW
1346.91
11.9 Prot.
62.0 Bake Abs.


581 M
90
-15
75
2.9
16
1969 Bird City Exp 40
134891 8-26-69 Prot 12.5 63.0 Bake Abs


PARKER
90
-25
65
1.7 +
17
Exp 40
1969 3000 Regional H R W L Line Bird City Ks
134959 8-26-69 Prot 12.1 58.5 Bake Abs


582 M
90
-25
65
1.8
13
1969 3000 Regional H R W L Line Exp 40

7400044

11. HEAD:

[ ] Density: 1 = LAX 2 = DENSE Middense

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

[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)*: _____

[0 7] CM. LENGTH [1 0] MM. WIDTH

12. GLUMES AT MATURITY:

[2] 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:

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

16. SEED: ovate to elliptical

[1-3] Shape: (1) = OVATE 2 = OVAL (3) = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[1-2] Brush: (1) = SHORT (2) = MEDIUM 3 = LONG

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

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

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

[0 6] MM. LENGTH [0 3] MM. WIDTH [2 9] GM. PER 1000 SEEDS

17. SEED CREASE: Crease midwide and middeep.

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

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

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

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

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

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

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

[1] OTHER *(Specify)* _____

HESSIAN FLY RACES: [1] GP [0] A [0] B [0] C [0] D [0] E [0] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

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

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.

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. Pennit

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