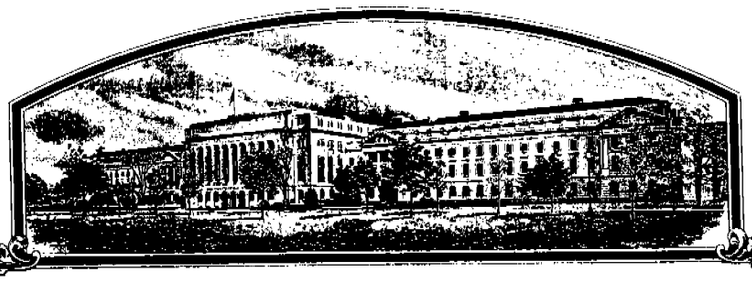

No. 7600068

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, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT IETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT AT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'R158'

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* 18th *day of* March *in the year of our Lord one thousand nine hundred and* seventy-seven

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

FORM GR-470
(1-76)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
PLANT VARIETY PROTECTION OFFICE
NATIONAL AGRICULTURAL LIBRARY
BELTSVILLE, MARYLAND 20705

FORM APPROVED
OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1a. TEMPORARY DESIGNATION OF VARIETY R158	1b. VARIETY NAME R158 KAE	FOR OFFICIAL USE ONLY PV NUMBER 7600068
2. KIND NAME Wheat	3. GENUS AND SPECIES NAME Triticum aestiuum	FILING DATE 4·28·76 / TIME 4:00 P.M.
4. FAMILY NAME (BOTANICAL) Gramineae	5. DATE OF DETERMINATION July, 1974 KAE	FEE RECEIVED $250.00 $250.00 $250.00 / DATE — — —
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. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION Delaware KAE	11. DATE OF INCORPORATION 3-24-1928 KAE

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] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [x] 13B. Exhibit B, Novelty Statement.
- [x] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [x] 13D. Exhibit D, Additional Description of the Variety.

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 [ ] NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed? [ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

15. Does the applicant(s) agree to the publication of his/her (their) name(s) and address in the Official Journal? [x] YES [ ] NO

16. The applicant(s) declare(s) 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) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) 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 Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

June 1, 1976 — (DATE)

R F Holland — (SIGNATURE OF APPLICANT)

00001

(DATE) — (SIGNATURE OF APPLICANT)

KLetter of 10-27-76

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, National Agricultural Library, Beltsville, Maryland 20705. (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 Give the date the applicant determined that he had a new variety based on (1) the definition in Section 41(a) of the Act and (2) the date a decision was made to increase the seed.

13a Give (1), the genealogy, including public and commerical varieties, lines, or clones used, and the breeding method. (2), the details of subsequent stages of selection and multiplication. (3), the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4), evidence of stability.

RECEIVED
JUN 7 1976
OF PLANT VARIETY PROTECTION DIV.

13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties; (1) identify these varieties and state all differences objectively; (2) Attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form for all characteristics, for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe; such as; plant habit, plant color, disease resistance, etc.

14A If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled or published or the certificate has been issued. However, if the applicant specifies "NO", he may change his choice. (See Section 180.15 of the Regulations and Rules of Practice.)

76-68

Exhibit A

Origin and Breeding of R158

1. R158 was derived from the cross - MS Sturdy/4/ (MS Seu Seun/3/T. timopheevi/Marquis^2//Kan^2) F4 which was made by DEKALB AgResearch, Inc. in the spring of 1970 at Wichita, Kansas.

2. The F1 was grown out in the Fall of 1970 in the Wichita greenhouse.

3. The F2 seed was planted in the Wichita nursery in January of 1971, and a single plant selection was later made in field plot 115300.

4. Seed from the individual F2 plant was grown at Wichita in 1971-72 in plot 104500. The F3 plants were harvested in bulk after rogueing.

5. F4 seed was planted in a small increase and crossing block (175096) at Wichita in 1972-73 when it underwent additional purification. This year the F4 was also widely tested for yield and adaptation.

6. Hybrids of the R-line were yield tested in 1973-74. Hybrids showed good yield and uniform restoration. The R-line was also planted in a 1¼ acre increase and crossing block arrangement and was again rogued.

7. R158 is stable and uniform over generations similar to the variety Sturdy.

76-68

Exhibit B

Botanical Description of the Variety

R158 is an early, semidwarf hard red winter wheat having similar plant characteristics to the variety Sturdy but has smaller leaves and more tendency for lodging at maturity. R158 also differs from Sturdy in having Timopheevi cytoplasm and pollen-restoring genes that restores pollen fertility to hybrid wheats with Timopheevi cytoplasm. It is also not as erect-growing in the early Spring as Sturdy.

R158 is further distinguished by the following characteristics: Stem white, moderately strong; spike awned oblong to tapering middense; erect to inclined; glumes glabrous, white, midlong, midwide; shoulders square; beaks acuminate; awns white; kernels red, hard, elliptical; germ midsized; crease wide and deep; cheeks angular; brush midsize without collar.

Leaf rust pustules will develop more densely on R158 than its parent Sturdy. However, it carries resistance but not to all races and part of its resistance is apparently of the slow rusting type. It is susceptible to soil borne mosaic and powdery mildew.

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

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 76-68
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: (October 20 emergence)

[1][6][6] FIRST FLOWERING Ponca City, Oklahoma [1][7][3] LAST FLOWERING

4. MATURITY *(50% Flowering)*:

[0][2] NO. OF DAYS *EARLIER* THAN ..... [2] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[ ][ ] NO. OF DAYS *LATER* THAN ..... [ ] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

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

[ ][ ][ ] CM. HIGH

[ ][ ] CM. TALLER THAN ..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[2][3] CM. SHORTER THAN ..... [2] 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] Waxy bloom: 1 = ABSENT 2 = PRESENT

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

[1] Internodes: 1 = HOLLOW 2 = SOLID

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

[2][2] 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:

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

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

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

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

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

[2][8] CM. LEAF LENGTH *(First leaf below flag leaf)*:

00004

4 of 9

76-68

FORM GR-470-6 (REVERSE)

11. HEAD:

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

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

[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 2] 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.)*

[4] 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:

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

16. SEED:

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

[2] Cheek: 1 = ROUNDED 2 = ANGULAR

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

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

[5] 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 7] GM. PER 1000 SEEDS

RECEIVED JUN 7 1976 PVPO

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'

[3] 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

[ ] 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	Sturdy	Seed size	Sturdy
Leaf size	Sturdy	Seed shape	Sturdy
Leaf color	Sturdy	Coleoptile elongation	Sturdy
Leaf carriage	Sturdy	Seedling pigmentation	Sturdy

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.

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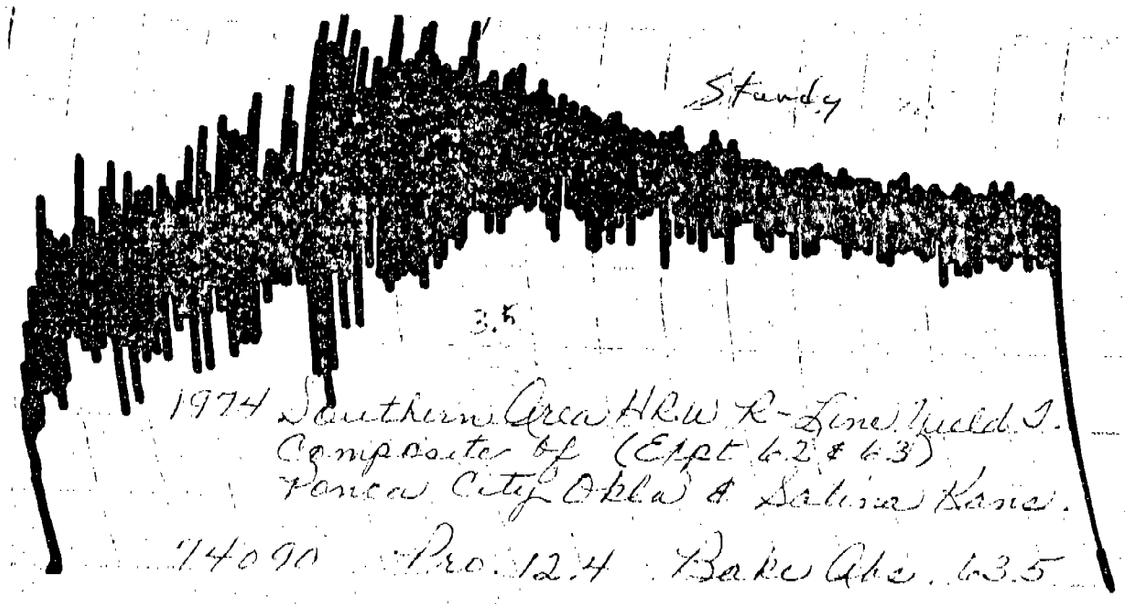
Exhibit D

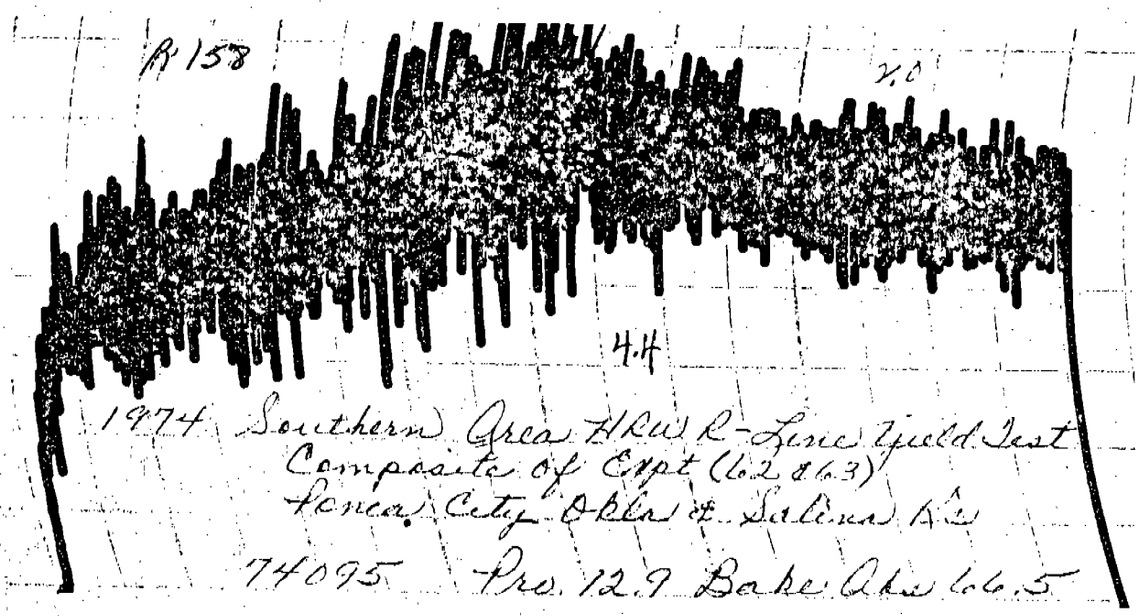
Data Indicative of Novelty

Novelty is based on the unique combination of the following characteristics: R158 most closely resembles Sturdy but it has Timopheevi cytoplasm and pollen restoring genes. It also differs markedly in having taller and weaker straw than Sturdy. Its gluten properties are stronger and more tolerant to mixing than Sturdy (see enclosure).

76-68

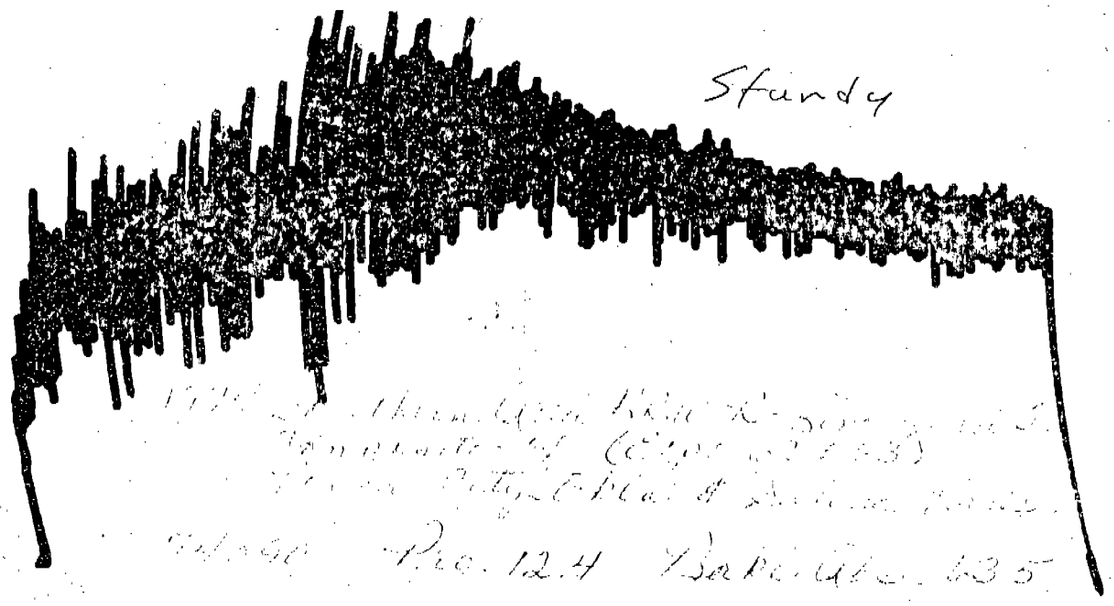


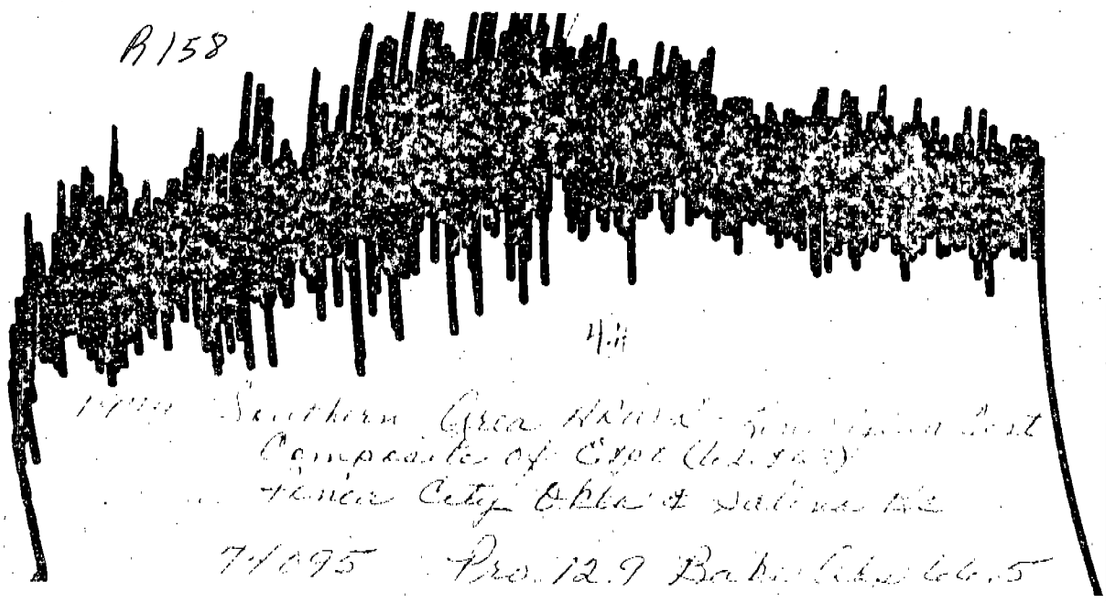
1974 Southern Area HRW R-Line Yield T.
Composite of (Expt 62 & 63)
Ponca City Okla & Salina Kans.
74090 Pro. 12.4 Bake Abs. 63.5



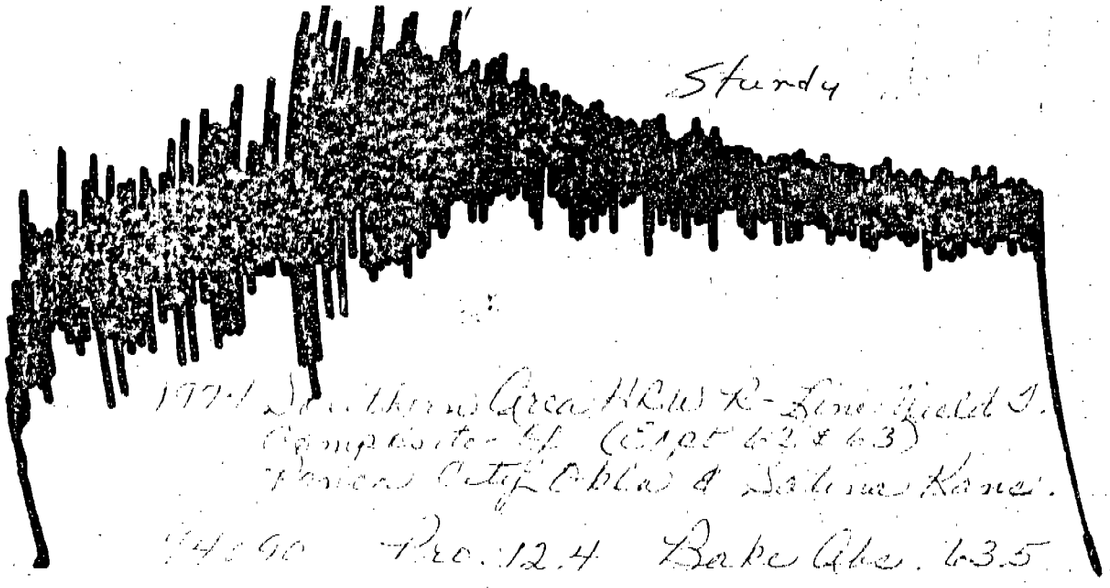
1974 Southern Area HRW R-Line Yield Test
Composite of Expt (62 & 63)
Ponca City Okla & Salina Kans
74095 Pro. 12.9 Bake Abs 66.5

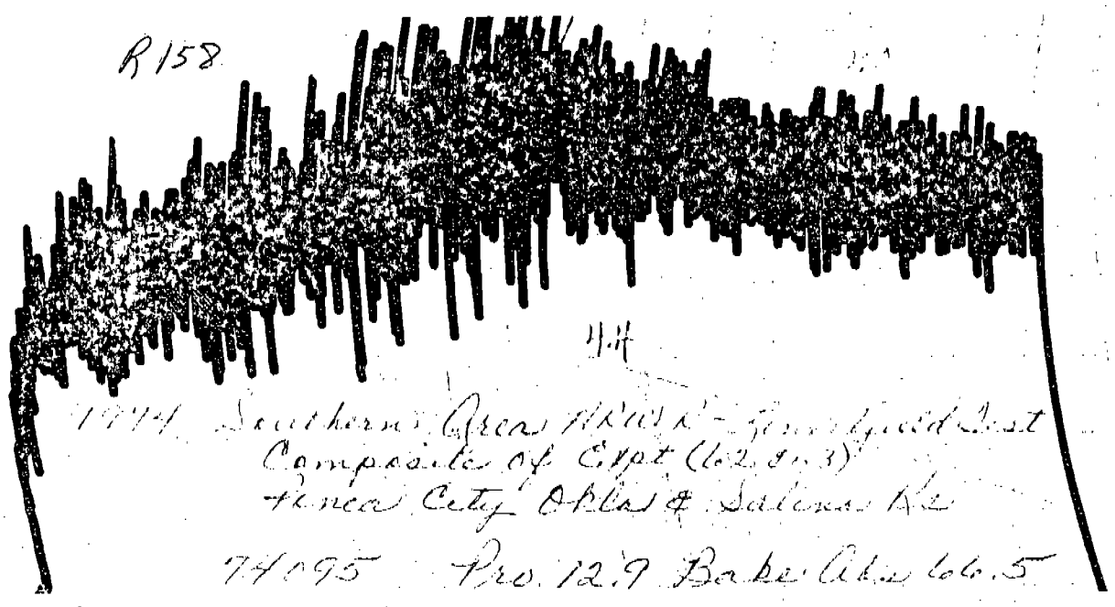
76-68





76-68


Sturdy
1974 Southern Area HRW R-Line Yield T.
Composite of (Expt 62 & 63)
Ponca City Okla & Salina Kans.
74090 Pro. 12.4 Bake Abs. 63.5


R158
1974 Southern Area HRW R-Line Yield Test
Composite of Expt (62 & 63)
Ponca City Okla & Salina Ks
74095 Pro. 12.9 Bake Abs 66.5

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: [signature]

Its: VICE PRESIDENT

ATTEST:

M. E. Perret

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