



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME;

Douglass W. King Company

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 VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS OFFERED AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'DK-49S'

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 28th day of December in the year of our Lord one thousand nine hundred and seventy-eight

Attest:

[Signature]
 Commissioner
 Plant Variety Protection Office
 Grain Division
 Agricultural Marketing Service

[Signature]
 Secretary of Agriculture



APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: See Reverse.

1a. TEMPORARY DESIGNATION OF VARIETY Expt. No. 72SA149	1b. VARIETY NAME DK-49S	FOR OFFICIAL USE ONLY	
		PV NUMBER 7800004	
2. KIND NAME Common wheat	3. GENUS AND SPECIES NAME Triticum aestivum, L.	FILING DATE 10-12-77	TIME 3:00 A.M.
		FEE RECEIVED \$ 250.00	DATE 10-12-77
4. FAMILY NAME (BOTANICAL) Gramineae	5. DATE OF DETERMINATION May 1975	\$ 250.00	10-12-77
		\$	
6. NAME OF APPLICANT(S) Douglass W. King Co.	7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) 4627 Emil Road P.O. Box 20320 San Antonio, Texas 78286	8. TELEPHONE AREA CODE AND NUMBER 512-661-4191	
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 Texas	11. DATE OF INCORPORATION Mar. 1, 1946

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

Mr. Blake Williams, Jr.
President
Douglass W. King Co.
4627 Emil Road
P.O. Box 20320
San Antonio, Texas 78286

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- 13B. Exhibit B, Novelty Statement.
- 13C. Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)
- 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 NO14B. 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? ONE (1) year each

 FOUNDATION REGISTERED CERTIFIED15. Does the applicant(s) agree to the publication of his/her (their) name(s) and address in the Official Journal? 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.

Jan 18, 1978
(DATE)

Blake Williams Jr.
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

1

FEB 13 1978

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 commercial 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.
- 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.)

ITEM 13 EXHIBIT A (Revised)

Origin and History of DK-49S Hard Red Spring Wheat

Class: Hard red spring, bread wheat, Triticum aestivum L.

Name: Variety DK-49S is owned by Douglass W. King Seed Company. The name has been cleared and approved by the Trademark Division, U.S. Department of Agriculture (See letter).

Developed by I.M. Atkins, Breeder and Consultant and Louis Jupe, Agronomist, for Douglass W. King Seed Company.

Plant Protection Certificate: To be assigned.

Breeding and increase procedures:

Parentage is unknown. In 1969, approximately 1000 wheat hybrids, F₂ remnant seed, were received from the CIMMYT group in Mexico City.

Breeding procedure: F₃ bulk hybrid rows were grown in 1969-70 season at San Antonio, Texas. Severe thinning occurred owing to low temperatures and drouth, providing desirable natural selection. Surviving plants of hybrids were harvested in bulk. In 1971, a large bulk population was grown and some head selections made for a summer crop at Aberdeen, Idaho. Bulk F₅ and F₆ lines were grown in 1972 and these again increased in a summer crop.

1973 Bulk populations, plant selections and head selections were grown. Superior lines increased during the summer. Preliminary yield testing and elimination of some strains.

1974 Bulk populations, selected pure lines, head rows plus preliminary and some replicated yield tests.

1975 Replicated and preliminary trials of many strains. DK-49S and others tested at several locations. Seed purification started. Quality tests and disease tests.

1976 Replicated and preliminary trials at several locations, Quality tests and disease tests. Purification and summer increase of 1 acre field at Aberdeen, Idaho.

1977 Replicated and preliminary trials continued. Quality and disease tests. Increase and purify seed.

1978 Planned further increase and purification of seed with possible distribution to contract growers.

Stability: Variety DK-49S has shown excellent uniformity and stability of plant type in yield tests and increase fields over several seasons, both winter and spring seeded. Off-types observed and being removed include brown-glumed plants, awnless plants from natural crosses, taller and later maturing plants. Off-type plants should not exceed one plant in 2000 of foundation seed fields, nor one plant in 1000 in certified seed fields.

Semi-dwarf varieties are frequently more variable in height than standard-height varieties and more subject to natural crossing. Off-type plants are more easily visible in fields.

ITEM 13B EXHIBIT B

For

DK-49S Hard Red Spring Wheat

DK-49S spring wheat is most similar to the Mexican semi-dwarf variety Cajeme 71, the dominant commercial spring wheat variety grown in South Texas. The new variety differs from Cajeme 71 in having more narrow seedling leaves (4.8mm vs 5.9 mm. for Cajeme 71); shorter spikes (73.7 mm. vs 77.0 mm. for Cajeme 71); shorter awns (53.3 mm. vs 59.7 mm. for Cajeme 71); shorter beaks (11.8 mm. vs 14.4 mm. for Cajeme 71) but longer second internodes (13.52 cm. vs 11.68 cm. for Cajeme 71).

Compared to Penjamo 62, the other important commercial variety grown in South Texas, DK-49S is approximately the same height but has stronger, more storm resistant straw and much superior leaf rust resistance under Texas conditions. The above listed differences differentiates DK-49S from Cajeme 71 and all other varieties tested or observed. Under some conditions, other differences may be observed.

Variety DK-49S has produced higher grain yields in 8 replicated yield tests in three seasons in Texas ; the test weight is slightly higher and the grain is better suited for the production of bakery flour than Cajeme 71 or Penjamo 62.

Table of Means, Differences And Statistical Data
 For Characters of DK-495 And Cajeme 71 Wheats
 Douglas W. King Seed Company

Revised 8/30/78

Character			Difference 495 vs Cajeme 71	T. Value	Significant at	
	Cajeme 71	DK-495			.01 level	.05 level
Seedling leaf width, ^(a) mm Inch.	5.85	4.82	- 1.03			
	0.230	0.190	- 0.040	4.349**	2.01	2.68
Mature leaf length, cm.	20.65	20.89	0.24	0.49NS	2.01	2.68
Mature leaf width, mm Inch.	10.1	10.2	0.10			
	0.39	0.404	0.007	0.77NS	2.01	2.68
Spike width, mm. Inch.	10.08	10.16	0.08			
	0.397	0.406	0.003	0.349NS	2.01	2.68
Spike length, mm. Inch.	77.6	73.7	- 3.36			
	3.032	2.90	- 0.132	2.29*	2.01	2.68
Glume length, mm. Inch.	10.00	9.00	- 1.00			
	0.393	0.354	- 0.037	0.645NS	2.01	2.68
Glume width, mm. Inch.	3.91	3.84	- 0.07			
	0.154	0.151	- 0.003	0.895	2.01	2.68
Awn length, mm. Inch.	55.7	53.3	- 6.4			
	2.25	2.098	- 0.252	3.271**	2.01	2.68
Beak length, mm. Inch.	14.40	11.80	- 2.60			
	0.568	0.464	- 0.104	4.448**	2.01	2.68
Internode length, cm	11.68	13.52	1.84	5.629**	2.01	2.68
Grain yield, bu/A	27.63	32.49	5.46	1.710NS	2.31	3.36
Test weight, lbs/bu.	56.19	57.13	0.97	1.315NS	2.36	3.50
Leaf rust, % 4 Sta. Yrs.	38	Tr	38			
Date headed, 4 Sta. Yrs.	Apr. 7	Apr. 9	2			
Days from Jan. 18 Planting, Texas 1975	72	67	- 5			
Plant height, cm	58.4	68.6	10.2			
Seed length, mm.	7.03	6.37	- 6.6			
Seed width, mm.	2.86	2.97	.11			
Weight of 100 kernels gms.	3.25	2.98	- 0.27			

(a) Through error, no measurements of leaf length of seedling
 leaves were taken.

Statistical analysis not possible on last items, field observations
 or measurements taken on large lots.

* Significant at the .05 level. ** Significant at the .01 level

8/30 J. M. Atkins

DK-495 Application 100004

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-6
(10-16-72)

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) Douglass W. King Company	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) 4627 Emil Road, P.O. Box 20320 San Antonio, Texas 78220	PVPO NUMBER 78 000 04
	VARIETY NAME OR TEMPORARY DESIGNATION DK-495

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. or) when number is either 99 or less or 9 or less.

1. KIND:

<input type="text" value="1"/> 1 = COMMON	<input type="text" value="2"/> 2 = DURUM	<input type="text" value="3"/> 3 = EMMER	<input type="text" value="4"/> 4 = SPELT	<input type="text" value="5"/> 5 = POLISH	<input type="text" value="6"/> 6 = POULARD	<input type="text" value="7"/> 7 = CLUB
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2. TYPE:

<input type="text" value="1"/> 1 = SPRING	<input type="text" value="2"/> 2 = WINTER	<input type="text" value="3"/> 3 = OTHER (Specify) _____	<input type="text" value="2"/> 1 = SOFT	<input type="text" value="3"/> 3 = OTHER (Specify) _____
<input type="text" value="2"/> 1 = WHITE	<input type="text" value="2"/> 2 = RED	<input type="text" value="3"/> 3 = OTHER (Specify) _____	<input type="text" value="2"/> 2 = HARD	

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

<input type="text" value="6"/> <input type="text" value="7"/> FIRST FLOWERING	<input type="text" value="7"/> <input type="text" value="1"/> LAST FLOWERING
---	--

4. MATURITY (50% Flowering):

<input type="text" value="0"/> <input type="text" value="0"/> NO. OF DAYS EARLIER THAN	<input type="text" value="0"/> 1 = ARTHUR	<input type="text" value="2"/> 2 = SCOUT	<input type="text" value="3"/> 3 = CHRIS
<input type="text" value="0"/> <input type="text" value="2"/> NO. OF DAYS LATER THAN ... Cajeme .. 71	<input type="text" value="0"/> 4 = LEMMI	<input type="text" value="5"/> 5 = NUGAINES	<input type="text" value="6"/> 6 = LEEDS

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

<input type="text" value="6"/> <input type="text" value="9"/> CM. HIGH	<input type="text" value="0"/> 1 = ARTHUR	<input type="text" value="2"/> 2 = SCOUT	<input type="text" value="3"/> 3 = CHRIS
<input type="text" value="1"/> <input type="text" value="0"/> CM. TALLER THAN ... Cajeme .. 71	<input type="text" value="0"/> 4 = LEMMI	<input type="text" value="5"/> 5 = NUGAINES	<input type="text" value="6"/> 6 = LEEDS
<input type="text" value=""/> <input type="text" value=""/> CM. SHORTER THAN	<input type="text" value="0"/>		

6. PLANT COLOR AT BOOTING (See reverse):	7. ANTHUR COLOR:
<input type="text" value="2"/> 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN	<input type="text" value="1"/> 1 = YELLOW 2 = PURPLE

8. STEM:

<input type="text" value="1"/> Anthocyanin: 1 = ABSENT 2 = PRESENT	<input type="text" value="1"/> Waxy bloom: 1 = ABSENT 2 = PRESENT
<input type="text" value="1"/> Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT	<input type="text" value="1"/> Internodes: 1 = HOLLOW 2 = SOLID
<input type="text" value="0"/> <input type="text" value="3"/> NO. OF NODES (Originating from node above ground)	<input type="text" value="1"/> <input type="text" value="4"/> CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

<input type="text" value="1"/> Anthocyanin: 1 = ABSENT 2 = PRESENT	<input type="text" value="1"/> Hairiness: 1 = ABSENT 2 = PRESENT
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10. LEAF:

<input type="text" value="2"/> Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (Specify) _____	<input type="text" value="1"/> Flag leaf: 1 = NOT TWISTED 2 = TWISTED
<input type="text" value="1"/> Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT	<input type="text" value="1"/> Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
<input type="text" value="1"/> <input type="text" value="0"/> MM. LEAF WIDTH (First leaf below flag leaf)	<input type="text" value="2"/> <input type="text" value="0"/> CM. LEAF LENGTH (First leaf below flag leaf):

Revised copy 5
8/30 J. M. Atkins

1 Density: 1 = LAX 2 = DENSE

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

4 Awedness: 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): _____

08 CM. LENGTH

10 MM. WIDTH

12. GLUMES AT MATURITY:

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

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

4 Shoulder 1 = WANTING 2 = OBLIQUE 3 = ROUNDED
shape: 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:

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

1 Check: 1 = ROUNDED 2 = ANGULAR

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

1 Brush: 1 = NOT COLLARED 2 = COLLARED

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

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

06 MM. LENGTH

03 MM. WIDTH

03 GM. PER 100 SEEDS

17. SEED CREASE:

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

1 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

0 OTHER (Specify) _____

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

0 SAWFLY

1 APHID (Bydv.)

1 GREEN BUG

0 CEREAL LEAF BEETLE

0 OTHER (Specify) _____ HESSIAN FLY RACES:

0 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	Cajeme 7/	Seed size	Cajeme 7/
Leaf size	"	Seed shape	"
Leaf color	"	Coleoptile elongation	"
Leaf carriage	"	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. Briggles 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.

8/30 J.M. Athin 6

TEXAS DEPARTMENT OF AGRICULTURE

Test No.

33714

SEED LABORATORY
REAGAN V. BROWN COMMISSIONER
BOX 629
GIDDINGS -TX 78942

Designated by Sender: Wheat, DK-49S

Lot No.

Phenol Test \$3.00

Received: 11-3-77

Test Requested - Complete

Germ. Only

Purity Only

KIND 283	PURE SEED %	INERT MATTER %	OTHER CROP SEED %	WEED SEED %	GERMI-NATION %	HARD SEED %	DORMANT SEED %	NOXIOUS WEEDS PER POUND
			PHENOL	TEST				

Date Completed 11-8-77

Submitted By 06696 Douglass W. King Co., Inc.
P. O. Box 20320
San Antonio, Texas 78286

Additional Information

Phenol Test:
400 Brown Seed

Signed:

KENNETH W. BOATWRIGHT - Seed Analyst

TEXAS DEPARTMENT OF AGRICULTURE

Test No.

33711

SEED LABORATORY
REAGAN V. BROWN COMMISSIONER
BOX 629
GIDDINGS TX 78942

Designated by Sender: Wheat, Cajeme 71

Lot No.

Phenol Test \$3.00

Received: 11-3-77

Test Requested - Complete

Germ. Only

Purity Only

KIND 283	PURE SEED %	INERT MATTER %	OTHER CROP SEED %	WEED SEED %	GERMI-NATION %	HARD SEED %	DORMANT SEED %	NOXIOUS WEEDS PER POUND
			PHENOL	TEST				

Date Completed 11-8-77

Submitted By 06696 Douglass W. King Co., Inc.
P. O. Box 20320
San Antonio, Texas 78286

Additional Information

Phenol Test
394 Brown Seed, 6 Brown-Black Seed

Signed:

KENNETH W. BOATWRIGHT - Seed Analyst

Item 13 D Exhibit D (Page 2, revised).

1. Kind: Wheat, common hard red spring wheat, variety DK-49S

2. Type: DK-49S spring wheat is a day-length insensitive, hard, red spring bread wheat. Owing to the mild climate of South Texas, this type of wheat can be grown from mid-winter (Dec. 15 to Feb. 10) seeding where it will mature in May. This type may also be spring seeded at the higher elevations of the High Plains of Texas (Feb. 15 to Mar. 15), where it will mature in late June.

3. Season: The number of days from seeding to first flowering may range from 60 to 80 days in South Texas but may be prolonged to 90 to 100 days on the High Plains.

4. Maturity: DK-49S wheat variety ranges in maturity from 1 to 4 days later in heading than either ~~the~~ Cajeme 71 or Penjamo 62 (Mean 2 days).

5. Plant height: Plants of DK-49S average about the same in height as those of Penjamo 62 but are on the average 10 cm. taller than ~~the~~ Cajeme 71 (68.6 cm. vs 58.4 cm. for Cajeme 71).

6,7,8,9, See chart.

10. Leaves: The seedling leaves of DK-49S averaged 4.82 mm. in width at the base compared to 5.85 mm for ~~the~~ Cajeme 71. The difference is small but statistically significant. The mature leaves of the two varieties averaged the same in width and length.

11. Head or spike: The spikes of DK-49S averaged 73.7 mm. vs 77.0 mm. for ~~the~~ Cajeme 71. The difference of 3.3 mm. or 0.132 inch was statistically significant at the .01 level. The width of heads of the two varieties was essentially the same.

Item 13 D Exhibit D (Page 3, revised).

11. Head or spike (continued): The spike in general resembles that of Penjam0 62. The awns of DK-49S averaged 53.3 mm. while those of Cajeme 71 averaged 59.7 mm. The difference of 6.4 mm. was statistically significant. The beaks of DK-49S averaged 11.80 mm. vs 14.4 mm. for Cajeme 71, the difference of 2.60 mm. being statistically significant.
12. Glumes : The glumes of DK-49S averaged 9.0mm. and 3.84 mm. wide, both being very similar to Cajeme 71 and classed as long and wide.
- 13,14,15 See chart.
16. Seed: The seed of DK-49S were shorter than those of Cajeme 71, (6.37mm vs 7.03 mm for Cajeme 71). However, the kernels of DK-49S were wider than those of Cajeme 71 (2.97 mm. vs 2.86 mm. for Cajeme 71. The seed of DK-49S weighed 2.98 grams per 100 seed compared to 3.25 grams for those of Cajeme 71. These measurements were obtained by measuring 10 seed at one time and weighing 1000 at one time so no statistical analysis could be made with the limited number of units.
- Phenol tests by the Texas State Department of Agriculture Laboratory classed the seed of DK-49S as 100 percent brown, category 4 on the chart (See attached report).
17. See chart.
18. Diseases: Spring wheat variety DK-49S has maintained a high degree of resistance to leaf rust during three seasons and growing at several locations in Texas. Average for Cajeme 71 in the same tests was 38 percent infection.
- Quality: See attached pages for report on quality for milling and production of pan bread.

QUALITY CHARACTERISTICS OF DK-49S SPRING WHEAT
COMPARED WITH APPROPRIATE CHECK VARIETIES

The new spring wheat variety, DK-49S, was compared in two seasons and from two locations with appropriate commercial varieties. The 1976 increase plot grown in South Texas could only be compared with Sturdy, a high quality winter wheat. Data shown in the table indicate that DK-49S was satisfactory in all respects and comparable to the variety Sturdy.

Increase fields were grown in the hard red spring wheat area of Idaho in 1975 and 1976. In 1975 the variety ^MCajenne 71, ^{9/21/78} also grown commercially in South Texas, and the variety Borah were used as check varieties. For some unexplained reason DR-49S had lower protein than the check varieties. Perhaps for this reason, the loaf characteristics were criticized from this sample. Other characteristics, such as absorption, ash and milling were normal.

The 1976 increase seed of DK-49S was compared to the variety Protar, acceptable in quality. A sample of Sturdy grown and representing wheat in South Texas was included for comparison. The quality characteristics of DK-49S were all satisfactory and equal to the check varieties in 1976.

The new variety DK-49S is believed to of acceptable quality for growing under South Texas conditions. The Lubbock Grain Exchange graded DK-49S as a hard red spring wheat with the sample submitted having 40 percent dark hard vitreous kernels.

Quality Characteristics Of DK-495 Spring Wheat Compared with Appropriate Check Varieties

Item	1976 Fall		1975 ^{9/22/78} Spring Seeded			1976 Spring Seeded		
	DK-495	Sturdy*	DK-495	Cajeme 71	Borch	DK-495	Protar	Sturdy*
Moisture %			15.3	14.4	13.3	14.8	13.8	14.5
Protein %	13.80	14.1	13.4	14.7	15.4	14.6		15.0
Flour protein %	12.6	12.1	9.5	12.8	10.6	12.9	12.0	13.7
Ash	.55	.52	.45	.48	.50	.55	.57	.48
Absorption %	56.7	52.6	67.1	62.3	61.7	67.5	65.5	66.5
Mixing time	13	14		14	13			
Mixing Peak	6 1/2	8 1/2	5	9 1/2	6	6 1/2	4 1/2	10
Stability	11 1/2	15	7 1/2	11 1/2	11	10 3/4	8	13
M.T.I	40	30	40	25	30	15	20	30
Dough - Volume			2200	2225	2400			
Quality			Fair	Good	Mellow			
Texture			Fair	Open	Open		sl. open	open
Oven-spring			Sticky	Sticky	Good	sl. open	sl. open	open
Crust			Light	Good	Good	Smooth	Smooth	Smooth
Valorimeter						67	58	78
loaf volume						800 gr.	790 gr.	740 gr.
Crust color						95 vs. DC	95 vs. DC	96 BC
fermentation						Normal	Normal	Normal
Millng Yield %						Very strong flour	Very strong flour	Very strong flour
						69.5		68.9

* Sturdy - Hard red winter variety, fall seeded