No. 7700105

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Seed Research, 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 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 A CLASS OF 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

'5422'

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* 25th *day of* January *in the year of our Lord one thousand nine hundred and* seventy-nine

PLANT VARIETY PROTECTION OFFICE · U.S. DEPARTMENT OF AGRICULTURE

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	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
5422	11/22/78 542 2	PV NUMBER 7700105
2. KIND NAME	3. GENUS AND SPECIES NAME	FILING DATE / TIME
Hard Red Winter Wheat	Triticum aestivum	9-13-77 / 1:30 P.M.
4. FAMILY NAME (BOTANICAL)	5. DATE OF DETERMINATION	FEE RECEIVED / DATE
Graminaeae	June, 1972	$250.00 / 9-13-77 $250.00 / 9-13-77 $250.00 / 12-26-78

6. NAME OF APPLICANT(S)	7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)	8. TELEPHONE AREA CODE AND NUMBER
Seed Research Associates, Inc.	Route 2, Box 48 Scott City, Kansas 67871	316-872-2807

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.)	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Kansas	June, 1973

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

Kenneth L. Goertzen, President
Seed Research Associates Inc.
Route 2, Box 48
Scott City, Kansas 67871

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.)* [X] YES [ ] 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? [X] FOUNDATION [X] REGISTERED 3/25/80 [X] 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.

9/23/77 (DATE) — Kenneth L. Goertzen (SIGNATURE OF APPLICANT)

(DATE) — (SIGNATURE OF APPLICANT)

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.

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.)

EXHIBIT A: Origin and breeding history of 5422

SRAI 2380 (spring habit, semi dwarf, high protein line) was crossed with SRAI 2390 (winter habit, short semi dwarf, high protein line with brown chaff) No commonly grown bread wheats are involved in the parentage.

A single plant was selected from this cross in the F_4 generation which was semi dwarf in stature, had 13 heads with 3 seeds set per spikelet. It was brown chaff and with winter habit. Increase from this single plant selection produced 5422.

Different generations produce plants that have the same appearance and performance.

5422 meets stability and variability standards for hard red winter wheat varieties.

Breeders seed is maintained from a bulk of the F4 single plant selection. Roguing of the breeders seed is practiced to remove any possible variants that result from volunteer in plot, mechanical mixtures, outcrosses, or any other atypical plants.

Breeders seed is planted on ground that has been summer fallowed for at least one year.

Breeders seed is used to produce Foundation Seed using the same methods to maintain breeders seed but with less intense roguing.

Foundation seed is used to produce Certified Seed which is handled to meet the Crop Improvement Certification requirements.

Certification is being applied for in 1977.

Variants 1 white head / 3,000 B as per letter of 11/10/78

Exhibit B: Novelty Statement for 5422 7700105

5422 compared with most similar commercial variety Triumph 64.

	5422	Triumph 64
Season	Early	Early
Height	Semi dwarf	Normal
Glume Color	Brown	Straw
Genetically High Protein	Yes	No

5422

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)
Seed Research Associates Inc.

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)
Route 2, Box 48
Scott City, Kansas, 67871

FOR OFFICIAL USE ONLY

PVPO NUMBER 7700105

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
[ ][ ][ ] LAST FLOWERING

4. MATURITY (*50% Flowering*):
[ ][0] NO. OF DAYS *EARLIER* THAN [7] 1 = ARTHUR 2 = SCOUT 3 = CHRIS
[ ][0] NO. OF DAYS *LATER* THAN [7] 4 = LEMHI 5 = NUGAINES 6 = LEEDS
7 = Triumph

5. PLANT HEIGHT (*From soil level to top of head*):
[ ][8][4] CM. HIGH Scott County irrigated, Scout 103 cm.
[ ][ ] CM. TALLER THAN [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS
[1][9] CM. SHORTER THAN [2] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (*See reverse*):
[3] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:
[1] 1 = YELLOW 2 = PURPLE

8. STEM:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[ ] Waxy bloom: 1 = ABSENT 2 = PRESENT
[2] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT
[1] Internodes: 1 = HOLLOW 2 = SOLID
[ ][4] NO. OF NODES (*Originating from node above ground*)
[1][9] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:
[ ] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____
[2] Flag leaf: 1 = NOT TWISTED 2 = TWISTED
[ ] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
[ ] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
[1][2] MM. LEAF WIDTH (~~*First leaf below*~~ *flag leaf*)
[2][0] CM. LEAF LENGTH (~~*First leaf below*~~ *flag leaf*):

FORM GR-470-C (REVERSE)

7700105

11. HEAD:

[2] Density: 1 = LAX 2 = MID DENSE

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

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[5] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify):

[0][9] CM. LENGTH

[1][3] MM. WIDTH

12. GLUMES AT MATURITY:

[2] 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.)

[1] 1 Glabrous 2 Pubescent

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

[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:

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

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] 8 4/20/78 [X] 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][7] MM. LENGTH

[0][3] MM. WIDTH

[3][0] GM. PER 1000 SEEDS

17. SEED CREASE:

1 [2] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA'
2 = 60% OR LESS OF KERNEL 'CHRIS'
8 4/20/78 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[2] 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)

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

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

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

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

[ ] OTHER (Specify) HESSIAN FLY RACES: [ ] GP [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	5466	Seed size	5466
Leaf size	5466	Seed shape	5466
Leaf color	5466	Coleoptile elongation	
Leaf carriage		Seedling pigmentation	5466

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.

C. Botanical Characteristics of 5422

Plant Characteristics:

1. Maturity: Early
2. Height: Semi Dwarf
3. Habit of Growth: Winter

Stem Characteristics:

1. Color: Straw
2. Strength: Strong
3. Hollow Straw

Spike Characteristics:

1. Awns: Present, brown
2. Shape: oblong
3. Density: Mid dense
4. Position: Erect
5. Shattering: Some

Glume Characteristics

1. Color: Brown
2. Length - Mid long
3. Width: Wide
4. Shoulder square to elevated with acuminate beak

Kernel Characteristics:

1. Color: Red
2. Length: 7 mm.
3. Width: 3 mm.

4 Gm per 1000 seeds: 30

5. Germ: large
6. Texture: hard
7. Shape: ovate
8. Crease: midwide, mid deep with rounded cheek
9. Brush: long, not collared

EXHIBIT D.

Area of Adaptation and Primary Use of Variety

The variety has been tested primarily in Kansas and is adapted to that state.

5422 is a strong gluten genetically high protein wheat that will be used primarily for blending with weaker lower protein wheats.

7700105

1976 Dryland Plot
Haven, Kansas
Low Soil Fertility

	Ave. Bu./ Acre	% Protein	Lbs. Protein/ Acre	Protein/Acre as % of Triumph
Triumph 64	35.0	11.1	233	100
5422	41.5	13.9	345	148.1

1975 Dryland Plot
Haven, Kansas
Low Soil Fertility

Triumph 64	28	10.9	183	100
5422	72	13.6	587	321

	1975		1976	
	Season	Height	Season	Height
Triumph 64	Early	Normal	Early	Normal
5422	Early	Semi Dwarf	Early	Semi Dwarf

QUALITY EVALUATION FROM 1976 DRYLAND PLOT
Haven, Kansas

(evaluation by Dixie Portland Flour Mills)

VARIETY	TEST WT.	WHEAT PROTEIN	FLOUR PROTEIN	% EXTRACTION	MIXING TIME	cc.VOL.	VOL. RATING	OVERALL QUALITY RATING
Triumph 64	62	11.0%	9.9%	70.0	4.25	715	19	Poor +
5422	61	13.8%	12.9%	73.0	6.5	880	30	Good