No. 7300049

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Purdue University
Agricultural Experiment Station

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. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS FIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

Abe

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* 15th *day of* January *in the year of our Lord one thousand nine hundred and* seventy-four

Earl L Butz

Secretary of Agriculture

Attest:

L. R. Rollin

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

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 Abe	2. KIND NAME Wheat	FOR OFFICIAL USE ONLY PVPO NUMBER 73049
3. GENUS AND SPECIES NAME Triticum aestivum	4. FAMILY NAME *(Botanical)* Gramineae	FILING DATE 1-22-73 / TIME 3:30 P.M.
	5. DATE OF DETERMINATION June 7, 1972	FEE RECEIVED $250.00 / CHARGES
6. NAME OF APPLICANT(S) Purdue University Agricultural Experiment Station	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)* Agricultural Experiment Station Purdue University Lafayette, Indiana 47907	8. TELEPHONE AREA CODE AND NUMBER 317-749-2461
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)* Division of Land Grant University	10. STATE OF INCORPORATION Established by Federal Law, Hatch Act, 1889	11. DATE OF INCORPORATION 1889

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

Dr. H. H. Kramer
Agricultural Experiment Station
Purdue University
Lafayette, Indiana 47907

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.)* [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? Three

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).

January 15, 1973
(DATE)

H H Kramer
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

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12A. Exhibit A. Origin and Breeding history of Abe Wheat

Abe was developed at the Purdue University Agricultural Experiment Station in cooperation with the Plant Science and Entomology Divisions, Agricultural Research Service, United States Department of Agriculture.

Abe, previously designated Purdue 65245B12-3-7-7 was derived following the third backcross to Arthur to add resistance to Hessian fly of the "Ribeiro" (H_5) type and resistance of the "Transfer" type (LR 9) to leaf rust.

The abbreviated parentage is: Arthur* 4/3/Purdue 6028A2-15-9-2/2/ Riley*2/Riley 67.

Riley 67 was the immediate source of "Transfer" resistance and Purdue 6028A2-15-9-2 was the immediate source of "Ribeiro" resistance.

The detailed parentage of Abe is:

Arthur*4/14/Knox*4/8/Kawvale/5/Fultz/Hungarian/2/W38/3/ Wabash/4/Fairfield/6/Trumbull*3/2/Hope/Hussar/7/Knox/5/ Fairfield/4/P.I.94587/3/Fultz/Hungarian/2/Fultz/Hungarian/ 12/Knox*4/8/Kawvale/5/Fultz/Hungarian/2/W38/3/Wabash/4/ Fairfield/6/Trumbull*3/2/Hope/Hussar/7/Knox/5/Fairfield/ 4/P.I.94587/3/Fultz/Hungarian/2/Fultz/Hungarian/11/Knox*2/ 7/Kawvale/5/Fultz/Hungarian/2/W38/3/Wabash/4/Fairfield/6/ Trumbull*3/2/Hope/Hussar/7/Knox/5/Fairfield/4/P.I.94587/3/ Fultz/Hungarian/2/Fultz/Hungarian/10/Knox*2/8/Kawvale/5/ Fultz/Hungarian/2/W38/3/Wabash/4/Fairfield/6/Trumbull*3/ 2/Hope/Hussar/7/Knox/5/Fairfield/4/P.I.94587/3/Fultz/ Hungarian/2/Fultz/Hungarian/9/Kawvale/5/Fultz/Hungarian/ 2/W38/Wabash/4/Fairfield/7/Vigo/Ribeiro/4/Trumbull/3/W38 2/Fultz/Hungarian/6/Kawvale/5/Fultz/Hungarian/2/W38/3/ Wabash/4/Fairfield/8/Knox/LaPorte/13/Riley sib*2/Riley 67

The backcross method of breeding was used followed by pedigree selection.

The first cross to Arthur utilized F_1 plants from crosses of Purdue 6028A2-15-9-2 by the F_1's of Riley ^{2} X Riley 67.

In the subsequent three crosses back to Arthur, F_1 plants were used which had been identified as possessing the LR9 gene for seedling resistance to leaf rust. F_2 progenies of each F_1 parent plant were tested to race D of Hessian fly to verify that the F_1 parent carried the H_5 gene for resistance. Sufficient crosses were made at each step so that backcrosses not possessing resistance to Hessian fly could be discarded.

Following the final backcross, pedigree selection was made in the F_1, F_2, F_3 and F_4 generations of selfing.

The original source of breeders seed was in the F_7 generation of selfing following the three backcrosses in breeding.

Abe has appeared somewhat more uniform than Arthur. Common wheat has been recognized as being almost completely self-pollinated.

It is recognized that the translocation source of LR9 may cause infrequent cytological irregularities (R. E. Finney. 1971. Genetic stability in wheat of leaf rust resistance derived from genera Agropyron and Aegilops. M.S. Thesis. Purdue University). This source of LR9 has been utilized in the Riley 67 and Arthur 71 varieties without a problem.

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12B. Exhibit B. Botanical Description of Abe

Abe is a common soft red winter wheat, Triticum aestivum L.

Abe averaged one day later than Arthur in flowering date in regional trials in 1971. At Lafayette Indiana when seeded about October 1, average first flowering is May 26 or about 228 days after emergence. Last flowering is about 7 days later. It is recognized that day length and seasonal temperatures influence flowering of varieties differentially.

Abe has averaged 91 cm in height in 1971 regional trials, about 2 cm shorter than Arthur (Table 1)

At booting the plant color is blue green. Abe tends to be blue green similar to the darkest green plants in Arthur.

Anther color of Abe is yellow like Arthur.

Anthocyanin has been generally absent in the stem of Abe as grown in Indiana. A moderate waxy bloom occurs on the stem becoming less apparent after flowering. Internodes are hollow. Stems are strong and yellow at maturity.

Abe is resistant to "node-bending" described in Agron. J. 49: 518-519, 1957.

The auricles are hairy and generally lacking in anthocyanin.

Leaves are a blue green on young plants and blue green at booting. Flag leaves are medium in size and generally erect at booting. Later they become more hortizontal and recurved. Flag leaves generally are not twisted. Hairs are absent on the first leaf sheath. A moderate level of waxy bloom occurs on the last leaf sheath.

Flag leaves, while generally observed as glabrous, possess a sparce level of short hairs, 30 to 50 per mm^2, which may be observed with a microscope.

Spikes are mid-dense (lax), oblong, apically awnletted, yellow and generally nodding at maturity. The awnlets of Abe are distinctly longer than those of Arthur or Arthur 71.

The longest awnlet per spike of Abe averages about one cm longer than those of Arthur or Abe.

The frequency of short awnlets is very different for Abe as compared to Arthur and Arthur 71.

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The frequency of the longest awnlet being 1.9 cm or less is about 6% for Abe, 26% for Arthur 71 and 24% for Arthur (Table 2).

Spike width and length are variable with production level and population, averaging about 12 mm wide and 6 cm long.

The glumes of Abe are similar to Arthur. They are mid-long and mid-wide. Shoulders are rounded (to square) and mid-wide. Beaks are mid-wide, obtuse and 0.5 to 1.5 mm long.

Coleoptile color of Abe is a light purple. Color sometimes occurs as a linear band covering only part of the coleoptile.

Seedling anthocyanin has not occurred in our observations.

Kernels are red in color and ovate in shape, with rounded cheeks and a mid-deep crease. The brush is medium in size and midlong. The embryo is large in size. Kernels average 6.2 mm. long and about 3.3 mm. wide and about 39 g. per 1000. The phenol reaction is brown.

Abe has the H_5 resistance to Hessian fly derived from Ribeiro. It has been resitant to races A, B, C, D, E, F, G and H in the greenhouse tests.

Resistance of the H_5 type is temperature sensitive. Research of R. L. Gallun, J. E. Foster at Purdue University in controlled climate tests showed Arthur 71 (H_5 gene) to be infested 1% at 65F, 9% at 70F, 42% at 75F and 97% at 85F. In certified fields in Indiana in 1971-72 Arthur 71 was infested only 1.9% vs 8.3% for Arthur.

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Table 1. Average region wide performance of Abe in the Uniform Eastern Soft Wheat Nursery in 1971

Variety	Yield Bu/A (25)*	Test Weight (25)	Height (in) (25)	Headed May (16)	Lodging score (16)
Abe	62.2	59.6	36	21	2.1
Arthur	57.8	60.1	38	20	2.0
Arthur 71	55.0	59.4	37	21	3.0

* Numbers in parenthesis refer to number of tests averaged.

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Table 2. Awnlet Characteristics

Awnlet length class (cm)	Frequency of longest awnlet per spike		
	Abe	Arthur	Arthur 71
1-1.9	6	24	26
2-2.9	26	38	41
3-3.9	50	30	30
4-4.9	15	8	3
5-5.9	3	0	0
Total	100	100	100

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Quality Evaluation of Abe (65245B12-3-7-7)
(NC Regional Soft Wheat Laboratory, Wooster, Ohio)

3-Way Comparison

Data for Abe, Arthur, and Knox 62 from the Indiana 1969, 1970, and 1971 Advanced Nursery series, 1971 Regional Drill Plot Series, and 1971 Uniform Eastern Nursery series were averaged (Table 1, left). Knox 62 is considered to have very good soft wheat milling and baking qualities and Arthur is probably a notch below Knox 62.

The data indicate that Abe is satisfactorily soft in kernel texture: it is high in Pearling and Particle-Size Indices, and gives a good yield of break flour. While flour ash seems a bit high in view of its flour yield, adjustments in mill roll settings will probably improve the yield-ash picture. There seems to be a tendency toward slightly higher wheat and flour protein contents, especially when compared with those of Knox 62.

The mean adjusted viscosity for Abe flour is higher than either Arthur or Knox 62; however, its AWRC value is satisfactorily low and its cookie diameter, while tending to be somewhat low, does not appear to be a major deficiency.

In summary, Abe appears to resemble Knox 62 in kernel softness and flour granularity. It is similar to Arthur in protein content, a little higher than Knox 62. Its overall flour properties (baking potential) appear to favor Arthur over Knox 62.

2-Way Comparison

Data for Abe and Arthur from the Indiana 1969 and 1970 Regional Drill Plot entries were averaged and compared. Knox 62 was not present in these series. Mean test values are presented in Table 1, right.

In wheat and milling properties, Abe compares very favorably with Arthur except in flour yield, which may be corrected by more optimal mill settings for Abe. The satisfactory Pearling and Particle-Size Indices and break flour yield support the data obtained in the 3-way comparison.

Adjusted viscosity for Abe is higher than that of Arthur while the AWRC value is lower; in both instances the data corroborate the previous comparison. Cookie diameter values indicate that the cookie potential for Abe is about on the same level as Arthur.

In summary, it appears that Abe is a little softer in kernel texture than Arthur and is about on a par with the check variety in baking potential.

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Table 1. Mean test data for Abe, Arthur, and Knox 62 (3-way comparison) and for Abe and Arthur (2-way comparison) for the quality evaluation of Abe.

	3-way comparison[a]			2-way comparison[b]	
	Abe	Arthur	Knox 62	Abe	Arthur
Test weight (lb/bu)	61.6	61.5	62.6	62.0	61.7
Wheat Protein (%)	13.1	13.0	12.6	11.9	11.7
Pearling Index (%)	51.3	49.0	47.1	42.4	41.0
Particle-Size Index (%)	22.4	21.1	22.1	22.6	20.9
Break Flour Yield (%)	26.1	24.0	28.7	27.2	23.2
Flour Yield (%)	70.3	71.2	70.4	69.2	72.6
Flour Ash (%)	.43	.41	.38	.42	.41
Flour Protein (%)	11.7	11.9	11.3	10.3	10.2
Adj. Viscosity (°MacM.)	80.6	72.0	66.8	91.5	83.0
AWRC (%)	51.6	52.0	51.4	48.4	49.9
Cookie Diam. (cm)	18.2	18.3	18.4	18.0	17.8
Cookie Top Grain	6.8	7.2	8.0	8.0	8.5

a/ Mean data for Indiana 1969, 1970, 1971 Advanced Nursery, 1971 Regional Drill Plot, and 1971 Uniform Eastern Nursery series.

b/ Mean data for Indiana 1969, 1970 Regional Drill Plot series.

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Figure 1. Spike and glume characteristics of Abe wheat

FORM GR-470-6
(7-3-72)

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)
Purdue University Agricultural Experiment Station

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
Purdue University
Lafayette, Indiana 47907

FOR OFFICIAL USE ONLY
PVPO NUMBER 73049
VARIETY NAME OR TEMPORARY DESIGNATION
Abe

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)* _____
[1] 1 = SOFT 2 = HARD 3 = OTHER *(Specify)* _____
[2] 1 = WHITE 2 = RED 3 = OTHER *(Specify)* _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:
[2][2][8] FIRST FLOWERING
[2][3][5] LAST FLOWERING

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

5. PLANT HEIGHT *(From soil level to top of head)*:
[0][9][1] CM. HIGH
[ ][ ] CM. TALLER THAN .....
[0][3] CM. SHORTER THAN .....
[ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS
[1]

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
[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
[2] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:
[1] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER *(Specify)*: _____
[1] 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][1] MM. LEAF WIDTH *(First leaf below flag leaf)*
[1][8] CM. LEAF LENGTH *(First leaf below flag leaf)*:

FORM GR-470-6 (REVERSE) 'Abe' 73-49

11. HEAD:

[1] Density: 1 = LAX 2 = DENSE

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

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

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

[0 6] 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.)*

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

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

13. COLEOPTILE COLOR:

[3] 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] Cheek: 1 = ROUNDED 2 = ANGULAR

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

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

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

[3] Embryo size: 1 = SMALL *(Lemhi)* 2 = MEDIUM *(Scout)* 3 = LARGE *(Arthur)*

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

[0 6] MM. LENGTH

[0 3] MM. WIDTH

[0 4] 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)

[2] STEM RUST *(Races)* 15B, 29, 38, 56

[2] LEAF RUST *(Races)* 5, 15, 35, 76, 104, UN9

[0] STRIPE RUST *(Races)* _____

[2] LOOSE SMUT

[2] POWDERY MILDEW

[ ] BUNT

[ ] OTHER *(Specify)* _____

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

[0] SAWFLY

[0] APHID *(Bydv.)*

[0] GREEN BUG

[1] CEREAL LEAF BEETLE

[ ] OTHER *(Specify)* _____

HESSIAN FLY RACES:

[2] GP [2] A [2] B [2] C

[2] D [2] E [2] F [2] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

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

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.

73049

Abe

Explanation of Exhibit C

3. Days to flowering varies with time of fall seeding and spring seasonal weather. The 225 days to first flowering is average for October 1 seeding at Lafayette, Indiana.

8. The stem may develop a very light purple color with barley yellow dwarf infection. A slight waxy bloom is present.

9. Auricles are generally green but can develop color if infected with barley yellow dwarf virus. A few auricle hairs are generally present.

10. An estimated 10% of the flag leaves are twisted and 90% are not. This is not a "pig-tail" twist as observed in some varieties.

11. Cm length average 6.02 cm in 1972 production field with face width 12 mm, and edge width 9 mm.

13. Coleoptiles have a light purple stripe.

16. This is our first attempt at phenol classification. We do not have an established laboratory.

18. Resistance to stem rust derived from Arthur. Resistance to leaf rust derived from Transfer and Arthur.

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12D Exhibit D, Data Indicative of Novelty

Abe is similar to Arthur 71 RPPO number 72084 in resistances to disease resistance and hessian fly resistance. Abe is related to Arthur and Arthur 71 in parantage.

Abe is distinct from Arthur and Arthur 71 in blue green foliage versus green of Arthur and light green of Arthur 71.

Abe is distinct in having longer awnlets than Arthur or Arthur 71 (Table 2).

Abe has a distinctly higher yielding capacity than Arthur 71 (Table 1).

Abe has an erect flag leaf at booting versus hortizontal for Arthur and Arthur 71.

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* Numbers in parenthesis refer to number of tests averaged.

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Table 2. Awnlet Characteristics

Awnlet length class (cm)	Frequency of longest awnlet per spike		
	Abe	Arthur	Arthur 71
1-1.9	6	24	26
2-2.9	26	38	41
3-3.9	50	30	30
4-4.9	15	8	3
5-5.9	3	0	0
Total	100	100	100

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Exhibit E Application for Variety Protection of 'Abe' Wheat

Purdue University is the sole owner of 'Abe' Wheat

Signed H H Kramer
H. H. Kramer
Director, Purdue University
(Indiana) Agricultural Experiment Station