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Enter required information and upon completion, return to nvrb@aosca.org
by clicking on this link and attaching the application.**

*** if unable to submit in Word format, please contact the AOSCA office for assistance.**

**ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES
NATIONAL SMALL GRAIN VARIETY REVIEW BOARD
WHEAT APPLICATION – PART B – 2018**

This application – Part B – must be submitted along with Part A
(Note: You may submit ONE Part A application for multiple Part B applications)

Please email the completed applications to: nvrb@aosca.org

All information provided on this application shall be maintained in complete confidence by the Association of Official Seed Certifying Agencies (AOSCA), its staff, and individual members of the AOSCA Variety Review Board. Each member of the Review Board will be required to sign a statement to this effect prior to their receipt of any applications for review. Upon completion of the review process, reviewers will be required to destroy or delete all applications in their possession. One copy of each application will be maintained on file in the AOSCA office.

**APPLICATION FOR REVIEW OF SMALL GRAIN VARIETIES
FOR CERTIFICATION**

WHEAT (*Triticum aestivum* L.)

Variety Name NuWheat 7 Experimental Designation EXP2007HRW
Applicant WheatSeedCo, Inc.

**IT IS THE APPLICANT’S RESPONSIBILITY TO SUBMIT AN AMENDMENT APPLICATION
FOR NAME CHANGE WHEN THE PERMANENT VARIETY NAME HAS BEEN SELECTED.**

REQUIRED INFORMATION
(For reference, see U.S. Federal Seed Act §201.68)

- 1. Origin and Breeding History:** Describe the variety’s origin and the breeding methods and procedures employed in developing it. Include germplasm sources and specific selection traits. State the location and year that breeder seed was first produced. Insert this information in the following box.

WheatSeed Co® variety NuWheat 7 (experimental cultivar EXP2007HRW) is a hard red winter wheat (*Triticum aestivum* L.) developed by WheatSeedCo, Inc. NuWheat7 was developed from the cross “OldWheat82/Heritage//Turkey/Karkof” which was made in the fall of 2000. Single heads were selected from the F2 population of this cross in 2001. Selections were based on height, maturity and leaf rust tolerance. Single seed descent was used to advance these selections through the F3 and F4 generations during 2002 and 2003. F5 headrows of these selections were planted at Manhattan, KS in 2004 where they were further screened for height, straw strength, foliar diseases, and stem rust. Selected F5 headrows were individually bulk harvested and assigned experimental designations. EXP2007HRW was the designation used for NuWheat 7 throughout its advanced testing stages. An F6 increase plot was grown at Manhattan and observation plots were grown at Emporia, KS. NuWheat 7 was yield and quality tested in State University nurseries in Manhattan and Emporia, Kansas during 2006 through 2008. NuWheat7 was further screened on the previously mentioned traits as well as milling and baking quality. First breeder seed was produced in 2009 near Manhattan, KS in 2009.

2. **Variety Objective Description:** On pages 3-5, describe the variety by identifying the appropriate term in the list of descriptors provided. The corresponding descriptors on page 7, Section 5 (the Summary Description) may be entered by copy and paste or directly typing them into the corresponding boxes.
3. **Supporting Information:** Provide data to characterize the variety in the following areas:
 - a) Yield and other agronomic responses obtained from test locations that support the area of adaptation.
 - b) Disease and insect reactions if any such reactions are stated as varietal attributes. Provide testing conditions used to determine reactions (*e.g.*, field, greenhouse, or laboratory; identity of testing methods). State specific races or strains of organisms, if known.
 - c) Provide evidence of quality and/or other relevant attributes if these claims are used as a means of identifying the variety.

See Tables 1 through 5

Provide data from at least two years and two locations in the area of adaptation for yield and agronomic response traits, as appropriate. Include and identify at least one recognized check variety for agronomic data and for milling/baking traits, if milling/baking data are provided. Include and identify susceptible and resistant checks for comparative pest reactions.

Present all data in well-constructed tables appended to the end of this application. Number the tables and indicate where the data were collected. Include captions or footnotes as necessary to clearly explain the nature of the units of measurements used in the header. Provide the number of entries in the tests, the test grand mean, and a measure of statistical significance, such as least significant difference or multiple range comparisons, for each location-year or test.

4. **Summary Description:** Provide a concise single-page description of the variety for AOSCA to publish for use by official seed certifying agencies. All claims must be supported by data.

Use the instructions and template located at the end of this application.

Consult the sample application on the AOSCA website for guidance.

VARIETY OBJECTIVE DESCRIPTION

WHEAT (*Triticum aestivum* L.)

Variety Name: NuWheat 7

Instructions: Select **one (1)** descriptor (except where otherwise instructed) to enter in the corresponding element on the Summary Description page.

1. KIND OF WHEAT:

Common X Durum Emmer Spelt
 Polish Poulard Club

If Common, state kernel characteristics in Item 5.1 on page 7. Example: Hard red common, and place an "X" in the appropriate selection below.

Hard Red X Soft Red
 Hard White Soft White

2. SEASONAL GROWTH HABIT:

Winter X Spring Other

3. COLEOPTILE COLOR:

White X Red Other

4. JUVENILE GROWTH HABIT:

Prostrate Semi-Erect X Erect

5. LEAF COLOR AT BOOT:

Yellow-Green Green X
 Blue-Green Gray-Blue

6. FLAG LEAF AT BOOT: (Multiple descriptors may be selected)

Erect X Re-curved
 Twisted X Not-Twisted
 Wax Absent Wax Present X

7. AURICLE COLOR:

White X Purple Other

8. HEADING DATE / ANTHESIS:

Average number of day(s) to 50% heading 116 after Jan 1This averages 5 Day(s) Earlier _____ Day(s) Later _____OR _____ The Same as OldWheat 82 _____ (known variety)

9. ANTHOR COLOR:

Yellow X Purple _____**STEM CHARACTERISTICS**

10. ANTHOCYANIN:

Absent _____ Present _____

11. PLANT HEIGHT:

Average number in centimeters: 92.5This averages 3 cm TALLER _____ cm SHORTER _____OR _____ The Same as OldWheat 82 _____ (known variety)

12. INTERNODES:

Hollow X Solid _____ Semi-solid _____**SPIKE CHARACTERISTICS (at maturity)**

13. SHAPE:

Tapering X Oblong _____ Clavate _____ Elliptical _____

14. DENSITY:

Lax _____ Mid Dense X Dense _____

15. CURVATURE (Orientation at maturity):

Erect _____ Inclined _____ Nodding X

16. AWNS:

Awnless _____ Apically awnletted X Awnletted _____ Awned _____

17. AWN COLOR:

White _____ Black _____ Brown _____ Tan X**GLUME CHARACTERISTICS (at maturity)**

18. COLOR:

Tan X White/Amber _____ Other _____

19. LENGTH:

Short Medium Long

20. SHOULDER SHAPE:

Wanting Oblique Rounded
Square Elevated Apiculate

21. SHOULDER WIDTH:

Narrow Medium Wide

22. BEAK SHAPE:

Acuminate Obtuse Acute

23. BEAK LENGTH:

Short Medium Long Very long

24. PUBESCENCE:

Present Absent (glabrous) **SEED CHARACTERISTICS**

25. COLOR:

White Amber Red Other

26. SHAPE:

Ovate Oval Elliptical

27. CHEEK:

Rounded Angular

28. BRUSH:

Short Medium Long

29. AVERAGE 1,000-KERNEL WEIGHT (Insert weight and X for comparison)

32 Grams, Which is: Grams Lighter Than Grams Heavier Than
OR The Same as OldWheat 82 (known variety)

30. OTHER:

List any other traits or special markers that may be helpful in identifying the variety, including characteristics determined by molecular or bioassay methods that might be required as a condition of eligibility for final certification.

NOTE: The U.S. Federal Seed and most state seed laws do not allow the marketing of a variety with variants in excess of 5%. AOSCA suggests that applicants discuss this issue with the USDA Agriculture Marketing Service – Seed Regulatory and Testing Division, located in Gastonia, North Carolina.

True variants that may occur include taller plants at a rate of 0.005% and red chaff plants at a rate of 0.002%.

Table 1. Wheat yields in bushels per acre.

Location	Year	No. Entries	NuWheat 7 Bu/ac	OldWheat 1 Bu/ac	OldWheat 2 Bu/ac	OldWheat 3 3 Bu/ac	LSD .05	CV%
Manhattan, KS	2006	20	45.5	43.5	41.0	44.3	2.3	6
	2007	22	47.5	45.1	42.1	46.8	2.1	7
	2008	25	50.0	49.2	46.1	48.8	1.7	5
Emporia, KS	2007	24	50.3	50.1	46.9	49.2	2.9	8
	2008	20	54.6	51.9	48.5	54.6	2.2	8

Table 2. Agronomic traits

Location	Year	No. Entries	Test wt. Lb/bu	Height Cm	Heading Days after Jan 1	Straw lodging 1=none 9 = 100%	
Manhattan, KS	2006	20					
			NuWheat 7	58.7	90.5	116	2
			OldWheat 1	58.3	92.4	125	3
			OldWheat 2	59.1	94.1	128	2
			OldWheat 3	57.5	91.4	120	2
LSD .05			1.1	2.5	5	n.s.	
CV %			7	10	7		
Emporia, KS	2007	24					
			NuWheat 7	59.0	90.0	118	2
			OldWheat 1	59.0	93.3	124	3
			OldWheat 2	58.1	93.1	126	3
			OldWheat 3	57.0	89.8	119	2
LSD .05			1.3	2.0	4	n.s.	
CV %			8	6	6		

Table 3. Disease reaction – Leaf rust

Location	Year	No. Entries	NuWheat 7	OldWheat 1 Resist	OldWheat 2 Resist	OldWheat 3 Suscept.	LSD .05	CV%
Manhattan, KS	2006	20	1=no rust; 9=severe rust					
			2	2	3	5	1	15
			2007	22	2	3	2	4
	2008	25	3	4	3	6	2	14
Emporia, KS	2007	24	2	2	3	4	1	13
	2008	20	2	3	4	5	2	15

Table 4. Disease reaction – Stripe rust

Location	Year	No. Entries	NuWheat 7	OldWheat 1 Resist	OldWheat 2 Resist	OldWheat 4 Suscept.	LSD .05	CV%
Manhattan, KS	2006	20	1=no rust; 9=severe rust					
			2	2	3	6	2	18
			2007	22	2	2	3	5
	2008	25	3	4	3	6	2	12
Emporia, KS	2007	24	2	3	3	4	2	10
	2008	20	2	2	4	5	1	8

Table 5. Disease reaction – Leaf blight complex

Location	Year	No. Entries	NuWheat 7	OldWheat 1 Resist	OldWheat 2 Resist	OldWheat 4 Suscept.	LSD .05	CV%
1=no disease; 9=severe disease								
Manhattan, KS	2006	20	3	4	2	7	2	12
	2007	22	2	3	3	5	3	18
	2008	25	3	4	3	7	2	11
Emporia, KS	2007	24	2	2	3	4	1	10
	2008	20	2	3	4	5	2	15

Table 6. Average hard wheat quality data, 2007-2008.

Variety	Protein 12% Moisture	Thousand kernel weight	Flour ash	Falling Number	Mix time	Bake absorption	Loaf volume
	%	g	%		Min.	%	cc
NuWheat 7	12.6	51.1	0.58	299	15	63.0	2400
OldWheat 1	12.3	50.0	1.54	307	17	60.3	2350
OldWheat 2	11.9	48.9	0.98	278	20	59.8	2276
OldWheat 3	12.1	50.3	0.88	280	19	61.1	2312

Quality data collected at the USDA-ARS Hard Wheat Quality Lab in Manhattan, KS.

Wheat

NuWheat 7

- NuWheat7 (EXP2007HRW) is a hard red winter wheat developed by WheatSeCo.
- NuWheat7 was selected from the cross OldWheat82/Heritage//Turkey/Karkof' made in the fall of 1997. Single heads were selected from the F2 population. Selection criteria during single seed descent procedures included short height, early maturity, and tolerance to leaf and stem rust, stripe rust, and other leaf pathogens. Later generations were also selected for milling and baking qualities.
- NuWheat7 has shown good adaptation for general purpose usage in the U.S. Central Plains winter wheat regions based on tests conducted in Kansas.
- NuWheat 7 has shown good resistance to leaf rust in the central high plains region. It also has very good resistance to stripe rust. It is moderately resistant to the complex of organisms that incite leaf blights including *Septoria tritici* blotch, *Stagnospora nodorum* leaf blotch and tan spot. Its milling and baking characteristics are acceptable.

5. Identifying characteristics

1. Kind:	Common, Hard Red Winter Wheat		
	If common, provide appropriate kernel characteristic: (Hard Red, Soft Red, Hard White, Soft White)		
2. Seasonal Growth Habit:	Winter	16. Awn Type:	Apically awnletted
3. Coleoptile Color:	White	17. Awn Color:	Tan
4. Juvenile Growth Habit:	Semi-erect	18. Glume Color:	Tan
5. Leaf Color at Boot:	Green	19. Glume Length:	Short
6. Flag Leaf at Boot:	Erect, Twisted, Waxy Bloom	20. Shoulder Shape:	Rounded
7. Auricle Color:	White	21. Shoulder Width:	Medium
8. Days to 50% Heading:	116 after Jan 1 (early)	22. Beak Shape:	Obtuse
9. Anther Color:	Yellow	23. Beak Length (S.M.L.VL):	Short
10. Anthocyanin:	White	24. Glume Pubescence:	Present
11. Plant Height (cm):	92.5	25. Seed Color:	Red
12. Internodes:	Hollow	26. Seed Shape:	Ovate
13. Spike Shape:	Tapering	27. Cheeks:	Rounded
14. Spike Density:	Mid-dense	28. Brush Size (S,M,L.):	Medium
15. Spike Curvature:	Nodding	29. Avg 1,000 Kernel Wt (grams):	32

30. Physiological/biochemical Traits: None

Variants and frequency: True variants that may occur include taller plants at a rate of 0.005% and red chaff plants at the rate of 0.002%.

- The breeder, foundation, and registered seed classes will be maintained and controlled by the WheatSeCo Seedstock Division at Sproutsville, KS. Foundation seed will be initially produced from breeder seed, and thereafter foundation seed will be produced from foundation seed, maintaining the specific identity and purity of the variety as released by the breeding department. Certified seed will be grown from foundation or breeder seed by designated WheatSeCo Associates. Production of certified seed will be licensed by WheatSeCo. There are no trait testing requirements to be met for certified seed classes.
- Certified seed of NuWheat 7 will first be offered for sale in the fall of 2015 if the variety is recommended for certification.
- Application for Plant Variety Protection is anticipated and the Title V certification option (sale by variety name only as a class of certified seed) will be elected. Morphological data can be provided to the PVP database, if requested.
- Certified acreage is not to be published by AOSCA or by individual certifying agencies.