7966204 Hard Red Spring Wheat

Tested as XA9660

1. Breeding History

XA9660 was selected from the cross '07651-11/WESTBRED936'.

*Generation	*Year	*Description
Cross	2008	The cross was made near Bozeman, MT.
F_1	2008	Plants were grown near Yuma, AZ and advanced using bulk.
F_2	2009	Plants were grown near Bozeman, MT and advanced using bulk.
F_3	2009	Plants were grown near Yuma, AZ and advanced using bulk.
F_4	2010	Plants were grown near Bozeman, MT and advanced using bulk.
F_5	2010	Plants were grown near Yuma, AZ and advanced using single plant selection.
F_6	2011	Plants were grown near Bozeman, MT and advanced using bulk.
F_7	2012	Plants were grown near Bozeman, MT and the variety 01071783 was identified and selected based on yield, agronomics and disease resistance.

Yield Testing

Generation	Year	Advancement/Selection Criteria
F_8	2013	Yield, Agronomics, Test Weight, Protein, Disease, Quality
F_9	2014	Yield, Agronomics, Test Weight, Protein, Disease, Quality
F_{10}	2015	Yield, Agronomics, Test Weight, Protein, Disease, Quality
F_{11}	2016	Yield, Agronomics, Test Weight, Protein, Disease, Quality

2. Phenotypic description

1. Kind:	Hard Red		
If common, provide appropriate kernel characteristic: (Hard Red, Soft Red, Hard White, Soft White)			
2. Seasonal Growth Habit:	Spring	16. Awn Type:	Awned
3. Coleoptile Color:	White	17. Awn Color:	White
4. Juvenile Growth Habit:	Semi-erect	18. Glume Color:	White
5. Leaf Color at Boot:	Green	19. Glume Length:	Long
6. Flag Leaf at Boot:	Erect,Twisted,Wax Absent	20. Shoulder Shape:	Elevated
7. Auricle Color:	Purple	21. Shoulder Width:	Narrow
8. Days to 50% Heading:	134	22. Beak Shape:	Acuminate
9. Anther Color:	Yellow	23. Beak Length (S.M.L.VL):	No Data
10. Anthoncyanin:	Absent	24. Glume Pubescence:	Not Present
11. Plant Height (cm):	84	25. Seed Color	Red
12. Internodes:	Hollow	26. Seed Shape:	Ovate
13. Spike Shape:	Tapering	27. Cheeks:	Angular
14. Spike Density:	Lax	28. Brush Size (S,M,L.):	Short
15. Spike Curvature:	Erect	29. Avg 1,000 Kernel Wt (g):	48.5

30. Physiological/biochemical Traits:

Variants and frequency:

A variant that is similar to XA9660 but has white seed occurs at a frequency of up to .50% (50 out 10,000 seeds). A variant that is similar to XA9660 but is 10cm to 15cm taller occurs at a frequency of up to .2% (20/10,000). A bronze head variant may occur at a frequency of .1% (10/10,000). An awnless variant may occur at a frequency of .1% (10/10,000). Otherwise, this variety has been uniform and stable in appearance and performance across several generations and environments.

3. TABLE 2 DESCRIPTION PARAGRAPH

In Table 2, yield, quality, and agronomic characteristics collected in 2014-2016 in the Northwest region of the United States, including Washington, Idaho, and Montana, or wheat cultivar XA9660 are compared to check cultivars. Table 2 shows protein and SDS on a 12% moisture basis. Plant height is measured in inches. Lodging and disease ratings were measured on a 1-9 scale with 1 being the most resistant and 9 being the most susceptible.

TABLE 2: COMPARATIVE DATA FOR CULTIVAR XA9660 and SELECTED CULTIVARS

Head	XA9660	XA9660	XA9660	XA9660	XA9660
Other	WB9668	WB9411	WB9200	BULLSEYE	DAYN
NA Standardized Regions	Wheat_NA:GREATER NORTHWEST	Wheat_NA:GREATER NORTHWEST	Wheat_NA:GREATER NORTHWEST	Wheat_NA:GREATER NORTHWEST	Wheat_NA:GREATER NORTHWEST
YLD_BE Years	3	3	3	3	2
YLD_BE # Obs	27	27	27	22	17
YLD_BE Wins Total	22	20	19	15	6
YLD_BE Wins %	81	74	70	68	35
H YLD_BE	86.1	86.1	86.1	95.3	92.5
O YLD_BE	80	83.4	78.8	88.3	95
YLD_BE Dev	6.0913841	2.6433202	7.2397031	7.0291071	-2.5323017
YLD_BE p-Val	0.0003674	0.0840875	0.0030319	0.0297131	0.0825939
YLD_BE Signif	**	+	**	*	+
TWT_BE Years	3	3	3	3	2
TWT_BE # Obs	23	23	22	19	15
TWT_BE Wins Total	12	11	6	10	9
TWT_BE Wins %	52	48	27	53	60
H TWT_BE	60.7	60.7	60.8	61	61.7
O TWT_BE	60.5	60.4	61.1	60.5	61.1
TWT_BE Dev	0.1508845	0.2777272	-0.3063651	0.5109829	0.5936076
TWT_BE p-Val	0.6313453	0.3975513	0.373898	0.2671668	0.0853004
TWT_BE Signif					+
PRO_BE Years	3	3	3	3	2
PRO_BE # Obs	6	5	5	5	3
PRO_BE Wins Total	0	0	0	0	0
PRO_BE Wins %	0	0	0	0	0
H PRO_BE	14.4	14.3	14.3	14.4	14.1
O PRO_BE	16	15.6	15	14.9	14.7
PRO_BE Dev	-1.5889265	-1.23836	-0.68352	-0.5181262	-0.5542
PRO_BE p-Val	0.0005223	0.0129905	0.0370427	0.0233422	0.0755489
PRO_BE Signif	**	*	*	*	+
LG3 Years	2	1	1	2	1
LG3 # Obs	3	1	1	3	1
LG3 Wins Total	2	1	0	3	0
LG3 Wins %	100	100	--	100	--
H LG3	1	1	1	1	1
O LG3	1.3	1.3	1	4.2	1
LG3 Dev	-0.2579539	-0.3333	0	-3.1513251	0
LG3 p-Val	0.3129762			0.2456795	
LG3 Signif					
PHT Years	2	2	2	2	1
PHT # Obs	4	3	3	4	1
PHT Wins Total	1	1	2	3	1
PHT Wins %	25	33	67	75	100
H PHT	33	31	31	33	33
O PHT	31	32	31	33	37
PHT Dev	1.3674605	-0.4555525	0.0000066	-0.6947434	-3.8333268
PHT p-Val	0.295509	0.7943663	0.9999948	0.2973674	
PHT Signif					
HED Years	3	2	2	2	1
HED # Obs	6	4	4	5	1
HED Wins Total	3	2	0	4	1
HED Wins %	50	50	0	80	100
H HED	134	166	166	128	160
O HED	133	166	164	130	161
HED Dev	0.1647647	-0.8180575	1.5625	-1.2750818	-1.8333
HED p-Val	0.7500615	0.3792333	0.0404035	0.0656547	
HED Signif			*	+	

**,*,+Significant at P<0.01, 0.05, or 0.10, respectively

4.

XA9660
HARD RED SPRING

XA9660 is a common Hard Red Spring wheat adapted to the Pacific Northwest region of the United States. XA9660 was developed by WestBred, from the cross '07651-11/WESTBRED936'.

XA9660 is a semi-tall hard red spring wheat. The head is tapering, lax, and erect at maturity. The glume shoulders are elevated with an acuminate beak. The seed is hard, red, and ovate with angular cheeks. The brush is short with no collar.

A variant similar to XA9660 but is 10-15 cm taller occurs at a frequency of .2% (20 plants per 10,000). A white seed variant may occur at a frequency of up to .50% (50 seeds per 10,000). An awnless variant may occur at a frequency of .1% (10 plants per 10,000). A bronze chaff variant may occur at a frequency of .1% (10/10,000). Otherwise, this variety has been uniform and stable in appearance and performance across several generations and environments.

5. Recognized classes of this variety will be breeder, foundation, registered, and certified. Monsanto will maintain the variety by the head-row purification and bulk seed methods to produce breeder seed as needed and foundation seed will be produced from breeder or foundation class of seed.