

VANDAL

Hard red spring wheat

UNIVERSITY OF IDAHO

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Vandal (PI 546056) is a new hard red spring wheat variety released for production in Idaho and other western states. Vandal is a semidwarf wheat developed for high-yield environments in the Pacific Northwest. Vandal is similar in height and tillering to Westbred 906R and Westbred 926. In southern Idaho irrigated trials, Vandal generally had higher yields than Borah, Westbred 906R, Westbred 926, or Pondera. Vandal was developed cooperatively by the U.S. Department of Agriculture Agricultural Research Service and the Idaho Agricultural Experiment Station.

History

Vandal is a pure line selection from the 1978 cross A78540S of CM16716-M-3M-2Y-3M-0Y/A72483S-3-2. CM16716-M-3M-2Y-3M-0Y is a CIMMYT Mexico breeding line also designated as Cowbird Sib, and A72483S-3-2 is an Aberdeen breeding line with the pedigree McCall/Baijo 66/4/TZPP/Sonora 64/3/Lee//No. 58/Thatcher.

A78540S was advanced by the bulk breeding method in the F₂ and F₃ generations. In 1981, head selections were made from the F₃ bulk and grown as F₄ head rows in 1982. The head selection from which Vandal was derived was designated A78540S-20 and tested in southeastern Idaho yield trials from 1983 to 1985.

In 1986, A78540S-20 was entered into the Tri-State Spring Wheat Nursery as advanced breeding line IDO341. IDO341 was tested in the Western Regional Spring Wheat Nursery from 1987 to 1989. Vandal is a composite of approximately 250 head selections made from IDO341 in 1988 and selected in 1989 and 1990 for uniformity.

Variety description

Vandal is a long-season spring wheat, heading 4 and 6 days later than Copper and Westbred 906R, respectively. Vandal is similar in height and tillering to Westbred 906R and Westbred 926.

Vandal leaf color is intermediate green, similar to that of Borah. Anthocyanin pigmentation is absent from stems, leaf auricles, and anthers.

Flag leaves are broad and semierect, similar in size and carriage to those of Westbred 926. The inflorescence of Vandal is awned and mid-dense, with short, wide, glabrous glumes having oblique shoulders and acuminate beaks. Vandal chaff color is white to yellow-white at maturity.

Vandal has hard red spring seed conformation; seed shape is elliptical with angular cheeks and a short, uncollared brush. The seed crease is wide and shallow, similar to that of the variety Chris. Vandal has adult plant resistance to stripe rust (*Puccinia striiformis* West.) races prevalent in the Pacific Northwest. Vandal is susceptible to the Russian wheat aphid (*Diuraphis noxia* (Mordvilko)) and the Hessian fly (*Mayetiola destructor* (Say)).

Areas of adaptation and agronomic characteristics

Vandal is adapted for production in irrigated, high-yield environments in Idaho and other Pacific Northwest states. In irrigated trials at Aberdeen from 1983 to 1990 (table 1), Vandal averaged 98.1 bushels per acre, which was 112, 105, and 94 percent the yields of Borah, Pondera, and Copper, respectively. In these trials, Vandal had higher test weight than Borah (table 1) but lower test weight than Pondera or Copper. Vandal lodged less than Copper in 9 of 11 irrigated trials at Aberdeen between 1985 and 1990 (table 2).

Vandal has good baking quality with an average flour protein of 13.5 percent in southeastern Idaho trials (table 3). In the same trials, Copper and Westbred 906R had average flour protein contents of 12.9 and 12.7 percent, respectively. In baking-quality tests conducted from 1986 to 1989 on grain from southeastern Idaho trials, dough mixing time and loaf volume were 2.9 minutes and 976 milliliters for Vandal, 2.5 minutes and 916 milliliters for Copper, and 2.7 minutes and 954 milliliters for Westbred 906R (table 3).

Planting date studies from several locations indicate Vandal loses more test weight than some other spring wheat varieties when planted late. To maintain high test weight, Vandal should not be planted late.

Additional agronomic data appear in tables 4 and 5.

Availability of Vandal seed

Breeder and foundation seed of Vandal will be maintained by the Idaho Agricultural Experiment Station, Foundation Seed Program. Requests for seed should be directed to Coordinator, Foundation Seed Program, College of Agriculture, University of Idaho, Moscow, Idaho 83843. The U.S. Department of Agriculture has no seed for commercial distribution.

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Table 1. Yield and test weight of Vandal and selected spring wheats, Aberdeen, Kimberly, and Tetonia.

Variety	Years	Aberdeen, irrigated		Kimberly, irrigated		Tetonia, dryland	
		Yield	Test weight	Yield	Test weight	Yield	Test weight
		(bu/acre)	(lb/bu)	(bu/acre)	(lb/bu)	(bu/acre)	(lb/bu)
Vandal	1983-90	98	59.0	86	59.1	40	58.1
Borah	1983-90	88	58.5	85	60.1	41	59.5
Copper	1985-90	104	60.0	90	60.7	37	59.4
Pondera	1983-90	94	60.9	83	60.9	38	60.3
WPB 906R	1985-90	89	59.3	76	61.6	36	59.6
WPB 926	1987-90	86	59.6	72	60.5	44	59.7

Note: Yield and test weight adjusted for missing years using the least squares method.

Table 2. Agronomic data for Vandal and selected spring wheat varieties, Aberdeen.

Variety	Years	Heading date	Height	Lodging score ¹	Straw strength ¹	Maturity date
			(inches)			
Vandal	1983-90	6/25	33	1.1	1.9	8/8
Borah	1983-90	6/20	33	2.0	3.2	8/4
Copper	1985-90	6/21	34	2.8	3.1	8/5
Pondera	1983-90	6/21	35	1.9	3.0	8/4
WPB 906R	1985-90	6/19	33	1.2	1.6	8/4
WPB 926	1987-90	6/19	32	1.1	1.4	8/4

Note: Data adjusted for missing years by least squares method.

¹Lower scores preferred for lodging score and straw strength.

Table 5. Agronomic data for Vandal and selected spring wheat varieties, southern Idaho county Extension trials, 1989-91.

Variety	Protein	Test weight	Plant height	Lodging	Kernel hardness
	(%)	(lb/bu)	(inches)	(%)	(1-100)
No. locations	11	16	12	8	4
Vandal	14.1	58.5	30.4	3	86
Borah	12.8	59.3	31.3	19	75
Copper	13.0	60.0	32.7	17	81
Pondera	13.9	60.8	32.9	9	87
WPB 906R	13.4	60.0	30.5	0	77
WPB 926	13.8	59.6	30.5	2	78

Table 3. Milling and baking quality of Vandal and selected spring wheat varieties. Grain from Aberdeen, Kimberly, and Tetonia, 1986-89.

Variety	Flour protein	Milling yield	Mixograph			Mixing time	Dough type	Loaf volume	Interior texture	Exterior texture
			Peak	Height	Tolerance					
	(%)	(%)	(min)	(cm)	(degrees)	(min)	(0-9)	(ml)	(0-5)	(0-5)
Vandal	13.5	60.9	3.4	7.4	63.0	2.9	6.9	976	3.0	2.7
Borah	12.8	63.4	2.3	5.9	60.5	1.8	6.2	986	2.9	2.2
Copper	12.9	64.0	2.9	5.7	65.7	2.5	7.0	916	2.4	2.6
Pondera	12.8	60.8	2.5	7.0	62.5	2.2	6.9	1,007	2.6	2.4
WPB 906R	12.7	61.2	3.2	6.5	67.6	2.6	7.0	969	2.6	2.5
WPB926	12.8	61.2	3.2	6.2	65.9	2.7	6.9	954	2.8	2.5

Note: Higher numbers are preferred for all characteristics.

Table 4. Yield of Vandal and selected spring wheat varieties, irrigated, county Extension trials.

Variety	Southwestern Idaho			Southcentral and southeastern Idaho			Overall average
	1989	1990	1991	1989	1990	1991	
	(bu/acre)						
Vandal	91	91	66	81	69	82	80.0
Borah	106	91	79	88	79	79	87.0
Copper	97	86	71	93	77	86	85.0
Pondera	96	88	—	77	71	79	80.3
WPB 906R	98	—	—	78	74	—	81.3
WPB 926	101	91	70	82	72	84	83.3

Note: All data are for three locations except southcentral and southeastern Idaho, 1989, for 1 location and southcentral and southeastern Idaho, 1991, for 5 locations. The overall average is for 18 locations.

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