'Briggs'

A New Hard Red Spring Wheat

Karl Glover, SDSU plant breeder
Robert Hall, SDSU Extension agronomist

Briggs hard red spring wheat was developed by the South Dakota Agricultural Experiment Station and released in 2002. Briggs was tested under the experimental designation SD3367.

Briggs is a tall semi-dwarf hard red spring wheat that originated from the cross BW114/Bergen//SD3097. The name honors Dr. Hilton M. Briggs, who served as president of South Dakota State University from 1958 to 1975.

Briggs is protected under Title V of the United States Plant Variety Protection Act with the certification option.

The most significant features of Briggs are its yield potential, protein concentration, and higher-than-average test weight. Although Briggs is not as resistant as 'Ingot' or 'Alsen,' Briggs does exhibit an intermediate level of tolerance to scab. It is moderately resistant to the leaf and stem rust races prevalent in South Dakota, and has medium to high kernel and milling quality characteristics.

The two-parent cross (BW114/Bergen) was made in the greenhouse at Brookings in the fall of 1991. F_1 plants from this cross were crossed to the third parent (SD3097) in the spring of 1992. F_1 plants of the three-parent population were then grown at a nursery through the winter months near Yuma, Ariz. F_2 yield plots were sown in the spring of 1993 at Aurora and South Shore, S.D. Additional seeds from this population were space-planted at Aurora. Upon harvest of the plots, seed yield was measured and found to be acceptable for advancement of the population. Twenty individual heads from the spaced plants were then picked and threshed individually. All heads were grown as independent $F_{2:3}$ rows in the winter nursery during the winter of 1993–1994.

Table 1. Comparison of Briggs with other popular varieties.

	LOCATION											
	Brookings		South Shore		Highmore		Spink Co.		Selby		Brown Co.	
Variety	'03	3-yr	'03	3-yr	'03	3-yr	'03	3-yr	'03	3-yr	'03	3-yr
	bu/a											
Forge	65	59	48	49	30	.	60	47	60	45	50	51
Ingot	55	50	49	50	28	.	54	43	58	43	45	46
Briggs	53	51	52	51	28	.	60	46	54	43	56	50
Oxen	47	44	50	48	30	.	65	50	46	40	50	48
Reeder	58	53	53	52	28	.	60	49	61	47	42	47
Russ	64	55	52	50	35	.	63	48	60	45	47	48
Walworth	65	53	50	49	29	.	58	43	59	44	49	44

	LOCATION						STATEWIDE						
							2003 Bu.			Yield		TYG*	
	Wall		Bison		Ralph		Prot.	Wt.	Ht.	--bu/a--		------%-----	
Variety	'03	3-yr	'03	3-yr	'03	3-yr	pct	lb	in	'03	3-yr	'03	3-yr
	bu/a												
Forge	38	33	49	.	34	.	13.4	61	32	48	45	63	100
Ingot	36	33	49	.	26	.	14.6	62	35	44	42	25	67
Briggs	31	30	50	.	33	.	14.5	61	33	46	43	38	67
Oxen	37	34	45	.	26	.	14.7	59	29	44	42	38	83
Reeder	37	34	49	.	31	.	14.7	60	31	46	44	50	100
Russ	35	32	45	.	32	.	14.1	60	33	48	44	50	100
Walworth	37	33	43	.	27	.	14.6	60	31	46	42	38	67
						State Avg.:	14.5	60	32	45	42		

*TYG: percent of time that entry is in the top-yield group at eight ('03) or six (3-yr) sites.

Table 2. Comparison of Briggs disease reactions and other traits with other popular varieties for the year 2003.

		TRAITS AND DISEASE REACTION#						
				—Rust—				
Variety	Origin	Rel. Hdg. day	Ldg. Resis.	Stripe	Leaf	Stem	Fusarium~ Head Blight	PVP Status*
Forge	SD-97	-1	G	MS	MS	MR	MS	Yes
Ingot	SD-98	-1	F	MR	MS	R	M*	Yes
Briggs	SD-02	0	F	MR	R	R	M	Yes
Oxen	SD-96	+2	G	MR	MR	R	MS	Yes
Reeder	SD-95	+2	G	R	MR	R	MS	Yes
Russ	ND-99	+3	G	MR	MS	R	MS	Yes
Walworth	SD-01	+2	F	S	MS	R	M	Yes

E= excellent. VG= very good, G= good, F= fair, P= poor, R= resistant, MR= moderately resistant. M= intermediate, MS= moderately susceptible, S= susceptible.
~ Consistent tolerance to Fusaruim head blight (scab) in grain yield and quality.
* Plant variety protection (PVP), title V, certification option—to be sold by variety name only as a class of certified seed.

$F_{2:4}$ yield plots from rows selected in Arizona were then sown at Aurora and South Shore in the spring of 1994. Prior to harvesting plots within this test, 20 individual heads with acceptable agronomic and disease resistance characters were picked from the plots. Upon harvest and determination of yield and test weight potential, heads selected from the plots were again threshed singly and grown as $F_{4:5}$ rows in Arizona during the winter of 1994–1995.

$F_{4:6}$ yield plots were then planted at Aurora and South Shore in 1995 from rows selected for advancement from the winter nursery. Agronomic and disease resistance characteristics associated with most field plots were determined. After the harvest of plots that were acceptable, yield, test weight, and protein concentrations were collected.

Two sister-lines from within this population were eventually found to be acceptable for advancement to replicated trials the following season. In 1996, SD3367 and SD3368 were entered in preliminary yield trials (PYT). After one year of PYT observation, SD3368 was discarded and SD3367 was entered into the advanced yield trials (AYT) where it was tested from 1997 through 2001.

SD3367 was simultaneously included in South Dakota State University Crop Performance Testing yield trials from 1999 through 2001, in Uniform Regional Yield trials during 2000 and 2001, and also in the 2000 Wheat Quality Council trial.

When compared on a statewide basis to 'Ingot,' 'Oxen,' and 'Walworth,' Briggs produced 1 bushel per acre higher grain yield. Its yield was 1 bushel per acre less than 'Reeder' and 'Russ' and 2 bushels per acre less than 'Forge.' When compared to the same varieties, Briggs' test weight was 1 pound per bushel less than that of Ingot, equal to Forge, and 1 to 2 pounds per bushel heavier than the remaining varieties. The protein concentration of Briggs is generally considered to be average, although its kernel and milling quality characteristics are above average. Briggs' heading date is early and similar to that of 'Butte 86.' It is taller than all of the comparison varieties except Ingot, and, like Ingot and Walworth, its straw strength is rated as fair.

This publication is found on the web at: http://agbiopubs.sdstate.edu/articles/B740.pdf
Published in accordance with an act passed in 1881 by the 14th Legislative Assembly, Dakota Territory, establishing the Dakota Agricultural College and with the act of re-organization passed in 1887 by the 17th Legislative Assembly, which established the Agricultural Experiment Station at South Dakota State University. South Dakota State University is an Affirmative Action/Equal Opportunity Employer and offers all benefits, services, education, and employment without regard for race, color, creed, religion, national origin, ancestry, citizenship, age, gender, sexual orientation, disability, or Vietnam Era veteran status. B740: 1,600 printed at_ each. January 2004.

South Dakota State University
Agricultural Experiment Station
U.S. Department of Agriculture

B740

'Briggs'

A New Hard Red Spring Wheat