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Walworth Hard Red Spring Wheat

R. G. Hall

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Walworth

hard red spring
wheat



SOUTH DAKOTA STATE UNIVERSITY
Agricultural Experiment Station
U.S. Department of Agriculture



Walworth

*hard red spring
wheat*

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R. Hall, Extension agronomist, crops

'Walworth' was released as foundation seed in 2001 by the South Dakota Agricultural Experiment Station. Protection under Title V of the U.S. Plant Variety Protection Act was granted in October 2002, and certified seed is available in 2003.

Walworth is a hard red spring wheat named to honor the support given to wheat breeding by the large number of spring wheat growers in Walworth County, South Dakota. It may be sold by variety name only as a class of certified seed.

Origin and breeding history

Walworth was selected as an F₄ derived line from the cross 'SD3116/Oxen' made at Brookings, S.D., in 1990-91. The pedigree of SD3116 is 'Shield/ Butte' 86.'

F₁ plants were grown at Yuma, Ariz., during the winter of 1991/ 92. Individual F₂ plant selections were made at Brookings in 1993 and were grown at Yuma the following winter (1993/94) as plant rows. The plant rows at Yuma were harvested and used to plant F_{2:4} yield trials and a space planted nursery at Brookings in 1994.

Based on data collected from the yield trials, individual plants were chosen within the selected populations. Populations were selected based on grain yield, grain volume weight, and bread-making characteristics. Individual plants were also visually selected for resistance to leaf and stem rust.

Plant rows were grown in Yuma during the winter of 1994/95, and F_{4:6} yield trials were conducted at Brookings in 1995. Based on yield performance and disease resistance, the line was advanced to replicated yield testing in 1996 with an experimental designation of SD3348.

Walworth was tested in the SDSU Spring Wheat Breeding Program from 1997 through 2000, in Crop Performance Testing (CPT) trials from 1998 to 2000, and in the Uniform Regional Spring Wheat Nursery (URN) from 1998 through 2000. It was tested by the Wheat Quality Council (WQC) in 2000.

Seed was increased from 1996 to 1999 by the SDSU Spring Wheat Breeding program. Breeders' seed was increased in 1999. Foundation seed was released in 2000.

Agronomic characteristics

Walworth was uniform and stable for all morphological characters except height during four generations of increase and evaluation.

A tall variant (5-10 inches) was identified at a frequency of 0.056% in 1997 breeder seed and in 1999 foundation seed fields. Up to 0.2% taller type variant plants may be encountered in subsequent generations.

Walworth is most similar to the hard red spring wheats 'Oxen' and 'Russ.' Walworth is not usually as tall as 'Forge' in South Dakota. Replicated yield tests of Walworth show that its yield stability was equal to Oxen and Russ over all test locations in 2002 (2002 top yield percentage in Table 2). Over the 3-year period of 2000/2002 it was in the top yield group at 83% of locations (Table 2). A variety is considered to have excellent yield stability when its top yield percentage is 50% or higher.

On average in 2002, Walworth was 1 inch taller than Oxen and 1 inch shorter than Russ (Table 2). Its test weight was similar to that of Oxen and Russ. Walworth's protein content was higher than Russ and Forge but similar to that of Oxen. The relative heading date of Walworth is generally 1 day later than that of either Oxen or Russ.

Table 1. Yield performance of Walworth compared to four other popular varieties, 2000-2002.

Variety	Brookings		South Shore		Wall <i>bulacre</i>		Spink Co.		Selby		Brown Co.	
	'02	3-yr	'02	3-yr	'02	3-yr	'02	3-yr	'02	3-yr	'02	3-yr
Forge	47	53	32	48	17	35	34	43	38	42	33	49
Oxen	45	45	28	44	20	36	35	45	39	42	34	46
Reeder	45	47	31	49	19	36	33	48	35	44	37	49
Russ	44	51	32	50	16	35	32	44	37	42	32	47
Walworth	46	47	28	48	19	35	31	41	36	42	33	43

Table 2. South Dakota performance averages for Walworth compared to four other popular varieties.

Variety	Relative Heading day	Protein pct	2002 Bushel Weight		Yield-bu/acre		Top Yield Percentage	
			lb	Ht. inch	'02	3-yr	'02	3-yr
Forge	-1	15.5	57	27	34	43	33	100
Oxen	2	16.4	56	26	33	41	33	100
Reeder	3	16.0	56	26	33	43	33	100
Russ	2	15.9	56	28	32	42	17	100
Walworth	3	16.3	56	27	32	41	33	83

Table 3. Origin, disease reaction, other traits of Walworth compared to four other popular varieties.

Variety	Origin	Standability	Disease reaction			PVP Status*
			Leaf Rust	Stem Rust	Fusarium Head Blight	
Forge	SD-97	Good	MS	MR	MS#	Yes
Oxen	SD-96	Good	MR	R	MS#	Yes
Reeder	ND-99	V.Good	MS	R	MS#	Yes
Russ	SD-95	Good	MR	R	MS#	Yes
Walworth	SD-01	Good	MR	R	M	Yes

+ R = resistant, MR = moderately resistant, M = intermediate, MS = moderately susceptible, S = susceptible

Consistent tolerance to head blight 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.

