Minnesota Agricultural Experiment Station
University of Minnesota

Varietal Trials Results

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Wheat, Hard Red Spring

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Spring wheat varieties were compared in replicated trial plots at Waseca, Lamberton, Morris, Crookston, Stephen and St. Paul and on-farm sites near Fergus Falls, Oklee and Perley. The Roseau location was not seeded due to excessively wet conditions. These plots are handled so that the factors affecting yield and other characteristics are as nearly the same for all varieties at each location as possible.

These hard red spring wheat trials are not designed for crop (species) comparisons, because the various crops are grown on different fields or with different management. The data should only be used to compare varieties within a table. Tested hard red spring wheat varieties are listed in the order of their flowering date in the tables.

Variety Selection Criteria

While grain yield is an important economic trait, return per acre also is affected by grain quality. Because Fusarium Head Blight (FHB), or scab, can reduce grain quality and yield dramatically, it is an important consideration.

The foliar disease rating, which represents the total complex of leaf diseases other than leaf and stripe rust, includes the Septoria complex, tan spot, powdery mildew and bacterial leaf stripe. Although varieties may differ for their response to each of those diseases, the rating does not differentiate among them. Consequently, the rating should be used as a general indication and only for varietal selection in areas where these diseases have been a problem or if the previous crop was wheat or barley. Control of leaf diseases with fungicides may be warranted, even for varieties with an above-average rating.

Table 1. Origin and agronomic characteristics of hard red spring wheat varieties in Minnesota in single-year (2009) and multiple-year comparisons (2007-2009).

Variety	Origin [1]	Days to Heading [2]	Height inches [2]	Straw strength [3]
Ada	2006 MN	53.5	30.5	4
Albany	2009 Trigen	55.8	30.0	5
Barlow	2009 NDSU	51.7	32.7	6
Bigg Red	2004 WestBred	54.7	33.9	6
Blade	2007 WestBred	53.8	31.0	4
Breaker	2008 WestBred	53.1	31.2	3
Brennan	2009 AgriPro	55.6	30.4	4
Brick	2009 NDSU	48.1	32.9	5
Briggs	2002 SDSU	49.7	32.3	7
Brogan	2009 Westbred	53.1	29.4	3
Cromwell	2007 Thunder Seed	54.3	31.0	5
Faller	2007 NDSU	54.1	31.8	5
Freyr	2004 AgriPro	51.9	33.5	6
Glenn	2005 NDSU	50.6	33.4	4
Granger	2004 SDSU	51.5	34.8	7
Hat Trick	2006 Trigen	53.1	30.5	5
Howard	2006 NDSU	52.1	33.0	7
Jenna	2009 AgriPro	55.2	30.6	4
Kelby	2006 AgriPro	50.5	27.8	4
Knudson	2001 AgriPro	52.5	30.4	5
Kuntz	2007 AgriPro	52.7	29.0	4
Marshall	1982 MN	55.2	29.2	4
Oklee	2003 MN	50.3	30.8	6
RB07	2007 MN	50.4	29.8	5
Sabin	2009 MN	53.4	30.0	6
Samson	2007 WestBred	52.6	28.3	2
Steele-ND	2004 NDSU	53.1	32.5	7
Tom	2008 MN	51.7	32.2	6
Traverse	2006 SDSU	51.1	33.6	6
Vantage	2007 WestBred	56.5	30.0	2
Mean		52.7	31.2	

[1] Abbreviations: MN = Minnesota Agricultural Experiment Station, NDSU = North Dakota State University Research Foundation, SDSU = South Dakota Agricultural Experiment Station, Trigen = Trigen Seed Services LLC.

[2] 2009 data.

[3] 1-9 scale in which 1 is the strongest straw and 9 is the weakest. Based on 2005-2009 data. The rating of newer entries may change by as much as one rating point as more data are collected.

Disease ratings are now on a 1-9 scale where 1 = most resistant and 9 = most susceptible. Rating differences of 2 or more should be considered significant. Bacterial leaf stripe assessments for the most consistently resistant and susceptible varieties are footnoted in the Other Leaf Diseases column of Table 3. This rating is based on four locations from 2005 to 2009 where bacterial leaf stripe was observed. Additional data are needed before a complete rating of all varieties can be provided.

Blade, Cromwell, Faller, Howard and Knudson are consistently more resistant to bacterial leaf stripe while Hat Trick, Kelby, and Samson have consistently been more susceptible. At this point there are no effective control options for bacterial leaf stripe other than avoiding the use of infected seed. However, the extent to which seed-borne inoculum contributes to disease problems the next season is unknown.

Based on acres planted, leading varieties in Minnesota are Faller and RB07. New releases for 2009 are Albany (Trigen), Barlow (NDSU), Brennan and Jenna (AgriPro), Brogan (Westbred), Brick (SDSU) and Sabin (MN).

Leaf rust caused substantial damage on susceptible varieties in 2007. Varieties with ratings of 5 or higher should be closely monitored during the season for rust development. Varieties with ratings of 4 or better should not experience economic levels of damage in most years.

Stripe rust was a serious problem on susceptible varieties in some locations in 2004. This disease is not as widespread and does not occur as regularly as leaf rust, but can be very damaging when temperatures remain unseasonably cool into early July. Most varieties are resistant or moderately resistant.

Stem rust ratings are included in the disease tables because there are differences in variety reaction. The levels of this disease have been very low in production fields in recent years, even on susceptible varieties.

Due to the increased use of fungicides on wheat in Minnesota, we initiated an additional variety trial in 2004 in which fungicides are applied at the time of herbicide application (Feekes 5), flag leaf emergence (Feekes 9), and at the onset of flowering (Feekes 10.51). The practice of three fungicide applications during the growing season is not recommended.

Table 2. Grain quality of hard red spring wheat varieties in Minnesota in single-year (2009) and multiple-year comparisons (2007-2009).

	Test Weight (Lb/Bu)		Protein (%)[1]		Baking	Pre-Harvest
Variety	2009	2-Year	2009	2-Year	Quality[2]	Sprouting[3]
Ada	62.3	62.1	14.5	14.3	Medium	2
Albany	61.4	60.5	13.7	13.7	Low-Medium	4
BarLow	62.3	62.1	15.4	15.1	—	1
Bigg Red	62.6	62.9	14.1	14.0	Medium-Low	4
Blade	62.6	62.5	15.3	14.9	Medium-High	5
Breaker	62.8	62.7	15.2	14.8	—	—
Brennan	60.6	60.3	15.3	14.6	—	—
Brick	62.6	62.4	15.1	14.9	Medium	2
Briggs	61.9	61.5	15.1	14.8	Medium	2
Brogan	61.6	—	14.5	—	—	—
Cromwell	62.2	62.1	15.2	14.9	Medium-High	3
Faller	61.4	61.1	14.4	14.4	Medium	2
Freyr	61.3	60.6	15.1	14.7	Medium	2
Glenn	64.0	63.8	15.7	15.5	High	1
Granger	61.0	61.0	14.9	14.9	Medium	4
Hat Trick	61.8	61.9	14.9	14.5	Medium-Low	4
Howard	62.9	61.9	15.2	14.9	Medium-High	1
Jenna	60.4	61.0	14.6	14.5	—	—
Kelby	60.9	61.2	15.5	15.0	Medium	1
Knudson	61.3	61.2	14.4	14.0	Medium-High	3
Kuntz	60.5	60.5	14.7	14.3	Medium	2
Marshall	60.1	59.2	14.3	14.0	Low	2
Oklee	62.1	62.1	15.4	15.2	Low-Medium	3
RB07	61.3	61.1	15.2	14.8	Medium-High	2
Sabin	60.9	60.5	14.8	14.6	Medium-High	4
Samson	60.6	60.4	14.0	13.9	Medium-High	4
Steele-ND	62.2	61.9	15.4	15.1	High	2
Tom	61.5	61.4	15.0	14.6	Medium	1
Traverse	59.1	59.0	14.1	14.0	Low	4
Vantage	62.8	62.7	15.7	15.5	Medium	2
Mean	61.6	61.4	14.9	14.6		

[1] 12% moisture basis.

[2] 2004-2008 crop years.

[3] 1-9 scale in which 1 is best and 9 is worst. Values of 1-3 should be considered as resistant.

Table 3. Disease reactions[1] of hard red spring wheat varieties in Minnesota in multiple-year comparisons (2007-2009).

Variety	Leaf Rust	Stem Rust[2]	Other Leaf Diseases[3]	Scab
Ada	5	2	5[4]	6
Albany	3	3	5	4
Barlow	1	1	—	4
Bigg Red	8	2	7	3
Blade	2	2	3[6]	4
Breaker	3	2	3	—
Brennan	2	2	—	—
Brick	2	2	7	3
Briggs	1	2	5	5
Brogan	—	—	—	—
Cromwell	4	1	4[6]	4
Faller	1	1	3[6]	4
Freyr	4	4	4	4
Glenn	1	1	4	3
Granger	3	1	4	5
Hat Trick	5	4	5[4,5]	4
Howard	1	1	4[6]	6
Jenna	3	2	—	—
Kelby	2	1	4[5]	5
Knudson	2	3	3[6]	6
Kuntz	3	1	4	6
Marshall	8	1	7	7
Oklee	4	1	5	5
RB07	1	1	5	5
Sabin	3	1	6	4
Samson	5	1	6[5]	7
Steele-ND	1	1	4	6
Tom	4	1	5	4
Traverse	5	2	5	5
Vantage	5	3	6	5

[1] 1-9 scale: 1 = most resistant, 9 = most susceptible.

[2] Stem rust levels have been very low in production fields in recent years. Even on susceptible varieties.

[3] Includes tan spot, septoria, bacterial leaf stripe and powdery mildew.

[4] These varieties are more susceptible to powdery mildew.

[5] This variety was more susceptible to bacterial leaf stripe based on three environments with this disease from 2007 and 2009.

[6] These varieties were more resistanct to bacterial leaf stripe based on three environments with this disease from 2007 and 2009.

This fungicide regime was implemented to measure the performance of varieties when fungal diseases were controlled to the maximum extent possible. A grower's decisions regarding fungicide applications should be based on the available decision support systems, and only if and when disease levels are forecasted to reach economic damaging levels.

The additional performance evaluations were carried out adjacent to the conventional (no fungicides applied) trials, so results can be compared directly. The trials were conducted in Lamberton, Crookston, and Morris in 2009. In 2009, the fungicide regime as applied in these trials increased grain yield on average by more than 5 bu/acre, compared to about 9 bu/acre in 2007 and 4 bu/acre in 2008. The 3-year comparisons showed an increase in grain yield of about 6 bu/acre.

Rather than the average increases in grain yield, the responses of individual varieties provide the most useful information; varieties rated susceptible to leaf rust and other fungal leaf diseases benefited most from fungicide applications.

Test Plot Research

Test plot establishment and management were supervised by Jim Cameron, Derek Crompton, Matt Bickell, Steve Quiring and Donn Vellekson.

Hard red spring wheat planting rate and date.

Calculating and seeding the appropriate amount of seed is an important first step towards maximizing yield. The seeding rate is a function of the number of kernels per pound of seed, the percent germination of the lot, the expected stand loss as a function of the quality of the seedbed, and the desired stand. In Minnesota, an average optimum stand for hard red spring wheat when planted early is between 28 to 30 plants per square foot or approximately 1.25 million plants per acre. This number should increase by 1 to 2 plants per square foot for every week planting is delayed past the early, optimum, seeding date. Expected stand loss even under good seedbed conditions is between 10% to 20% and will increase with a poor seedbed or improper seed placement due to poor depth control.

The general formula for calculating a seeding rate is:

$$\text{Seeding Rate (Pounds/Acre)} = \frac{\text{Desired Stand (Plants/Acre)} \div (1 - \text{Expected Stand Loss})}{\text{(Seeds/Pound)} \times \text{Percentage Germination}}$$

Calculate the seeding rate for every single seed lot and calibrate the drill accordingly.

Example: Early variety.

Desired Stand, (Plants/Acre)	Expected Stand Loss	Seeds per Pound	Percentage Germination	Seeding Rate, (Lb/Acre)
1.25 million	0.20	14,000	0.95	117

Table 4. Relative grain yield of hard red spring wheat varieties in northern Minnesota locations in single-year (2009) and multiple-year comparisons (2006-2009).

	Crookston			Roseau	Stephen			On-Farm		
Variety	2009	2-Year	3-Year	2-Year [1]	2009	2-Year	3-Year	Average [2]	2-Year	3-Year
Ada	97	98	97	98	98	99	98	96	98	98
Albany	114	113	119	96	106	97	106	112	112	—
Barlow	105	99	—	—	110	107	—	96	100	—
Bigg Red	92	92	92	89	90	89	90	99	97	93
Blade	101	101	101	104	96	94	98	102	100	101
Breaker	104	103	—	—	99	103	—	97	99	—
Brennan	98	99	—	—	98	101	—	96	99	—
Brick	83	92	98	98	96	101	100	100	103	—
Briggs	99	98	99	112	104	95	97	94	96	98
Brogan	98	—	—	—	97	—	—	101	—	—
Cromwell	103	102	102	110	98	97	97	98	98	100
Faller	124	119	123	125	119	111	116	115	110	112
Freyr	99	102	104	99	97	96	98	101	99	101
Glenn	88	91	94	100	94	100	97	89	93	95
Granger	90	93	93	99	94	89	90	103	103	102
Hat Trick	87	94	93	96	111	105	109	103	101	102
Howard	111	105	103	105	104	99	103	105	101	99
Jenna	108	104	—	—	97	102	—	101	106	—
Kelby	86	94	96	112	93	100	99	90	93	93
Knudson	109	105	106	103	103	102	105	105	104	106
Kuntz	94	100	104	100	98	102	101	95	99	102
Marshall	96	96	88	81	87	86	85	91	85	79
Oklee	98	96	96	104	98	100	98	90	96	96
RB07	102	104	106	90	100	106	106	107	104	105
Sabin	98	101	101	99	99	97	98	105	104	104
Samson	120	115	114	111	114	111	113	100	102	105
Steele-ND	100	98	99	99	97	97	96	100	99	102
Tom	93	96	99	105	107	113	107	96	100	100
Traverse	104	104	106	115	114	116	115	115	108	111
Vantage	106	98	99	104	97	94	98	99	94	94
Mean (Bu/Acre)	85.8	92.3	97.9	*59.3*	79.0	79.1	76.3	88.5	90.1	86.4
LSD (0.05)	11.6	10.7	8.8	17.9	10.3	12.4	10.7	7.0	6.5	6.8
No. Environments	1	2	3	2	1	2	3			

[1] The Roseau site was not planted in 2009 due to excessive wetness. 2-year data are 2007-2008 average.
[2] 2-year data are 2007-2008.

Table 5. Relative grain yield of hard red spring wheat varieties in southern Minnesota locations in single year (2009) and multiple-year comparisons (2007-2009).

	Lamberton			Morris [1]		St. Paul			Waseca		
Variety	2009	2-Year	3-Year	2009	2-Year	2009	2-Year	3-Year	2009	2-Year	3-Year
Ada	89	87	93	110	107	109	91	87	93	98	94
Albany	136	109	120	112	111	108	107	103	133	128	129
Barlow	95	97	—	102	—	95	100	—	99	101	—
Bigg Red	97	104	100	103	101	111	105	104	111	101	100
Blade	97	102	104	95	99	98	99	101	99	97	97
Breaker	111	105	—	101	—	102	102	—	106	105	—
Brennan	112	113	—	108	—	113	110	—	113	111	—
Brick	90	101	101	89	98	93	99	101	89	90	85
Briggs	92	96	105	95	101	94	102	105	94	89	83
Brogan	105	—	—	116	—	106	—	—	100	—	—
Cromwell	98	93	91	100	99	87	93	95	98	94	90
Faller	123	114	120	111	116	96	92	97	120	106	106
Freyr	109	104	103	97	100	100	102	105	98	96	91
Glenn	99	95	98	75	80	105	103	102	86	87	87
Granger	93	111	114	117	115	100	99	99	112	94	96
Hat Trick	77	86	95	94	98	69	73	75	108	101	110
Howard	109	113	112	107	102	122	117	117	93	104	109
Jenna	107	112	—	109	—	101	106	—	123	115	—
Kelby	87	93	96	86	90	105	113	120	85	91	87
Knudson	101	112	117	107	110	92	92	90	98	103	109

[1] The Morris 2008 trial was abandoned due to herbicide drift damage. The 2-year data are from 2007 and 2009.

Table 5. (coninued) Relative grain yield of hard red spring wheat varieties in southern Minnesota locations in single year (2009) and multiple-year comparisons (2007-2009).

	Lamberton			Morris [1]		St. Paul			Waseca		
Variety	2009	2-Year	3-Year	2009	2-Year	2009	2-Year	3-Year	2009	2-Year	3-Year
Kuntz	96	91	95	108	107	89	97	98	103	99	96
Marshall	101	80	75	96	83	89	81	78	73	69	59
Oklee	108	98	95	100	97	101	106	108	103	101	102
RB07	100	100	102	98	93	96	103	105	99	105	103
Sabin	98	109	110	98	106	114	110	110	98	108	120
Samson	101	99	102	107	106	113	110	108	93	101	106
Steele-ND	97	99	104	97	102	110	107	109	87	102	110
Tom	102	101	99	81	89	98	101	104	102	94	86
Traverse	115	122	120	111	112	103	100	100	104	110	120
Vantage	112	103	101	109	103	95	97	91	90	95	100
Mean (Bu/Acre)	65.5	52.7	50.8	49.6	61.8	58.1	63.5	62.4	54.0	57.1	55.6
LSD (0.05)	14.1	15.8	18.1	19.1	14.3	18.2	13.4	12.3	20.1	18.9	18.6
No. Environments	1	2	3	1	2	1	2	3	1	2	3

[1] The Morris 2008 trial was abandoned due to herbicide drift damage. The 2-year data are from 2007 and 2009.

Table 6. Relative grain yield of hard red spring wheat varieties in Minnesota in single-year (2009) and multiple-year comparisons (2007-2009).

	State			North			South		
Variety	2009	2-Year	3-Year	2009	2-Year	3-Year	2009	2-Year	3-Year
Ada	99	96	96	98	97	98	100	95	94
Albany	118	109	113	110	103	108	122	114	116
Barlow	101	100	—	107	102	—	98	100	—
Bigg Red	101	99	97	91	93	91	105	103	101
Blade	98	99	100	99	98	101	97	99	100
Breaker	104	104	—	102	103	—	105	104	—
Brennan	107	107	—	98	101	—	111	111	—
Brick	90	96	97	90	96	99	90	96	96
Briggs	96	96	100	101	96	102	94	95	98
Brogan	104	—	—	98	—	—	107	—	—
Cromwell	97	97	97	100	100	102	96	94	93
Faller	116	110	114	122	117	121	113	105	109
Freyr	100	99	100	98	98	101	101	100	100
Glenn	91	94	95	91	97	97	91	92	93
Granger	101	99	100	92	91	93	106	104	105
Hat Trick	91	93	97	99	100	100	87	88	94
Howard	107	107	108	107	102	103	107	111	111
Jenna	108	108	—	102	104	—	110	111	—
Kelby	90	98	100	89	98	101	91	97	99
Knudson	102	103	106	106	102	105	99	103	106
Kuntz	98	99	100	96	102	102	99	97	98
Marshall	90	84	78	92	91	85	90	80	73
Oklee	101	101	100	98	99	99	103	102	101
RB07	99	102	102	101	103	102	98	102	102
Sabin	101	104	107	99	98	99	102	107	112
Samson	108	107	108	117	112	113	103	104	105
Steele-ND	98	100	103	99	96	98	98	102	106
Tom	97	99	99	100	104	104	96	96	95
Traverse	108	110	112	109	110	112	108	111	113
Vantage	102	100	99	102	100	100	101	100	99
Mean (Bu/Acre)	65.0	67.7	65.5	82.4	82.1	76.4	55.9	56.0	56.9
LSD (0.05)	9.8	6.5	5.7	10.6	7.6	6.7	11.5	10.0	8.6
No. Environments	6	12	19	2	5	8	4	7	11

Table 7. Grain yield (bushels per acre) of hard red spring wheat varieties grown under conventional and intensive management.

	North						South						State					
	2009		2-year		3-year		2009		2-year		3-year		2009		2-year		3-year	
Variety	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int
Ada	83.5	89.2	81.0	85.0	73.2	81.6	55.1	55.2	47.9	52.2	53.1	56.3	64.6	66.5	64.5	68.6	63.1	68.9
Albany	97.6	105.7	90.0	94.8	—	—	69.5	76.1	57.1	67.0	—	—	78.8	86.0	73.6	80.9	—	—
Barlow	90.3	93.4	81.9	84.7	—	—	55.0	63.7	49.9	56.8	—	—	66.9	73.6	65.9	70.8	—	—
Bigg Red	78.3	84.4	79.8	81.9	69.0	76.6	55.6	64.4	51.9	59.9	53.3	63.8	63.4	71.0	65.8	70.9	61.1	70.2
Blade	87.1	88.3	84.6	85.3	76.7	77.5	54.1	59.1	50.3	53.8	54.3	58.7	65.1	68.9	67.5	69.6	65.5	68.1
Breaker	89.6	91.2	86.3	87.9	—	—	59.3	59.3	53.0	54.6	—	—	69.4	69.9	69.6	71.3	—	—
Brennan	84.1	97.7	84.3	94.3	—	—	61.7	68.4	56.4	62.7	—	—	69.2	78.2	70.3	78.5	—	—
Brick	71.4	87.3	78.0	85.9	—	—	51.1	58.6	49.3	54.9	—	—	57.6	68.1	63.6	70.4	—	—
Briggs	84.8	88.5	81.3	84.8	76.9	81.7	52.3	59.6	48.2	54.9	55.0	59.4	63.1	69.3	64.8	69.8	65.9	70.5
Brogan	84.5	89.9	—	—	—	—	61.5	63.0	—	—	—	—	69.1	72.0	—	—	—	—
Cromwell	88.1	90.0	85.7	89.2	78.3	82.8	55.5	59.3	48.7	52.8	50.6	54.4	66.3	69.6	67.2	71.0	64.5	68.6
Faller	106.3	108.3	100.3	102.8	92.6	95.0	66.4	73.6	58.2	64.6	63.7	68.2	79.7	85.2	79.2	83.7	78.2	81.6
Freyr	84.9	93.0	83.9	89.2	77.0	84.2	58.3	65.5	52.2	59.2	54.8	61.9	67.2	74.7	68.0	74.2	65.9	73.0
Glenn	75.5	77.2	78.9	82.6	72.2	76.6	50.0	55.6	45.6	50.3	48.7	53.6	58.5	62.8	62.3	66.5	60.4	65.1
Granger	77.5	73.3	77.5	78.9	71.3	74.2	57.8	68.1	55.8	63.1	60.0	66.2	64.4	69.9	66.7	71.0	65.6	70.2
Hat Trick	74.4	86.9	80.9	87.0	71.4	79.1	48.0	53.2	45.0	48.5	51.5	55.5	56.6	64.4	63.0	67.8	61.4	67.3
Howard	95.4	88.1	87.1	86.5	77.9	81.6	60.3	56.3	55.9	54.7	57.1	60.0	72.1	66.9	71.5	70.6	67.5	70.8
Jenna	92.3	100.1	87.6	90.7	—	—	60.5	67.5	55.9	62.6	—	—	71.1	78.4	71.7	76.6	—	—
Kelby	73.7	77.4	80.9	80.4	75.7	77.9	48.9	52.2	46.1	52.8	50.1	55.4	56.9	60.6	63.5	66.6	63.0	66.6
Knudson	93.3	99.6	85.7	87.3	78.6	82.4	58.0	63.1	55.1	59.9	60.1	65.3	69.8	75.3	70.4	73.6	69.4	73.9
Kuntz	83.1	87.6	85.9	87.5	78.0	82.7	56.6	65.7	49.2	58.8	53.8	59.4	65.5	73.0	67.5	73.2	65.9	71.1
Marshall	82.7	92.4	78.7	86.1	65.2	82.8	54.2	63.0	43.9	55.9	41.6	58.0	66.1	69.9	61.3	71.0	53.4	70.4
Oklee	84.1	81.2	82.1	83.6	74.0	79.1	57.6	62.5	50.3	56.7	51.2	58.7	66.4	68.7	66.2	70.1	62.6	68.9
RB07	87.3	93.1	85.0	89.4	76.2	79.9	55.8	61.7	50.5	57.2	52.2	58.3	66.3	72.2	67.8	73.3	64.2	69.1
Sabin	84.1	96.4	83.2	87.3	—	—	55.2	64.8	52.8	58.0	—	—	63.5	71.1	68.0	72.6	—	—
Samson	102.8	99.7	95.1	98.7	85.1	91.6	58.4	62.3	51.7	59.6	55.6	63.6	64.8	75.5	73.5	79.2	70.4	77.6
Steele-ND	85.7	88.3	80.5	85.2	74.2	79.4	54.4	56.9	49.7	53.1	55.0	57.1	64.9	67.4	65.1	69.2	64.6	68.2
Tom	80.1	80.6	81.5	84.9	—	—	52.3	57.0	48.4	52.6	—	—	61.6	64.8	65.0	68.7	—	—
Traverse	89.5	98.6	88.2	88.1	81.6	83.5	63.4	71.2	59.6	67.0	62.2	71.5	72.1	80.3	73.9	77.6	71.9	77.5
Vantage	91.0	100.8	85.7	93.1	75.9	83.3	62.1	61.6	53.9	57.6	54.8	61.4	71.7	74.6	69.8	75.4	65.3	72.3
Mean (Bu/Acre)	85.9	90.7	84.2	87.7	76.2	81.6	56.0	61.5	50.3	55.9	54.2	60.3	66.0	71.2	67.8	72.5	65.2	71.0
LSD (0.05)	19.5	20.0	16.1	17.9	12.1	13.2	20.0	16.0	17.0	15.0	11.4	11.7	15.5	15.2	11.5	11.8	8.5	9.3
No. of Environments	1	1	3	3	5	5	2	2	3	3	5	5	3	3	6	6	10	10