

# **HARD RED SPRING WHEAT** **VARIETY TRIALS**

**Minnesota Agricultural Experiment Station — University of Minnesota**  
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This is a report on results of hard red spring wheat variety tests conducted by the Minnesota Agricultural Experiment Station. It was prepared by research geneticists Robert H. Busch (612-625-1975; <busch005@tc.umn.edu>) and James A. Anderson (612-625-9763; <ander319@tc.umn.edu>), Agronomy and Plant Genetics, University of Minnesota, St. Paul, MN 55108.

Successful production of hard red spring wheat depends to a considerable extent on selecting the best varieties for a particular farm, with particular attention given to a variety's susceptibility to scab. For that reason, varieties are compared in trial plots on Minnesota Agricultural Experiment Station fields at Waseca, Lamberton, Morris, Crookston, Stephen, Roseau, and St. Paul, and on the fields of cooperating farmers.

Wheat varieties are grown in replicated plots at each location. 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 is possible.

Scab epidemics in the hard red spring wheat growing areas of the state have demonstrated the clear need to give greater weight to selecting varieties for their tolerance to this devastating disease. Consequently, only newly released varieties where reaction to scab has not been well documented, and older varieties with scab ratings better than susceptible, are tested and described.



***Locations where hard red spring wheat trials were conducted for this report.***

## **Variety Classifications**

The Minnesota Agricultural Experiment Station no longer makes recommendations for hard red spring wheat varieties. The basis on which recommendations were made in the past is no longer considered appropriate because of the severity of scab epidemics.

## **Seed Sources**

Seed of some tested and other hard red spring wheat varieties may be eligible for

certification, and the use of certified seed is suggested. However, certification does not imply recommendation. Table 4 lists possible wheat seed sources included in the *Minnesota Registered and Certified Seed Directory for 1999 Planting* (available without charge from the Minnesota Crop Improvement Association, 1900 Hendon Avenue, St. Paul, MN 55108; 612-625-7766 or 800-510-6242).

## Interpreting the Tables

Tested varieties are listed in the order of their maturity.

Scab evaluations provide severity ratings, based on visual spread of the disease on the spike and tolerance scores, which reflect the variety's ability to maintain plump seed. These ratings should be considered together to reduce risk of loss. The use of more than one variety to provide different days to heading and to use different seeding dates is highly recommended to reduce risk. Variety descriptions do not provide information on scab resistance; table information should be used.

The LSD (Least Significant Difference) values associated with the data in table 3 are measures of variability within the trials. If a yield difference between two varieties within a single column exceeds the LSD value at the bottom, you can assume that the higher yielding variety was truly better 95 percent of the time. If the difference is less than the LSD, greater attention should be given to other traits which are important in making your variety choices.

## Plant Variety Protection Act

Varieties covered by the U.S. Plant Variety Protection Act are identified by the symbol **PVP**. When the symbol is followed by "(94)" the seed of the variety may *not* be sold by a producer, not even to a relative or neighbor, without the express permission of the variety's developer/owner.

## Varieties Evaluated

**BacUp** — Awned, very early, medium height. Resistant to stem rust and moderately resistant to leaf rust. Low to medium yield and very high test weight. Susceptible to foliar diseases and lodging. High tolerance to scab. Very high protein percent. Specialty variety release for scab tolerance with recommendation that it not be used on more than 20 percent of acreage. Released by USDA-ARS and Minnesota Agricultural Experiment Station 1996.

**Forge** — Awned, early, medium height. Resistant to stem rust and moderately resistant to leaf rust. High yield and test weight. Moderately susceptible to lodging. Moderately susceptible to foliar diseases. Medium protein percent. Released by South Dakota Agricultural Experiment Station 1997. **PVP** (94)

**Ingot** — Awned, early, tall. Resistant to stem rust and moderately resistant to leaf rust. High yield and very high test weight. Moderately susceptible to lodging and to foliar diseases. Medium protein percent. Released by South Dakota Agricultural Experiment Station 1998. **PVP** (94)

**Kulm** — Awned, early, medium height. Resistant to stem rust and moderately resistant to leaf rust. High to medium yield and high test weight. Moderately susceptible to lodging. High protein percent. Released by North Dakota Agricultural Experiment Station 1994. **PVP** (94)

**Sharp** — Awned, early, medium height. Resistant to stem rust and moderately resistant to leaf rust. High yield and test weight. Moderately susceptible to lodging and black chaff. Medium protein percent. Released by South Dakota Agricultural Experiment Station 1990.

**Sharpshooter** — Awned, early, medium height. Resistant to stem rust and moderately resistant to leaf rust. Medium to high yield and high test weight. Moderately susceptible to foliar diseases and lodging. Medium protein percent. Similar to Sharp, selected for possibly enhanced scab tolerance. Released by Western Plant Breeders 1996. **PVP** (94)

**Oxen** — Awned, early-midseason, semidwarf. Moderately resistant to stem rust and moderately susceptible to leaf rust. Very high yield and medium test weight. Moderately susceptible to foliar diseases. Medium protein percent. Released by South Dakota Agricultural Experiment Station 1996. **PVP** (94)

**Russ** — Awned, early-midseason maturity, medium height. Moderately resistant to stem rust and leaf rust. High yield and medium test weight. Moderately susceptible to lodging. Susceptible to foliar diseases. Medium protein percent. Released by South Dakota Agricultural Experiment Station 1995.

**Grandin** — Awned, early, semidwarf. Resistant to stem rust and moderately susceptible to leaf rust. High yield and test weight. Moderate lodging resistance. Moderately susceptible to foliar diseases. High protein percent. Released by North Dakota Agricultural Experiment Station 1989.

**Hamer** — Awned, early-midseason maturity, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Very high yield and medium test weight. Good lodging resistance. Moderately resistant to foliar diseases. Medium to low protein percent. Released by AgriPro 1995. **PVP** (94)

**Nora** — Awned, midseason, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Medium to low yield and low to medium test weight. Moderately susceptible to lodging and moderately resistant to foliar diseases. Medium protein percent. Released by AgriPro 1996. **PVP** (94)

**AC Domain** — Awnless, midseason-early, medium height. Resistant to stem rust and moderately resistant to leaf rust. Medium yield and high test weight. Moderately susceptible to lodging and foliar diseases. High to medium protein percent. Released by Agriculture and Agri-Food, Manitoba, Canada, 1993. Seed sales regulated by SeCan.

**2375** — Awned, early, medium height. Resistant to stem rust and moderately susceptible to leaf rust. High yield and test weight. Tolerant to loose smut. Moderately susceptible to lodging, shattering and foliar diseases. Medium protein percent. Released by Pioneer Hi-Bred 1988. Sold by North Dakota State University Research Foundation since 1990.

**Trenton** — Awned, midseason, medium height. Moderately resistant to stem rust and moderately susceptible to leaf rust. Medium to high yield and test weight. Moderately susceptible to lodging. Moderately susceptible to foliar diseases. Medium-high protein percent. Recommended by North Dakota State University for western and central North Dakota. Released by North Dakota Agricultural Experiment Station 1995. **PVP** (94)

**HJ98** — Awned, midseason, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Very high yield and medium test weight. Moderately susceptible to lodging and to foliar diseases. Medium to low percent protein. Released by Minnesota Agricultural Experiment Station and USDA-ARS 1998. **PVP** (94)

**Mercury** — Awned, midseason, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. High yield and medium test weight. Good lodging resistance. Moderately susceptible to foliar diseases. Medium to low percent protein. Released by North Star Genetics 1998. **PVP** (94)

**Keene** — Awned, midseason-late, tall. Resistant to stem rust and moderately resistant to leaf rust. Medium to high yield and test weight. Moderately susceptible to lodging. Medium protein percent Released by North Dakota Agricultural Experiment Station 1997. **PVP** (94)

**Lars** — Awned, midseason, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Very high yield and low test weight. Good lodging resistance. Moderately resistant to foliar diseases. Low to medium protein percent. Released by AgriPro 1995. **PVP** (94).

**Verde** — Awned, midseason-late maturity, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Very high yield and medium test weight. Good lodging resistance. Moderately resistant to foliar diseases. Medium to low protein percent. Released by Minnesota Agricultural Experiment Station and USDA-ARS 1995. **PVP** (94)

**AC Cora** — Awnless, late, tall. Resistant to stem rust and moderately resistant to leaf rust. Medium to low yield and medium test weight. Susceptible to lodging. Moderately resistant to foliar diseases. High protein percent. Released by Agriculture and Agri-Food, Manitoba, Canada, 1993. Seed sales regulated by SeCan.

**AC Barrie** — Awnless, late, tall. Resistant to stem rust and moderately susceptible to leaf rust. Low to medium yield and medium test weight. Moderately susceptible to lodging. Moderately resistant to foliar diseases. High to medium protein percent. Released by Agriculture and Agri-Food, Manitoba, Canada to Cargill 1997. **PVP** (94)

**Hager** — Awned, late, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Medium to high yield and medium test weight. Good lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by AgriPro 1998. **PVP** (94)

**Ivan** — Awned, late, semidwarf. Resistant to stem and moderately resistant to leaf rust. High yield and medium test weight. Moderately susceptible to foliar disease. Medium to low protein percent. Released by AgriPro 1998. **PVP** (94)

**AC Majestic** — Awnless, late, medium height. Resistant to stem and moderately resistant to leaf rust. Low to medium yield and test weight. Moderately susceptible to foliar disease. High to medium protein percent. Released by Agriculture and Agri-Food, Manitoba, Canada to Cargill 1996. **PVP** (94)

**Marshall** — Awned, late semidwarf. Resistant to stem rust and moderately susceptible to leaf rust. Medium to high yield and test weight. Moderately susceptible to foliar disease complex. Resistant to lodging. Low to medium protein percent. Released by Minnesota Agricultural Experiment Station and USDA-ARS 1982.

**Gunner** — Awned, late, medium height. Moderately resistant to stem rust and resistant to leaf rust. Medium yield and high test weight. Moderately susceptible to foliar diseases and lodging. Tolerance to scab. High protein percent . Released by AgriPro 1996. **PVP** (94)

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**Table 1** — Growth and quality characteristics of hard red spring wheat varieties, 1996-1998.

Lodging score: 1 = Erect; 9 = Flat.

"On farms" test weight is derived from wheat grown at 13 locations on cooperating farmers' fields in 1998.

Data for Ingot, Sharpshooter, Nora, Mercury, Keene and Hager are only from 1997-98.

Data for AC Barrie and Ivan are only from 1998.

Protein percentage is expressed on a 12 percent moisture basis.

Variety	Heading Date	Height (inches)	Lodging score	Test Weight (lb/bu)		Protein %	Milling Baking Quality
				Branch Station	On Farms		
BacUp	6-24	33	4.3	61.3	60.8	17.1	high
Forge	6-24	32	2.7	60.2	60.4	15.1	med
Ingot	6-24	35	3.6	61.8	62.4	15.4	hi-med
Kulm	6-25	35	3.0	60.1	—	15.7	hi-med
Sharp	6-25	34	3.4	60.8	60.4	15.1	med
Sharpshooter	6-26	35	3.5	60.8	61.8	15.1	med
Oxen	6-26	31	3.1	58.9	58.7	15.2	med
Russ	6-27	34	3.3	58.8	59.2	14.9	med
Grandin	6-27	33	2.6	59.4	58.3	15.5	high
Hamer	6-27	31	2.2	59.4	59	14.9	med-low
Nora	6-27	28	3.3	57.9	57.5	15.5	med
AC Domain	6-27	35	3.2	59.1	—	16.0	med-hi
2375	6-28	33	4.3	59.9	59.6	14.9	med
Trenton	6-28	37	3.7	59.5	—	15.6	hi-med
HJ98	6-28	32	3.9	58.2	59.1	14.5	med
Mercury	6-28	28	2.3	58.4	—	14.4	med
Keene	6-28	38	3.0	58.9	—	15.4	med-hi
Lars	6-29	28	2.3	58.0	56.7	14.1	med-low
Norm ( <i>scab susceptible check</i> )	6-29	32	2.3	57.1	—	14.0	med-hi
Verde	6-30	32	2.7	59.0	59.3	14.3	med
AC Cora	6-30	37	4.3	58.5	—	15.9	med
AC Barrie	6-30	37	2.7	58.6	58.9	15.5	med
Hager	6-30	32	2.7	58.0	57.2	15.1	med
Ivan	6-30	30	2.2	58.1	—	14.0	med-low
AC Majestic	6-30	35	3.2	58.0	—	15.7	med
Marshall	7-1	30	1.9	57.5	57.6	14.3	med-low
Gunner	7-1	34	2.7	60.3	61.2	16.1	med

**Table 2** — Disease susceptibility and tolerances of hard red spring wheat varieties, 1996-1998.

Foliar disease rating based on North Dakota State University data from 1996-1998: R = Resistant; MR = Moderately Resistant; MS = Moderately Susceptible; S = Susceptible.

Scab severity rating: R = Resistant; MR = Moderately Resistant; MS = Moderately Susceptible; S = Susceptible.

Scab tolerance to maintain plump kernels under scab epidemics: 1 = Very Well; 2 = Well; 3 = Moderate; 4 = Fair; 5 = Poor.

Data for Ingot, Sharpshooter, Nora, Mercury, Keene and Hager are only from 1997-98.

Data for AC Barrie and Ivan are from 1998 only

Variety	Leaf Rust1	Stem Rust1	Foliar Disease	Scab Severity	Scab Tolerance
BacUp	MS	R	S	MR	1.5
Forge	MS	R	MS	MS-S	2.5
Ingot	MR	R	MS	MS-MR	2.0
Kulm	MR	R	S	S-MS	2.5
Sharp	MR	R	MS	MS-MR	2.5
Sharpshooter	MR	R	MS	MS-MR	2.5
Oxen	MS	MR	MS	MS-S	3.0
Russ	MR	MR	S	MS	3.0
Grandin	MS	R	S	MS-S	3.0
Hamer	MR	R	MR	MS-S	3.5
Nora	MR	R	MR	S	4.0
AC Domain	MR	R	MS	MS-S	3.0
2375	MS	R	S	MS	2.5
Trenton	MS	MR	MS	MS-S	3.0
HJ98	MR	R	MS	MS	3.5
Mercury	MR	R	MS	S	4.5
Keene	MR	R	MR	MS	3.0
Lars	MR	R	MR	S	4.5
Norm ( <i>scab susceptible check</i> )	R	R	MR	S	5.0
Verde	MR	R	MR	MS-S	3.0
AC Cora	MR	R	MR	MS	3.0
AC Barrie	MS	R	MR	MS	2.5
Hager	MR	R	MS	S-MS	3.5
Ivan	MR	R	MS	S-MS	3.5
AC Majestic	MR	R	MR	MS	3.0
Marshall	MS	R	MS	MS-S	3.5
Gunner	MR	R	MR	MR-MS	2.5

**Table 3** — Yields, bushels per acre, of hard red spring wheat varieties, 1996-1998.

"On farms" yields are derived from wheat grown at 13 locations on cooperating farmers' fields in 1998.

Data for Ingot, Sharpshooter, Nora, Mercury, Keene and Hager are only from 1997-98.

Data for AC Barrie and Ivan are from 1998 only

Variety	North				South				Average		
	Crookston	Stephen	Roseau	On Farms	St. Paul	Morris	Waseca	Lamberton	North	South	State
BacUp	32	39	40	46	34	51	30	46	38	40	39
Forge	48	46	55	67	49	56	45	58	50	52	51
Ingot	48	47	54	69	49	56	45	58	50	52	51
Kulm	45	43	52	—	45	74	45	61	47	54	50
Sharp	45	48	52	59	41	68	43	53	49	49	49
Sharpshooter	42	48	52	58	45	58	45	44	48	48	48
Oxen	51	48	58	69	55	76	45	61	53	56	55
Russ	39	49	48	71	43	74	50	53	46	53	50
Grandin	48	44	46	55	51	57	39	51	46	49	47
Hamer	53	45	58	69	53	63	47	58	52	55	53
Nora	53	44	43	57	49	58	38	45	45	46	45
AC Domain	40	44	48	—	43	59	34	50	45	45	45
2375	49	51	53	66	47	63	44	53	52	51	51
Trenton	42	42	50	—	38	58	44	58	45	50	48
HJ98	49	58	59	72	53	61	44	60	56	55	55
Mercury	45	50	56	—	57	62	48	59	53	55	54
Keene	39	44	47	—	45	62	41	57	43	51	48
Lars	54	50	54	63	57	70	45	53	53	54	53
Norm ( <i>scab susceptible check</i> )	44	40	53	—	52	61	45	59	46	54	50
Verde	50	50	61	71	55	65	47	60	54	56	55
AC Cora	39	47	47	—	38	43	38	55	45	45	45
AC Barrie	—	45	48	56	41	58	33	44	44	40	41
Hager	48	45	56	64	47	55	37	51	50	48	48
Ivan	—	52	58	—	57	67	41	53	54	51	53
AC Majestic	37	50	38	—	36	45	33	48	42	41	41
Marshall	51	47	45	60	51	30	32	47	47	43	45
Gunner	42	52	49	67	44	50	38	47	48	44	46
LSD 5%	10.2	8.0	8.3	3.9	6.6	10.1	7.6	8.9	5.4	5.4	3.9

**Table 4** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

The listing of registered / certified sources is not to be construed as an offer for sale by grower, nor is it to be considered as public advertising or as a posting of public notice in any manner. Fields of registered / certified growers have, however, been sampled, tested and inspected by the MCIA. Contact the MCIA for further information, caveats, and considerations.

**Registered / certified seed (R = Registered; C = Certified)**

2375	Clay	Fuglie, Duane	Ulen	218-596-8528	C
	Clay	Lee Seed Farm	Borup	218-494-3330	C
	Clay	Peterson Farm, Sherwood E.	Baker	218-789-7378	C
	Clay	Swanson, Arthur & Dirk	Moorhead	218-233-5996	C
	Clay	Swenson, Clifford	Ulen	218-596-8882	C
	Clay	Thompson, Richard	Barnesville	218-789-7208	C
	Clay	Tri-County Co-op Assn.	Ulen	218-596-8821	C
	Clay	Valan, Orlen Jr.	Moorhead	218-236-9479	C
	Clay	Zimmerman, Wayne	Ulen	218-596-8628	C
	Douglas	Sward Seed Farm	Nelson	320-762-0143	C
	Freeborn	Albert Lea Seed House, Inc.	Albert Lea	507-373-3161	C



**Table 4 (continued)** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

2375	Grant	Adams Seed	Wendell	218-458-2151	C
	Grant	Backman Seeds	Herman	320-677-2231	C
	Grant	Kapphahn, John M.	Elbow Lake	218-685-4604	C
	Grant	Red River Marketing Co.	Elbow Lake	218-685-6100	C
	Grant	Thiel Seed Service	Wendell	218-458-2415	C
	Grant	Vipond Farm, Inc.	Herman	320-677-2535	C
	Kandiyohi	Behm Seed Company	Atwater	320-974-3003	C
	Kandiyohi	Loge, Alan	Willmar	320-235-4178	C
	Kittson	Petersen, Ronald L.	Lake Bronson	218-754-4631	C
	Kittson	Sugden, William	Hallock	218-843-2593	C
	Kittson	Younggren, Dan	Hallock	218-843-3318	C
	Lac qui Parle	Hermanson Seed Plant	Boyd	320-855-2527	C
	Lac qui Parle	Kemen, Robert & Sons	Madison	320-769-4413	C
	Le Sueur	Haas Seed Farm	Le Sueur	507-665-3683	C
	Lincoln	Jerzak, John	Ivanhoe	507-694-1834	C
	Lincoln	Popowski, John	Ivanhoe	507-694-1593	C
	Lyon	Olson, Jonathan	Cottonwood	507-423-5338	C
	Mahnomen	Bursch Farms, Inc.	Mahnomen	218-935-5353	C
	Mahnomen	Pazdernik Farms, Inc.	Waubun	218-473-2232	C
	Marshall	Bring, Wesley	Strandquist	218-874-3713	C
	Marshall	Green, Carl M.	Strandquist	218-597-2861	C
	Marshall	Gryskiewicz, Donald & Jeff	Stephen	218-437-8164	C
	Marshall	Jensen Farms	Stephen	218-478-2476	C
	Marshall	Kowalski, James	Stephen	218-455-3894	C
	Marshall	Peterson, Maynard	Stephen	218-478-3859	C
	Marshall	Sczepanski, Thomas	Stephen	218-478-2462	C
	McLeod	Dammann Seed Farms	Plato	320-864-3004	C
	McLeod	Schulz, Nolan E.	Stewart	320-562-2396	C
	Meeker	Dahlman Seed Co.	Dassel	320-275-2527	C
	Norman	Brandt, Robert Jr.	Ada	218-784-4093	C
	Norman	Chisholm, Keith P.	Gary	218-356-8674	C
	Norman	Circle C Seeds	Gary	218-356-8214	C
	Norman	Kraft, Roger	Gary	218-584-8451	C
	Norman	Malme, Cecil	Shelly	218-886-8488	C
	Polk	Balstad, Scott	Fosston	218-435-6311	C
	Polk	Brule, David A.	Crookston	218-281-2944	C
	Polk	Caillier, Daniel	Crookston	218-281-2840	C
	Polk	Christian Farms	Fertile	218-945-6021	C
	Polk	Larson Farms	Climax	218-857-3345	C
	Polk	Mat - Co., Inc.	Fosston	218-435-6667	C
	Polk	Peterson, Douglas	East Grand Forks	218-773-9120	C
	Red Lake	Vatthauer Farm	Red Lake Falls	218-253-2490	C
	Redwood	Hagen, Don	Belview	507-641-5327	C
	Redwood	Sawwell's Seed, Inc.	Clements	507-692-2240	C
	Renville	Hanson Seeds	Fairfax	507-426-7320	C
	Renville	Toreen, Douglas	Bird Island	320-365-4777	C
	Roseau	Kukowski, Jim	Strathcona	218-781-2478	C
	Scott	Hauer Farms, Inc.	Shakopee	612-445-7554	C
	Stevens	Haberer Seed Farm	Morris	320-795-2468	C
	Stevens	Sperr, Duane & Rollie	Donnelly	320-246-3496	C
	Swift	Falk Seed Farm	Murdock	320-875-4341	C
	Swift	Nelson Seed Company	Benson	320-843-3610	C
	Traverse	Johnson, Merton	Wheaton	320-563-8025	C
	Wilkin	Beyer Seed Farm	Kent	218-643-5126	C
	Wilkin	Haugrud Seed Plant	Rothsay	218-493-4275	C
	Wilkin	Knapp Seed Farm, Inc.	Foxhome	218-739-3366	C
	Wilkin	Nordick, J & R	Rothsay	218-867-2605	C
	Wilkin	Torkelson, Dennis & Brent	Foxhome	218-736-4607	C
	Wright	Dahlco Seeds, Inc.	Cokato	320-286-5982	C
	Wright	Hopkins, Joseph	Buffalo	612-682-1868	C
	Wright	Terning Seeds, Inc.	Cokato	320-286-2168	C

**Table 4 (continued)** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

2398	Lyon	Olson, Jonathan	Cottonwood	507-423-5338	C
AC Barrie	Clay	Kuehl Bros. Farms	Glyndon	218-498-2141	C
	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	R
	Marshall	Bring, Wesley	Strandquist	218-874-3713	C
	Marshall	Erickson, Paul	Thief River Falls	218-449-3331	C
	Marshall	Farmers Elevator Company	Alvarado	218-965-4812	C
	Marshall	Hammerlund Farms	Oslo	218-695-3481	C
	Marshall	Jensen Farms	Stephen	218-478-2476	C
	Marshall	Kowalski, James	Stephen	218-455-3894	C
	Marshall	McGlynn, Neil	Stephen	218-478-2777	C
	Marshall	Sczepanski, Thomas	Stephen	218-478-2462	R
	Marshall	Widner, Neil	Stephen	218-478-3616	C
	Polk	Johnson, Myron J.	East Grand Forks	218-773-1791	C
	Polk	Kovar, Frank & Duane	East Grand Forks	218-773-9238	C
	Polk	Ross Seed Co.	Fisher	218-891-2211	C
	Polk	Thorson Farm, Inc., J. O.	East Grand Forks	218-893-2285	RC
Roseau	Kukowski, Jim	Strathcona	218-781-2478	R	
AC Domain	Clay	Kuehl Bros. Farms	Glyndon	218-498-2141	C
BacUp	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	RC
	Mahnomen	Spaeth, Douglas M.	Mahnomen	218-935-5830	C
	Marshall	Riopelle, Jack L.	Argyle	218-437-8147	R
Butte 86	Clay	Oberg Farms	Moorhead	218-236-9856	C
	Clay	Thompson, Richard	Barnesville	218-789-7208	C
	Lake of Woods	Pieper Farms, Jerry	Williams	218-783-6610	R
Forge	Becker	Hein Farms, Inc.	Audubon	218-439-6621	C
	Becker	Steffl, William D.	Callaway	218-375-2283	RC
	Big Stone	Clinton Ag Service, Inc.	Clinton	320-325-5203	C
	Brown	Roszbach Lakeside Seeds, Inc.	Hanska	507-794-7698	R
	Clay	Arneson Farms	Hawley	218-483-4165	C
	Clay	Baker, Jim & Kurt	Sabin	218-789-7360	C
	Clay	Fuglie, Duane	Ulen	218-596-8528	C
	Clay	Johnson, Brian M.	Hawley	218-962-3316	C
	Clay	Jossund, Mark A.	Moorhead	218-233-1561	C
	Clay	Kragnes, David	Felton	218-236-0857	C
	Clay	Kuehl Bros. Farms	Glyndon	218-498-2141	C
	Clay	Lee Seed Farm	Borup	218-494-3330	C
	Clay	Ness, Larry	Moorhead	218-585-4179	C
	Clay	Nord, Donald & John	Hawley	218-937-5783	C
	Clay	Sillers Farm	Moorhead	218-233-7841	RC
	Clay	Tang, Gorden & Sons	Felton	218-494-3643	C
	Clay	Thompson, Richard	Barnesville	218-789-7208	C
	Clay	Tonsfeldt Farms, Inc.	Barnesville	701-238-2323	C
	Clay	Tri-County Co-op Assn.	Ulen	218-596-8821	C
	Clay	Wetterlin, Jerry	Glyndon	218-494-3339	C
	Clay	Zimmerman, Wayne	Ulen	218-596-8628	C
	Freeborn	Albert Lea Seed House, Inc.	Albert Lea	507-373-3161	RC
	Grant	Adams Seed	Wendell	218-458-2151	RC
	Grant	Kapphahn, John M.	Elbow Lake	218-685-4604	C
	Grant	Thiel Seed Service	Wendell	218-458-2415	R
	Kandiyohi	Kallevig Seeds Inc	Willmar	320-235-6619	RC
	Kandiyohi	Loge, Alan	Willmar	320-235-4178	R
	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	R
	Kittson	Nelson, Merle L.	Drayton	218-455-3508	RC
	Kittson	Olsonawski, Jerry	Hallock	218-379-3235	R
	Kittson	Osowski, Terry	Hallock	218-843-3371	R
	Kittson	Rickenberg, Jeff	Kennedy	218-674-4231	R
	Kittson	Sedenquist Farms, Inc.	Kennedy	218-674-4218	R
Kittson	Stewart, H. Shane	St. Vincent	218-379-3282	R	
Kittson	Stewart, Hilson L.	St. Vincent	218-379-3282	R	

**Table 4 (continued)** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

Forge	Kittson	Webster Farms, Inc. J & N	Kennedy	218-674-4497	C
	Lac qui Parle	Harwick, Harlien & Kenneth	Dawson	320-752-4455	R
	Lake of Woods	Helmstetter Farm	Roosevelt	218-442-7285	R
	Lake of Woods	Olson, Emil A.	Roosevelt	218-442-5465	R
	Lake of Woods	Tveit Farms	Roosevelt	218-442-5281	R
	Lake of Woods	Dick Stangler Farm Seed	Kilkenny	507-595-2883	C
	Lincoln	Anderson, Merv	Porter	507-223-7981	R
	Mahnomen	Pazdernik Farms, Inc.	Waubun	218-473-2232	C
	Marshall	Backstrom Farms, Inc.	Warren	218-745-5113	RC
	Marshall	Baird Farms, Inc.	Warren	218-745-5330	RC
	Marshall	Farmers Elevator Company	Alvarado	218-965-4812	C
	Marshall	Gostanzik, Stan	Argyle	218-437-8149	R
	Marshall	Gryskiewicz, Donald & Jeff	Stephen	218-437-8164	RC
	Marshall	Hammerlund Farms	Oslo	218-695-3481	C
	Marshall	Jensen Farms	Stephen	218-478-2476	RC
	Marshall	Kowalski, James	Stephen	218-455-3894	RC
	Marshall	Kuznia, Kenneth J.	Argyle	218-437-8203	R
	Marshall	Omdahl Ridge Farms	Grand Forks	218-745-5595	R
	Marshall	Riopelle, Jack L.	Argyle	218-437-8147	R
	Marshall	Rivard Farms, Inc.	Argyle	218-437-6479	R
	Marshall	Robertson Brothers	Argyle	218-437-6411	R
	Marshall	Sczepanski, Thomas	Stephen	218-478-2462	RC
	Marshall	St. Germain, David L.	Argyle	218-437-8583	C
	Marshall	Widner, Neil	Stephen	218-478-3616	R
	Marshall	Yutzenka, Don and Mark	Argyle	218-437-8428	C
	Marshall	Yutzenka, Kevin & Leonard	Argyle	218-437-6468	R
	McLeod	Thalman Seeds Inc.	Plato	320-238-2185	C
	Meeker	Wigen Seed Farm	Litchfield	320-693-8182	RC
	Norman	Bernhardson, Charles E.	Shelly	218-886-7335	RC
	Norman	Brandt, Robert	Ada	218-784-4093	R
	Norman	Brandt, Robert Jr.	Ada	218-784-4093	C
	Norman	Brandt, Wayne & John	Ada	218-784-4774	R
	Norman	Chisholm, Joseph R.	Gary	218-356-8282	R
	Norman	Chisholm, Mark M.	Gary	218-356-8507	R
	Norman	Hellerud, Philip	Halstad	218-456-2662	C
	Norman	Peppel Bros. Donald & Dennis	Borup	218-582-3242	C
	Norman	Steen Farms, Peter	Halstad	218-456-2665	C
	Otter Tail	Brenden, Bruce L.	Rothsay	218-867-2410	C
	Otter Tail	Brenden, Selvin C.	Rothsay	218-867-2134	R
	Otter Tail	Keller, Clifford L.	Fergus Falls	218-736-4664	C
	Otter Tail	Walkup, John	Campbell	218-739-2580	C
	Out of State	Anderson, Gerald D	Grand Forks	701-775-8766	C
	Pennington	Scholin Farms	Thief River Falls	218-964-5268	RC
	Pennington	Swanson, Curtis W.	Thief River Falls	218-964-5619	RC
	Polk	Anderson Farms, Inc., J D	East Grand Forks	218-773-2280	R
	Polk	Bauer Farms	Erskine	218-687-5356	C
	Polk	Brule, David A.	Crookston	218-281-2944	C
	Polk	Caillier, Daniel	Crookston	218-281-2840	C
	Polk	Capistran Seed Company	Crookston	218-281-7840	C
	Polk	Hanson, Paul M	Crookston	218-281-5898	C
	Polk	Kovar, Frank & Duane	East Grand Forks	218-773-9238	C
	Polk	Larson Farms, Inc., Ralph	East Grand Forks	218-773-1463	RC
	Polk	Larson, Ray H., Inc.	Angus	218-745-5923	C
	Polk	Larson, Roger O.	Euclid	218-281-5697	C
	Polk	LeMar Farms, Inc.	Crookston	218-281-5608	C
	Polk	Mack Farms, Inc., Ron	East Grand Forks	218-773-2601	C
	Polk	Mat - Co., Inc.	Fosston	218-435-6667	RC
	Polk	Mid-Valley Grain Cooperative	Crookston	218-281-2881	RC
	Polk	Novak, James	Angus	218-745-5048	C
	Polk	Ostenaar, Sidney & DeWayne	Mc Intosh	218-563-7395	R
	Polk	Peterson, Douglas	East Grand Forks	218-773-9120	RC

**Table 4 (continued)** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

Forge	Polk	Quern, Miles	Oslo	218-695-3878	RC
	Polk	Sonsteli, Gordon & Gary	Winger	218-938-4189	R
	Polk	Thompson, Ordean H.	East Grand Forks	218-773-2251	C
	Polk	Thorson Farm, Inc., J. O.	East Grand Forks	218-893-2285	RC
	Polk	Tiedemann, Gene R.	Euclid	218-281-6723	RC
	Polk	Wentzel, Walton Farms, Inc.	Fisher	218-281-2207	C
	Pope	Langlois, William	Crookston	218-281-6881	C
	Red Lake	Baird, Rick	Red Lake Falls	218-253-2399	C
	Red Lake	Myhre Farms	Red Lake Falls	218-698-4485	R
	Red Lake	Swenson Seed Farm	Brooks	218-796-5285	RC
	Red Lake	Vatthauer Farm	Red Lake Falls	218-253-2490	R
	Roseau	Habstritt Farms, Inc.	Roseau	218-463-1193	RC
	Roseau	K & L Farms	Wannaska	218-425-7719	C
	Roseau	Kukowski, Jim	Strathcona	218-781-2478	R
	Swift	Falk Seed Farm	Murdock	320-875-4341	R
	Traverse	Johnson, David A.	Wheaton	320-563-4533	C
	Traverse	Johnson, Robert & Richard	Wheaton	320-563-4490	R
	Traverse	Lundquist, Gene	Wheaton	320-563-8644	C
	Traverse	Raguse, William	Tintah	320-563-4865	C
	Wilkin	Beyer Seed Farm	Kent	218-643-5126	R
	Wilkin	Blilie, Steve	Wolverton	218-995-2815	R
	Wilkin	Friederichs Farm	Foxhome	218-643-2363	R
	Wilkin	Haugrud Seed Plant	Rothsay	218-493-4275	RC
	Wilkin	Knapp Seed Farm, Inc.	Foxhome	218-739-3366	RC
	Wilkin	Kruse & Tischer Farms	Breckenridge	218-643-1100	R
	Wilkin	Larson Farms/Eldon	Rothsay	218-867-2674	R
	Wilkin	Nelson, Bradley	Wolverton	218-995-2299	C
	Wilkin	Steenblock Farms, Dale	Campbell	218-630-5500	C
	Wilkin	Torkelson, Dennis & Brent	Foxhome	218-736-4607	R
	Yellow Med.	Antony, David N.	Porter	507-223-7144	R
	Grandin	Clay	Krabbenhoft & Sons, Inc.	Sabin	218-789-7206
Clearwater		Fredrickson Farms, Donald	Bagley	218-694-2732	C
Polk		Ostenaar, Sidney & DeWayne	Mc Intosh	218-563-7395	C
Red Lake		Vatthauer Farm	Red Lake Falls	218-253-2490	C
Gunner	Kittson	Hunter, Daniel	Lancaster	218-762-5331	C
	Kittson	Petersen, Ronald L.	Lake Bronson	218-754-4631	C
	Polk	Capistran Seed Company	Crookston	218-281-7840	C
	Polk	Danielson, Ellsworth	Fosston	218-435-1729	C
	Polk	Ostenaar, Sidney & DeWayne	Mc Intosh	218-563-7395	C
	Polk	Ross Seed Co.	Fisher	218-891-2211	C
HJ98	Clay	Heartland Seeds	Moorhead	218-585-4621	R
	Clay	Petermann Seed Farms	Hawley	218-483-3302	R
	Clay	Tobolt Seed	Moorhead	218-287-2904	R
	Clay	Zimmerman, Wayne	Ulen	218-596-8628	R
	Grant	Red River Marketing Co.	Elbow Lake	218-685-6100	R
	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	R
	Kittson	Carlson, James A.	Hallock	218-843-3483	R
	Kittson	Nelson, Merle L.	Drayton	218-455-3508	R
	Kittson	Olsonawski, Jerry	Hallock	218-379-3235	R
	Kittson	Petersen, Ronald L.	Lake Bronson	218-754-4631	R
	Kittson	Rickenberg, Jeff	Kennedy	218-674-4231	R
	Kittson	Stewart, H. Shane	St. Vincent	218-379-3282	R
	Kittson	Stewart, Hilson L.	St. Vincent	218-379-3282	R
	Mahnomen	Pazdernik Farms, Inc.	Waubun	218-473-2232	R
	Marshall	Jensen Farms	Stephen	218-478-2476	R
	Marshall	Kowalski, James	Stephen	218-455-3894	R
	Marshall	Kruger Bros. Farms, Inc.	Warren	218-437-8435	R
	Marshall	Riopelle, Earl & Brent	Argyle	218-437-8291	R
	Marshall	Riopelle, Jack L.	Argyle	218-437-8147	R
	Marshall	Rivard Farms, Inc.	Argyle	218-437-6479	R

**Table 4 (continued)** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

HJ98	Marshall	Rivard's Quality Seeds, Inc.	Argyle	218-437-6638	R
	Marshall	Yutzenka, Kevin & Leonard	Argyle	218-437-6468	R
	Norman	Brandt, Wayne & John	Ada	218-784-4774	R
	Norman	Chisholm, Keith P.	Gary	218-356-8674	R
	Norman	Circle C Seeds	Gary	218-356-8214	R
	Norman	Ellingson Farms	Borup	218-861-6605	R
	Otter Tail	Walkup, John	Campbell	218-739-2580	R
	Pennington	Engelstad Farms of Rocksbury	Thief River Falls	218-681-1000	R
	Polk	Danielson, Ellsworth	Fosston	218-435-1729	R
	Polk	Holy, Donald J.	East Grand Forks	218-773-1468	R
	Polk	Larson, Ray H., Inc.	Angus	218-745-5923	R
	Polk	Peterson, D.W., Inc.	Warren	218-745-4507	R
	Polk	Peterson, Douglas	East Grand Forks	218-773-9120	R
	Polk	Thorson Farm, Inc., J. O.	East Grand Forks	218-893-2285	R
	Red Lake	Vatthauer Farm	Red Lake Falls	218-253-2490	R
	Roseau	Kukowski, Jim	Strathcona	218-781-2478	R
	Wilkin	Friederichs Farm	Foxhome	218-643-2363	R
	Wilkin	Knapp Seed Farm, Inc.	Foxhome	218-739-3366	R
	Ingot	Clay	Evert Farms Ltd Partnership	Sabin	218-789-7338
Clay		Wetterlin, Jerry	Glyndon	218-494-3339	R
Grant		Kapphahn, John M.	Elbow Lake	218-685-4604	R
Grant		Red River Marketing Co.	Elbow Lake	218-685-6100	R
Grant		Thiel Seed Service	Wendell	218-458-2415	R
Marshall		Anderson, Harvey & Luther	Stephen	218-455-3305	R
Marshall		Gryskiewicz, Donald & Jeff	Stephen	218-437-8164	R
Marshall		Riopelle, Jack L.	Argyle	218-437-8147	R
Marshall		Rivard Farms, G.A.	Argyle	218-437-6638	R
Polk		Peterson, Douglas	East Grand Forks	218-773-9120	R
Polk		Thorson Farm, Inc., J. O.	East Grand Forks	218-893-2285	R
Polk		Wentzel, Walton Farms, Inc.	Fisher	218-281-2207	R
Wilkin		Friederichs Farm	Foxhome	218-643-2363	R
Wilkin		Nelson, Bradley	Wolverton	218-995-2299	R
Kulm	Freeborn	Albert Lea Seed House, Inc.	Albert Lea	507-373-3161	RC
	Lincoln	Jerzak, William W.	Ivanhoe	507-694-1736	C
	Marshall	Anderson, Harvey & Luther	Stephen	218-455-3305	R
Lars	Clay	Lee Seed Farm	Borup	218-494-3330	C
	Polk	Capistran Seed Company	Crookston	218-281-7840	C
	Renville	Ziller Seed Company, Inc.	Bird Island	320-365-3674	C
Marshall	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	RC
	Lake of Woods	Helmstetter Farm	Roosevelt	218-442-7285	C
	Marshall	Philipp, D. Joe	Goodridge	218-681-5574	C
	Polk	Sonsteli, Gordon & Gary	Winger	218-938-4189	C
	Roseau	Kilen, Jerel	Greenbush	218-782-2883	C
	Roseau	Kukowski, Jim	Strathcona	218-781-2478	C
McKenzie	Out Of State	Terra International	Grand Forks	701-775-8183	R
Nora	Polk	Capistran Seed Company	Crookston	218-281-7840	C
Oxen	Becker	Larson, David G.	Lake Park	218-238-5824	C
	Becker	Steffl, William D.	Callaway	218-375-2283	C
	Big Stone	Clinton Ag Service, Inc.	Clinton	320-325-5203	RC
	Big Stone	Jahnke Farms	Johnson	320-748-7687	C
	Brown	Cunningham Seed Farms	Sleepy Eye	507-794-7323	C
	Brown	Rossbach Lakeside Seeds, Inc.	Hanska	507-794-7698	C
	Clay	Anderson, Lynn	Moorhead	218-287-1765	R
	Clay	Arneson Farms	Hawley	218-483-4165	C
	Clay	Brendemuhl, Inc., M-D	Moorhead	218-233-5192	C
	Clay	Johnson, Brian M.	Hawley	218-962-3316	C
	Clay	Krabbenhoff & Sons, Inc.	Sabin	218-789-7206	C
	Clay	Petermann Seed Farms	Hawley	218-483-3302	RC

**Table 4 (continued)** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

Oxen	Clay	Peterson Farm, Sherwood E.	Baker	218-789-7378	RC
	Clay	Tri-County Co-op Assn.	Ulen	218-596-8821	C
	Clay	Valan, Orlen Jr.	Moorhead	218-236-9479	C
	Clay	Wetterlin, Jerry	Glyndon	218-494-3339	C
	Clay	Zimmerman, Wayne	Ulen	218-596-8628	C
	Dakota	May, Jr., William	Farmington	612-463-8541	C
	Douglas	Sward Seed Farm	Nelson	320-762-0143	C
	Douglas	Thompson Farms	Kensington	320-965-2486	C
	Freeborn	Albert Lea Seed House, Inc.	Albert Lea	507-373-3161	RC
	Grant	Adams Seed	Wendell	218-458-2151	C
	Grant	Backman, Tim	Herman	320-677-2785	C
	Grant	Biss, Larry	Wendell	218-458-2205	R
	Grant	Coleman, Gerald	Elbow Lake	218-685-4707	C
	Grant	Jennen, Richard J. & Sons	Elbow Lake	218-685-4903	R
	Grant	Kramer	Herman	320-677-2680	C
	Grant	Red River Marketing Co.	Elbow Lake	218-685-6100	RC
	Grant	Thiel Seed Service	Wendell	218-458-2415	C
	Grant	Westrom, Myron L.	Elbow Lake	218-685-4232	RC
	Kandiyohi	Behm Seed Company	Atwater	320-974-3003	RC
	Kittson	Johnson Farms, Inc., Lloyd	Karlstad	218-436-2817	C
	Kittson	Olsonawski, Jerry	Hallock	218-379-3235	C
	Kittson	Schwenzfeier Bros.	Hallock	218-754-6891	C
	Lac qui Parle	Buer's Seeds	Canby	507-223-5100	C
	Lac qui Parle	Hermanson Seed Plant	Boyd	320-855-2527	C
	Lac qui Parle	Kemen, Robert & Sons	Madison	320-769-4413	RC
	Lac qui Parle	Madison Farmers Mill & Elev.	Madison	320-598-7351	C
	Lake of Woods	Helmstetter Farm	Roosevelt	218-442-7285	RC
	Lake of Woods	Pieper Farms, Jerry	Williams	218-783-6610	C
	Le Sueur	Dick Stangler Farm Seed	Kilkenny	507-595-2883	RC
	Lincoln	Anderson, Merv	Porter	507-223-7981	R
	Lincoln	Dumke, Allen C.	Hendricks	507-275-3056	C
	Lincoln	Jerzak, Jerome	Ivanhoe	507-694-1582	R
	Lincoln	Jerzak, John	Ivanhoe	507-694-1834	C
	Lincoln	Jerzak, William W.	Ivanhoe	507-694-1736	R
	Lyon	Tracy-Garvin Cooperative	Tracy	507-629-3780	C
	Mahnomen	Bursch Farms, Inc.	Mahnomen	218-935-5353	RC
	Mahnomen	Pazdernik Farms, Inc.	Waubun	218-473-2232	C
	Marshall	Anderson, Brian C.	Stephen	218-455-3495	C
	Marshall	Erickson, Paul	Thief River Falls	218-449-3331	C
	Marshall	Jensen Farms	Stephen	218-478-2476	RC
	Marshall	Kowalski, James	Stephen	218-455-3894	R
	Marshall	Peterson, Maynard	Stephen	218-478-3859	C
	Marshall	Riopelle, Jack L.	Argyle	218-437-8147	R
	Marshall	Sczepanski, Thomas	Stephen	218-478-2462	C
	Marshall	Sinclair, Peter M.	Stephen	218-478-3594	C
	McLeod	Dammann Seed Farms	Plato	320-864-3004	C
	McLeod	Thalmann Seeds Inc.	Plato	320-238-2185	C
	Meeker	Anderson Seeds	Dassel	320-286-2700	C
	Meeker	Johnson Seeds of Dassel, Inc.	Dassel	320-275-2430	C
	Meeker	Miller Seed Farm	Dassel	320-275-2463	RC
	Meeker	Wigen Seed Farm	Litchfield	320-693-8182	C
	Norman	Chisholm, Keith P.	Gary	218-356-8674	R
	Norman	Ellingson Farms	Borup	218-861-6605	C
	Norman	Halland, Barry	Gary	218-356-8791	C
	Norman	Kveno, Harry	Gary	218-356-8278	R
	Norman	Nelson, Kenneth R.	Halstad	218-456-2578	C
	Norman	Peppel Bros. Donald & Dennis	Borup	218-582-3242	C
	Norman	Ramstad Brothers	Ada	218-784-7190	C
	Otter Tail	Walkup, John	Campbell	218-739-2580	C
	Polk	Bauer Farms	Erskine	218-687-5356	C
	Polk	Brule, David A.	Crookston	218-281-2944	C

**Table 4 (continued)** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

Oxen	Polk	Mat - Co., Inc.	Fosston	218-435-6667	RC
	Polk	Novak, James	Angus	218-745-5048	C
	Polk	Peterson, D.W., Inc.	Warren	218-745-4507	R
	Polk	Vig Farms Inc.	Fosston	218-435-1316	RC
	Red Lake	Swenson Seed Farm	Brooks	218-796-5285	RC
	Redwood	Sawvell's Seed, Inc.	Clements	507-692-2240	C
	Renville	Enestvedt Bros.	Sacred Heart	320-765-2728	C
	Renville	JSF, Inc.	Sacred Heart	320-765-2225	C
	Roseau	Habstritt Farms, Inc.	Roseau	218-463-1193	RC
	Roseau	Kukowski, Jim	Strathcona	218-781-2478	C
	Stearns	Middendorf Seed Farm	Sauk Centre	320-352-6053	C
	Stevens	Bruer, Michael C.	Alberta	320-324-7577	C
	Stevens	Haberer Seed Farm	Morris	320-795-2468	C
	Stevens	Haberer, Ann	Morris	320-795-2468	C
	Swift	Busse Seeds	Appleton	320-394-2315	C
	Swift	Falk Seed Farm	Murdock	320-875-4341	RC
	Swift	Gordon Farms, Inc.	Murdock	320-875-3132	C
	Swift	Lee's Seed Farm	Benson	320-843-2857	C
	Swift	Nelson Seed Company	Benson	320-843-3610	C
	Traverse	Lundquist Seed, Inc.	Wheaton	320-563-8622	C
	Traverse	Lundquist, Steven	Wheaton	320-563-8644	C
	Traverse	Rinke, David	Wheaton	320-563-4864	C
	Wilkin	Beyer Seed Farm	Kent	218-643-5126	RC
	Wilkin	Friederichs Farm	Foxhome	218-643-2363	R
	Wilkin	Haugrud Seed Plant	Rothsay	218-493-4275	RC
	Wilkin	Knapp Seed Farm, Inc.	Foxhome	218-739-3366	C
	Wilkin	Steenblock Farms, Dale	Campbell	218-630-5500	C
	Wilkin	Torkelson, Dennis & Brent	Foxhome	218-736-4607	C
	Wright	Terning Seeds, Inc.	Cokato	320-286-2168	C
	Yellow Med.	Antony, David N.	Porter	507-223-7144	RC
Russ	Becker	Hein Farms, Inc.	Audubon	218-439-6621	C
	Becker	Lockhart, Michael	Ulen	218-596-8500	C
	Clay	Baker, Jim & Kurt	Sabin	218-789-7360	C
	Clay	Fuglie, Duane	Ulen	218-596-8528	C
	Clay	Heartland Seeds	Moorhead	218-585-4621	C
	Clay	Johnson, Brian M.	Hawley	218-962-3316	C
	Clay	Krabbenhoft & Sons, Inc.	Sabin	218-789-7206	C
	Clay	Petermann Seed Farms	Hawley	218-483-3302	RC
	Clay	Peterson Farm, Sherwood E.	Baker	218-789-7378	RC
	Clay	Zimmerman, Wayne	Ulen	218-596-8628	C
	Grant	Jennen, Richard J. & Sons	Elbow Lake	218-685-4903	R
	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	RC
	Kittson	Gillie Grain	Hallock	218-754-4931	C
	Kittson	Johnson Farms, Inc., Lloyd	Karlstad	218-436-2817	C
	Lake of Woods	Helmstetter Farm	Roosevelt	218-442-7285	C
	Mahnomen	Bursch Farms, Inc.	Mahnomen	218-935-5353	RC
	Mahnomen	Pazdernik Farms, Inc.	Waubun	218-473-2232	C
	Marshall	Bring, Wesley	Strandquist	218-874-3713	C
	Marshall	Farmers Elevator Company	Alvarado	218-965-4812	C
	Marshall	Jensen Farms	Stephen	218-478-2476	RC
	Marshall	Martin, Doyle A.	Thief River Falls	218-449-3635	C
	Marshall	Peterson, Maynard	Stephen	218-478-3859	R
	Norman	Black Bros.	Fertile	218-945-6343	C
	Norman	Chisholm, Keith P.	Gary	218-356-8674	RC
	Norman	Ellingson Farms	Borup	218-861-6605	C
	Norman	Kveno, Harry	Gary	218-356-8278	C
	Norman	Peppel Bros. Donald & Dennis	Borup	218-582-3242	C
	Otter Tail	Brenden, Bruce L.	Rothsay	218-867-2410	R
	Pennington	Scholin Farms	Thief River Falls	218-964-5268	RC
	Polk	Balstad, Scott	Fosston	218-435-6311	C
	Polk	Caillier, Daniel	Crookston	218-281-2840	C

**Table 4 (continued)** — Potential 1999 hard red spring wheat seed sources known to the Minnesota Crop Improvement Association.

Russ	Polk	Clementson, Jon	Erskine	218-687-2345	C
	Polk	H & J Farms, Inc.	Warren	218-745-5018	C
	Polk	J.E.P. Farm	Euclid	218-745-5915	R
	Polk	Kovar, Frank & Duane	East Grand Forks	218-773-9238	C
	Polk	Mat - Co., Inc.	Fosston	218-435-6667	RC
	Polk	Ostenaar, Sidney & DeWayne	Mc Intosh	218-563-7395	R
	Polk	Peterson, D.W., Inc.	Warren	218-745-4507	R
	Polk	Peterson, Douglas	East Grand Forks	218-773-9120	RC
	Polk	Pulkrabek, Anthony H.	Angus	218-745-5053	C
	Polk	Sonstelie, Gordon & Gary	Winger	218-938-4189	C
	Red Lake	Myhre Farms	Red Lake Falls	218-698-4485	C
	Red Lake	Swenson Seed Farm	Brooks	218-796-5285	RC
	Red Lake	Vatthauer Farm	Red Lake Falls	218-253-2490	C
	Roseau	Kukowski, Jim	Strathcona	218-781-2478	C
	Wilkin	Beyer Seed Farm	Kent	218-643-5126	RC
	Wilkin	Friederichs Farm	Foxhome	218-643-2363	R
	Sharp	Becker	Hein Farms, Inc.	Audubon	218-439-6621
Clay		Evert Farms Ltd Partnership	Sabin	218-789-7338	C
Clay		Heartland Seeds	Moorhead	218-585-4621	C
Clay		Krabbenhoft & Sons, Inc.	Sabin	218-789-7206	C
Clay		Oberg Farms	Moorhead	218-236-9856	C
Clay		Petermann Seed Farms	Hawley	218-483-3302	RC
Clay		Valan, Orlen Jr.	Moorhead	218-236-9479	C
Clay		Wagner, Robert T.	Barnesville	218-789-7212	C
Kittson		Olsonawski, Jerry	Hallock	218-379-3235	C
Polk		Larson Farms, Jerry Larson	Climax	218-857-3345	C
Scott		Hauer Farms, Inc.	Shakopee	612-445-7554	C
Wilkin		Nelson, Bradley	Wolverton	218-995-2299	C
Wilkin		Nordick, J & R	Rothsay	218-867-2605	C
Yellow Med.		Rosetter, Richard D.	Granite Falls	320-564-3620	R
Sharpshooter	Clay	Lee Seed Farm	Borup	218-494-3330	C
	Polk	Capistran, Wayne	Crookston	218-281-5705	C
	Polk	Ross Seed Co.	Fisher	218-891-2211	RC
	Redwood	Sawvell's Seed, Inc.	Clements	507-692-2240	C
	Redwood	Sawvell, Ronald	Clements	507-692-2240	C
	Traverse	Lundquist Seed, Inc.	Wheaton	320-563-8622	C
	Wright	Dahlco Seeds, Inc.	Cokato	320-286-5982	C
Verde	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	RC
	Kittson	Petersen, Ronald L.	Lake Bronson	218-754-4631	C
	Kittson	Rynning Farms	Kennedy	218-674-4425	C
	Kittson	Sorenson, David	Hallock	218-843-3436	R
	Lake o.t. Woods	Helmstetter Farm	Roosevelt	218-442-7285	RC
	Mahnomen	Bursch Farms, Inc.	Mahnomen	218-935-5353	C
	Marshall	Holte, Steven	Grygla	218-294-6537	C
	Marshall	Jensen Farms	Stephen	218-478-2476	C
	Marshall	Kuznia, Kenneth J.	Argyle	218-437-8203	R
	Marshall	Nelson Farm % Doyle	Goodridge	218-681-6972	C
	Marshall	Robertson Brothers	Argyle	218-437-6411	R
	Norman	Chisholm, Keith P.	Gary	218-356-8674	C
	Pennington	Asp, Kenneth	Thief River Falls	218-681-3272	C
	Pennington	Swanson, Curtis W.	Thief River Falls	218-964-5619	C
	Polk	Bergman Farms, James	Oslo	218-965-4913	C
	Polk	Larson Farms, Inc., Ralph	East Grand Forks	218-773-1463	C
	Red Lake	Swenson Seed Farm	Brooks	218-796-5285	C
	Roseau	Kukowski, Jim	Strathcona	218-781-2478	R



## Hard Red Spring Wheat Planting Rate and Date

Rate is based on normal seedbeds and on normal size, good quality seed. Rate used can vary greatly depending on seed cost, desired stand, expected mortality, emerging ability, seed weight, seed germination, seedbed condition, depth of planting and planting equipment. Weight given is the most widely accepted in the U.S.

Bushel Weight (pounds)	Seeds/pound (number)	Rate/acre (pounds)	Rate (seeds)	Planting Date
60	15,200	90-120	29/square foot	Early Spring