



# WHEAT

## Hard Red Spring

tions 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, sound kernels. These ratings should be considered together to reduce risk of loss. To reduce risk, the use of different seeding dates and of more than one variety to provide different days to heading is highly recommended.

### Varieties

**BacUp** – Awned, very early, medium height. Resistant to stem rust, moderately susceptible to leaf rust. Low yield, very high test weight. Fair lodging resistance. Susceptible to foliar diseases. High tolerance to scab. Very high protein percent. Specialty variety release for scab tolerance with recommendation that it not be used on over 15% to 20% of acreage. Released by USDA-ARS and Minn. AES in 1996.

**Forge** – Awned, early, medium height. Moderately resistant to stem rust, moderately susceptible to leaf rust. High to medium yield, high test weight. Good lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1997. **PVF (pending)**

**Ingot** – Awned, early, tall. Resistant to stem rust, moderately susceptible to leaf rust. High to medium yield, very high test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1998. **PVF (pending)**

**Kulm** – Awned, early, medium height. Resistant to stem rust, moderately resistant to leaf rust. High yield and test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. High protein percent. Released by N.D. AES in 1994. **PVF (94)**

**Oxen** – Awned, early, semidwarf. Moderately resistant to stem rust, moderately

susceptible to leaf rust. Very high yield, medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1996. **PVF (94)**

**Sharp** – Awned, early, medium height. Resistant to stem rust, moderately resistant to leaf rust. Medium to high yield, high test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1990.

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

**Ember** – Awned, early-midseason maturity, medium height. Resistant to stem rust, moderately resistant to leaf rust. Medium to low yield and high test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Low to medium protein percent. Released by S.D. AES in 1999. **PVF (pending)**

**Hamer** – Awned, early-midseason maturity, semidwarf. Resistant to stem rust, 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. **PVF (94)**

**2375** – Awned, early-midseason maturity, medium height. Resistant to stem rust, moderately susceptible to leaf rust. High to medium yield and test weight. Fair lodging resistance. Susceptible to foliar diseases. Tolerant to loose smut. Moderately susceptible to shattering. Medium protein percent. Released by Pioneer Hi-Bred in 1988. Sold by

**S**pring wheat varieties are compared in replicated trial plots at Waseca, Lambertson, Morris, Crookston, Stephen, Roseau and St. Paul.

Only new varieties or varieties with better than susceptible reaction to scab are being tested. Variety descriptions do not provide information on scab resistance; table information should be used. Varieties are listed in maturity order. One hard white spring wheat, Argent, is also being tested.

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.

### Crop Background

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.

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

**Characteristics of hard red spring wheat varieties, 1997-1999.**

Variety	Heading date	Height inches	Lodging 1=erect 9=flat	Test Weight, lb/bu	% Protein @ 12 % Moisture	Milling/Baking Quality
BacUp	6-19	33	4.7	61.1	16.8	high
Forge	6-19	33	2.7	59.7	14.8	med
Ingot	6-19	35	3.4	61.3	15.2	high-med
Kulm	6-20	35	3.0	60.0	15.4	high-med
Oxen	6-20	31	3.3	58.3	15.0	med
Sharp	6-20	34	3.5	60.5	14.8	med
Sharpshooter	6-20	34	3.6	60.7	14.8	med
Ember <sup>1</sup>	6-21	33	4.1	59.7	14.2	med
Hamer	6-21	31	2.4	59.0	14.8	med-low
2375	6-22	32	4.7	59.6	14.6	med
Argent <sup>2</sup>	6-22	33	2.6	59.3	15.4	–
Parshall <sup>2</sup>	6-22	36	2.7	60.6	15.4	med-high
Russ	6-22	33	3.7	58.5	14.8	med
HJ98	6-23	31	4.3	57.8	14.4	med
Ivan <sup>2</sup>	6-23	30	2.0	58.8	13.9	med-low
Keene	6-23	37	3.5	58.9	15.2	med-high
Lars	6-23	28	2.4	57.5	14.0	med
Mercury	6-23	28	2.4	58.5	14.4	med
Nora	6-23	28	3.5	57.7	15.4	med
Norm <sup>3</sup>	6-23	31	2.2	57.7	14.1	med-high
NorPro	6-23	31	1.8	58.1	14.9	med
Reeder <sup>1</sup>	6-23	33	2.5	59.2	14.8	med-high
AC Barrie <sup>2</sup>	6-24	36	4.1	58.1	15.3	med
McVey	6-24	33	4.8	56.3	13.6	med-low
Verde	6-24	31	2.7	58.6	14.4	med-low
Gunner	6-25	34	2.9	59.6	15.9	med
Hagar	6-25	31	2.7	57.6	14.8	med
Marshall	6-26	30	1.8	56.9	14.3	med-low
Mean	6-22	32	3.3	58.8	14.9	
LSD	0.8	0.9	0.8	0.7	0.2	

<sup>1</sup>Data from 1999. <sup>2</sup>Data from 1998-1999. <sup>3</sup>Scab-susceptible check.

North Dakota State University Research Foundation 1990. **PVP (94)**

**Argent** – Hard white spring wheat, awned, early-midseason maturity, medium height. Resistant to stem rust, moderately susceptible to leaf rust. Medium to high yield and medium test weight. Good lodging resistance. Moderately susceptible to foliar diseases. High protein percent. Released by N.D. AES in 1998. **PVP (pending)**

**Parshall** – Awned, early-midseason maturity, tall. Resistant to stem rust, moderately resistant to leaf rust. High yield and test weight. Good lodging resistance. Moderately resistant to foliar dis-

eases. High protein percent. Released by N.D. AES in 1999. **PVP (pending)**

**Russ** – Awned, early-midseason maturity, medium height. Moderately resistant to stem rust and leaf rust. Medium to high yield, medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1995. **PVP (94)**

**HJ98** – Awned, midseason, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Very high yield and medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium to low percent pro-

tein. Released by Minn. AES and USDA-ARS in 1998. **PVP (94)**

**Ivan** – Awned, midseason, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Very high yield, medium test weight. Very good lodging resistance. Moderately resistant to foliar diseases. Low to medium protein percent. Released by AgriPro in 1998. **PVP (pending)**

**Keene** – Awned, midseason, tall. Resistant to stem rust, moderately resistant to leaf rust. Medium yield and test weight. Fair lodging resistance. Moderately resistant to foliar diseases. Medium protein percent. Released by N.D. AES in 1997. **PVP (94)**

**Disease susceptibility and tolerances of hard red spring wheat varieties, 1997-1999**

Variety	Leaf Rust <sup>1</sup>	Stem Rust <sup>1</sup>	Foliar Disease <sup>1,2</sup>	Scab Severity <sup>1</sup>	Scab Tolerance <sup>3</sup>
BacUp	MS	R	S	MR	1.5
Forge	MS	MR	MS	MS-S	2.5
Ingot	MS	R	MS	MR-MS	2.0
Kulm	MR	R	MS	S-MS	2.5
Oxen	MS	MR	MS	MS-S	3.0
Sharp	MR	R	MS	MS-MR	2.5
Sharpshooter	MR	R	MS	MS-MR	2.5
Ember <sup>4</sup>	MR-MS	R	MS	MR	2.0
Hamer	MR	R	MR-R	MS-S	3.5
2375	MS	R	S	MS-MR	2.5
Argent <sup>5</sup>	MS	R	MS	MS-MR	2.5
Parshall <sup>5</sup>	MR	R	MR-R	MS-MR	2.0
Russ	MR	MR	MS	MS	3.0
HJ98	MR	R	MS	MS	3.0
Ivan <sup>5</sup>	MR	R	MR	S-MS	3.5
Keene	MR	R	MR	MS-MR	3.0
Lars	MR	R	MR	S	4.5
Mercury	MR	R	MR	S	5.0
Nora	MR	R	S	S	4.0
Norm <sup>6</sup>	R	R	MR-R	S	5.0
NorPro <sup>1</sup>	MR	–	MR	MS	3.5
Reeder <sup>4</sup>	MR	R	MR-R	MS	3.0
AC Barrie <sup>5</sup>	MS	R	MS	MS-MR	2.5
McVey	MR-MS	R	MR-MS	MR	3.0
Verde	MR	R	MR-R	MS	3.0
Gunner	MR-MS	R	MR	MR-MS	2.5
Hagar	MR	R	MS	S-MS	4.0
Marshall	MS	R	MS	MS-S	3.5

<sup>1</sup> R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible. <sup>2</sup> Ratings based on NDSU data from 1996-1998 and U of Minn. data from 1999. <sup>3</sup> Tolerance to maintain plump, sound kernels under scab epidemics: 1=very well, 2=well, 3=moderate, 4=fair, 5=poor. <sup>4</sup> Data from 1999.

<sup>5</sup> Data from 1998-1999. <sup>6</sup> Scab-susceptible check.

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

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

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

**Norm** – Awned, midseason, semidwarf. Resistant to stem rust and to leaf rust. High yield, medium test weight. Good lodging resistance. Moderately resistant to foliar diseases. Low to medium protein percent. Included in trials as a scab

susceptible check. Released by Minn. AES and USDA-ARS in 1992. **FVF**

**NorPro** – Awned, midseason, semi-dwarf. Moderately resistant to leaf rust. High yield, medium test weight. Very good lodging resistance. Moderately resistant to foliar diseases. Medium protein percent. Released by AgriPro in 1999. **FVF (pending)**

**Reeder** – Awned, midseason, medium height. Resistant to stem rust, moderately resistant to leaf rust. High yield and test weight. Good lodging resistance. Moderately resistant to foliar diseases. Medium protein percent. Released by N.D. AES in 1999. **FVF (pending)**

**AC Barrie** – Awnless, midseason-late, tall. Resistant to stem rust and moderately susceptible to leaf rust. Low yield, medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. High to medium protein percent. Released by Agriculture and Agri-Food, Manitoba, Canada, to Cargill in 1997.

**McVey** – Awned, midseason-late maturity, medium height. Resistant to stem rust, moderately resistant to leaf rust. High yield, low test weight. Fair lodging resistance. Moderately resistant to foliar diseases. Low protein percent. Released by Minn. AES and USDA-ARS 1999. **FVF (pending)**

**Verde** – Awned, midseason-late maturity, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Very high yield, medium test weight. Good lodging resistance. Moderately resistant to foliar diseases. Medium to low protein percent. Released by Minn. AES and USDA-ARS in 1995. **FVF (94)**

**Gunner** – Awned, late, medium height. Resistant to stem rust, moderately resistant to leaf rust. Medium yield, high test weight. Good lodging resistance. Moderately resistant to foliar diseases. High protein percent. Released by AgriPro in 1996. **FVF (94)**

**Yield (percent of the mean) of hard red spring wheat varieties, 1997-1999**

Variety	North				South				Average		
	Crookston <sup>1</sup>	Stephen	Roseau	On-Farm <sup>2</sup>	St. Paul <sup>1</sup>	Morris	Waseca	Lamberton	North	South	State
BacUp	90	79	79	89	68	78	68	77	83	75	78
Forge	102	90	96	100	88	93	104	96	96	98	97
Ingot	100	98	97	105	99	115	112	106	100	111	106
Kulm	105	97	97	–	100	106	111	117	100	112	107
Oxen	110	103	111	122	109	120	109	115	109	117	114
Sharp	105	97	96	–	86	104	100	96	100	100	100
Sharpshooter	94	94	97	94	79	89	99	78	96	89	92
Ember <sup>4</sup>	82	92	99	90	102	64	104	85	91	88	89
Hamer	108	102	103	–	117	113	114	113	105	117	112
2375	108	108	106	107	99	99	96	96	109	99	103
Argent <sup>3</sup>	93	90	85	91	84	103	95	106	89	101	96
Parshall <sup>3</sup>	108	94	103	102	94	103	95	106	101	102	102
Russ	89	103	89	119	97	112	121	100	96	111	104
HJ98	112	116	108	101	107	104	104	105	114	107	110
Ivan <sup>3</sup>	122	112	117	125	127	118	111	111	117	117	117
Keene	82	92	93	89	92	92	97	105	92	99	96
Lars	111	106	104	125	124	113	108	105	108	113	111
Mercury	101	109	109	–	123	112	117	112	109	117	114
Nora	96	94	84	95	100	95	86	84	92	92	92
Norm <sup>5</sup>	101	96	108	–	106	101	102	114	103	108	106
NorPro <sup>4</sup>	103	108	97	–	113	104	109	117	103	110	107
Reeder <sup>4</sup>	91	90	95	109	113	118	109	116	92	114	105
AC Barrie <sup>3</sup>	77	78	77	69	79	82	74	81	78	80	79
McVey	102	120	113	108	100	101	106	103	115	105	109
Verde	104	105	115	107	114	100	111	118	110	112	111
Gunner	80	107	90	75	95	90	88	90	95	92	93
Hagar	95	92	110	88	101	91	87	89	101	93	96
Marshall	107	90	97	92	101	72	62	82	98	78	87
Mean (bu/acre)	42.2	47.1	48.9	48.0	40.0	54.0	43.4	45.8	45.9	45.4	45.6
LSD (0.05)	22	18	18	10	21	19	15	15	11	9	8

<sup>1</sup> Data from 1997 and 1999. <sup>2</sup> Data from 12 locations grown in Red River Valley in 1999, not included in North average. <sup>3</sup> Data from 1998 and 1999.

<sup>4</sup> Data from 1999. <sup>5</sup> Scab-susceptible check.

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

**Marshall** – Awned, late, semidwarf. Resistant to stem rust, moderately susceptible to leaf rust. Medium to low yield and test weight. Very good lodging resistance. Moderately susceptible to foliar diseases. Low to medium protein percent. Released by Minn. AES and USDA-ARS in 1982. **PVP**

**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 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:

$$\text{Seeding Rate (Pounds/Acre)} = \frac{(\text{Desired Stand in Plants/Acre}) (1 + \text{Expected Stand Loss})}{[(\text{Seeds/Pound}) (\text{Percentage Germination})]}$$

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	95	113



Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Polk	Balstad, Scott, Fosston	218-435-6311	C	Marshall	Baird Farms, Inc., Warren	218-745-5330	C R
Polk	Barrett, John M., East Grand Forks	218-773-0338	C	Marshall	Field, William, Stephen	218-478-3508	C
Polk	Brule, David A., Crookston	218-281-2944	C	Marshall	Hammerlund Farms, Oslo	218-695-3481	C
Polk	Larson Farms, Jerry Larson, Climax	218-857-3345	C	Marshall	Jensen Farms, Stephen	218-478-3398	C R
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	C	Marshall	McGlynn, Neil, Stephen	218-478-2777	C
Redwood	Hagen, Don, Belview	507-641-5327	C	Marshall	Peterson, Maynard, Stephen	218-478-3859	R
Renville	Hanson Seeds, Fairfax	507-426-7320	C	Marshall	Pietruszewski, Alan, Stephen	218-478-2431	C
Roseau	Cenex Harvest States Elevator, Badger	218-528-3205	C	Marshall	Riopelle, Jack L., Argyle	218-437-8147	R
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C	Marshall	Robertson Brothers, Argyle	218-437-6411	C
Stevens	Haberer Seed Farm, Morris	320-795-2468	C	Marshall	Sczepsanski, Thomas, Stephen	218-478-2462	C
Wilkin	Beyer Seed Farm, Kent	218-643-5126	C	Marshall	Stusynski, David, Standquist	218-436-2717	C
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	C	McLeod	Thalmann Seeds Inc., Plato	320-238-2185	C
Wilkin	Nordick, J & R, Rothsay	218-867-2605	C	Norman	Brandt, Robert, Ada	218-784-4093	C
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C	Norman	Chisholm, Tim, Gary	218-356-8507	C
Wright	Dahlco Seeds, Inc., Cokato	320-286-5982	C	Norman	Peppel Bros. Donald & Dennis, Borup	218-582-3242	C
Wright	Hopkins, Joseph, Buffalo	612-682-1868	C	Otter Tail	Brenden, Selvin C., Rothsay	218-867-2134	C
Wright	Terning Seeds, Inc., Cokato	320-286-2168	C	Out of state	Anderson, Gerald D, Grand Forks, N.D.	701-775-8766	C
<b>A99ar</b>				Pennington	Scholin Farms, Thief River Falls	218-964-5268	C R
Wright	Terning Seeds, Inc., Cokato	320-286-2168	C	Polk	Anderson Farms, Inc., J D, East Grand Forks	218-773-2280	C
<b>AC Barrie</b>				Polk	Bauer Farms, Erskine	218-687-5356	C
Kittson	Bloomquist Farms, Inc., Drayton	218-455-3863	C R	Polk	Brule, David A., Crookston	218-281-2944	C
Pennington	Scholin Farms, Thief River Falls	218-964-5268	R	Polk	Caillier, Daniel, Crookston	218-281-2840	C
Polk	Barrett, Glenn R., Angus	218-745-4782	R	Polk	Capistran Seed Company, Crookston	218-281-7840	C
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R	Polk	Egeland, Inc., John M., Fisher	218-893-2662	C
<b>Argent</b>				Polk	H & J Farms, Inc., Warren	218-745-5018	R
Clay	Zimmerman, Wayne, Ulen	218-596-8628	R	Polk	Hanson, Paul M, Crookston	218-281-5898	C
Marshall	Kowalski, James, Stephen	218-478-3899	R	Polk	Kovar, Frank & Duane, East Grand Forks	218-773-9238	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R	Polk	Larson Farms, Inc., Ralph, East Grand Forks	218-773-1463	C
Wright	Klein, Christopher, Monticello	612-295-2270	R	Polk	Larson, Roger O., Euclid	218-281-5697	C
<b>BacUp</b>				Polk	Mat - Co., Inc., Fosston	218-435-6667	C
Polk	Pulkrabek, Anthony H., Angus	218-745-5053	R	Polk	Mid-Valley Grain Cooperative, Crookston	218-281-2881	C
<b>Ember</b>				Polk	Novak, James, Angus	218-745-5048	C
Grant	Adams Seed, Wendell	218-458-2151	R	Polk	Peterson, Douglas, East Grand Forks	218-773-9120	C R
Grant	Biss, Larry, Wendell	218-458-2205	R	Polk	Ross Seed Co., Fisher	218-891-2211	C
Lac qui Parle	Harwick, Kenneth, Madison	320-752-4455	R	Polk	Sonstelie, Gordon & Gary, Winger	218-938-4189	C
Marshall	Riopelle, Jack L., Argyle	218-437-8147	R	Polk	Thompson, Ordean H., East Grand Forks	218-773-2251	C
Otter Tail	Keller, Clifford L., Fergus Falls	218-736-4664	R	Red Lake	Myhre Farms, Red Lake Falls	218-698-4485	C
Traverse	Johnson, Robert, Wheaton	320-563-4490	R	Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	R	Red Lake	Vatthauer Farm, Red Lake Falls	218-253-2490	C
<b>Forge</b>				Roseau	Cenex Harvest States Elevator, Badger	218-528-3205	C
Becker	Hein Farms, Inc., Audubon	218-439-6621	C	Traverse	Lundquist Seed, Inc., Wheaton	320-563-8622	C
Clay	Fuglie, Duane, Ulen	218-596-8528	C	Traverse	Lundquist, Gene, Wheaton	320-563-8644	C
Clay	Hastings Farms LLP, Joseph & John, Felton	218-494-3935	C	Wilkin	Beyer Seed Farm, Kent	218-643-5126	C
Clay	Johnson, Brian M., Hawley	218-962-3316	C	Wilkin	Friederichs Farm, Foxhome	218-643-2363	R
Clay	Krabbenhof & Sons, Inc., Sabin	218-789-7206	C	Wilkin	Nelson, Bradley, Wolverton	218-995-2299	C
Clay	Lee Seed Farm, Borup	218-494-3330	C	Wilkin	Nordick, J & R, Rothsay	218-867-2605	C
Clay	Olek, Bradley, Felton	218-494-3440	C	Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C
Clay	Peterson Farm, Sherwood E., Baker	218-789-7378	C R	<b>Gunner</b>			
Clay	Sillers Farm, Moorhead	218-233-7841	C	Clay	Lee Seed Farm, Borup	218-494-3330	C
Clay	Thompson, Richard, Barnesville	218-789-7208	C	Kittson	Hunter, Daniel, Lancaster	218-762-5331	C
Clay	Tri-County Co-op Assn., Ulen	218-596-8821	C	Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C
Clay	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	C	Polk	Capistran Seed Company, Crookston	218-281-7840	C R
Clay	Zimmerman, Wayne, Ulen	218-596-8628	C	Polk	Capistran, Kevin, Crookston	218-281-5705	C
Grant	Adams Seed, Wendell	218-458-2151	C	Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Kandiyohi	Loge, Alan, Willmar	320-235-4178	C	Polk	Ostena, Sidney & DeWayne, Mc Intosh	218-563-7395	C
Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C R	Polk	Ross Seed Co., Fisher	218-891-2211	C R
Kittson	Klein, David, Hallock	218-843-2451	C	<b>HJ98</b>			
Kittson	Kotchman, James W., Pembina	701-825-6821	C	Clay	Heartland Seeds, Moorhead	218-585-4621	R
Kittson	Oswski, Terry, Hallock	218-843-3371	C	Clay	Petermann Seed Farms, Hawley	218-483-3302	C R
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C	Douglas	Sward Seed Farm, Nelson	320-762-0143	R
Kittson	Stewart, Hilson L., St. Vincent	218-379-3282	C	Grant	Red River Marketing Co., Elbow Lake	218-685-6100	C
Lac qui Parle	Harwick, Kenneth, Madison	320-752-4455	R	Grant	Thiel Seed Service, Wendell	218-458-2415	C
Lake Of Woods	Helmstetter Farm, Roosevelt	218-442-7285	C	Grant	Westrom, Chad B., Elbow Lake	218-685-4232	R
Lincoln	Anderson, Merv, Porter	507-223-7981	C	Kandiyohi	Behm Seed Company, Atwater	320-974-3003	R
Marshall	Backstrom Farms, Inc., Warren	218-745-5113	C	Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C R
				Kittson	Gillie Grain, Hallock	218-754-4931	C
				Kittson	Johnson Farms, Inc., Lloyd, Karlstad	218-436-2817	R



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Kittson	Klein, Todd, Scott & Kevin, Hallock	218-843-2764	C	Clay	Evert Farms Ltd Partnership, Sabin	218-789-7338	C R
Kittson	Nelson, Merle L., Drayton, N.D.	218-455-3508	C	Clay	Heartland Seeds, Moorhead	218-585-4621	C
Kittson	Olsonawski, Jerry, Hallock	218-379-3235	C	Clay	Ness, Larry, Moorhead	218-585-4179	C
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C	Clay	Nord, Donald & John, Hawley	218-937-5783	C
Kittson	Schwenzfeier Bros., Hallock	218-754-6891	R	Clay	Petermann Seed Farms, Hawley	218-483-3302	C R
Kittson	Stewart, H. Shane, St. Vincent	218-379-3282	C	Clay	Zimmerman, Wayne, Ulen	218-596-8628	C
Kittson	Stewart, Hilson L., St. Vincent	218-379-3282	C	Douglas	Sward Seed Farm, Nelson	320-762-0143	R
Kittson	Wiese, Inc., Kenneth A., Humboldt	218-379-3120	R	Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Lake Of Woods	Helmstetter Farm, Roosevelt	218-442-7285	R	Grant	Coleman, Gerald, Elbow Lake	218-685-4707	C
Mahnomen	Bursch Farms, Inc., Mahnomen	218-935-5353	C R	Grant	Kapphahn, John M., Elbow Lake	218-685-4604	C R
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C	Grant	Thiel Seed Service, Wendell	218-458-2415	C R
Marshall	Anderson, Harvey & Luther, Stephen	218-455-3305	R	Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C R
Marshall	Backstrom Farms, Inc., Warren	218-745-5113	R	Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C R
Marshall	Baird Farms, Inc., Warren	218-745-5330	C R	Kittson	Carlson, James A., Hallock	218-843-3483	C
Marshall	Circle M, Warren	218-745-5610	C	Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C
Marshall	Farmers Elevator Company, Alvarado	218-965-4812	C	Lac qui Parle	Buer, Reid, Canby	507-223-7946	C
Marshall	Green, Carl M., Strandquist	218-597-2861	C	Lincoln	Anderson, Merv, Porter	507-223-7981	R
Marshall	Hoper, Gary J., Stephen	218-478-2441	C	Lincoln	Jerzak, Jerome, Ivanhoe	507-694-1582	R
Marshall	Jensen Farms, Stephen	218-478-3398	C R	Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C
Marshall	Kowalski, James, Stephen	218-478-3899	C R	Marshall	Backstrom Farms, Inc., Warren	218-745-5113	C
Marshall	Kruger Bros. Farms, Inc., Warren	218-437-8435	C	Marshall	Circle M, Warren	218-745-5610	C
Marshall	Kuznia, Kenneth J., Argyle	218-437-8203	R	Marshall	Farmers Elevator Company, Alvarado	218-965-4812	C
Marshall	Omdahl Ridge Farms, Grand Forks	218-745-5595	R	Marshall	Hammerlund Farms, Oslo	218-695-3481	C
Marshall	Peterson, Maynard, Stephen	218-478-3859	R	Marshall	Kowalski, James, Stephen	218-478-3899	R
Marshall	Riopelle, Earl & Brent, Argyle	218-437-8291	C	Marshall	Riopelle, Jack L., Argyle	218-437-8147	R
Marshall	Riopelle, Jack L., Argyle	218-437-8147	R	Marshall	Robertson Brothers, Argyle	218-437-6411	R
Marshall	Sczepanski, Thomas, Stephen	218-478-2462	C R	Marshall	Sczepanski, Thomas, Stephen	218-478-2462	C R
Marshall	Yutzenka, Don and Mark, Argyle	218-437-8428	C	McLeod	Klapotz, John E., Hutchinson	320-587-8080	R
Norman	Brandt, Wayne G. & John, Ada	218-784-4774	C	Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Norman	Chisholm, Keith P., Gary	218-356-8674	C R	Norman	Borge, Brian, Ada	218-784-2168	C
Norman	Chisholm, Michael, Gary	218-356-8507	C	Norman	Brandt, Robert Jr., Ada	218-784-4093	R
Norman	Krogstad, Jimmie, Fertile	218-945-6242	C	Norman	Brandt, Wayne G. & John, Ada	218-784-4774	R
Norman	Krogstad, Steve, Fertile	218-945-6336	C	Norman	Chisholm, Keith P., Gary	218-356-8674	R
Norman	Sirjord Farms, Bejou	218-356-8285	C	Otter Tail	Walkup, John, Campbell	218-739-2580	C
Norman	Sirjord, Avery, Gary	218-356-8631	R	Out of state	Anderson, Gerald D., East Grand Forks	701-775-8766	C R
Otter Tail	Walkup, John, Campbell	218-739-2580	C	Pennington	Scholin Farms, Thief River Falls	218-964-5268	R
Pennington	Engelstad Farms of Rocksbury, Thf Rvr Falls	218-681-1000	C	Polk	Amiot, Regis, Crookston	218-281-1255	R
Pennington	Farmers Co-op Grain & Seed, Thf Rvr Falls	218-681-6281	C	Polk	Brule, David A., Crookston	218-281-2944	C
Pennington	Swanson, Curtis W., Thief River Falls	218-964-5619	C	Polk	Caillier, Daniel, Crookston	218-281-2840	C
Polk	Balstad, Scott, Fosston	218-435-6311	R	Polk	Capistran Seed Company, Crookston	218-281-7840	C
Polk	Danielson, Ellsworth, Fosston	218-435-1729	R	Polk	Hanson, Paul M., Crookston	218-281-5898	C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C	Polk	Kasprick Farms, Angus	218-745-5016	C
Polk	Gullekson, Ray, Brent & Brian, Beltrami	218-926-5642	R	Polk	Kovar, Frank & Duane, East Grand Forks, N.D.	218-773-9238	C
Polk	Holy, Donald J., East Grand Forks	218-773-1468	C	Polk	Larson Farms, Jerry Larson, Climax	218-857-3345	C
Polk	Larson, Ray H., Inc., Angus	218-745-5923	C	Polk	Larson, Arlan Farms, Inc., Climax	218-857-2535	C
Polk	Mack Farms, Inc., Ron, East Grand Forks	218-773-2601	C	Polk	Mack Farms, Inc., Ron, East Grand Forks	218-773-2601	C
Polk	Mat - Co., Inc., Fosston	218-435-6667	C R	Polk	Mat - Co., Inc., Fosston	218-435-6667	C R
Polk	Ostena, Sidney & DeWayne, Mc Intosh	218-563-7395	C	Polk	Novak, James, Angus	218-745-5048	C
Polk	Peterson, D.W., Inc., Warren	218-745-4507	C R	Polk	Peterson, D.W., Inc., Warren	218-745-4507	C
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R	Polk	Peterson, Douglas, East Grand Forks	218-773-9120	C R
Polk	Ross Seed Co., Fisher	218-891-2211	C	Polk	Ross Seed Co., Fisher	218-891-2211	C
Polk	Thorson Farm, Inc., J. O., East Grand Forks	218-893-2285	C R	Polk	Thorson Farm, Inc., J. O., East Grand Forks	218-893-2285	R
Polk	Vig Farms Inc., Fosston	218-435-1316	C	Polk	Vig Farms Inc., Fosston	218-435-1316	R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C R	Polk	Wentzel, Walton Farms, Inc., Fisher	218-281-2207	C
Roseau	Cenex Harvest States Elevator, Badger	218-528-3205	C	Red Lake	Nymann Farms, Erik Nymann, Plummer	218-465-4421	C R
Stevens	Bruer, Michael C., Alberta	320-324-7577	C	Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R
Wilkin	Friederichs Farm, Foxhome	218-643-2363	C	Red Lake	Whalen, Greg, Oklee	218-796-5379	C
Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C	Stevens	Bruer, Michael C., Alberta	320-324-7577	C
Wilkin	Steenblock Farms, Dale, Campbell	218-630-5500	C	Stevens	Haberer Seed Farm, Morris	320-795-2468	C
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	R	Swift	Falk Seed Farm, Murdock	320-875-4341	R
<b>Ingot</b>				Swift	Klassen, Jim, Benson	320-843-4176	R
Becker	Flottesch, Jerome, Callaway	218-375-2141	C	Traverse	Johnson, Merton, Wheaton	320-563-8025	R
Becker	Larson, David G., Lake Park	218-238-5824	C	Traverse	Triple E Farms, Inc., Wheaton	320-563-4239	C
Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	C	Wilkin	Beyer Seed Farm, Kent	218-643-5126	C R
Big Stone	Olson, Wesley E., Clinton	320-325-5565	C	Wilkin	Friederichs Farm, Foxhome	218-643-2363	C R
Clay	Anderson, Lynn, Moorhead	218-287-1765	R	Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C
Clay	Benedict Farms, Inc., Sabin	218-789-7326	C	Wilkin	Nelson, Bradley, Wolverton	218-995-2299	C R

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Wilkin	Nordick, J & R, Rothsay	218-867-2605	C	Marshall	Kuznia, Kenneth J., Argyle	218-437-8203	R
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	R	Marshall	Omdahl Ridge Farms, Grand Forks	218-745-5595	C R
<b>Ivan</b>							
Grant	Thiel Seed Service, Wendell	218-458-2415	C	Marshall	Peterson Farms of Warren, Warren	218-745-4077	C R
Kittson	Hunter, Daniel, Lancaster	218-762-5331	C	Marshall	Riopelle, Earl & Brent, Argyle	218-437-8291	R
Polk	Capistran Seed Company, Crookston	218-281-7840	C R	Marshall	Riopelle, Jack L., Argyle	218-437-8147	R
Polk	Ross Seed Co., Fisher	218-891-2211	C	Marshall	Riopelle, Larry, Argyle	218-437-8247	R
<b>Kulm</b>							
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R	Marshall	Rivard Farms, Inc., Argyle	218-437-6479	R
<b>Lars</b>							
Renville	Ziller Seed Company, Inc., Bird Island	320-365-3674	C	Marshall	Rivard's Quality Seeds, Inc., Argyle	218-437-6638	C
<b>McKenzie</b>							
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C	Marshall	Sczepanski, Thomas, Stephen	218-478-2462	R
Out of State	Terra International, Grand Forks, N.D.	701-775-8183	C R	Marshall	Setterholm, Glenn, Argyle	218-437-8294	C
<b>McVey</b>							
Clay	Anderson, Edmund L., Ulen	218-596-8605	R	Marshall	Widner, Neil, Stephen	218-478-3616	C
Clay	Arneson Farms, Hawley	218-483-4165	R	Marshall	Yutrzenka, Don and Mark, Argyle	218-437-8428	R
Clay	Lee Seed Farm, Borup	218-494-3330	C R	Norman	Bernhardson, Charles E., Shelly	218-886-7335	R
Clay	Pearson, Karol G., Georgetown	218-861-6668	R	Norman	Borge, Brian, Ada	218-784-2168	C
Clay	Petermann Seeds, Inc., Hawley	218-483-3302	R	Norman	Brandt, Robert, Ada	218-784-4093	R
Clay	Peterson Farm, Sherwood E., Baker	218-789-7378	R	Norman	Brandt, Wayne G. & John, Ada	218-784-4774	R
Clay	Sillers Farm, Moorhead	218-233-7841	R	Norman	Chisholm, Keith P., Gary	218-356-8674	R
Clay	Tande, Harmen, Moorhead	218-233-0250	R	Norman	Chisholm, Kevin J., Gary	218-945-6116	C
Clay	Tobolt Seed, Moorhead	218-287-2904	R	Norman	Chisholm, Mark M., Gary	218-356-8507	C
Grant	Adams Seed, Wendell	218-458-2151	R	Norman	Ellingson Farms, Borup	218-861-6605	C R
Grant	Jennen, Richard J. & Family, Elbow Lake	218-685-4903	R	Norman	Johnson, Donald, Borup	218-784-7569	C
Grant	Kapphahn, John M., Elbow Lake	218-685-4604	R	Norman	Kappes, Peter, Ada	218-784-7581	C
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	R	Pennington	Dahlen, David E., Goodridge	218-378-4422	C
Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	R	Pennington	Engelstad Farms of Rocksbury, Thf Rvr Falls	218-681-1000	C R
Kittson	Carlson, James A., Hallock	218-843-3483	R	Pennington	Swanson, Curtis W., Thief River Falls	218-964-5619	R
Kittson	Cosley Seed Plant, Humboldt	218-379-3295	C	Polk	Balstad, Scott, Fosston	218-435-6311	R
Kittson	Dowdle Farms, Inc., Kennedy	218-466-2181	C	Polk	Clementson, Jon, Erskine	218-687-2345	C
Kittson	Finney, John N., Humboldt	218-379-3163	C	Polk	Danielson, Ellsworth, Fosston	218-435-1729	R
Kittson	Johnson Farms, Inc., Lloyd, Karlstad	218-436-2817	C	Polk	Dufault, Tim, Crookston	218-281-1880	C
Kittson	Nelson, Merle L., Drayton, N.D.	218-455-3508	R	Polk	Farmers Co-operative Co., Winger	218-938-4126	C
Kittson	Olsonawski, Jerry, Hallock	218-379-3235	R	Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Kittson	Osovski, Terry, Hallock	218-843-3371	C	Polk	Gullekson, Ray, Brent & Brian, Beltrami	218-926-5642	C
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C R	Polk	J.E.P. Farm, Euclid	218-745-5915	C
Kittson	Rynning Farms, Kennedy	218-674-4425	C	Polk	Larson Farms, Inc., Ralph, East Grand Forks	218-773-1463	R
Kittson	Schwenzfeier Bros., Hallock	218-754-6891	R	Polk	Larson, Ray H., Inc., Angus	218-745-5923	R
Kittson	Sedenquist Farms, Inc., Kennedy	218-674-4218	C R	Polk	LeMar Farms, Inc., Crookston	218-281-5608	C
Kittson	Sorenson, David, Hallock	218-843-3436	C R	Polk	Mat - Co., Inc., Fosston	218-435-6667	R
Kittson	Stewart, H. Shane, St. Vincent	218-379-3282	R	Polk	Ostenaar, Sidney & DeWayne, Mc Intosh	218-563-7395	R
Kittson	Stewart, Hilson L., St. Vincent	218-379-3282	R	Polk	Peterson, D.W., Inc., Warren	218-745-4507	C R
Kittson	Stromgren Farms, Lake Bronson	218-754-7405	R	Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R
Kittson	Sugden, William, Hallock	218-843-2593	R	Polk	Pulkrabek Farms, Inc. Gary, Angus	218-745-5891	R
Kittson	Webster Farms, Inc. J & N, Kennedy	218-674-4497	R	Polk	Ross Seed Co., Fisher	218-891-2211	C
Kittson	Weinlaeder Seed Company, Drayton, N.D.	701-454-6427	C	Polk	Tiedemann, Gene R., Euclid	218-281-6723	R
Kittson	Wiese, Inc., James C., Humboldt	218-379-3257	C	Polk	Vig Farms Inc., Fosston	218-435-1316	C
Kittson	Wiese, Inc., Kenneth A., Humboldt	218-379-3120	C	Polk	Wentzel, Walton Farms, Inc., Fisher	218-281-2207	R
Kittson	Younggren, Dan, Hallock	218-843-3318	C	Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
Lake Of Woods	Helmstetter Farm, Roosevelt	218-442-7285	R	Red Lake	Vatthauer Farm, Red Lake Falls	218-253-2490	R
Mahnomen	Bursch Farms, Inc., Mahnomen	218-935-5353	C R	Roseau	Kukowski, Jim, Strathcona	218-781-2478	R
Mahnomen	Greenhills, Inc., Mahnomen	218-935-2446	C	Roseau	Lund, Ludvig, Roseau	218-463-1029	R
Mahnomen	Haugo, David, Waubun	218-473-2254	R	Roseau	Magnusson Farms, Roseau	218-463-2374	R
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C	Roseau	McFarlane Seeds, Inc., Greenbush	218-782-2700	R
Marshall	Aakre, Leif, Stephen	218-478-3086	C	Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	R
Marshall	Anderson, Harvey & Luther, Stephen	18-455-3305	R	Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C
Marshall	Anderson, Joel, Alvarado	218-965-4597	C	<b>Nora</b>			
Marshall	Backstrom Farms, Inc., Warren	218-745-5113	R	Polk	Capistran Seed Company, Crookston	218-281-7840	R
Marshall	Baird Farms, Inc., Warren	218-745-5330	C R	<b>Norm</b>			
Marshall	Circle M, Warren	218-745-5610	C	Grant	Westrom, Chad B., Elbow Lake	218-685-4232	R
Marshall	Gostanzik, Stan, Argyle	218-437-8149	R	<b>Oxen</b>			
Marshall	Jensen Farms, Stephen	218-478-3398	R	Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	C R
Marshall	Kowalski, James, Stephen	218-478-3899	R	Brown	Rosbach Lakeside Seeds, Inc., Hanska	507-794-7698	C
Marshall	Kruger Bros. Farms, Inc., Warren	218-437-8435	C R	Clay	Brendemuhl, Inc., M-D, Moorhead	218-233-5192	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	Oberg Farms, Moorhead	218-236-9856	C
				Clay	Petermann Seed Farms, Hawley	218-483-3302	C R



