

BARLEY

VARIETY TRIALS

**Minnesota Agricultural Experiment Station — University of Minnesota
December 1998**

This is a report on results of barley productivity tests conducted by the Minnesota Agricultural Experiment Station. It was prepared by Donald C. Rasmusson, agronomist (612-625-7278; <rasmu002@tc.umn.edu>), and Edward Schiefelbein, scientist (612-625-0250; <schie003@tc.umn.edu>), Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul, MN 55108.

Successful barley production depends to a considerable extent on selecting the best varieties for a particular farm. For that reason, varieties are compared in trial plots on Minnesota Agricultural Experiment Station fields at St. Paul, Morris and Crookston, and on fields of cooperating farmers in Stephen and Roseau. Important old varieties and new varieties are grown in replicated plots at each location. These plots are handled so that factors affecting yield and other characteristics are nearly the same for all varieties at each location.

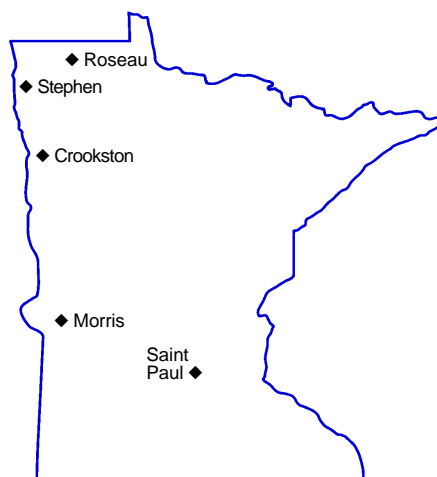
Variety Classifications

Barley varieties are classed into groups under the headings “recommended public varieties,” “special purpose variety,” and “other varieties.” Variety descriptions are arranged alphabetically within groups. Classifications of barley varieties into the respective groups are determined each year by the Experiment Station Crop Variety Review Committee.

A variety is usually not eligible for the “recommended” group unless it has out performed other varieties in important characteristics in three years of testing. Listings in an “other varieties” category are usually inferior in one or more characteristics, as demonstrated in comparative tests.

Seed Sources

Seed of tested and other barley varieties may be eligible for certification, and the use of certified seed is suggested. However, certification does not imply recommendation. Table 5



Locations where barley trials were conducted for this report.

lists possible barley 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).

Fusarium Head Blight

Fusarium head blight (scab) caused losses in barley again in 1998. The largest loss was due to vomitoxin (DON), but yield and quality were also reduced. Vomitoxin level in harvested grain was down from 1997, but still caused discounting in the marketplace in many areas.

Interpreting the Tables

The LSD (Least Significance Difference) values associated with the data in table 1 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 yielding.

A 5 percent level of significance is used in the table. This means that yield differences exceeding the stated LSD value are real 95 percent of the time. If the difference is less than the LSD, greater attention should be given to other traits which are also 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.

New Variety

MNBrite, a new barley with intermediate resistance to Fusarium head blight, was released by the Minnesota Agricultural Experiment Station in 1998. Seed will be available for commercial production in 1999. See description below and data in tables 3 and 4 on scab severity and toxin (DON) level in MNBrite compared to Robust and Stander.

Variety Recommendation Groups

Recommended Public Varieties

Foster — Medium yield. Maturity similar to Robust. Kernel plumpness good, similar to Robust. Intermediate in lodging reaction between Robust and Stander. Resistant to spot blotch. Six-rowed, semi-smooth awns, colorless aleurone. Has long rachilla hairs allowing grain to be distinguished from that of Robust and Stander. Classified as a malting variety by American Malting Barley Association (AMBA). Some discounting in the marketplace has occurred as compared to Robust. Developed by the North Dakota Agricultural Experiment Station from a cross involving Robust, ND 5570, Glenn and Karl. Released 1995. **PVP**

MNBrite — Provides some protection against Fusarium head blight (scab); has about one-half as many infected kernels per head as Robust and Stander, and its toxin level (DON)

is also about one-half of Robust and Stander. The kernels are brighter and more disease-free than for other varieties, hence the name MNBrite. It is similar to Robust in yield, maturity, and kernel plumpness, as well as lodging reaction, except that the straw is more fragile at maturity. Resistant to spot blotch. Malting and brewing quality evaluation by industry is underway. One concern is that MNBrite is higher in grain protein than Robust. Six-rowed, semi-smooth awns, colorless aleurone. Grain samples difficult to distinguish from Robust and Stander. Developed by the Minnesota Agricultural Experiment Station. Released 1998. **PVP** (pending)

Robust — Medium yield and medium maturity. Fair lodging resistance and kernel plumpness. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. Classified as a malting variety by AMBA. Robust is currently the six-rowed variety of choice for malting and brewing in the Midwest. Resistant to spot blotch. Developed by the Minnesota Agricultural Experiment Station from a cross of Morex and Manker. Released 1983. **PVP**

Stander — High yield. Superior in lodging resistance to Robust and Foster. Good kernel plumpness, similar to Foster. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. While classified as a malting variety by AMBA, some maltsters and brewers prefer Robust over Stander. Resistant to spot blotch. Developed by the Minnesota Agricultural Experiment Station from crosses involving Excel, Robust, and Bumper. Released 1993. **PVP**

Special Purpose Variety

Royal — Intended for use as a forage-companion crop and feed-grain variety. Not a malting type. Six-rowed, semi-smooth awn, blue aleurone, semidwarf stature. Forage quality superior to taller varieties based on digestibility and intake potential; low in fiber and lignin. Similar to Robust in forage protein and forage yield at the soft dough stage. Compared to taller barley and oat varieties, it competes less with underseeded forage legumes because of its short stature and superior lodging resistance. Resistant to spot blotch. Developed by the the Minnesota Agricultural Experiment Station from crosses involving Robust, Azure and semidwarf Minn. M32. Released 1994. **PVP**

Other Varieties

Bowman — Medium yield. Medium maturity. Very good kernel plumpness. Medium lodging resistance. Two-rowed, smooth awns, long rachilla hairs, colorless aleurone. Not approved for malting by AMBA. Limited demand for two-rowed non-malting type in Minnesota. Similar to Robust in resistance to leaf diseases. Developed by North Dakota Agricultural Experiment Station from cross involving several parents. Released 1984.

Excel — High yield. Medium maturity. Similar to Robust in lodging resistance. Kernel plumpness lower than Robust. Six-rowed semi-smooth awn, colorless aleurone. Has long rachilla hairs allowing grain to be distinguished from that of Robust and Stander. Classified as a malting variety by AMBA. Resistant to spot blotch. Developed by the Minnesota Agricultural Experiment Station from a cross involving Robust, Manker and a sister-line of Morex. Released 1990. **PVP**

Morex — Low yield. Susceptible to lodging. Kernel plumpness intermediate. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. Awns may drop off as crop approaches maturity. Threshes easily. Classified as a malting variety by AMBA. Moderate resistance to spot blotch. Developed by the Minnesota Agricultural Experiment Station from a cross of Cree and Bonanza. Released 1978. **PVP**

Acknowledgements, Permissions and Caveats

Field plot supervision and assistance was provided by, David LeGare, John Wiersma at Crookston, and staff at Morris. Information on the reaction of varieties to specific pathogens was largely obtained by Ruth Dill-Macky, Department of Pathology.

Publication project chair is Leland L. Hardman, professor, Agronomy and Plant Genetics. Web product manager for extension communications is Larry A. Etkin, senior editor.

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Table 1 — Grain yield of selected barley varieties in bushels per acre, 1996-1998.

Variety	Crookston	Morris	Stephen	St.Paul	Roseau	Average
<i>Number of trials</i>	7	5	2	4	2	20
Robust	99	104	102	78	80	94
Stander	117	112	107	91	87	106
Foster	110	108	100	90	79	101
MNBrite	104	106	104	82	83	98
LSD 5%	5	8	10	8	11	4

Table 2 — Agronomic traits of selected barley varieties, 1996-1998.

Variety	Heading Date	Height (cm)	Lodging %	Plump %
<i>Number of trials</i>	12	13	6	6
Robust	6-22	91	46	80
Foster	6-22	89	47	80
MNBrite	6-23	89	44	78
Stander	6-24	84	38	82

Table 3 — Scab severity, percent infected kernels/spike in selected barley varieties, 1996-1998.

"Inoculated Mindak" trials are a cooperative tri-state FHB nursery grown at Crookston and St. Paul, Minnesota, and Fargo and Langdon, North Dakota.

"Non-Inoculated A-Screening" locations are Crookston, Morris and St. Paul, Minnesota.

Variety	Inoculated		Non-Inoculated	
	Mindak	A-Screening	Crookston, MN	Langdon, ND
	<i>4 locations</i>	<i>2 years, 3 locations</i>	<i>3 trials</i>	<i>2 trials</i>
Robust	20	30	10	15
Foster	20	—	—	15
MNBrite	12	14	05	06
Stander	29	37	11	15

Table 4 — Toxin (DON, ppm) values in selected barley varieties.

Variety	Crookston, 3 trials, 1996	Crookston, 2 trials, 1998	
	Natural	Natural	Inoculated
Robust	3.4	9.1	15.7
MNBrite	2.7	4.1	14.4
Stander	5.6	11.8	18.8

Table 5 — Potential 1999 barley 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)

Excel	Clay	Beedy Farms, Inc.	Moorhead	218-236-8082	C
	Clay	Hurner, Craig	Glyndon	218-236-6790	C
	Kittson	Weinlaeder Seed Company	Drayton	701-454-6427	R
	Marshall	Backstrom Farms, Inc.	Warren	218-745-5113	C
	Marshall	Bring, Wesley	Strandquist	218-874-3713	R
	Marshall	Sczepanski, Thomas	Stephen	218-478-2462	R
	Polk	Novacek, Ronald	East Grand Forks	218-773-2293	C
	Roseau	Habstritt Farms, Inc.	Roseau	218-463-1193	R
	Todd	Brekke, Floyd	Eagle Bend	218-738-2672	C
	Foster	Clay	Arneson Farms	Hawley	218-483-4165
Clay		Gemar, Timothy	Felton	218-236-5223	C
Clay		Olsgaard, Daniel J.	Moorhead	18-585-4436	C
Douglas		Sward Seed Farm	Nelson	320-762-0143	R
Kittson		Bloomquist Farms, Inc.	Drayton	218-455-3863	RC
Mahnomen		Haugo, David	Waubun	218-473-2254	C
Meeker		Wigen Seed Farm	Litchfield	320-693-8182	C
Hazen	Todd	Faust, Kevin	Long Prairie	320-732-3361	R
	Wright	Dahlco Seeds, Inc.	Cokato	320-286-5982	C
MNBrite	Clay	Wetterlin, Jerry	Glyndon	218-494-3339	C
	Clay	Zimmerman, Wayne	Ulen	218-596-8628	R
	Freeborn	Albert Lea Seed House, Inc.	Albert Lea	507-373-3161	RC
	Kandiyohi	Loge, Alan	Willmar	320-235-4178	C
	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	R
	Kittson	Carlson, James A.	Hallock	218-843-3483	C

Table 5 (continued) — Potential 1999 barley seed sources known to the Minnesota Crop Improvement Association.

MNBrite	Kittson	Hunt, Hugh	Hallock	218-843-2327	R
	Kittson	Jensen, A. Gay Farms Co.	Drayton	701-454-6294	C
	Kittson	Kowalski, Francis L.	Drayton	701-352-3691	R
	Kittson	Nelson, Merle L.	Drayton	218-455-3508	R
	Kittson	Olsonawski, Jerry	Hallock	218-379-3235	C
	Kittson	Petersen, Ronald L.	Lake Bronson	218-754-4631	RC
	Kittson	Rickenberg, Jeff	Kennedy	218-674-4231	R
	Kittson	Sedenquist Farms, Inc.	Kennedy	218-674-4218	C
	Kittson	Weinlaeder Seed Company	Drayton	701-454-6427	RC
	Mahnomen	Haugo, David	Waubun	218-473-2254	R
	Mahnomen	Pazdernik Farms, Inc.	Waubun	218-473-2232	RC
	Marshall	Backstrom Farms, Inc.	Warren	218-745-5113	RC
	Marshall	Gryskiewicz, Donald & Jeff	Stephen	218-437-8164	RC
	Marshall	Jensen Farms	Stephen	218-478-2476	RC
	Marshall	Kowalski, James	Stephen	218-455-3894	R
	Marshall	Rivard's Quality Seeds, Inc.	Argyle	218-437-6638	RC
	Marshall	Robertson Brothers	Argyle	218-437-6411	R
	Marshall	Sczepanski, Thomas	Stephen	218-478-2462	C
	Marshall	Widner, Neil	Stephen	218-478-3616	C
	Marshall	Yutzenka, Kevin & Leonard	Argyle	218-437-6468	R
	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, Keith P.	Gary	218-356-8674	R
	Norman	Circle C Seeds	Gary	218-356-8214	C
	Norman	Malme, Cecil	Shelly	218-886-8488	R
	Otter Tail	Brenden, Bruce L.	Rothsay	218-867-2410	C
	Otter Tail	Brenden, Selvin C.	Rothsay	218-867-2134	R
	Pennington	Engelstad Farms of Rocksbury	Thief River Falls	218-681-1000	RC
	Pennington	Scholin Farms	Thief River Falls	218-964-5268	RC
	Pipestone	Skyline Production System	Woodstock	507-777-4262	C
	Pipestone	Spronk, Art & Sons Seed Farm	Edgerton	507-442-5334	R
	Polk	Anderson Farms, Inc., J D	East Grand Forks	218-773-2280	R
	Polk	Capistran Seed Company	Crookston	218-281-7840	R
	Polk	Danielson, Ellsworth	Fosston	218-435-1729	R
	Polk	Gunvalson & Imlle	Gonvick	218-268-4415	R
	Polk	Larson Farms, Inc., Ralph	East Grand Forks	218-773-1463	RC
	Polk	Larson, Ray H., Inc.	Angus	218-745-5923	R
	Polk	Mat - Co., Inc.	Fosston	218-435-6667	R
	Polk	Peterson, Douglas	East Grand Forks	218-773-9120	R
Polk	Ross Seed Co.	Fisher	218-891-2211	R	
Polk	Thorson Farm, Inc., J. O.	East Grand Forks	218-893-2285	RC	
Polk	Tiedemann, Gene R.	Euclid	218-281-6723	RC	
Polk	Vig Farms Inc.	Fosston	218-435-1316	C	
Polk	Wentzel, Walton Farms, Inc.	Fisher	218-281-2207	R	
Red Lake	Myhre Farms	Red Lake Falls	218-698-4485	R	
Red Lake	Swenson Seed Farm	Brooks	218-796-5285	RC	
Roseau	Habstritt Farms, Inc.	Roseau	218-463-1193	RC	
Wilkin	Friederichs Farm	Foxhome	218-643-2363	R	
Wilkin	Knapp Seed Farm, Inc.	Foxhome	218-739-3366	RC	
Robust	Becker	Hein Farms, Inc.	Audubon	218-439-6621	C
	Carlton	Korhonen, Art	Kettle River	218-273-4931	C
	Clay	Kuehl Bros. Farms	Glyndon	218-498-2141	C
	Clay	Olek, Bradley	Felton	218-494-3440	C
	Clay	Olek, Vernard	Felton	218-494-3440	C
	Clay	Swanson, Arthur & Dirk	Moorhead	218-233-5996	C
	Freeborn	Albert Lea Seed House, Inc.	Albert Lea	507-373-3161	C
	Grant	Adams Seed	Wendell	218-458-2151	RC
	Kittson	Grundstrom, Gary	Donaldson	218-466-2755	C
	Kittson	Petersen, Ronald L.	Lake Bronson	218-754-4631	C

Table 5 (continued) — Potential 1999 barley seed sources known to the Minnesota Crop Improvement Association.

Robust	Mahnomen	Greenhills, Inc.	Fargo	701-277-0708	C
	Mahnomen	Pazdernik Farms, Inc.	Waubun	218-473-2232	C
	Marshall	Anderson, Harvey & Luther	Stephen	218-455-3305	R
	Marshall	Backstrom Farms, Inc.	Warren	218-745-5113	C
	Marshall	Double A Farms	Viking	218-523-4246	C
	Marshall	Erickson, Paul	Thief River Falls	218-449-3331	C
	Marshall	Farmers Elevator Company	Alvarado	218-965-4812	C
	Marshall	Martin, Doyle A.	Thief River Falls	218-449-3635	C
	Marshall	Rivard Farms, Inc.	Argyle	218-437-6479	C
	Marshall	Robertson Brothers	Argyle	218-437-6411	R
	Marshall	Sczepanski, Thomas	Stephen	218-478-2462	R
	Meeker	Peterson, Melvin	Atwater	320-877-7585	R
	Meeker	Peterson, Russell M.	Grove City	320-877-7793	C
	Meeker	Wigen Seed Farm	Litchfield	320-693-8182	C
	Norman	Chisholm, Keith P.	Gary	218-356-8674	C
	Norman	Nelson, Kenneth R.	Halstad	218-456-2578	C
	Norman	Sirjord Farms	Bejou	218-356-8285	C
	Otter Tail	Crop Production Services	Perham	218-346-2355	C
	Otter Tail	Huwe, Larry	Perham	218-346-3101	C
	Pennington	Mehrkens, Kyle	Thief River Falls	218-681-4611	C
	Polk	Abrams, Gary	Crookston	218-926-5744	C
	Polk	Brule, David A.	Crookston	218-281-2944	C
	Polk	Caillier, Daniel	Crookston	218-281-2840	C
	Polk	Clementson, Jon	Erskine	218-687-2345	C
	Polk	Gullekson, Ray, Brent & Brian	Beltrami	218-926-5642	C
	Polk	Kovar, Frank & Duane	East Grand Forks	218-773-9238	C
	Polk	Larson Farms, Jerry Larson	Climax	218-857-3345	C
	Polk	Mat - Co., Inc.	Fosston	218-435-6667	RC
	Polk	Novak, James	Angus	218-745-5048	C
	Polk	Ostenaar, Sidney & DeWayne	Mc Intosh	218-563-7395	C
	Red Lake	Payment, Darrell	Red Lake Falls	218-253-2254	C
	Red Lake	Swenson Seed Farm	Brooks	218-796-5285	RC
	Roseau	Cenex Harvest States Elevators	Badger	218-528-3205	C
	Roseau	Kilen, Jerel	Greenbush	218-782-2883	C
	Roseau	Svoboda - Transgrud	Badger	218-528-3692	C
	Stearns	Jokeland Farms	Holdingford	320-746-2147	C
	Stearns	Middendorf Seed Farm	Sauk Centre	320-352-6053	C
	Stearns	Nietfeld Farm, Inc.	Melrose	320-987-3442	C
	Todd	Brekke, Floyd	Eagle Bend	218-738-2672	C
	Todd	Faust, Kevin	Long Prairie	320-732-3361	C
	Washington	Wagner, W.V.	Hastings	651-437-5718	C
	Wilkin	Haugrud Seed Plant	Rothsay	218-493-4275	R
	Wilkin	Knapp Seed Farm, Inc.	Foxhome	218-739-3366	C
Royal	Pipestone	Zeinstr, Michael	Holland	507-347-3342	C
	Rice	Werner Farm Seeds	Dundas	507-645-7995	C
	Wabasha	Zabel Seeds	Plainview	507-534-2487	RC
Stander	Douglas	Sward Seed Farm	Nelson	320-762-0143	C
	Freeborn	Albert Lea Seed House, Inc.	Albert Lea	507-373-3161	RC
	Goodhue	Ag Partners Co-op	Goodhue	651-923-4496	C
	Goodhue	Buck, Don	Zumbrota	507-732-5186	C
	Grant	Adams Seed	Wendell	218-458-2151	C
	Grant	Lacey Company, Gerald A.	Wendell	218-458-2595	R
	Kandiyohi	Behm Seed Company	Atwater	320-974-3003	R
	Kittson	Bloomquist Farms, Inc.	Drayton	218-455-3863	RC
	Kittson	Johnson Farms, Inc., Lloyd	Karlstad	218-436-2817	R
	Marshall	Bring, Wesley	Strandquist	218-874-3713	C
	Marshall	Gryskiewicz, Donald & Jeff	Stephen	218-437-8164	C
	Marshall	Hamnes Farms, Inc.	Stephen	218-478-3382	C
	Marshall	Jensen Farms	Stephen	218-478-2476	C
	Marshall	Kowalski, James	Stephen	218-455-3894	C

Table 5 (continued) — Potential 1999 barley seed sources known to the Minnesota Crop Improvement Association.

Stander	Marshall	Kuznia, Kenneth J.	Argyle	218-437-8203	R
	Marshall	Peterson, Maynard	Stephen	218-478-3859	R
	Marshall	Riopelle, Jack L.	Argyle	218-437-8147	R
	Marshall	Rivard Farms, G.A.	Argyle	218-437-6638	R
	Marshall	Sczepanski, Thomas	Stephen	218-478-2462	C
	Marshall	Tulibaski Brothers	Argyle	218-437-8415	C
	Mower	Grass & Sons Seed Service	Leroy	507-324-5820	R
	Pennington	Scholin Farms	Thief River Falls	218-964-5268	RC
	Pipestone	Spronk, Art & Sons Seed Farm	Edgerton	507-442-5334	R
	Polk	Barrett, Glenn R.	Angus	218-745-4782	R
	Polk	Bergman Farms, James	Oslo	218-965-4913	C
	Polk	Brule, David A.	Crookston	218-281-2944	C
	Polk	Caillier, Daniel	Crookston	218-281-2840	C
	Polk	Capistran, Kevin	Crookston	218-281-5705	C
	Polk	Kovar, Frank & Duane	East Grand Forks	218-773-9238	C
	Polk	McWalter Farms, Inc.	East Grand Forks	218-773-1473	C
	Polk	Peterson, D.W., Inc.	Warren	218-745-4507	R
	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
	Stearns	Middendorf Seed Farm	Sauk Centre	320-352-6053	C
	Wabasha	Zabel Seeds	Plainview	507-534-2487	C
	Wilkin	Knapp Seed Farm, Inc.	Foxhome	218-739-3366	C
	Wright	Hopkins, Joseph	Buffalo	612-682-1868	C

Barley 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
48	14,300	85	28/square foot	Early spring