For Crop Production 1999 _____

HARD RED WINTER WHEAT VARIETY TRIALS

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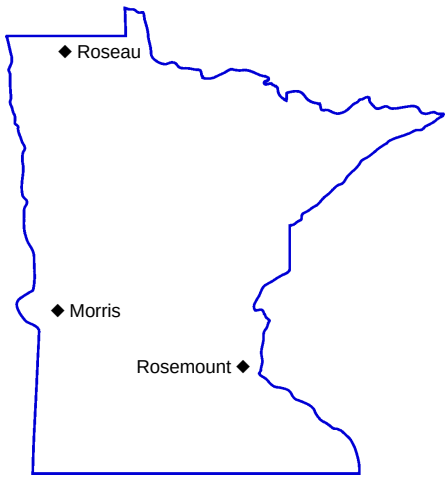
This is a report on results of hard red winter wheat variety tests conducted by the Minnesota Agricultural Experiment Station. It was prepared by research geneticists and James A. Anderson (612-625-9763; <ander319@tc.umn.edu>) and Robert H. Busch (612-625-1975; <busch005@tc.umn.edu>), Agronomy and Plant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

Successful production of winter wheat 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 Morris, Roseau, and Rosemount.

Hard red winter 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.

Cultural practices have a major effect on winter survival of all winter wheat varieties. Planting into a firm seedbed with at least some stubble remaining to retain snow cover can reduce winterkill.



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

Variety Classifications

Only a limited number of varieties are available, and the Minnesota Agricultural Experiment Station does not makes recommendations for hard red winter wheat varieties.

Seed Sources

Seed of some tested hard red spring wheat varieties may be eligible for certification. The use of certified seed is suggested, however, certification does not imply recommendation. Table 3 lists possible wheat seed sources for some varieties 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

A minimum of two years of testing is required before any data is presented. Varieties are listed in order of heading.

The LSD (Least Significance Difference) values associated with the data in table 2 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 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.

Varieties Evaluated

Tandem — Awned, semidwarf, early, good lodging resistance. Moderate winter hardiness. Very long coleoptile. Resistant to stem rust and susceptible to leaf rust. High test weight, excellent quality. Released by S.D. AES in 1997. PVP

Arapahoe — Awned, semidwarf, early and good lodging resistance. Moderate winter hardiness. Medium length coleoptile. Resistant to stem rust, moderately resistant to leaf rust. Medium test weight, satisfactory quality. Released by Nebraska AES and USDA-ARS in 1988. PVP

Crimson — Awned, red-chaffed, medium height, early-medium maturity, very good lodging resistance. Moderately high winter hardiness. Very long coleoptile. Moderately resistant to stem rust, susceptible to leaf rust. Moderate resistance to Septoria tritici blotch. Very high test weight, good quality. Released by S.D. AES in 1997. PVP

Roughrider — Awned, tall, medium maturity and fair lodging resistance. Very high winter hardiness. Very long coleoptile. Resistant to stem rust but susceptible to leaf rust. High test weight, excellent quality. Released by N.D. AES in 1975. PVP

Seward — Awned, tall, medium-late, good lodging resistance. Moderately high winter hardiness. Long coleoptile. Resistant to stem rust, moderately susceptible to leaf rust. Medium test weight, satisfactory quality. Released by N.D. AES in 1987.

Elkhorn — Awned, tall, medium-late, fair lodging resistance. High winter hardiness. Long coleoptile. Resistant to stem rust and moderately susceptible to leaf rust. Medium test weight, good quality. Released by N.D. AES in 1995. PVP

Acknowledgements, Permissions and Caveats

Information on hard red winter wheat variety reactions to leaf and stem rust was provided by Donald McVey, USDA-ARS Cereal Disease Lab. Fieldwork for winter wheat trials was supervised by Dave Legare and George Nelson.

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 — Growth characteristics of publicly developed winter wheat varieties, 1995, 1996, 1998.

Lodging score: 1 = Erect; 9 = Flat.

Winter hardiness rating: VH = Very High; H = High; MH = Moderately High; M = Moderate.

Rust resistance rating: R = Resistant; MR = Moderately Resistant; MS = Moderately Susceptible; S = Susceptible.

Data for Tandem is for 1996 and 1998 only.

Data for Arapahoe is for 1995 and 1996 only.

Variety	Heading Date	Height (inches)	Winter hardiness	Lodging score	— Rust Resistance — Leaf	Stem
Tandem	6-6	39	M	2	S	R
Arapahoe	6-8	41	M	2	MR	R
Crimson	6-8	39	MH	1	S	MR
Roughrider	6-10	42	VH	4	S	R
Seward	6-11	41	MH	2	S	R
Elkhorn	6-11	42	H	4	MS	R

Table 2 — Yield and characteristics of publicly developed winter wheat varieties, 1995, 1996, 1998.

Yield is expressed as a percent of the average yield for all locations. While values higher than the average (above 100 percent) are not always statistically significant, they are useful indicators of superior yield performance. Varietal characteristics such as lodging and disease resistance will affect yield performance.

Protein percentage is expressed on a 12 percent moisture basis.

Roseau data is from 1998 only.

Data for Tandem is for 1996 and 1998 only.

Data for Arapahoe is for 1995 and 1996 only.

Variety	Test Weight (lb/bu)	Protein %	Yield (percent of the mean) Rosemount	Morris	Roseau	Average
Tandem	59.3	13.8	106	102	100	104
Arapahoe	58.0	13.1	117	97	—	101
Crimson	59.7	13.4	98	100	94	98
Roughrider	59.2	13.1	86	93	89	90
Seward	58.4	12.4	116	107	108	111
Elkhorn	58.0	13.9	99	101	102	100
LSD 5%	—	—	28	10.5	NS	10.4
Average (bu/acre)	—	—	51.7	59	37.6	52.7

Table 3 — Potential 1999 hard red winter 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)

Arapahoe	Le Sueur	Dick Stangler Farm Seed	Kilkenny	507-595-2883	C
	McLeod	Dammann Seed Farms	Plato	320-864-3004	C
	McLeod	Thalmann Seeds Inc.	Plato	320-238-2185	C
	Polk	Vig Farms Inc.	Fosston	218-435-1316	C
Elkhorn	Clay	Petermann Seed Farms	Hawley	218-483-3302	C
	McLeod	Dammann Seed Farms	Plato	320-864-3004	C
	Norman	Chisholm, Keith P.	Gary	218-356-8674	RC
	Roseau	K & L Farms	Warnnaska	218-425-7719	C
Seward	Dakota	May, Jr., William	Farmington	612-463-8541	C
	Freeborn	Albert Lea Seed House, Inc.	Albert Lea	507-373-3161	C
	Le Sueur	Haas Seed Farm	Le Sueur	507-665-3683	RC
	Meeker	Thissen, Ben	Litchfield	320-693-7382	R
	Norman	Chisholm, Keith P.	Gary	218-356-8674	R
	Scott	Hauer Farms, Inc.	Shakopee	612-445-7554	C
	Swift	Falk Seed Farm	Murdock	320-875-4341	C
	Todd	Brekke, Floyd	Eagle Bend	218-738-2672	C
	Wright	Dahlco Seeds, Inc.	Cokato	320-286-5982	C

Hard Red Winter 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	14,500	75 +	25/square foot	September