

**UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE**

**in cooperation with**

**STATE AGRICULTURAL EXPERIMENT STATIONS**

**Report on Hard Red Spring Wheat Varieties Grown in Cooperative Plot and  
Nursery Experiments in the Spring Wheat Region in 2006**

Hard Spring Wheat Nursery Coordinator:  
D.F. Garvin, Research Geneticist, USDA-ARS

Report prepared by D.F. Garvin and Z. Blankenheim

This is a joint progress report of cooperative investigations underway in the State Agricultural Experiment Stations and the Agricultural Research Service of the U.S. Department of Agriculture. It contains preliminary data which have not been sufficiently confirmed to justify general release, and interpretations may be modified after additional experimentation. Confirmed results will be published through established channels. This report is primarily a tool for use by cooperators and their official staffs, and for those persons having direct and special interest in the development of agricultural research programs.

This report includes data furnished by the State Agricultural Experiment Stations as well as by the Agricultural Research Service of the U.S. Department of Agriculture. This report is not intended for publication and should not be referred to in literature citations, nor quoted in publicity or advertising.

Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

Agricultural Research Service  
U.S. Department of Agriculture  
Midwest Area  
St. Paul, Minnesota  
December, 2006

## 2006 HARD RED SPRING WHEAT UNIFORM REGIONAL NURSERY REPORT

<b>CONTENTS</b>	<b>PAGE</b>
Cooperating Agencies, Stations and Personnel	2
Provisional Policy for Protected or Patented Genes	4
Spring Wheat Production Statistics	5
Description and Summary of 2006 HRSWURN	6
Figure 1. Geographic Locations of 2006 HRSWURN	7
Table 1. List of Entries in the 2006 HRSWURN	8
Table 2. Nursery Locations and Comparative Plot Management Data	9
Tables 3-22. Nursery Data by Individual Location	10-29
Table 23. Summary of Trait Means Across Locations	30
Table 24. Yield Rankings by Location	31
Table 25. Summary of 2-Year Means Combined Over 2005-2006	32
Table 26. Seedling Leaf Rust Reactions, St. Paul, MN	33
Table 27. Stripe Rust Reactions, Pullman, WA	34
Table 28. <i>Fusarium</i> Head Blight Reactions, Crookston, MN	35

## COOPERATING AGENCIES, STATIONS, AND PERSONNEL FOR THE 2006 HRSWURN

### USDA-AGRICULTURAL RESEARCH SERVICE

National Program Leader

M.W. Simmons

Midwest Area Director

S. R. Shafer

Nursery Coordinator

Plant Science Research Unit, St. Paul, MN

D.F. Garvin

Quality Investigations

Cereal Crops Research Unit, Fargo, ND

G. Hareland

Disease Evaluations

Cereal Disease Laboratory, St. Paul, MN

J. Kolmer

Yue Jin

Wheat Genetics, Physiology, Quality, and Disease  
Research Unit, Pullman, WA

Xianming Chen

### MINNESOTA AGRICULTURAL EXPERIMENT STATION

St. Paul, University of Minnesota

Agronomy and Plant Genetics

J. Anderson

G. Linkert

Plant Pathology

R. Dill-Macky

Morris, West Central Experiment Station

G. Nelson

Crookston, Northwestern Experiment Station

J. Wiersma

### AGRICULTURE AND AGRI-FOOD CANADA

Winnipeg, Cereal Research Centre (Glenlea)

Breeding and Genetics

Cereal Diseases

G. Humphreys

T. Fetch

Swift Current, Semiarid Prairie Agricultural Research Centre

B. McCallum

R. DePauw

D. Dahlman

### NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION

Fargo, North Dakota State University

Agronomy

W. Berzonsky

M. Mergoum

Plant Pathology

Robert Stack

Hettinger Research Extension Center

E. Eriksmoen

Langdon Research Extension Center

B. Hanson

Williston Research Extension Center

N. Riveland

Carrington Research Extension Center

B. Schatz

### SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION

Brookings, South Dakota State University

K. Glover

MONTANA AGRICULTURAL EXPERIMENT STATION  
Bozeman, Montana State University

Sidney, Eastern Ag Research Center

L. Talbert  
S. Lanning  
J. Eckhoff  
D. Kunda  
B. Garza

NEBRASKA AGRICULTURAL EXPERIMENT STATION  
Scottsbluff, University of Nebraska (Sidney NE location)

D. Baltensperger  
G. Frickel

WYOMING AGRICULTURAL EXPERIMENT STATION  
Powell, University of Wyoming

M. Killen

WASHINGTON AGRICULTURAL EXPERIMENT STATION  
Pullman, Washington State University

K. Kidwell  
G. Shelton

## **Entering Lines with Protected or Patented Genes into the Hard Red Spring Wheat Uniform Regional Nursery**

The following information details the Hard Winter Wheat Regional Program position on this issue. Basically, the same situation exists in the Spring Wheat Region, and it is therefore suggested that these guidelines are appropriate and thus accepted for the Hard Red Spring Wheat Uniform Regional Nursery as well, until such a time as the participants agree to deviate from it:

---

### **From: Robert Graybosch, Coordinator of Hard Winter Wheat Region**

A question has arisen as to whether wheat germplasm lines carrying protected or patented genes may be entered in the HWW regional program. We have decided to allow such submissions, on a provisional basis, for the 2001 nurseries. Submissions must adhere to the provisions below, and submissions of such lines after the 2001 year will depend upon the adoption of formal guidelines. We are in the process of drafting a formal plan, hopefully one that will be approved at the 2001 Hard Winter Wheat Workers Conference.

### **Provisional plan for the submission of lines with patented or protected genes:**

**Definition: "protected" gene = a gene whose use is restricted by patents, Material Transfer Agreements, or other types of research agreements.**

Wheat lines carrying such traits may be entered in the 2001 HWW Regional nurseries (RGON, SRPN, NRPN) under the following conditions:

1. Cooperators may cross with the line in question. Thereafter, the cooperator making such crosses must either have their own research agreement with the trait owner, or, if such an agreement is lacking, they must remove the trait from breeding populations by selection.
2. The owner of the trait has been informed of the submission, and that they agree to the conditions set forth in #1.
3. All other uses of the line are governed by the Wheat Workers Code of Ethics.
4. The trait may not have been inserted into the wheat genome by genetic engineering. In other words, the wheat line in question may not be transgenic.

At this point in time, transgenics may not be entered in the program. I am certain this question will arise in the near future, so I have contacted USDA-APHIS regarding this point. If you are interested in the details, the attached file contains the pertinent points of our e-mail exchange (note by HRSW coordinator: this file is not included in this report). The APHIS responses are in bold. To make a long story short - transgenic wheat lines will be allowed in the regional program only if they have been granted permanent non-regulated status. Non-regulated status is granted only after the originator files a formal petition to de-regulate a line with APHIS.

---

## SPRING WHEAT PRODUCTION, 2006

***SPRING WHEAT OTHER THAN DURUM*** Growers produced an estimated 460.5 million bushels of spring wheat. This production estimate is approximately 8.7 percent lower than year 2005 production, and approximately 19.1 percent lower than 2004. Yield averaged 33.2 bushels per acre, a decrease of 3.9 bushels per acre from year 2005, and 10 bushels per acre lower than in year 2004. Area harvested totaled approximately 13.9 million acres, which is slightly greater than the acreage harvested in 2005.

### **Spring Wheat Production Statistics, 2004-2006.\***

	<u>Acres Harvested (x1000)</u>			<u>Production (x1000 Bushels)</u>			<u>Yield (Bushels/Acre)</u>		
	2004	2005	2006	2004	2005	2006	2004	2005	2006
Minnesota	1,610	1,730	1,650	88,550	70,930	77,550	55	41	47
Montana	2,850	2,550	2,900	88,350	81,600	63,800	31	32	22
North Dakota	5,950	6,600	6,850	243,950	224,400	212,350	41	34	31
South Dakota	1,530	1,690	1,420	71,910	67,600	42,600	47	40	30
USA	13,174	13,609	13,878	568,918	504,456	460,480	43.2	37.1	33.2

\* Source: National Agricultural Statistics Service: (<http://www.nass.usda.gov/QuickStats/index2.jsp>)

## 2006 NURSERY DESCRIPTION AND SUMMARY

The Hard Red Spring Wheat Uniform Regional Nursery (HRSWURN) was planted for the 78th year in 2006. The nursery contained 35 entries submitted by 12 different scientific or industry breeding programs, and 5 checks (Table 1). Trials were conducted as randomized complete blocks with three replicates except where noted. The HRSWURN was planted at 21 locations in 7 different states in the USA (MN, ND, SD, MT, NE, WY, and WA), and two Canadian provinces (Manitoba and Saskatchewan). Twenty locations provided data for inclusion in this report (Figure 1, Table 2). Data summaries for each of these locations are presented in Tables 3 through 22. For each location summary, entries are listed in descending order of yield. Overall means across locations for a set of core traits are summarized in Table 23, and yield rankings for individual locations are found in Table 24. Two-year means for entries previously entered in the 2005 HRSWURN are presented in Table 25. Entries were also evaluated for various diseases at different locations; these can be found by looking at individual location data summaries. Seedling leaf rust resistance was evaluated in St. Paul, MN, and stripe rust evaluations were run in fields near Pullman, WA. These data are presented in Tables 26 and 27 respectively. Lastly, entries were evaluated in a *Fusarium* head blight nursery at Crookston, MN; these results are provided in Table 28. The highest average yielding location was Winnipeg, Canada, with 79.2 Bu/Ac, while the lowest yielding location was Williston, ND, with 31.2 Bu/Ac. The average yield for 19 combined locations where the nursery was replicated was 58.1 Bu/Ac.

**Figure 1. Hard Red SpringWheat Uniform Regional Nursery, Reporting Locations, 2006**

