

**A PETITION TO THE WESTERN REGIONAL EXPERIMENT STATION DIRECTORS FOR
CONTINUATION OF A WESTERN COORDINATING COMMITTEE**

NUMBER: WCC-97
TITLE: RESEARCH ON DISEASES OF CEREALS
DURATION: October 1, 2000 to September 30, 2005

JUSTIFICATION:

The cereal grains, particularly wheat and barley, constitute major cash crops throughout the western region of the United States. The types of cereal grains produced are diverse. Soft white winter and spring wheats are grown in the higher rainfall and irrigated areas. Hard red winter and spring wheats are produced in the lower rainfall, non-irrigated areas. Fall-sown hard red spring wheat, primarily produced under irrigation, is an important production system in the desert southwest (California and Arizona). Durum wheat is produced in portions of Montana, Idaho, California, and Arizona. Barley and oats are grown in all areas. Identity-preserved wheats such as 377S hard white spring wheat are being developed to fill special niche markets. Diseases of these cereals are also diverse in their number and dynamic in their annual economic impact.

Cereal producers, striving to maximize economic returns and reduce soil erosion, are adopting changes in tillage and cultural practices such as direct seeding (i.e., minimum or no-till), shorter rotations, earlier fall seeding, increased soil fertility, and, where water is available, more frequent irrigation. Each year more cereals are produced under sprinkler irrigation. All of the above factors have a profound effect on cereal diseases, which are or may become serious threats to cereal grain production. With grain prices at historic lows (adjusted for inflation), cereal producers are desperate for assistance in reducing operating costs and minimizing disease losses.

Newly introduced or detected diseases pose an especially serious threat. President Clinton's Executive Order on Invasive Species issued February 3, 1999 mandates a management plan which will "identify, monitor, and interdict pathways that may be involved in the introduction of invasive species." With its links between research, extension, and industry, this committee is ideally suited to play a key role in the president's plan. The most dramatic and economically serious recent example of an invasive species that affected a crop in the United States is Karnal bunt (KB) of wheat which was detected for the first time in the United States in March 1996 in Arizona. Detection of KB caused major disruptions in USA grain trade with 21 countries and the economic ramifications remain unclear.

Other cereal diseases have recently invaded the region or have emerged as important damaging diseases. Barley stripe rust (BSR) appeared in the USA for the first time in 1991, is now firmly established in California, Oregon and Washington, and threatens the malting and feed barley industry, since virtually all barley varieties are susceptible to BSR. High Plains disease, first detected in 1993, has caused major yield losses in corn in several states including Idaho, Utah, and Colorado, and now threatens the wheat, barley and corn industry throughout the Great Plains and Intermountain states. Fusarium head blight has spread from the corn belt states into the Great Plains, causing millions of bushels in lost production, numerous farm and equipment sales, and disruption of farm families and whole communities.

Over the next several decades, it is anticipated that increased emphasis on disease prevention/control will be required to enable growers to remain competitive in the international market, and to meet the need for development of control measures with less adverse environmental impacts. New funding for cereal root disease control, with particular emphasis on direct-seeded crops, was just provided in the FY99 ARS budget and will support and expand efforts in this area in Idaho, Oregon, and Washington.

WCC-97 is the only specific regional body providing for coordination of research and education on diseases of wheat and other small grain cereals in the region. With the decline in overall support for agricultural research, continued coordination and exchange of research information among states in the western region is crucial. The committee welcomes participation and input from states outside the region as well, and North Dakota, South Dakota, Minnesota, Nebraska, and Kansas now have active members on the committee. The joint meeting with the Western Wheat Workers at Bozemen in 1999

was a good example of the committee reaching out to related scientific groups.

ACCOMPLISHMENTS OF WCC-97:

The accomplishments of WCC-97 over the past 3 years have been many and varied. Examples of major categories of accomplishment are given below:

- Several members of WCC-97 have played major roles in re-establishing international markets for U.S. wheat. In one case, members helped develop a risk assessment for dwarf bunt. This document has been used successfully in negotiations with China to allow importation of wheat carrying spores of this fungus, thus breaking a 25 year embargo that China had placed on wheat from the Pacific Northwest. In another case, members wrote a risk assessment for Cephalosporium stripe and the likelihood of it becoming established in Brazil. One member traveled to Brazil with USDA/APHIS/PPQ personnel to negotiate conditions for the re-establishment of U.S. wheat sales to that country which were blocked three years prior due to quarantine concerns about Cephalosporium stripe and other diseases. In both cases, having access to these markets should reap major dividends for U. S. wheat producers.
- WCC-97 continues to play a critical role in the coordination of research activities within the western region on barley stripe rust (BSR). Members of the committee were initially involved in the detection of this new disease and later developed methods for monitoring its progress. Now that it is firmly established in the region, efforts on breeding for resistance are underway with strong guidance from this committee. For instance, barley breeding lines and cultivars have been screened for resistance, initially in South America, and now in the Western Region, all through the efforts coordinated by several members of this committee (CO, WA, MT).
- Members of WCC-97 have also been instrumental in setting up monitoring sites and procedures for the new High Plains disease of corn and wheat. This program is continuing so that the potential sources of inoculum for this disease can be determined. Finally, members of WCC-97 have played a role in the detection and survey for Karnal bunt in wheat. For example, detection of Karnal bunt in a Montana seed facility by members of WCC-97 occurred before the seed had been distributed and thus prevented the introduction of this pathogen into Montana production fields. Members of WCC-97 are now playing a key role in determining how best to handle this disease if it were to be found outside of the initial introduction in California and Arizona.
- In the area of communication, WCC-97 has established a website (<http://agadsrv.msu.montana.edu/wcc97/>) and an electronic bulletin board (wcc97@listserv.montana.edu). These serve committee members and our clientele by providing useful information in a timely manner and permit rapid dissemination of information. In addition, WCC-97 has been actively involved in facilitating the publication of materials regarding cereal diseases for use by farmers, extension personnel, and researchers. It also played a critical role in publication of the Compendium of Barley Diseases, the Compendium of Wheat Diseases, Wheat Health Management, and Morecrop, an expert system for integrated management of cereal diseases.

OBJECTIVE OF THE COMMITTEE:

The specific objective of the committee is to provide a forum for the coordination of cooperative efforts in cereal pathology in the western U.S., specifically through interactions at annual meetings, the exchange of biological materials and methodologies, the development of an electronic bulletin board for small grain disease, and the publication of appropriate research and extension materials. The outcome will be improved communication among committee members and their respective states, thereby achieving maximum efficiency of research efforts. Extension programs for cereal disease control will carry research results to growers via publications and commodity schools and through the electronic bulletin board. This will be especially important as cereal producers in this region face the possibility of dealing with barley stripe rust, wheat Karnal bunt, High Plains disease, and potentially wheat and barley scab.

EXPECTED OUTCOMES: We expect that identification of and coordination of research activities on new and emerging small grain cereal diseases as well as exchange of information on techniques and strategies for dealing with these diseases will position researchers, extension personnel, and ultimately grain producers better to achieve maximum efficiency of research efforts and to deal more efficiently with these diseases. Use of the Internet and e-mail will allow researchers to communicate early detection of diseases as they may develop.

EDUCATIONAL PLAN: Researchers involved with this coordinating committee will communicate with and invite participation by plant pathologists from the USDA and private industry as well as from Extension personnel. Currently, at least one-third of our members have Extension appointments. Through them, growers will be informed of and information provided to them on emerging and/or new disease problems in their areas. Members of this committee played a major role in the production of the 2nd edition of the Compendium of Barley Diseases

OPERATIONAL STRUCTURE

There will be two offices for WCC-97. The Secretary is elected at the annual meeting and takes the minutes of the meeting and distributes them to members of the Committee. This person also serves as a liaison with the Administrative Advisor to see that all required annual reports are submitted to the office of the Executive Director, Western Association of Agricultural Experiment Station Directors. The chairman is also elected at the annual meeting and serves the following year to direct the activities of the Committee. In particular, the chairman will make sure that the objectives of the committee are being fulfilled. The next meeting of the Committee is usually at the home base of the Chairman, who then also serves as local arrangements chair. Meetings alternate among the Great Plains and western states. The 2000 site will be Manhattan, KS, and California is scheduled to host the 2001 meeting.

PARTICIPANTS

Cereal pathologists from all of the western states representing University and USDA-ARS scientists, extension personnel, and private industry researchers are regular participants in the annual meetings. Representatives of other disciplines concerned with cereal diseases including breeders, entomologists, and others noted above also participate on occasion. The rotation of the meeting site among the participating states allows for participation by individuals who may not be involved with cereal diseases full-time, such as private cereal breeders whose interests are more localized and University personnel with multiple commodity responsibilities. The addition of representatives from Minnesota, North Dakota, South Dakota, Nebraska, and Kansas will thrust this committee into even greater prominence.

Although each participating state has one official representative, we frequently have several participants from each state. Our mailing list includes more than 50 individuals. Information on attendance at the 1997, 1998, and 1999 meetings is presented in Appendix 1. Current representatives provide geographical coverage of the region as well as complementary specialization in terms of organisms studied and area of scientific expertise:

SIGNATURES:



Administrative Advisor

12-15-99

Date



Chair, Western Directors Assoc.

8-11-00

Date

WCC-97 participants and their area of specialization:

California - Lee Jackson: Extension Agronomist, Epidemiology of small grain diseases; pathogen variability and host resistance.

Colorado - Joe Hill: Common root rot, stripe rust, genetics of host-parasite interactions

Idaho - Bob Forster: Extension Plant Pathologist, Bacterial leaf streak, soilborne diseases; High Plains disease, seed health

Kansas - Bill Bockus: Tan spot, Cephalosporium stripe, residue related diseases

Minnesota - Ruth Dill-Mackey: Scab, host resistance

Montana - Don Mathre: Cephalosporium stripe, Karnal bunt, seed treatment

Nebraska - John Watkins: -General wheat diseases-extension, leaf rust-research.

North Dakota - Brian Steffenson: Cereal rusts, genetics of host resistance; Len Franc: Cereal leaf diseases, epidemiology, disease control measures

Oregon - Chris Mundt: Stripe rust, epidemiology, diseases caused by Septoria spp.

South Dakota - Yue Jin: Fungal diseases, epidemiology and host resistance

Utah - Brad Kropp: Dryland root rot, molecular detection of bacteria and fungi

Washington - Tim Murray: Strawbreaker foot rot, Cephalosporium stripe, genetics of host resistance; Roland Line: genetics of stripe rust resistance, epidemiology and control.

Wyoming - Gary Franc: Karnal bunt, epidemiology, diagnosis

Appendix I. Participants at annual meetings of WCC-97 in 1997, 1998, and 1999.

1997 Meeting in Ft. Collins, Colorado

Dan Biggerstaff	Western Plant Breeders, Bozeman, MT
Bill Brown	Colorado State University
Ruth Dill-Macky	University of Minnesota
Lee Jackson	University of California-Davis
Bob Forster	University of Idaho
Bill Grey	Montana State University
Joe Hill	Colorado State University
Bob Johnston	Montana State University
Rollie Line	USDA-ARS Washington State University
Don Mathre	Montana State University
Chris Mundt	Oregon State University
Tim Murray	Washington State University
Jack Riesselman	Montana State University

1998 Meeting in Fargo, North Dakota

Don Mathre	Montana State University
Lee Jackson	Univ. of California-Davis
Roland Line	USDA-ARS Pullman, WA
Christ Mundt	Oregon State University
Bill Bockus	Kansas State University
Mark Davis	Kansas State University
Yue Jin	South Dakota St. Univ
Greg Fox	Western Plant Breeders
Bill Brown	Colorado St. Univ.
Joe Hill	Colorado St. Univ
Jolanta Menert	Busch Ag Resources
Bob Forster	University of Idaho
Tim Murray	Washington State Univ
Ruth Dill-Macky	Univ. of Minnesota
Bob Johnston	Montana State University
Bill Grey	Montana State University
Len Franci	North Dakota St. Univ
Brian Steffenson	North Dak St. Univ.
Tom Fetch, Jr.	North Dak. St. Univ.
Joe Krupinsky	USDA, Mandan, ND
Shaobin Ahung	North Dak. St. Univ
Douglas Collins	Montana State Univ.
Kanat Tiourebaev	Montana State Univ.
Jerrapun Warapong	Montana State Univ.
Ivette Acuna	Montana State Univ.
Ruschelle Edlin	Montana State Univ.
Laura Carsten	Montana State Univ.

1999 Meeting in Bozeman, Montana

Robert Johnston	Montana State University
Bill Grey	Montana State University
Don Mathre	Montana State University

Jack Riesselman	Montana State University
Bill Brown	Colorado State University
Joe Hill	Colorado State University
Dale Clark	Western Plant Breeders, Bozeman, Montana
Roland Line	USDA – Washington State University
Randy Scott	Gustafson, Inc, Boise, Idaho
Bill Bockus	Kansas State University
Mark Davis	Kansas State University
Len Francl	North Dakota State University
Yue Jin	South Dakota State University
Xianming Chen	USDA – Washington State University
Vidal Velasco	Colorado State University
Linnea Skoglund	Busch Ag Resources, Fort Collins, Colorado
Ruth Dill-Macky	University of Minnesota
Lee Jackson	University of California, Davis
Bob Forster	University of Idaho
John Watkins	University of Nebraska

Also attending from Western Wheat Workers:

Sally Metz	Monsanto – St. Louis, Missouri
Bob Zemetra	University of Idaho, Moscow
Mary Guttieri	University of Idaho, Aberdeen
Stephen Guy	University of Idaho, Moscow
Audrey Bousquet	Western Plant Breeders, Bozeman, MT
Luther Talbert	Montana State University
Sarah Ward	Colorado State University
Craig Cook	Western Plant Breeders, Bozeman, MT
Ron Barnett	University of Florida
Dan Biggerstaff	Western Plant Breeders, Bozeman, MT
K. Krishnamurthy	Montana State University
Eric Smidansky	Montana State University
Peggy Lamb	Montana State University, Huntley
Jack Martin	Montana State University
Becky Murphy	Montana State University, Moccasin
Doug Holen	Montana State University, Kalispell
Al Carleton	Arizona Plant Breeders, Phoenix
Charles Erickson	USDA – Aberdeen, Idaho
Rob Graf	Ag and Agrifood Canada, Lethbridge, Alberta
Mike Giroux	Montana State University
Phil Bruckner	Montana State University
Ed Souza	University of Idaho, Aberdeen
Karim Ammar	Oregon State University
Ken Kephart	Montana State University, Huntley
Bob Graybosch	ARS, University of Nebraska, Lincoln
Gail Sharp	Montana State University