

**Proceedings of the
2nd International Symposium
on Fusarium Head Blight**

*incorporating the
8th European Fusarium Seminar*

Volume 1



Incorporating the 8th
European Fusarium Seminar

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PREFACE

The substantial research investments made by the United States through the U.S. Wheat and Barley Scab Initiative/USDA-ARS collaboration to combat Fusarium Head Blight (FHB) were justified in large measure by the argument that this scourge represents a mortal threat to the wheat and barley industries of the U.S. Earlier this year, Dr. Masa Iwanaga, Director General of CIMMYT, enabled me to see that unchecked, the detrimental effects of FHB on yield, food safety, and particularly world trade, render it a daunting *threat to Global Food Security*. Why? Though losses in yield and quality where FHB occurs can be devastating, the real villains are deoxynivalenol and its related toxins. As indicated by Dr. Thomas Miedaner in his comments below, International regulatory bodies, prompted primarily by developed economy governments, stand poised to impose limits on the acceptable levels of DON in wheat and barley. Dr. Iwanaga showed me that the negative effects such regulatory actions will have on world trade of wheat will disproportionately affect the world's poor.

A second justification for the U.S. Wheat and Barley Scab Initiative was the self-evident fact that no single institution within the U.S. had the resources, human or otherwise, to tackle this complex problem. I argue that the *global* distribution of Institutions leading the advances in different aspects of the fight against FHB, so clearly evident in these Proceedings, now renders self-evident the need for a *global* framework which maximizes synergy and minimizes information gaps. That framework, at a minimum, should include an information hub for the collection and communication of information for scientists, policy makers, and stakeholders involved in any aspect of FHB or regulation of its toxins.

Professor Dajun Liu welcomed participants to the 2000 International Symposium in China with a talk entitled "To Defeat Scab- The Duty-Bound Task of Scientists Worldwide." I second that sentiment, and expand on it by challenging all scientists and policy makers to redouble and globally coordinate our efforts to minimize occurrence of FHB and its toxins while simultaneously ensuring that any new food safety regulations governing *Fusarium* toxins are crafted on the basis of robust toxicological and exposure data. This Symposium is the largest gathering ever of scientists and stakeholders working on this problem. Let us make the most of this opportunity to not only acquire new knowledge, but to also begin the search for strategies which weave our national and international organizations into an integrated global network with which we will ultimately defeat FHB.

These Proceedings are a compilation of over 300 poster-abstracts and papers submitted by a like number of Symposium participants representing numerous institutions in at least 27 countries. Abstracts and papers included here are organized alphabetically by first author within the relevant symposium session as described below. This compilation of unedited submissions is first and foremost a tool for participants at this Symposium.

In May of 2000, nearly 100 scientists from institutions in 13 countries gathered in Suzhou and Nanjing, China, for the *International Symposium on Wheat Improvement for Scab Resistance*. At the suggestion of Dr. S. Rajaram (CIMMYT), the International Organizing Committee (IOC) for that event agreed to remain active with the goal of convening another international symposium in four years. In 2002, the Steering Committee of the U.S. Wheat and Barley Scab Initiative (USWBSI), at the request of the IOC, agreed to host an International Symposium in 2004, in lieu of its annual Fusarium Head Blight Forum. In 2003, IOC member Dr. Akos Mesterhazy (Hungary) pointed out that the 8th International European Fusarium Seminar was also scheduled for 2004 under the leadership of Dr. Thomas Miedaner (Germany). Acting in the spirit of true international collaboration, Dr. Miedaner and his scientific board approached the

IOC with a proposal to merge their 2004 Seminar with the developing International Symposium. The IOC embraced this sensible concept and invited Dr. Miedaner to join its ranks.

The IOC, with concurrence of the hosting USWBSI, agreed upon a mixed format of invited talks organized into an opening Plenary Session followed by six Research Sessions, each comprised of Invited Talks and follow-on Poster Sessions. The Research Sessions were defined as follows:

- ◆ **Host Plant Resistance and Variety Development** - Science and affiliated technologies focused on:
 - Discovery and/or characterization of naturally occurring host plant resistance genes in wheat, barley and related species (e.g., germplasm screening, conventional genetic analyses, QTL/gene discovery and/or mapping facilitated by DNA markers or genomic techniques, studies of resistance mechanisms, etc.)
 - Breeding strategies that maximize the rate of development and adoption of resistant varieties—either conventional or GM (e.g., DNA marker assisted selection, efficacy of screening/phenotyping techniques, breeding methods in general, etc.)
- ◆ **Genetic Engineering** - Science and affiliated technologies focused on GMO approaches to host plant resistance.
- ◆ **Chemical, Cultural and Biological Control**
- ◆ **Food Safety, Toxicology, and Utilization of Mycotoxin-contaminated Grain**
- ◆ **Pathogenesis, Epidemiology, and Disease Forecasting**
- ◆ **Taxonomy, Population Genetics, and Genomics of *Fusarium* spp.**

R. Ward
President, International Organizing Committee

The European *Fusarium* Seminar was started in 1987 by Jerzy CheBkowski at the Warsaw Agricultural University (Poland) and since then it has been organized every two to three years in another country. The number of participants has increased steadily reaching a number of 150 to 200 scientists. The latest symposia were in Szeged (Hungary), Berlin (Germany), and Poznan (Poland) in 1997, 2000, and 2002, respectively. The permanent title of this series of conferences is still “*Fusarium* – Mycotoxins, Taxonomy, and Pathogenicity”, but the spectrum of topics has been broadened by incorporating occurrence and genetics of *Fusarium* species, toxicology, resistance breeding, molecular genetics, and plant protection. The conferences used to be open to all *Fusarium* species and all crops of economic impact.

The main issue in the European Union at present is the concern for food security that is highly affected by *Fusarium* mycotoxins. The European Union is intensively discussing putting up thresholds for deoxynivalenol and zearalenone that will be valid for all member states.

In this perspective it is a great advantage that the ***U.S. Wheat & Barley Scab Initiative (USWBSI)*** and the ***8th European Fusarium Seminar*** are combined in the forthcoming symposium. Since problems with *Fusarium* species in our feed and food chain are of world-wide concern, it stands to reason that scientific results and conclusions should be open for discussion within the whole community of *Fusarium* researchers across national boundaries.

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