
Table of Contents

PLENARY SESSION

Industry Needs for Early Warning and Integrated Management Systems for Harmful

Mycotoxins

Deirdre Ortiz Invited Talk 3

SESSION 1: GENE DISCOVERY AND ENGINEERING RESISTANCE

Characterization of Wheat Cytochrome P450s Up-Regulated as an Early Response to the *Fusarium* Mycotoxin Deoxynivalenol

Chanemougasoundharam Arunachalam, Stephanie Walter, Guillaume Erard
and Fiona Doohan Poster #16 7

Identification of a Direct Role for Mitochondria in Trichothecene Resistance

Anwar Bin Umer, John McLaughlin, Debaleena Basu, Susan McCormick
and Nilgun Tumer Poster #1 8

Sequencing and Preliminary Analysis of Chromosome 2H Bin 10 Predicted Genes

C.N. Boyd, T. Drader, R. Horsley and A. Kleinhofs 9

Fighting Against FHB – An Excellent Novel Resistance Source for Future Wheat Breeding

Chenggen Chu, Shaobin Zhong, Shiaoman Chao, Timothy L. Friesen, Scott Halley,
Elias M. Elias, Justin D. Faris and Steven S. Xu Poster #2 14

Using Doubled Haploids to Speed up Genetic Analysis for Resistance to FHB and Other Complex Traits in Wheat

Chenggen Chu and Forrest Chumley Poster #3 15

Testing Transgenic Spring Barley Lines for Reaction to *Fusarium* Head Blight: 2010 Field Nursery Report

R. Dill-Macky, A.M. Elakkad, L.S. Dahleen, R.W. Skadsen and T. Abebe Poster #4 16

Chromosome Engineering and Transfer of Alien Sources for *Fusarium* Head Blight Resistance in Hard Red Winter Wheat

B. Friebe, J.C. Cainong, L.L. Qi, P.D. Chen, W.W. Bockus and B.S. Gill Poster #5 17

Putative Role for Ethylene Signaling in Type II Resistance to *Fusarium graminearum* in Wheat using Virus Induced Gene Silencing (VIGS) and a Gaseous Inhibitor of Ethylene Perception

Megan Gillespie and Steve Scofield Poster #6 18

Characterization of *Fusarium* Head Blight-Responsive Genes in Diverse Wild and Cultivated Barley

Yadong Huang, Benjamin P. Millett, Karen A. Beaubian, Stephanie K. Dahl,
Brian J. Steffenson, Kevin P. Smith and Gary J. Muehlbauer Poster #7 19

Comprehensive Metabolomics and Proteomics for Fusarium Head Blight Resistance	
Gene Discovery and Function in Triticeae	
A.C. Kushalappa, K.G. Kumaraswamy, V. Bollina, G. Raghavendra, Y. Dion, S. Rioux, T.M. Choo, A. Comeau, D. Somers and S. Fox.....	20
Activation Tag Screening to Identify Novel Genes for Trichothecene Resistance	
John McLaughlin, Emily Salmon-Denikos, Anwar Bin Umer, Debaleena Basu, Susan McCormick, Brian Gregory and Nilgun Tumer.....	Invited Talk and Poster #8 25
Engineering Defense Regulatory Genes and Host Susceptibility Factors for Enhancing FHB Resistance	
Vamsi Nalam, Ragiba Makandar, Dehlia McAfee, Juliane Essig, Hyeonju Lee, Harold Trick and Jyoti Shah.....	Poster #9 26
Development and Testing of Improved Enzymes for Transgenic Control of FHB	
Sean A. Newmister, Lynn Dahleen, Susan McCormick and Ivan Rayment.....	Poster #10 27
Greenhouse Evaluation of Transgenic Barley Expressing <i>Gastrodianin</i> for Resistance to Fusarium Head Blight	
Eng-Hwa Ng, Tilahun Abebe, James E. Jurgenson, Ruth Dill-Macky, Lynn Dahleen and Ronald Skadsen.....	28
Association Analysis of FHB Resistance Derived from Tunisian 108 in Durum Wheat	
Seyed M. Pirseyedi, Farhad Ghavami, Omid Ansari, Elias Elias and Shahryar Kianian.....	Poster #11 33
Induction of Plant Defence Gene Expression by Antagonistic Lipopeptides from <i>Paenibacillus</i> sp. Strain B2	
Sameh Selim, Jonathan Negrel, David Wendehenne, Sergio Ochatt, Silvio Gianinazzi and Diederik van Tuinen.....	Poster #12 34
Identifying and Characterizing Barley Genes that Protect against Trichothecenes	
S.H. Shin, S.J. Heinen, W. Schweiger, G. Adam and G.J. Muehlbauer.....	Poster #13 35
Transposons Based Saturation Mutagenesis to Explore FHB Resistance in Barley	
Surinder Singh, Manjit Singh, Han Qi Tan and Jaswinder Singh.....	Poster #14 36
Gene Expression Analysis of Related Wheat Lines with Contrasting Levels of Head Blight Resistance after <i>Fusarium graminearum</i> Inoculation	
Barbara Steiner, Apinun Limmongkon, Katharina Schiessl, Marc Lemmens, Hayan Jia, Gary Muehlbauer, Alexandra Posekany, David P. Kreil and Hermann Bürstmayr.....	Poster #15 37
Characterization of an MRP Involved in the Wheat Response to the Mycotoxin Deoxynivalenol	
Stephanie Walter and Fiona Doohan.....	Poster #17 38
Unravelling the Wheat Response to the Protein Synthesis Inhibitor Deoxynivalenol	
Stephanie Walter, Chanemougasoundharam Arunachalam and Fiona Doohan.....	Poster #18 39
Association Studies Validate and Discover Genetic Loci for Wheat Fusarium Head Blight Resistance	
D.D. Zhang, G.H. Bai, J.M. Yu, W. Bockus, P. St. Amand and S. Baenziger.....	Poster #19 40

SESSION 2: PATHOGEN BIOLOGY AND GENETICS
Genetic Basis for the 3-ADON and 15-ADON Trichothecene Chemotypes in *Fusarium*

Nancy J. Alexander, Susan P. McCormick and Robert H. Proctor.....Invited Talk..... 45

A Cross between Two Genetically Similar *Fusarium graminearum* Strains Produces**Stable Transgressive Segregants for FHB Pathogenicity Related Traits**

Sladana Bec, Dave Van Sanford and Lisa J. Vaillancourt.....Poster #20..... 46

Infection Structures and Mycotoxin Induction of *Fusarium graminearum* on**Wheat Florets**

Marike J. Boenisch and Wilhelm SchäferInvited Talk..... 47

A Subset of the Newly Discovered Northland Population of *Fusarium graminearum***from the U.S. does not Produce the B-Type Trichothecenes DON, 15ADON,****3ADON or NIV**

Liane R. Gale, Todd J. Ward and H. Corby Kistler.....Poster #21..... 48

DON Biosynthesis in Wheat

Heather Hallen-Adams and Frances Trail.....Poster #22..... 50

Tracking Released Clones of *Gibberella zeae* within Wheat and Barley Fields

M.D. Keller, D.G. Schmale, III, K.D. Waxman and G.C. Bergstrom.....Invited Talk..... 51

Understanding the Molecular Mechanisms of *Fusarium oxysporum*-Mediated**Degradation of Wheat Straw**

Mojibur Khan, Shahin Ali, Ewen Mullins and Fiona DoohanPoster #23..... 52

The HDF1 Histone Deacetylase Gene is Important for Conidiation, Sexual**Reproduction, and Pathogenesis in *Fusarium graminearum***

Yimin Li, Chenfang Wang, Wende Liu, Guanghui Wang, Zhensheng Kang,

H. Corby Kistler and Jin-Rong XuPoster #24..... 53

Fusarium TRI8* Determines 3-Acetyldeoxynivalenol (3ADON) or 15ADON*Production**

Susan P. McCormick, Nancy J. Alexander and Robert H. ProctorPoster #26..... 54

***Fusarium* spp. Associated with Head Blight in South African Wheat Production Areas**

G.J. van Coller, Z.A.R. Sedeman, A-L. Boutigny, L. Rose, S.C. Lamprecht

and A. ViljoenPoster #27..... 55

Systematic Characterization of the Kinome of the Wheat Scab Fungus *Fusarium****graminearum***

Chenfang Wang, Yuling Wang, Li-Jun Xu, Zhongtao Zhao, Shijie Zhang, Rui Hou,

Qian Zheng, Zhensheng Kang and Jin-Rong XuPoster #25..... 56

Preinoculation of Wheat Heads with a Nontoxigenic *Fusarium* Isolate Inhibits**Deoxynivalenol Production by a Toxigenic Pathogen**

Gary Y. Yuen, C. Christine Jochum, Liangcheng Du, Isis Arreguin

and Liane R. Gale.....Poster #28..... 57

SESSION 3: FHB MANAGEMENT
Aggressiveness of *Fusarium graminearum* 3ADON and 15ADON Populations as affected by Hard Red Spring Cultivar Resistance and Fungicide Treatment, under Field Conditions in North Dakota

Ali, S., K.D. Puri, M. McMullen and S. Zhong..... 65

Effects of Within-Field Corn Debris in Microplots on FHB and DON in Eleven U.S. Wheat Environments in 2010 G.C. Bergstrom, K.D. Waxman, D.G. Schmale III, C.A. Bradley, L.E. Sweets, S.N. Wegulo and M.D. Keller	Poster #29	69
Validation of Barley DON Risk Prediction Model K.D. Bondalapati and J.M. Stein.....	Poster #30	71
Multi-state Uniform Fungicide Evaluations for Control of Fusarium Head Blight and Associated Mycotoxins C.A. Bradley, E.A. Adee, S.A. Ebelhar, R. Dill-Macky, J.J. Wiersma, A.P. Grybauskas, W.W. Kirk, M.P. McMullen, S. Halley, E.A. Milus, L.E. Osborne, K.R. Ruden and B.G. Young.....	Poster #31	74
Evaluation of Host Plant Resistance and Fungicide Treatment for Suppression of Fusarium Head Blight E.A. Brucker, N.H. Karplus, C.A. Bradley and F.L. Kolb	Poster #32	75
Defining the Window of Scab Susceptibility in Mid-Atlantic Winter Wheat C. Cowger.....	Poster #33	76
Ecology of <i>Bacillus amyloliquefaciens</i> on Wheat Florets in Relation to Biological Control of FHB/DON J.M. Crane, D.M. Gibson and G.C. Bergstrom.....	Poster #34	77
Advances in the Development and Application of Prediction Models for FHB and DON E. DeWolf, D. Shah, P. Paul, L. Madden, K. Willyerd, P. Knight and D. Miller	Invited Talk	79
Integrated Management for Fusarium Head Blight in Wisconsin Paul Esker, Nancy Koval, Karen Lackermann, Shawn Conley, John Gaska and Mark Martinka	Poster #35	80
Results of the 2010 Uniform Fungicide Trial on Barley, Fargo, ND J. Jordahl, S. Meyer and M. McMullen	Poster #36	81
The Recovery of Released Clones of <i>Gibberella zeae</i> from Winter Wheat and Barley is Influenced by the Amount of Local Corn Stalk Residue M.D. Keller, W.E. Thomason and D.G. Schmale III	Poster #37	84
Data Mining of Weather and Climatic Data to Improve Risk Prediction of Fusarium Head Blight L.V. Madden, A.B. Kriss, P.A. Paul and X. Xu	Invited Talk	85
Determinants of Adoption of Scab Management Techniques Gregory McKee, Joel Ransom and Marcia McMullen.....	Invited Talk	86
Inoculation Timing, Mist Duration and Isolate Effects on FHB and DON in Two Durum Cultivars M. McMullen, J. Jordahl and S. Meyer	Poster #38	90
Populations of <i>Bacillus</i> Strains Applied to Wheat Heads for Biological Control of FHB: Results of Brookings, SD 2010 Field Plots N. Srinivasa Murthy and B.H. Bleakley.....	Poster #39	91
Procedure to Isolate and Identify <i>Fusarium graminearum</i> in Cereal Seed and Plant Tissues with the Aid of a Selective Medium S. Pouleur, L. Couture and R.M. Clear	Poster #40	92

Influence of Row Spacing, Seeding Rate, Fungicide and Variety on Yield and FHB Development in Spring Wheat, Durum and Barley	
J.K. Ransom, J. Pederson and S. Halley.....	Poster #41 93
2010 Trial for the Performance of Biological Control Agents for the Suppression of Fusarium Head Blight in South Dakota	
K.R. Ruden, L.E. Osborne, N. Srinivasa Murthy and B.H. Bleakley	Poster #42..... 94
Grain Harvesting Strategies to Mitigate Losses due to Fusarium Head Blight: A Cost/Benefit Assessment	
J.D. Salgado, M. Wallhead, L.V. Madden and P.A. Paul	Poster #43..... 95
Effect of Late Infection and Post-Inoculation Moisture on FHB Development in Wheat and Barley	
T.C. Scanlan and R. Dill-Macky	Poster #44..... 97
Colonization of Wheat Heads by Antagonist <i>Cryptococcus flavescens</i> OH 182.9 when Applied Alone or in Combination with Different Concentrations of Prosaro® and the Effect on Fusarium Head Blight Development in Field-Grown Wheat	
D.A. Schisler, P. Paul, M.J. Boehm, C.A. Bradley and C.A. Dunlap	98
Prosaro® Fungicide Performance in Winter Wheat in the Prairie Pothole Region of South Dakota and North Dakota	
K.B. Thorsness, B.E. Ruden, M.A. Wrucke, P.B. Vander Vorst and S.L. Dvorak.....	Poster #45..... 103
Evaluation of Integrated Methods for Managing FHB and Don in Winter Wheat in New York in 2010	
K.D. Waxman and G.C. Bergstrom	104
Control of FHB and DON by Prosaro® Fungicide in Moderately Resistant and Susceptible Winter Wheat Cultivars	
S.N. Wegulo, W.W. Bockus, J. Hernandez Nopsa, E.D. DeWolf, K.H.S. Peiris and F.E. Dowell.....	Poster #46..... 108
Inoculated Field Trials for Evaluating FHB/DON Integrated Management Strategies	
K. Willyerd, L. Madden, M. McMullen, S. Wegulo, B. Bockus, L. Sweets, C. Bradley, K. Wise, D. Hershman, G. Bergstrom, A. Grybauskas, L. Osborne, P. Esker and P. Paul.....	Poster #47..... 109
Implications of FHB Multi-Species Complex on Disease Development and Mycotoxin	
Xiangming Xu.....	Invited Talk..... 111
2010 Uniform Biological Control Trials - Preliminary Results	
G.Y. Yuen, C.C. Jochum, S.A. Halley, L.E. Sweets, W. Kirk and D.A. Schisler	Poster #48..... 112
Evaluation of Mating Pheromone Peptides for Inhibition of Wheat Spikelet Infection by <i>Fusarium graminearum</i>	
Gary Y. Yuen, C. Christy Jochum, Nathan W. Gross, James T. English and John F. Leslie.....	Poster #49..... 116

SESSION 4: FOOD SAFETY, TOXICOLOGY AND UTILIZATION OF MYCOTOXIN-CONTAMINATED GRAIN

Predicting Wheat Mycotoxin Content using Near Infrared Reflectance Spectroscopy	
C.S. Tibola, J.M.C. Fernandes and R. Delanora.....	Poster #50..... 121

Stability of the Tricothecene, Deoxynivalenol in Processed Foods and Wheat Flake Cereal

Kenneth A. Voss and Maurice E. SnookInvited Talk..... 122

**SESSION 5: VARIETY DEVELOPMENT AND HOST
PLANT RESISTANCE**

Validation of *Fhb1* and *QFhs.nau-2DL* in Several SRW Wheat Breeding Populations

Ana Balut, Anthony Clark, Gina Brown-Guedira, Edward Souza
and David Van SanfordPoster #53..... 127

Association Analysis of Markers for Breeding Scab Resistance in Winter Wheat

Benson, J., G. Brown-Guedira, J. Holland, J.P. Murphy and C.H. Sneller.....Poster #54..... 128

**Phenotypic Characterization of Fusarium Head Blight (FHB) Resistance in Hulled
and Hulless Winter Barley Grown in the Mid-Atlantic Region**

Gregory Berger, Piyum Khatibi, Wynse Brooks, Shuyu Liu, Marla Hall,
Andrew Green, Carl Griffey and David Schmale IIIPoster #55..... 129

**Comparison of Two Methods for Estimating *Fusarium* Damaged Kernels in Soft Red
Winter Wheat**

E.A. Brucker, J.N. Mundell, D.A. Van Sanford and F.L. KolbPoster #56..... 131

**Current Knowledge on the Genetics of Fusarium Head Blight Resistance in Wheat -
Implications for Resistance Breeding**

Hermann Bürstmayr, Barbara Steiner and Marc LemmensInvited Talk..... 132

**Advanced Back-Cross QTL Mapping of Resistance to Fusarium Head Blight derived
from *Triticum macha* (Georgian Spelt Wheat)**

Maria Bürstmayr, Marc Lemmens, Barbara Steiner and Hermann Bürstmayr.....Poster #57..... 134

**Evaluation of Back-Cross-Two Derived Sister Lines Carrying *Rht-B1a/b* or
Rht-D1a/b in a Highly *Fusarium* Resistant Donor Background**

Maria Bürstmayr, Marc Lemmens and Hermann BürstmayrPoster #58..... 135

**Development of Advanced Spring Wheat Lines with FHB Resistance through Alien
Introgression**

X. Cai, R.I. McArthur, Q. Zhang, R.E. Oliver, S. Zhong, S. Chao, G.A. Hareland,
W. Berzonsky, M. Mergoum, B. Hanson, Y. Dong and S.S. XuPoster #61..... 136

**Evaluation of Scab Resistance QTLs on Agronomic and Quality Traits of Soft Red
Winter Wheat**

Lydia Cardwell, Edward Souza, Gina Brown-Guedira, Yanhong Dong
and Jose Costa.....Poster #62..... 137

Mapping Scab Resistance in the Winter Wheat Line MD01W233-06-1

Jinfeng Gao, Yajuan Wang, Tristan Werner, Lydia Cardwell, J. Paul Murphy,
Gina Brown-Guedira, Carl Griffey, Yanhong Dong and Jose CostaPoster #63..... 138

A Novel Genome Mutation in Wheat Increases Fusarium Head Blight Resistance

D.F. Garvin, H. Porter, Z.J. Blankenheim, S. Chao and R. Dill-Macky.....Poster #64..... 142

**Fusarium Head Blight in Barley: Identification of the Causal *Fusarium* Species
in Europe and Testing of FHB Resistance using Artificial Inoculation**

Philipp Holzkecht, Paul Bury, Hermann Bürstmayr
and Marc Lemmens.....Poster #59..... 143

Molecular Mapping of Resistance to Fusarium Head Blight in Tetraploid Wheat	
Karin Huber, Abdallah Alimari, Johannes Heckmann, Maria Bürstmayr, Marc Lemmens, Barbara Steiner and Hermann Bürstmayr	Poster #60 144
Preliminary QTL Analysis of Fusarium Head Blight Resistance in the Soft Red Winter Wheat, ‘Truman’	
Md. Sariful Islam, Gina Brown-Guedira, Michael J. Gerau and Anne L. McKendry.....	Poster #65 145
Enhancement of Fusarium Head Blight Resistance in Soft Red Winter Wheat using Marker Assisted Selection	
Jerry Johnson, Dan Blend, Yuanfeng Hao and Zhenbang Chen	Poster #66 146
Identifying QTL for Fusarium Head Blight Resistance in a RIL Population Derived from a Three-way Cross Involving Three Resistant Parents	
N.H. Karplus, E.A. Brucker and F.L. Kolb	Poster #67 147
A Transcriptomic Approach to Elucidate the Possible Roles of Brassinosteroids in Early Plant Defense Responses	
G.B. Sunil Kumar, Mojibur Khan and Fiona Doohan	Poster #68 148
Effect of Isolated Microspore Culture and Silver Nitrate Pre-treatment on Improving <i>in vitro</i> Selection to Reduce Deoxynivalenol Accumulation in Barley	
W.G. Legge, J.R. Tucker, M. Banik and M.E. Savard.....	Poster #69 149
Efficacy of Near-Infrared Reflectance Spectroscopy to Predict <i>Fusarium</i> Damaged Kernels and Deoxynivalenol in Red and White Wheat in Michigan	
J.M. Lewis, T. Dietz, L. Siler, S. Hammar, S. Mishra and R. Laurenz	Poster #70 150
Efficient Selection for Low DON Levels in Wheat	
Gene Milus, David Moon and Peter Rohman	Poster #71 151
Usefulness of Greenhouse Evaluations as a Predictor of Wheat Head Blight Resistance in the Field	
Gene Milus, David Moon and Peter Rohman	Poster #72 152
Comparison of Different Inoculation Methods for Evaluation of FHB Resistance in Wheat Varieties	
Swasti Mishra, Lee Siler, Sue Hammar and Janet Lewis	Poster #73 153
The 2009-10 Southern Uniform Winter Wheat Scab Nursery	
J.P. Murphy and R.A. Navarro.....	Poster #74 154
Application of Single Kernel NIR Technology for Evaluation of Wheat Cultivars and Fungicides for FHB Management	
K.H.S. Peiris, W.W. Bockus and F.E. Dowell.....	Poster #75 159
Development of Single Kernel NIR Technology for Evaluation of FHB Resistance and for Identification of Reduced DON in Harvested Wheat Grain	
K.H.S. Peiris, Y. Dong, S. Wegulo, W. Berzonsky, W.W. Bockus, P.S. Baenziger and F.E. Dowell	Poster #76 161
Mapping Wheat Head Scab Resistance QTL in Mult757 using Family-based Linkage and Association Approach	
Umesh Rosyara, Jose L. Gonzalez-Hernandez, Kristene Gedye, Jeff Stein and Karl Glover.....	Poster #77 163
Fine Mapping of a Region on Chromosome 6H Associated with DON in Barley	
A.H. Sallam, K.A. Beaubien, R. Dill-Macky, S. Chao, Y. Dong and K.P. Smith	Poster #78 164

Table of Contents

Development and Distribution of Male-Sterile Facilitated Recurrent Selection

Populations

J. Shoots, M. Guttieri, F. Kolb, J. Lewis, A. McKendry, H. Ohm, C. Sneller, M.E. Sorrells,
E. Souza, D. Van Sanford, J. Costa, C. Griffey, S. Harrison, J. Johnson
and P. Murphy.....Poster #80..... 165

Report on the 2009-2010 Northern Uniform Winter Wheat Scab Nurseries

C.H. Sneller, P. Paul, M. Guttieri, L. Herald and B. Sugerma.....Poster #79..... 167

Genomic Selection for Fusarium Head Blight Resistance in Wheat

Mark E. Sorrells, Anna Bishop-Tran, Jessica Rutkoski, Jared Benson,
Gina Brown-Guedira and Elliot HeffnerInvited Talk..... 168

Milling and Flour Analysis of Winter Wheat Genotypes in Regional *Fusarium*

Nurseries

Edward Souza.....Poster #81..... 169

Comparison of Two Fusarium Head Blight Inoculation Methods in Wheat

C.J. Thompson, E.A. Brucker and F.L. KolbPoster #82..... 170

Identification of Quantitative Trait Loci for Fusarium Head Blight Resistance in a

Winter Wheat Population

C.J. Thompson, E.A. Brucker and F.L. KolbPoster #83..... 171

Introgression of Two Major FHB-Resistance QTLs into Durum and Hard Red

Spring Wheat

Steven S. Xu, Chenggen Chu, Timothy L. Friesen, Shiaoman Chao, Shaobin Zhong,
Scott Halley, Xiwen Cai and Elias M. Elias.....Invited Talk..... 172

OTHER PAPERS

The U.S. Wheat and Barley Scab Initiative's FHB Alert System

Hane, D., S. Canty, E. DeWolf, S. Crawford and D. Van Sanford.....Poster #51..... 177

2010 Fusarium Head Blight Epidemic in Ohio: Our Role in Extension and

Outreach

A.B. Kriss, K.T. Willyerd, P.A. Paul and L.V. Madden.....Poster #52..... 178

INDEX OF AUTHORS 181