
Table of Contents

BIOTECHNOLOGY

Introduction of a Modified Ribosomal Protein L3 Gene as a Strategy to Increase Trichothecene Toxin Resistance in Plants Gerhard Adam, Rudolf Mitterbauer, Armin Raditschnig, Hanna Weindorfer, and Josef Glössl	1
Reduced Virulence of <i>Fusarium graminearum</i> Mutants Deficient in TRI101: Transacetylase Activity N.J. Alexander, S. P. McCormick, and S.L. Ziegenhorn	4
Characterization of Wheat PR-Proteins cDNA's for Transformation of Wheat to Enhance Resistance to Scab A. Anand, W. Li, N. Sakthivel, S. Krishnaveni, S. Muthukrishnan, B.S. Gill, J.S.Essig, R.E.Adams, V.Janakiraman, H.N.Trick	5
Molecular Mapping of a QTL for Deoxynivalenol Tolerance in Wheat G-H Bai, R. Plattner, G. Shaner and F. Kolb	13
Establishment of a USDA-ARS Regional Molecular Genotyping Laboratory in Manhattan, KS GL Brown-Guedira	17
Genetic Analysis of Resistance to Fusarium Head Blight in Common Wheat J. Chen, C.A. Griffey, M.A. Saghai Maroof , W. Zhao, W. Xie, T. Pridgen and R.M. Biyashev	19
Effectiveness of MAS for Selection of Head Blight Resistance in Soft Red Winter Wheat J.M. Costa, K. Salmon, A. Demianski, and K. Grant	25
Expression Patterns of Genes from a Head Scab Infected Spike cDNA Library John Fellers, Kristi Hill-Ambroz, Wanlong Li, and Bikram Gill	26
Fine Mapping of A Quantitative Trait Locus for Wheat Scab Resistance Using PstI-AFLP Guo, P-G, Shaner, G.E, and G-H Bai	27
Finding Quantitative Trait Locus Associated with Fusarium Head Blight of Wheat Using Simple Sequence Repeat Markers Anju Gupta, P. E. Lipps, and K. G. Campbell	28
A Visible Fungal Growth Approach to Rapid Antifungal Protein Gene Pretesting Hilburn, K.L.B., Baldridge, G.D., Bushnell, W.R., and Zeyen R.J.	33
Genetic Transformation of Barley with Genes for Scab Resistance M. Manoharan, T. M. Hohn, and L. S. Dahleen	37
Identification of QTLs for Scab Resistance in Barley Mesfin, A., G.J. Muehlbauer, D.C. Rasmusson, R. Dill-Macky, T. Walsh, C.D. Gustus and K.P. Smith	38

Optimizing the Expression of Candidate Anti-Fusarium Protein Genes in Hexaploid Wheat P.A. Okubara, T.M. Hohn, R.M. Berka, N.A. Alexander, Z. Wang, L.P. Hart, and A.E. Blechl	39
Genomics Efforts to Understand Fusarium Head Blight in Wheat. Thérèse Ouellet, Hanhong Dan, Sharon Allard, H��l��ne Rocheleau, Tricia Glassco, Anju Koul, and Linda Harris	44
Preliminary Characterization of Wheat Events Harboring Novel Transgenes for Scab Resistance S.J. Sato, J.A. Schimelfenig, S. Mitra, T.E. Clemente, A. Mitra, M. Dickman, J.E. Watkins, and P.S. Baenziger	45
Targeted Expression a Thionin Gene to Inhibit Growth of <i>Fusarium graminearum</i> in Barley Ronald W. Skadsen, Puthigae Sathish, Jianming Fu, Maria Laura Federico, and Heidi Kaepler	46
Construction of Genomic Libraries Enriched with Microsatellite Sequences Q. J. Song, E. W. Fickus, and P. B. Cregan	50
Development and Physical Mapping of Microsatellite Markers in Wheat Sukhwinder-Singh, Wanglong Li, Qijian Song, P. Cregan, G. L. Brown-Guedira and B. S. Gill	52
Development of STSs and SNPs Linked to Fusarium Head Blight Resistance of Wheat Using AFLPs and Antifungal Gene Analogs I. Vroh Bi, F. L. Kolb, L. K. Boze, G. Bai, and L. L. Domier	55
Microsatellite Marker Development and Construction of a Microsatellite Allele Size Database of Elite and Scab Resistant Wheat Genotypes: Meiotic Mapping at MSU and Rationale for the Overall Project R. Ward, Chen Xin-min, Shi Jian-rong, Qijian Song, and P. Cregan	59
Genetic Engineering Wheat for Scab Resistance Wyckoff, M., L. Smith, G. Baldrige, R. Zeyen and G.J. Muehlbauer	61
Identification, Cloning and Sequencing of ESTs Related to FHB Resistance of Wheat D. H. Xing, Y. Yen, J. C. Rudd, Y. Jin	62
A Microassay Approach to Rapid Antifungal Protein Gene Pretesting R. J. Zeyen, G.D. Baldrige, W.R. Bushnell, K.L.B. Hilburn	64
Creation of an AFLP Map for Identification of Scab Resistance Genes from Wheat Cultivar WangShuibai Xu Zhang, Peiguo Guo, Weizhong Lu, and Guihua Bai	68
SSR Mapping and Sub-arm Physical Location of a Major Scab Resistance QTL in Wheat W. C. Zhou, F. L. Kolb, G. H. Bai, G. Shaner, and L. L. Domier	69

CHEMICAL AND BIOLOGICAL CONTROL

Seed Treatment with Bacterial Biocontrol Agents to Control Head Blight Bruce H. Bleakley, Yongmei Luo, and Nichole Baye	74
Control of Fusarium Head Blight with Biological Antagonists B.H. Bleakley, M.A. Draper, and K.R. Ruden	75
Biocontrol of Fusarium Head Blight in Brazil Wilmar C. da Luz1	77

Interaction of 28% Nitrogen with Folicur Fungicide When Applied at Heading as a Tank Mix	
M.A. Draper, J.C. Rudd, H.H. Casper, K.R. Ruden, and G. Lammers	82
Performance of Various Fungicides for Suppression of Fusarium Head Blight (Scab) in South Dakota – 2000	
M.A. Draper, J. Rudd, H.H. Casper, K.R. Ruden, and G. Lammers	85
Efficacy of the Fungicide Folicur In Controlling Barley Fusarium Head Blight in Genotypes with Partial Resistance	
R.D. Horsley, M.P. McMullen, and J.D. Pederson	89
Effects of Application Parameters on Control of Fusarium Head Blight with Fungicides	
M. McMullen, S. Halley, J. Pederson, J. Moos, and J. Jordahl	94
Uniform Fungicide Trial for Controlling FHB in Spring Wheat, ND, 2000	
Marcia McMullen, Blaine Schatz, and John Lukach	98
Uniform Fungicide Trial for Controlling FHB in Barley, ND, 2000	
Marcia McMullen and John Lukach	99
Analysis of the 2000 Uniform Wheat Fungicide Trials Across Locations	
Eugene A. Milus and Marcia McMullen	100
USDA-ARS, Ohio State University Cooperative Research on Biologically Controlling Fusarium Head Blight: Field Tests of Antagonists in 2000	
D.A. Schisler, N.I. Khan, M.J. Boehm, and Lipps, P.E.	105
Control of Fusarium Head Blight of Wheat with Foliar Fungicides	
Gregory Shaner and George Buechley	110
Identification of Bioprotectants for Control of <i>Gibberella zeae</i>	
Christine A. Stockwell, Gary C. Bergstrom, and Wilmar C. da Luz	114

EPIDEMIOLOGY AND DISEASE MANAGMENT

Effects of Rainfall and Temperature on Production of Perithecia by <i>Gibberella zeae</i> in Field Debris in Michigan	
Corrie Andries, Andrew Jarosz, and Frances Trail	118
Effect of Fusarium Infection During Wheat Seed Development on the Production of DON and Seed Quality	
Jason Argyris and Dennis M. TeKrony	123
Are <i>Gibberella zeae</i> Sexual Spores the Critical Inoculum for Wheat Head Blight?	
Daren W. Brown, Sung-Hwan Yun, Theresa Lee, B. Gillian Turgeon, and Anne E. Desjardins	128
Development of <i>Fusarium graminearum</i> in Detached Segments of Barley Leaves	
W.R. Bushnell, R.W. Skadsen, S. Lewandowski, T. Seeland, and D.E. Krueger	129
Variation in <i>Fusarium graminearum</i> Isolates from Nepal Associated with Their Host of Origin	
J. P. Carter, H. N. Rezanoor, A. E. Desjardins, and P. Nicholson	130
Prediction of Fusarium Head Blight Epidemics	
E.D. De Wolf, L.V. Madden, and P.E. Lipps	131
Crop Residue Moisture and <i>Gibberella zeae</i> Perithecia Development	
E.D. De Wolf, P.E. Lipps, and L.V. Madden	136

Factors Affecting the Development of Wheat Fusarium Head Blight	
E. De Wolf, L. Francl, P. Lipps, L. Madden, L. Osborne, and Y. Jin	137
A Visual Scale for Estimating Damage to Soft Red Winter Wheat Kernels by Fusarium Head Blight	
Jessica S. Engle, Erick D. De Wolf, and Patrick E. Lipps	141
Influence of Mist-Irrigation Volume on the Severity of Fusarium Head Blight and Seed Characteristics in Selected Check Cultivars and Lines of Wheat and Barley	
C. K. Evans and R. Dill-Macky	143
Gibberella zae Population Dynamics: A Progress Report	
L.J. Francl, S. Markell, S. Ali, and T.L. Friesen	144
Description and Evaluation of the NDSU Regional Wheat Disease Forecasting System	
L.J. Francl, C. Larson, and E.D. De Wolf	147
Pathogenicity and Virulence of Eight <i>Fusarium graminearum</i> Isolates Originating in Four Regions of Mexico	
L. Gilchrist, C. Velazquez, and J. Crossa	153
Local Genetic Diversity of <i>Gibberella zae</i> Populations from Corn Stubble, Wheat Stubble and Infected Wheat Heads	
Andrew M. Jarosz, Jennifer Schaupp, and Ngoc Kieu	156
AFLP Linkage Map of <i>Gibberella zae</i>	
J. E. Jurgenson, R. L. Bowden, K. A. Zeller, J. F. Leslie, N. A. Alexander, and R. D. Plattner	157
Sites of Action of Type II Resistance to FHB in Wheat: Ning 7840 Retards Spread of <i>F. graminearum</i> within Rachis	
J.M. Lewis, R.W. Ward, and L.P. Hart	158
Temporal Patterns of Ascospore Discharge by <i>Gibberella zae</i> from Colonized Corn Stalks Under Natural Conditions	
Sandra L. Maldonado-Ramirez and Gary C. Bergstrom	159
Fusarium Head Blight: Inoculum Detection, Disease Progress, and Environmental Influences	
L. Osborne, Y. Jin, and R. Kohl	163
A Sensor for Monitoring Wetness at the Soil-Air Interface	
L. Osborne and Y. Jin	169
Measuring Differences in the Ability of Strains of <i>Fusarium graminearum</i> to Spread Within Wheat Heads	
Rubella Sanyal, Weiping Xie, and H. Corby Kistler	173
Spatial Patterns of Fusarium Head Blight in New York Wheat Fields During the Epidemic of 2000	
Denis A. Shah, Christine A. Stockwell, Stanley O.Kawamoto, and Gary C. Bergstrom	174
Influence of Local Versus Regional Factors on Incidence of Seed Infection by Fusarium	
Denis A. Shah and Gary C. Bergstrom	176
The Beta-Binomial Distribution Describes the Incidence of Seed Infection by <i>Fusarium graminearum</i> Among Seedlots in a Region	
Denis A. Shah and Gary C. Bergstrom	178
Sampling Spores of <i>Fusarium graminearum</i>	
Gregory Shaner and George Buechley	182
Fusarium Head Blight in Barley in Ontario in 2000	
Tamburic-Ilincic, L., Falk, D. E., and Schaafsma, A. W.	187

The Mechanism of Forcible Discharge of Ascospores in <i>Gibberella zeae</i>	
H. Xu, I. Gaffoor, C. Andries and F. Trails	192
AFLP Markers Indicate Little Divergence Between U.S. Corn Belt Populations of <i>Fusarium graminearum</i> (<i>Gibberella zeae</i>)	
K.A. Zeller, R.L. Bowden, and J.F. Leslie	193

FOOD SAFETY, TOXICOLOGY AND UTILIZATION

Diagnostic Vomitoxin (DON) Services in 2000-2001	
Howard H. Casper	194
DON Level in Grain from Wheat Inoculated with <i>F. graminearum</i> is Not Correlated to the DON Producing Potential of Individual Cultures	
R. W. Stack, C. E. Wolf-Hall, H. H. Casper, and J. M. Hansen	198

GERMPLASM INTRODUCTION AND ENHANCEMENT

RGON: A Regional Strategy for Fusarium Head Blight Improvement	
P.S. Baenziger, R. A. Graybosch, J. E. Watkins, J.A. Schimelfenig, and D. Baltensperger	199
Detection of QTL Linked to FHB Resistance in Sumai 3-Derived Lines	
I.A. Del Blanco, R.C. Froberg, R.W. Stack, S.F. Kianian, and W.A. Berzonsky	200
Toward Transferring Scab Resistance from a Diploid Wild Grass, <i>Lophopyrum elongatum</i>, into Durum Wheat	
Prem P. Jauhar and Terrance S. Peterson	201
Greenhouse Based Evaluation of Asian and Italian Winter Wheat Germplasm for Type I Resistance to Fusarium Head Blight	
Anne L. McKendry and Kara S. Bestgen	205
Broadening the Genetic Base for Scab Resistance Through a CIMMYT/National Scab Initiative Partnership	
Anne L. McKendry	209
Evaluation of Yugoslavian Winter Wheat Germplasm for Resistance to Fusarium Head Blight	
Anne L. McKendry, J. Paul Murphy, Kara Bestgen, and Rene Navarro	215
Alien Genetic Diversity for Wheat Improvement: Focus on Scab Resistance	
A. Mujeeb-Kazi, R. Delgado, S. Cano, V. Rosas, and A. Cortés	220
Fusarium Head Blight Reaction of Durum Wheat Lines Conditioned by Chromosome Substitutions from <i>Triticum turgidum</i> L. var. <i>Dicoccoides</i>	
R.W. Stack, E. Elias, L.R. Joppa, and J.D. Miller	225
Inheritance of Resistance to Fusarium Head Blight in Spring Wheat F-1 Hybrids	
Robert W. Stack and Richard C. Froberg	226
Inheritance of Scab Resistance in Sapporo Haru Komugi Jugo	
X. Zhang, Y. Jin, and J. Rudd	227

Fusarium Head Blight Resistant Sources of Spring Wheat Identified from the USDA Collection	
X. Zhang, Y. Jin, R. Rudd, T. Hall, J. Rudd, and H. Bockelman	228
Geographical Distribution and Pedigree Analysis of Fusarium Head Blight Resistant Selections from the USDA Spring Wheat Germplasm Collection	
X. Zhang, Y. Jin, R. Rudd, J. Rudd, and H. Bockelman	234

VARIETY DEVELOPMENT AND UNIFORM NURSERIES

A Protocol for Marker-Assisted Selection of a Fusarium Head Blight Resistance Gene Derived from Sumai 3	
James A. Anderson, Sixin Liu, Michael O. Pumphrey, Jose L. Gonzalez-Hernandez, and Emily J. Wennerlind	239
Development of FHB-Resistant Cultivars for the Mid-South	
R.K. Bacon, E.A. Milus, J.T. Kelly, C.T. Weight, and P.C. Rohman	244
The Need for Uniformity in Designating Types of Scab Resistance	
W.R. Bushnell	245
Assessment and Reaction of <i>Triticum aestivum</i> Genotypes to <i>Fusarium graminearum</i> and Its Effects on Traits Related to Grain Yield and Quality	
M. Chappell, C. Griffey, J. Chen, T. Pridgen, D. Nabati, W. Zhao, and M. Vaughn	246
Reproducibility of Results from Field and Greenhouse Evaluations of Resistance to Fusarium Head Blight on Winter Wheat	
M.A. Davis, W.W. Bockus, and R.L. Bowden	251
Fusarium Head Blight Resistance in Wheat Cultivars Ning7840 and Freedom	
David R. Drake and Herbert W. Ohm	252
Evaluation of Yugoslavian Wheat Germplasm for Resistance to Fusarium Head Blight of Wheat	
Anju Gupta, Patrick E. Lipps, and Kimberly G. Campbell	253
Identifying Resistance and the Relationship Between Spikelet Symptoms and Kernel Infections in <i>Fusarium graminearum</i> Infected Soft Red Winter Wheat	
Marla Hall, Brenda Kennedy, and Dave Van Sanford	259
Progress of China/CIMMYT Shuttle Breeding and Germplasm Exchange Aimed at Combining High Yield Potential with Scab Resistance	
Z.H. He, M. van Ginkel, L. Gilchrist, and S. Rajaram	264
Breeding for Scab Resistance in Soft White Winter Wheat Report 1999-2000	
Guo-Liang Jiang, Lee Siler, Janet Lewis, and Richard Ward	269
Greenhouse and Field Evaluation of Resistance to Fusarium Head Blight in Soft Red Winter Wheat	
Brenda Kennedy, Marla Hall, Liu Hua, and Dave Van Sanford	273
Breeding for Fusarium Head Blight Resistance in Soft Red Winter Wheat	
F. L. Kolb, L. K. Boze, N. J. Smith, A. J. Stewart, W. C. Zhou, and I. Vroh Bi	277
Winter Wheat Breeding for Scab Resistance in South Dakota	
A. Magnuson, A. Ibrahim, J. Rudd, Y. Jin	280
Fusarium Head Blight Resistance of Wheat Line Ning894037	
Xiaorong Shen and Herbert W. Ohm	281

Fusarium Head Blight in the F-2 and F-3 Generations of a Spring Wheat Recombinant Population	
R.W. Stack, R.C. Frohberg, J. Mitchell Fetch and J.M. Hansen	282
Maintaining Fusarium Head Blight Resistance in Spring Wheat Through Successive Breeding Cycles	
R.W. Stack, R.C. Frohberg, and J. M. Hansen	283
Selecting for FHB Resistance in Early Generations of Winter Wheat Populations	
Tamburic-Ilicic, L., Schaafsma, A.W., Fedak, G. , and Falk, D.E.	284
Movement of <i>Fusarium graminearum</i> in Wheat Spikes Following Greenhouse Inoculation	
Dennis TeKrony, David Van Sanford, Jason Argyris, and Brenda Kennedy	288
Fusarium Head Blight Resistance in Spring Wheat and Barley: Effective Screening Nurseries	
W.G. Thompson and J.V. Wiersma	293
New Resistances in CIMMYT Bread Wheat Germplasm	
M. van Ginkel, L. Gilchrist, and C. Velazquez	297
The Effect of Drought Stress on Scab Development of Spring Wheat	
Lieceng Zhu, J.C. Rudd, Y. Jin. X. Zhang, R. Rudd. T.E. Shumacher	303

NCR-184 STATE REPORTS

NCR-184 2000 Arkansas State Report	
Eugene A. Milus	306
NCR-184 Management of Head Scab in Small Grains Illinois Report - November, 2000	
Frederic L. Kolb, Larry K. Boze, Norman J. Smith, Irie Vroh Bi, and Wenchun Zhou	307
Management of Scab of Small Grains NCR-184 2000 Indiana State Report	
Gregory Shaner	309
Annual Report for 2000 NCR-184 – Iowa	
G.P. Munkvold and J.M. Shriver	311
NCR-184 State Report Kansas 2000	
R.L. Bowden	312
NCR-184 2000 Kentucky State Report	
D.E. Hershman, D.S. VanSanford, and D.M. TeKrony	314
2000 NCR-184 State Report Management of Head Scab of Small Grains	
Patrick Hart	316
2000 NCR-184 Management of Fusarium Head Blight of Small Grains - Minnesota State Report	
Ruth Dill-Macky	319
NCR-184 Committee- Management of Head Scab in Small Grains 2000 Missouri Report	
Laura E. Sweets and Anne L. McKendry	322
Fusarium Head Blight in 2000 NCR-184 Nebraska State Report	
John E. Watkins	325
NCR-184 State Report New York 2000	
Gary C. Bergstrom	327

NCR-184 Report 2000 - North Dakota	
R.W. Stack	330
NCR-184 Management of Head Scab of Small Grains: 2000 Ohio Report	
Patrick E. Lipps, Erick D. Dewolf, Laurence V. Madden, Anju Gupta, and Jessica S. Engle	332
NCR-184, Managment of Head Scab of Small Grains 2000 South Dakota State Report	
Y. Jin	334
NCR 184: Virginia 2000 Sstate Report on Fusarium Head Blight	
Carl Griffey, Erik Stromberg, M. A. Saghai Maroof, Jianli Chen, Matthew Chappell, Weidong Zhao, and Tom Pridgen	337