

Nancy J. Alexander
National Center for Agricultural Utilization Research
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Education

State University College at Oswego, New York, B.S., Biology and Secondary Education, 1968

Duke University, M.A., Botany, 1970

Duke University, PhD, Zoology, 1977

Professional Positions

1980-present Research Scientist, USDA, National Center for Agric. Utilization Research

1997-1980 Postdoctoral Research Associate, The Ohio State University, Columbus

1971-1977 Graduate Research Assistant, Duke University

1968-1971 Graduate Research Assistant, Duke University

Honors and Awards

Graduate Fellowship, Duke University, 1968-1970

Research Award, Duke University, 1969-1970

NIH Research Award, Duke University, 1973-1975

NIH Genetics Traineeship, Duke University, 1975-1977

Ohio State University Postdoctoral Fellowship Award, Ohio State, 1977-1978

NIH Research Award, Ohio State, 1978-1980

Recipient of grant for \$140,286 from Illinois Soybean Program Operating Board, 1992

Recipient of US Wheat and Barley Scab Initiative Research Award \$33,000, 1999, 2000, 2001 co-PI with S. P. McCormick and G. Muehlbauer

Fusarium Head Blight Research

I have been working on the biosynthetic pathway of trichothecene production in *Fusarium* since 1997. Our group has identified over 11 genes that are involved in the pathway by using molecular genetic techniques combined with biochemical analyses. In order to define the function of a gene, we typically disrupt the gene, once identified, by insertions or deletions and then chemically characterize the phenotype of the mutant. Since finding two genes in *Fusarium* that apparently provide some self-protection from the toxin, my research has branched out to include the identification and isolation of genes that may provide plants with a mechanism for resisting the invasion of the fungus. This has been a collaborative effort with Gary Muehlbauer, from U. Minn. and Susan McCormick from NCAUR, resulting in 3 years of funding from the USWBSI. I am also working on developing a plant system for screening potentially interesting genes that will utilize the unicellular plant, *Chlamydomonas*. We have found two genes from the semi-resistant variety Frontana which provide yeast with resistance to toxin and are looking for more. We have also progressed with the development of using *Chlamydomonas* as an effective screening system for toxin-resistance genes.

Guihua Bai

469 Agricultural Hall

Oklahoma State University, Stillwater, OK 74078

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RESEARCH EXPERIENCES

Oklahoma State University, Stillwater OK, 1999-Present

Assistant Professor (wheat molecular genetics and breeding)

NCAUR/ ARS/ USDA, Peoria, IL, 1998-1999

Plant Molecular Biologist (mapping wheat resistance to DON and investigating pathogenesis of *Fusarium graminearum* on wheat)

University of Illinois, Urbana, IL, 1997

Postdoctoral Research Associate (wheat breeding and molecular mapping of wheat resistance to scab)

Texas Tech University, Lubbock, Texas, 1996

Postdoctoral Research Associate (molecular mapping of tef and sorghum).

Purdue University, West Lafayette, IN, 1990-1995

Research Assistant (wheat scab: host resistance, molecular marker and epidemiology).

Food and Crop Institute, Jiangsu Academy of Agric. Sci., Nanjing, China, 1985-1989.

Wheat Breeder (wheat breeding and genetics with emphasis on scab resistance)

EDUCATION

1995 Ph.D. Purdue University, Plant Pathology.

1985 M.S. Nanjing Agricultural University, Nanjing, China, Plant Genetics and Breeding.

1982 B.S. Nanjing Agricultural University, Nanjing, China, Agronomy.

I started my research on wheat resistance to scab in 1982 when I was a M.S. graduate student in China. In the USA, I optimized fungal culture and inoculation methods for greenhouse and field scab evaluation, studied inheritance of wheat resistance to scab concluding that wheat scab resistance controlled by a few genes with major effect, evaluated pathogenesis of transgenic fusarium strains, evaluated a international collection of scab resistant germplasm for scab resistance, DON content and genetic diversity using genetic markers, identified a major QTL and two other minor QTL for scab resistance and DNA content. In Oklahoma State University, my lab focuses on molecular breeding for disease resistance and functional genomics. I have been involved in USWSI's scab research programs since 1999 and made very good progress in molecular mapping of scab resistance and gene discovery. Recently, our lab has developed first two STS markers from AFLPs linked to 3BS major QTL and these markers will soon be released to public breeding programs. Also, we optimized protocol for high-throughput analysis of AFLP markers using Li-Cor DNA analyzer. So far, I published about 20 papers on different aspects of scab research.

Name: Tom Clemente

Position Title: Assistant Professor

Education

YEAR FIELD

INSTITUTION AND LOCATION	DEGREE	CONFERRED	OF STUDY
Indiana University of Pennsylvania	B.S.	1985	Biology
Oklahoma State University	M.S.	1989	Plant Pathology
North Carolina State University	Ph.D.	1993	Plant Pathology

Employment

Position	Department	Institution	Years
Research Assistant	Plant Pathology	Okla. State	1986-1989
Research Assistant	Plant Pathology	N.C. State	1989-1993
Post Doctorate Associate		Monsanto Co.	1993-1996
Research Assistant Professor	Biotechnology	U. of Nebraska	1996-2000
Assistant Professor	Dept. of Agronomy Plant Science Initiative	U. of Nebraska	2000-2001

Subset of Publications/Patents

- Clemente, T., B.J. LaValle, A.R. Howe, D.C. Ward, R.J. Rozman, P.E. Hunter, D.L. Broyles, D.S. Kasten, M.A. Hinchee. 2000. Progeny analysis of glyphosate selected transgenic soybeans derived from *Agrobacterium*-mediated transformation. *Crop Sci.* 40:797-803.
- Zhang, Z., A. Xing, P. Staswick, T. Clemente. 1999. The use of glufosinate as a selective agent in *Agrobacterium*-mediated transformation of soybean *Plant Cell, Tiss. Org Cult.* 56:37-46.
- Campbell, B.T., P.S. Baenziger, A. Mitra, S. Sato, T. Clemente. 2000. Inheritance of multiple transgenes in wheat. *Crop Sci.* 40:1133-1141.
- Xing, A., S. Sato, P. Staswick, Z. Zhang, T. Clemente. 2000 The use of the two T-DNA binary system to obtain marker-free transgenic soybeans. *Cell. Dev. Biol.* 36:456-463
- Hinchee, M.A., T.E. Clemente, D. Conner-Ward, M.J. Fedele, J.E. Fry, A.R. Howe, R.J. Rozman. 1999 Method for transforming soybean. U.S. Patent No. 5,959,179.
- Luo, Z.Q., T.E. Clemente, S.K. Farrand. 2000. Construction of an *Agrobacterium* C58 derivative that does not mutate to tetracycline resistance. *Mol. Plant. Micro. Int.* 14:98-03
- Dickman, M.B., Y.K. Park, T. Oltersdorf, T. Clemente, and R. French. 2001. Abrogation of disease development in plants expressing animal antiapoptotic genes. *Proc. Natl. Acad. Sci. USA.* 98:6957-6962.
- Buhr, T, S. Sato, F. Ebrahim, A. Xing, Y. Zhou, M. Mathiesen, B. Schweiger, A. Kinney, P. Staswick, T. Clemente. 2001. Ribozyme termination of RNA transcripts down-regulate seed fatty acid genes in transgenic soybean. *Accepted Plant Journal.*
- Farrand, S, T. Clemente and P. Staswick 2001. Counter selection strategy for gram-negative bacteria U.S. Patent Application.
- Clemente, T., T. Buhr and P. Staswick. 2001. Down-regulation of single genes and simultaneous down-regulation of multiple genes by nuclear localization of RNA transcripts. U.S. Patent Application
- Staswick, P. Z, Zhang, T. Clemente, and J. Specht. 2001. Efficient down regulation of the major vegetative storage protein genes in transgenic soybean does not compromise plant productivity. *Plant Physiol.* 127:1819-1826.
- Fei, S., T. Yu, T. Clemente, and T. Riordan. 2001. Nodal segment explant as a potential target for the genetic engineering of buffalograss. *Int. Turgrass Soc. Res. J.* 9:165-168.
- Lee, T-J, D. Coyne, T. Clemente, and A. Mitra. 2002. Partial resistance to bacterial wilt in transgenic tomato plants expressing non-plant antibacterial lactoferrin gene. *J. Amer. Soc. Hort. Sci.* 127:158-164

FHB Research: I coordinate all the wheat transformation effort in support of an ongoing FHB funded program at the University of Nebraska. My role in the project includes supervision of vector constructions, transformations, molecular characterizations of transformants and advise on standard operating procedures for field testing of lead lines.

Dr. John Fellers is a member of the USDA-ARS Plant Science and Entomology Research Unit. He is a native of Oklahoma and received his B.S. and M.S. degrees in Crop Science from Oklahoma State University where his research focused on wheat tissue culture. Dr. Fellers received his Ph.D. in Crop Science from the University of Kentucky where he studied the molecular virology, plant transformation, and development of pathogen derived disease resistance in tobacco plants. He continued this work in a post-doctorate position at North Carolina State University where he worked on mapping and cloning disease resistance genes in tobacco.

As a USDA scientist and partner in the KSU Wheat Genetics Resource Center, Dr. Fellers works on mapping and cloning disease resistance genes for Karnal bunt, leaf rust, scab, Hessian fly, and viruses. Dr. Fellers is also the Director of the USDA-KSU Sequencing Facility. Current projects include using EST expression arrays determine molecular pathways of plant response to scab, leaf rust and Karnal bunt infection, sequencing the region around the Lr21 locus, and sequencing a gene rich region on 5AL.

CURRICULUM VITAE
CARL A. GRIFFEY

Education

- Ph.D. in Agronomy, University of Nebraska, December 1987
- M.S. in Agronomy, Washington State University, 1984
- B.S. in Plant and Soil Science, University of Tennessee, 1981

Professional Experience

- Professor, CSES Dept. Virginia Tech, 2002
- Associate Professor, CSES Dept., Virginia Tech, 1995 to 2002
- Assistant Professor, CSES Dept., Virginia Tech, 1989 to 1995
- Research Associate, USDA-ARS, Cereal Rust Laboratory, 1988-89

Professional Organizations

- American Society of Agronomy
- Crop Science Society of America
- American Phytopathological Society

Awards and Honorary Societies

- National Association of Wheat Growers Annual Award for Outstanding Research Benefiting the U.S. Wheat Industry, February 2001
- Virginia Small Grains Association Friend of the Industry Award, August 2001

Recent Refereed Journal Articles

- Mammadov*, J.A., J.C. Zwonitzer*, R.M. Biyashev, C.A. Griffey, Y. Jin, B.J. Steffenson, and M.A. Saghai Maroof. 2002. Molecular mapping of *Rph5*: A gene conferring resistance to barley leaf rust (*Puccinia hordei* G. Otth). *Crop Science* 42: "In Press" (Accepted for publication November 2001).
- Van Sanford, D., J. Anderson, K. Campbell, J. Costa, P. Cregan, C. Griffey, P. Hayes, and R. Ward. 2001. Discovery and deployment of molecular markers linked to Fusarium Head Blight resistance: An integrated system for wheat and barley. *Crop Science* 41:638-644.
- Liu*, S., C.A. Griffey, M.A. Saghai Maroof. 2001. Identification of molecular markers associated with adult plant resistance to powdery mildew in common wheat cultivar Massey. *Crop Science* 41:1268-1275.

Varieties Released

- 24 Soft Winter Wheat Varieties, 1990-2001
- 4 Winter Feed Barley Varieties 1990-2001

Research on FHB

- Assessment and Development of Scab Resistance in SRW Wheat, 1998 to present
 - FHB resistant varieties developed: Roane and McCormick
 - Backcrossing type II resistance, using 3BS markers, into SRW wheat lines
 - Introgressing scab resistance using doubled haploids
- Heredity, Molecular Markers and Selective Breeding for Scab Resistance, 2000 to present
 - Inheritance of FHB resistance studied in wheat genotypes W14, Shaan 85, and Ernie
 - Mapped QTLs on chromosomes 3BS, 5AL and 2BS in W14 using F₂, F_{2:3} and DH
 - Cooperating with KSU genotyping center using MAS in backcrossing project

Bio Sketch

Jianming Fu, Ph. D.

Working address: USDA/ARS/Cereal Crops Research Unit, 501 Walnut St., Madison, WI 53705, USA, Phone: (608)262-4481, Fax: (608)264-5528, E-mail: jianmingfu@facstaff.wisc.edu

1. Brief description on my affiliation, experience on FHB research and transformation
I am a research associate affiliated with Agronomy Department at the University of Wisconsin-Madison, and working in USDA/ARS/Cereal Crops Research Unit (above). I have conducted Fusarium Head Blight research for last three years, including antifungal protein gene cloning and transformation in barley. I have worked on transformation for last 8 years, and stably transformed three plant species including poplar tree species via *Agrobacterium*, oat and barley via gene gun approach. I gave three oral presentations at international conferences and published two papers in peer-reviewed journals (e.g. *Plant Molecular Biology and Planta*) and submitted four manuscripts for publication about my transformation work and FHB research. I have membership in four professional societies including Sigma Xi. Besides my professional expertise, I am a hard-working person and willing to serve for research committees.

2. Employment history and education

- 1999 to present: Research associate with affiliation and working address above.
- 1999: Ph. D. in Plant Molecular Biology, Department of Biological Sciences, Rutgers University, The State University of New Jersey, USA. My Ph. D. thesis title: Transformation, expression and effects of a pine cytosolic glutamine synthetase gene in transgenic poplar.
- 1997: MS in Biology, Department of Biological Sciences, Rutgers.
- 1994 to 1999, Teaching Assistant in Department of Biological Sciences, Rutgers.
- 1987: MS in Forest Biology, Beijing Forestry University, P. R. of China.
- 1987 to 1994. Lecturer in Beijing Forestry University.
- 1982: BS in Agriculture, Beijing Forestry University.

3. Further information: contact me or contact my referees below:

(1) Dr. Ronald Skadsen, USDA-ARS-Cereal Crops Research Unit, 501 N. Walnut St., Madison, WI 53705, USA, Tel: (608)262-3672, Fax: (608)264-5528, E-mail: rskadsen@facstaff.wisc.edu

(2) Dr. Heidi Kaeppler, Agronomy Dept. of University of Wisconsin-Madison, 1575 Linden Drive, Madison, WI 53706, USA; Phone: (608)262-0246; Fax: (608)262-5217; Email: hkkaepple@facstaff.wisc.edu.

(3) Professor Edward G. Kirby, Ph. D., Department of Biological Sciences, Rutgers University, New Jersey, 07102, USA, Tel: (973)353-5104/5213, Fax: (973)353-5518, Email: ekirby@andromeda.rutgers.edu

Biographical Sketch Shahryar F. Kianian

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Fargo, ND 58105

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Lab (701) 231-8893
Home (701) 298-8026
email: s.kianian@ndsu.nodak.edu

Education

June, 1984	B.S. in Biological Sciences	University of California-Irvine
June, 1990	Ph.D. in Genetics	University of California-Davis

Positions Held

6/97-present	Assistant Professor	Plant Sciences Department, North Dakota State University
7/90-5/97	Postdoctoral Scientist	Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul, MN
7/84-6/90	Graduate Research Assistant	Department of Vegetable Crops, University of California-Davis, Davis, CA
9/82-6/84	Undergraduate Researcher	Department of Molecular Biology and Biochemistry, University of California-Irvine, Irvine, CA

Honors

2002	Larson/Yaggie Excellence in Research Award, North Dakota State University
1989	The Thomas W. and Mary S. Withaker Prize for demonstrated promise in the areas of Plant Breeding and Genetics, University of California-Davis
1984	The Ralph Waldo Gerard Award in recognition of outstanding research, University of California-Irvine
1984	Excellence in Research Award, University of California-Irvine

Professional Affiliations

1991-present	American Society of Agronomy (ASA)
1990-present	Genetic Society of America (GSA)
1989-present	American Association for the Advancement of Science (AAAS)

FHB Publications and Projects

2002 del Blanco, IA, Frohberg, RC, Stack, RW, Berzonsky, WA and Kianian, SF. Detection of QTL linked to Fusarium Head Blight resistance in Sumai3-derived North Dakota bread wheat line. In depart. Review

2002 Otto, CD, Kianian, SF, Elias, EM, Stack, RW, and Joppa, LR. Molecular Mapping of Fusarium Head Blight in a RICL Population of Tetraploid Wheat. *Plant Molecular Biology* 48:625

1999 PI on USDA-USWBSI funded project "Development of markers linked to FHB resistance in durum and hexaploid wheat". Project first initiated in 1999.

1999 PI on ND-State Board of Agriculture Research and Education funded "Introgression of FHB resistance genes from *Triticum dicoccoides* to HRS wheat. Project initiated in 1999.

Synergistic Activities:

Committee member on the Biotechnology granting program for the National Wheat and Barley SCAB Initiative 1998-2000
Co-chair of the Biotechnology granting program for the National Wheat and Barley SCAB Initiative 2000-2002
CoPI on USDA-USWBSI funded project "Development of durum wheat resistant to Fusarium head blight" 1999-2002
CoPI on USDA-USWBSI funded project "Improving white spring and specialty wheat germplasm for resistance to Fusarium head blight" 1999-2002
CoPI on a USDA-USWBSI funded project "Development of BAC contig spanning a major FHB QTL in durum wheat" 2001-2002
CoPI on NSF funded multi-institutional Plant Genomics grant "The structure and function of the expressed portion of the wheat genomes" 1999-2003. <http://wheat.pw.usda.gov/NSF/nsfpublic.swf>
CoPI on NSF funded multi-institutional Plant Genomics REU grant. Supplementary to the above project.
CoPI on USDA-IFAFS funded multi-institutional grant "Bringing genomics to the wheat fields" 2001-2005
<http://maswheat.ucdavis.edu/>

Harold Corby Kistler, Ph.D.
USDA/ARS Cereal Disease Laboratory
University of Minnesota
St. Paul, MN 55108 USA

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hckist@puccini.crl.umn.edu

Education

1983 Cornell University, Ithaca, NY. Ph.D. Plant Pathology, Minors: Genetics and Toxicology.
1975 Kent State University, Kent, OH. B.S. with honors, Biology.

Professional Experience

1999- present. Research Geneticist and Professor, United States Department of Agriculture, Agricultural Research Service, Cereal Disease Laboratory, University of Minnesota, St. Paul, Minnesota, USA.

1985- 1999. Professor, Associate Professor and Assistant Professor. Program in Plant Molecular and Cellular Biology, Plant Pathology Department, University of Florida, Gainesville, Florida, USA.

1983-1985. Postdoctoral Research Associate, Department of Plant Pathology, University of Wisconsin, Madison, Wisconsin, USA.

Affiliations and Service

American Association for the Advancement of Science. Member 1981-present.

American Society for Microbiology. Member 1984-present.

American Phytopathological Society (APS). Member 1981-present.

APS Genetics Committee 1992- 1995.

APS Physiology, Biochem., and Mol. Biol. Committee 1992-1995. Chairman, 1995.

APS Mycology Committee 1997-2000

Mycological Society of America. Member, 1994 - present.

Associate Editor, Phytopathology 1994-1997

Associate Editor, Molecular Plant-Microbe Interactions 1997-1999.

Award of Excellence for Graduate Research. University of Florida, 1998.

International Society for Plant Pathology, Fusarium committee, vice-chair, 1999-2003.

USDA Natl. Research Initiative, Competitive Grants Program, Plant Pathology Panel. 1993, 1999, 2002.

Whitehead Institute, Center for Genome Research, Fungal Genomics Advisory Panel. 2001-2002.

Relevant publications (2000-present):

O'Donnell, K., H.C. Kistler, B.K. Tacke, and H.H. Casper. 2000. Gene genealogies reveal global phylogeographic structure and reproductive isolation among lineages of *Fusarium graminearum*, the fungus causing wheat scab. Proc. Natl. Acad. Sci. USA 97:7905-7910.

Rosewich, U.L. and H.C. Kistler. 2000. Role of horizontal gene transfer in the evolution of fungi. Annu. Rev. Phytopathol. 38:325-363.

Ward T.J., J.P. Bielawski, H. C. Kistler, E. Sullivan, and K. O'Donnell. 2002. Ancient Polymorphism and Adaptive Evolution In the Trichothecene Mycotoxin Gene Cluster of Phytopathogenic *Fusarium* (Manuscript submitted) .

Trail, F., J.R. Xu, P. San Miguel, R. Halgren and H.C. Kistler. Analysis of expressed sequence tags from *Gibberella zeae*. (In preparation).

Hou, Z., C. Xue, H.C. Kistler and J.R. Xu. *MGV1* regulates female fertility and plant infection in *Fusarium graminearum* (In preparation).

Rosewich Gale, L., L.F. Chen, C.A. Hernick, K. Takamura, and H.C. Kistler. Analysis of field populations of *Fusarium graminearum* (teleomorph *Gibberella zeae*) from China. (In preparation).

Education:

Miami University, Oxford, OH: B.A., cum laude (microbiology, chemistry) 1964-1968.

University of Michigan, Ann Arbor, MI: M.S. (microbiology) 1968-1969.

University of Michigan, Ann Arbor, MI: Ph.D. (microbiology) 1972-1977.

Broad Goals and Objectives of Research Program

The major research goals of my laboratory include understanding, development and use of efficient and reproducible gene transfer and expression systems for cereals and grasses. We have in place user-friendly systems for all major cereals and grasses, e.g. maize, wheat, barley, oat, rice, sorghum, forage and turf grasses and are utilizing these systems in collaboration with others to study gene function and expression and for introducing genes of potential applied use.

Selected Research Project: Development of Marker-Free Transgenic Barley with Putative Antifungal Genes

This project, started in June 2001, is a part of the U.S.D.A. Wheat and Barley Scab Initiative and is in collaboration with Dr. Phil Bregitzer at the USDA in Aberdeen ID. The project is focused on the introduction of putative antifungal genes into a commercially released 6-row barley cultivar, Drummond.

The genes chosen to date for transformation efforts include *tlp1* (thaumatin-like protein) and *tlp4* from oat and *TRI101* and *TRI12* from the *Fusarium* pathogen itself. The genes will be introduced using the *Ds*-delivery system, described in Section II.B.2, which renders the engineered barley plants devoid of selection genes and plasmid backbones. This makes the plant easier to characterize in regulatory protocols and perhaps more acceptable to consumers.

Selected Research Publications:

Wan, Y. and P.G. Lemaux. 1994. Generation of Large Numbers of Independently Transformed Fertile Barley Plants. *Plant Physiology*, 104:37-48.

Bregitzer, P., Halbert, S. and Lemaux, P.G. 1998. Somaclonal Variation in the Progeny of Transgenic Barley, *Theoretical and Applied Genetics*, 96:421-425.

Cho, M.-J., Wong, J.H., Marx, C., Jiang, W., Lemaux, P.G. and Buchanan, B. 1999. Overexpression of thioredoxin *h* leads to enhanced activity of starch debranching enzyme (pullulanase) in barley grain. *Proc. Natl. Acad. Sci USA*

Cho, M.-J., Choi, H.W., Buchanan, B.B. and Lemaux, P.G. 1999. Inheritance of Tissue-Specific Expression of *uidA* in Transgenic Barley Plants. *Theoretical and Applied Genetics* 98:1253-1262.

Choi, H.W., Lemaux, P.G. and Cho, M.-J. 2000. Increased chromosomal variation in transgenic versus nontransgenic barley (*Hordeum vulgare* L.) plants. *Crop Science* 40:524-533.

Koprek, T., Rangel, S., McElroy, D., Louwerse, J.D., Williams-Carrier, R.E. and Lemaux, P.G. 2001. Transposon-mediated single-copy gene delivery leads to increased transgene expression stability in barley. *Plant Physiology* 125: 1354-1362.

Yu, X-H, Bregitzer, P. and Lemaux, P.G. Marker- and Plasmid-free Transgenic Barley Encoding Putative Antifungal Proteins. Proc 2001 National Head Blight Forum, Cincinnati OH, Dec 8-10, 2001, pp. 43-44.

John Edward Sherwood
Dept. Plant Sciences and Plant Pathology, Montana State University

Education:

B.A.	Zoology	1973	University of Vermont, Burlington
M.S.	Microbiology	1979	Colorado State University, Ft. Collins
Ph.D.	Microbiology	1984	Michigan State University, East Lansing

Professional Society Memberships:

American Phytopathological Society
American Society for Microbiology
International Society for Molecular Plant-Microbe Interactions

Professional Experience:

2001-present	Professor	Dept. Plant Sciences and Plant Pathology, MSU
1994-2001	Associate Professor	Dept. Plant Pathology, Montana State University
1988-1994	Assistant Professor	Dept. Plant Pathology, Montana State University
1984-1988	Research Associate	DOE-Plant Research Lab, Michigan State University

Research interests:

- Mating and disease control by mating inhibition of smut and bunt fungi.(Kosted et al. 2000. Structural requirements for activity of the mating pheromones of *Ustilago hordei*. Fungal Genet. Biol. 29:107-117, Kosted et al. 2002. Pheromone-related inhibitors of *Ustilago hordei* mating and *Tilletia sp* teliospore germination. Phytopathology 92:210-216.)
- Use of anti-fungal wheat puroindoline proteins to inhibit fungal plant diseases. (Krishnamurthy et al. 2001. Increased tolerance to fungal diseases of rice plants transformed with puroindoline genes. Molec. Plant-Microbe Interact. 14:1255-1260.)

Abstract for 2002 APS Meeting, Milwaukee, WI.

Control of Fusarium Scab with Puroindoline-Containing Transgenic Wheat.
S.A. Gerhardt, C. Balconi and J.E. Sherwood.

Head scab is a disease of wheat and barley that is caused by either *Fusarium graminearum* or *F. culmorum*, resulting in premature ripening and white heads. The puroindoline proteins PINA and PINB, which are found in the wheat endosperm and contribute to grain softness, have been shown to also have *in vitro* and *in vivo* anti-fungal properties. The growth of both *Fusarium* species that cause scab was negatively affected by PIN using *in vitro* bioassays. Wild-type and transgenic HiLine wheat that over-express the *pinB* gene driven by the constitutive maize ubiquitin promoter or by the endosperm-specific glutenin-promoter were inoculated with *F. culmorum* in field and glasshouse studies. The plants were analyzed for scab by visual inspection of the heads. Between 30-60% of control plants were heavily infected, with 40-70% infected spikelets/head, while only 4-20% of *pinB*-transgenic plants were infected at the same level. In addition, the percentage of tombstones produced by the *pin-B* transgenic lines was reduced by 30-90% when compared to controls. Experiments are in progress with *F. graminearum* as the disease agent to determine if similar results are obtained. These data suggest that puroindolines may provide protection to wheat against Fusarium scab.

Biographical Sketch - Ronald W. Skadsen

Ron Skadsen serves as a Research Plant Molecular Geneticist for the USDA, ARS, Cereal Crops Research Unit in Madison, Wisconsin. He has held this position since 1989. His research program deals with factors that affect barley and oat grain quality. Until the mid-90s, research was focused on the regulation of hydrolytic enzyme genes activated during germination and malting. When Fusarium became the main factor affecting barley quality, he shifted his research priorities to the cloning and expression of antifungal genes, developing tissue-specific promoters for expressing these genes, and the transformation of barley and oat with antifungal genes.

Dr. Skadsen received a B.S. in Forest Sciences from the University of Washington in 1969. He served for two years in the Army as a signal officer and then attended the University of Missouri, where he received an M.S. in Genetics. He then worked for Weyerhaeuser Co. for four years in their Centralia, Wa. tree improvement program. In 1977, he attended Purdue University and received a Ph.D. in Horticulture in 1981. His thesis research involved the molecular biology of aging in soybean cotyledons. He then became a post-doctoral associate at North Carolina State University and researched the cloning and expression of maize catalase genes.

CURRICULUM VITAE

Name: Nilgun E. Tumer
Title: Professor

Education:

August 1978 - October 1982 Ph.D. in Biochemistry, Purdue University
West Lafayette, Indiana
September 1974 - June 1978 B.A. Chemistry, Agnes Scott College,
Decatur, Georgia

Positions held:

1982-1983 Postdoctoral Fellow, Committee on Genetics, The University of Chicago
1983-1984 Postdoctoral Fellow, American Cancer Society, Department of Molecular Genetics
and Cell Biology, The University of Chicago
1984-1989 Senior Research Biologist/Research Specialist, Monsanto Co.
1989-1992 Group Leader, Monsanto Co.
1992-2001 Associate Professor, Biotech Center and Department of Plant Pathology, Rutgers Univ.
2001-present Professor, Biotech Center and Department of Plant Pathology, Rutgers University

Honors: Rutgers University Research Excellence Award, April 2000; Japanese Society for Promotion of Science Fellowship, April 2000; Johnson & Johnson Discovery Award, May 1995; Monsanto Company Excellence in Research Award, 1990; Special Achievement Award, Monsanto Co., 1987.

FHB Related Research: We have been studying the mechanism of action of a 29-kDa ribosome inactivating protein, pokeweed antiviral protein (PAP) *Phytolacca americana*. PAP is a site-specific N-glycosylase that depurinates the highly conserved α -sarcin/ricin (S/R) loop, in the large rRNA of eukaryotic and prokaryotic ribosomes. This depurination blocks the interaction between the rRNA and elongation factors, inhibiting protein synthesis at the translocation step. We showed that expression of PAP in transgenic plants leads to broad-spectrum resistance to viral and fungal infection. PAP accesses ribosomes by binding to ribosomal protein L3 (*RPL3*), which is a highly conserved ribosomal protein that participates in the formation of the peptidyltransferase center. Trichodermin, which belongs to the general class of 12, 13-epoxytrichothecenes, is known to inhibit peptide bond formation by binding to the peptidyltransferase center. Mutations in the *RPL3* gene were initially identified in yeast by conferring resistance to trichodermin. We are working on determining if mutations in L3 could confer resistance to other trichothecenes and whether trichothecene resistance may be attained through a mutation in L3 that would result in resistance towards *Fusarium* head blight (scab) in wheat.

Selected Recent Publications:

- K. Hudak, A. B. Hammell, J. Yasenachak, N. E. Tumer and J. D. Dinman (2001). C-terminal deletion mutant of pokeweed antiviral protein inhibits programmed +1 ribosomal frameshifting without depurinating the sarcin/ricin loop of rRNA. *Virology*, 279, 292-301.
- O. Zoubenko, K. Hudak and N. E. Tumer (2000). A nontoxic pokeweed antiviral protein mutant inhibits pathogen infection via a novel salicylic acid-independent pathway. *Plant Mol. Biol.*, 44, 219-229.
- P. Wang and N. E. Tumer (2000). Virus resistance mediated by ribosome inactivating proteins. *Advances in Virus Research*, 55, 325-356.
- K. Hudak, P. Wang and N. E. Tumer (2000). Pokeweed antiviral protein inhibits translation of capped RNAs independently of ribosome depurination by acting directly on the RNA template. *RNA*, 6, 369-380.
- K. A. Hudak, J.D. Dinman and N.E. Tumer (1999). Pokeweed antiviral protein accesses ribosomes by binding to L3. *J. Biol. Chem.* 274, 3859-3864.
- P. Wang and N. E. Tumer (1999). Pokeweed antiviral protein cleaves double-stranded supercoiled DNA using the same active-site required to depurinate rRNA. *Nuc. Acids. Res.* 27, 1900-1905.
- P. Wang, O. Zoubenko and N. E. Tumer (1998). Reduced toxicity and broad spectrum resistance to viral and fungal infection in transgenic plants expressing pokeweed antiviral protein II. *Plant Mol. Biol.* 38, 957-964.

CURRICULUM VITAE

Lisa J. Vaillancourt
Assistant Professor
Department of Plant Pathology

Education

Postdoctoral, 1991-1996, Microbiology and Molecular Genetics, University of Vermont
Ph.D. Degree, 1991. Plant Pathology, Purdue University
M.S. Degree, 1987. Plant Pathology, University of Illinois
B.S. Degree, 1984. Biological Science (cum laude), University of Connecticut

Relevant Employment

1996-present: Assistant Professor of Plant Pathology, University of Kentucky
1991-1996: Postdoctoral Scholar, Department of Microbiology and Molecular Genetics,
University of Vermont, Burlington VT. (Fungal Molecular Biology)
1988-1991: Graduate Research Assistant, Department of Botany and Plant Pathology, Purdue
University, West Lafayette IN. (Fungal Molecular Biology)
1987-1988: Graduate Research Assistant, Department of Plant Pathology, University of Illinois
at Urbana Champaign, IL. (Nematology)
1986-1987: Diagnostician, University of Illinois Plant Disease Clinic
1984-1986: Graduate Research Assistant, Department of Plant Pathology, University of Illinois
at Urbana Champaign, IL (Biochemistry of plant-pathogen interactions)

Professional Recognition

Grants

USDA/Wheat & Barley Scab Initiative PreProposal Role of a *Colletotrichum graminicola* Pathogenicity Gene Homologue in *F. graminearum*. 2002-2003
DuPont Company Research Grant to investigate molecular mechanisms of systemic colonization and movement of *Colletotrichum graminicola* in corn stalks. 2001-2004
USDA National Research Initiative (NRI) Competitive Grants Program Aggressiveness and Pathogenicity Determinants in Anthracnose Stalk Rot of Corn. 1997-2000

Fellowships

NIH Individual NRSA Postdoctoral Award, 1992-1995. "Regulation of Fruiting Body Development in the Mushroom *Schizophyllum commune*"
Markey Postdoctoral Fellowship, 1991. University of Vermont Department of Microbiology and Molecular Biology
New York Botanical Garden Summer Research Fellowship, 1984.

Lisa Vaillancourt has published 21 refereed journal articles and book chapters since 1989.

Bio-sketch

Name: **Diter H. von Wettstein**, Professor, born 20.09.1929, Göttingen, Germany.
Address: Department of Crop and Soil Sciences, Washington State University.
267 Johnson Hall, Pullman, WA 99164-6420
Tel.: 509 335 3635 Fax: 509 335 8674 e-mail: diter@wsu.edu

Honors: Foreign Associate of the National Academy of Sciences USA; Member: Royal Danish Academy of Sciences, Royal Physiographical Society, Lund, European Molecular Biology Organization, Deutsche Akademie der Naturforscher Leopoldina, Royal Swedish Academy of Sciences, Academy of Technical Sciences, Copenhagen, Academia Europaea, Académie Royale des Sciences de Belgique, Österreichische Akademie der Wissenschaften, Nordrhein-Westfälische Akad.d.Wissensch. Honorary Member Swedish Seed Association, Svalöf; Lillö-Stiftelsens Prize for Genetic Research, Gregor Mendel Medal, Leopoldina, Dr. agro. h.c. Copenhagen.

Professional experiences:

From October 1, 1996 R.A. Nilan Distinguished Professor at Dept. of Crop and Soil Sciences & School of Molecular Biosciences, Washington State University
1972 to Sept.30, 1996 Professor and Head, Department of Physiology, Carlsberg Laboratory, Copenhagen
1975 to 1988 Director Carlsberg Plant Breeding

Has published 320 papers in genetics, plant breeding, developmental physiology, cell biology, plant biochemistry and molecular biology.

Honorary Offices:

Member and Chair, Scientific Advisory Board Friedrich Miescher Institute, Basel, 1980-91; Chair Scientific and Technical Advisory Committee UNDP/World Bank/WHO Programme for Research and Training in Tropical Diseases, 1985-89; Member of Sainsbury Laboratory Council, Norwich, 1987-95; Member Fachbeirat, Max-Planck-Institut für Züchtungsforschung, Köln 1992-1996; Chair Fachbeirat, Institut für Pflanzengenetik & Kulturpflanzenforschung, Gatersleben, 1992-95; Chair International Advisory Board, Graduate School, Experimental Plant Sciences, Wageningen Agricultural University, 1993-95.

FHB research: We have cloned and tested testa, pericarp and epicarp specific gene promoters in barley and have made plans to express with these promoters genes encoding enzymes and other proteins that can prevent infection by *Fusarium*. The research is on hold until new funding is obtained.

Yang Yen

Associate Professor, Department of Biology and Microbiology, South Dakota State University

Education:

Ph.D., 1989. Agronomy, University of Missouri-Columbia

M.S., 1986. Crop genetics & breeding, Nanjing Agricultural University.

Graduation Diploma, 1977. English, Sichuan Teachers' College

Positions Held (since terminal degree):

Assistant Professor. South Dakota State University. (1996 - 2000)

Assistant Professor, University of Nebraska-Lincoln. (1992 – 1996)

Research Associate. University of Nebraska-Lincoln. (1991 – 1992)

Research Associate. MSU-DOE Plant Research Lab, Michigan State University. (1990 – 1991)

Courses taught (1996-present):

BIO201/202/203/204 *Genetic, Cellular & Organismal Biology*; BOT327A *Plant Physiology Laboratory*; BIO343 *Cell Biology*; BOT781 *Plant Biotechnology*; PS/BIO773 *Cytogenetics*

Publications from FHB-Related Researches: (A total of 6 articles and 7 abstracts)

Yen, Y. and D.J. Liu. 1987. Production and cytogenetics of intergeneric hybrid between *Reogneria ciliaris* and *Triticum aestivum*. *Scientifica Agricultura Sinica* 29: 17-21.

Yen, Y., D.-H., Xing, J.C. Rudd and Y. Jin. 2000. Differentially expressed genes during scab development. *In: Proceedings of International Wheat Scab Symposium, May 5-10, 2000, Suzhou and Nanjing, China, pp 239-244.*

Yen, Y., D.-H. Xing, J.C. Rudd and Y. Jin. 1999. Exploring the molecular mechanism of fusarium head blight resistance and developing breeder-friendly dna markers to FHB for wheat improvement. *In: Proceedings of 1999 National Fusarium Head Blight Forum, Dec. 5-7, 1999, Sioux Falls, SD, pp. 40-43.*

Xing, D.H., Y. Yen and J.C. Rudd. 2000. Identification of ESTs that are possibly related to the FHB-resistance of wheat (*Triticum aestivum* L.) cultivar Sumai 3. *Proc. SD Acad. Sci.* 75: 35-40.

Zhu, L.-C., J.C. Rudd and Y. Yen. (2001) Applying simple sequence repeat (SSR) markers in screening *Fusarium* head blight resistant parents. *Proc. SD Acad. Sci.* 76: 21-24.

Weng, Y., X. Zhang, Y. Yen and Y. Jin. 2001. Characterization of Fusarium head blight resistant germplasm with SSR markers linked to FHB resistance in Sumai 3. *In: 2001 National Fusarium Head Blight Forum Proceedings, Erlanger, KY, Dec. 8-10, 2001, page 212-215.*

Research Projects Pertaining to FHB

1. Transfer FHB resistance from *Reogneria ciliaris* into wheat (GRA, 1983-1986, China)
Interspecific hybrids and the derived addition lines were made
2. Implementation of Marker-assisted Selection in the Scab Breeding and Germplasm Enhancement Programs in South Dakota (PI, 1999-present, SDSU)
102 elite breeding lines and 87 elite germplasm selections were characterized with SSR and AFLP markers
3. Cloning and analysis of Fusarium and wheat genes essential to FHB development and resistance in wheat (PI, 1999-present, SDSU)
Seven full-length cDNAs related to FHB pathogenesis have been cloned and sequenced

Charles W. Bacon, Research Leader

March 25, 2002

NAME AND ADDRESS:

Charles W. Bacon, 267-64-7221
Supervisory Microbiologist, USDA/ARS,
Toxicology & Mycotoxin Research Unit, Russell Research Center, College Station Road
Athens, GA 30614-567,
Office: 706/ 546-3158; Laboratory: 706/ 546-3142; FAX: 706-546-3116; E-mail:
cbacon@saa.usda.ars.gov

Adjunct Professor

Department of Plant Pathology
University of Georgia
Athens, GA 30603

Education:

Clark College	B.S. 1995, Major Biology, Minor Chemistry
University of Michigan	Ph.D. 1973, Botany (Fungal Physiology)

Membership in Professional Societies:

American Society for Microbiology
Mycological Society of America
International Symbiosis Society
American Phytopathological Society

Honors:

- USDA Superior Service Award 1984, for creative research contributions in finding a cause of fescue grass toxicity and incorporating those findings in a new variety of fescue having great agronomic importance
- South Atlantic Area ARS Scientist of the Year (2000): "For conceiving and implementing a biological control research strategy with endophytic microorganisms for controlling toxic endophytic fungi and pathogens of plants"
ARS Distinguished Scientist of the Year (2001): "For studies on endophytic microorganisms with practical importance to agriculture"

Research Activities:

Dr. Bacon is the Supervisory Microbiologist and Research Leader for the Toxicology and Mycotoxin Research Unit, USDA, ARS, Richard B. Russell Agricultural Research Center, Athens, GA and Adjunct Professor of Plant Pathology, Department of Plant Pathology, College of Agriculture and Environmental Sciences, University of Georgia, Athens, GA. He is a fungal physiologist and mycologist. Dr. Bacon's research interests include the regulation and biosynthesis of mycotoxins, fungal endophyte-grass relationships, bacterial endophytes, and the coevolution of secondary products, primarily mycotoxins, with grasses and other plants, as an adaptive strategy for mutualistic associations. Presently, he has discovered that an entire species, *Bacillus mojavensis*, a desert dwelling bacterium with very close affinity to *B. subtilis*, is a natural endophyte, conferring protective factors against fungal pathogens, as well as beneficial traits to infected plants. He is utilizing this bacterium as a biocontrol for cereal grain, especially *Fusarium moniliforme* diseases of corn, and scab of wheat, as well as the control of mycotoxins in these crops and other fungal diseases of cereals. He has established that this bacterial endophyte can significantly reduce the mycotoxin production by *Fusarium moniliforme* in corn, and protect corn and wheat seedlings from diseases. His contributions are published in over 200 manuscripts, chapters, popular papers, and 4 edited books.

In recognition of the importance of this line of research, he was part of a team who was awarded the USDA Superior Service Award in 1984. In 2001, he was awarded the Distinguished Scientist of the Year by ARS in recognition of his life efforts of achievements in establishing endophytic microorganisms as a basic and applied tools for agricultural research. A fungal grass endophyte, *Epichloe baconii*, was named in his honor for his contributions in the field of fungal endophytes.

Martin A. Draper
Extension Plant Pathologist/Associate Professor
South Dakota State University

I currently serve the state of South Dakota and South Dakota State University as the only Extension Plant Pathologist. I have been in this position for five years. I am a native of Iowa and earned my BS from Iowa State (1982), MS from North Dakota State (1985), and PhD also from NDSU (1999). Prior to joining the faculty at SDSU I served for eight years as the manager of the Plant-Pest Diagnostic Lab and Seed Health Testing Lab at North Dakota State University and for the five years prior to that as the plant pathologist for the North Dakota Department of Agriculture-State Seed Department. For the last five years I have been on faculty at South Dakota State University where we are dealing with FHB problems primarily on hard red winter wheat and hard red spring wheat.

I have seen scab produce devastating results across the northern plains, affecting growers in South Dakota, North Dakota and Minnesota. Even in 2002, a year with relatively little FHB present in our wheat crop, our statewide surveys identified fields with as much as 50% FHB field severity. We have observed FHB outbreaks in various locations around in the state, but these outbreaks have tended to concentrate in the northeastern part of the state. However, wheat disease survey data suggests that the distribution of FHB is expanding westward in SD. This is similar to the experiences in North Dakota and the Canadian prairie provinces.

My research and extension program emphasizes wheat and soybean, two crops where there are disease problems to examine with new management strategies. Wheat disease management is a major thrust of my research and extension program. The wheat research projects that we carry out are all very applied. Wheat leaf diseases, root and crown diseases, and FHB are all included in our program. FHB has been one of the prime factors in the decrease in durum acres in SD from greater than 450,000 acres in the late 1980s to less than 18,000 acres in 2000.

I have been involved in testing fungicides in South Dakota for FHB suppression since 1997 on spring wheat since 1997 and winter wheat since 1999. We have done some initial studies with aerial application and intend to continue some of that work later this spring. The fungicide screening work will also continue. For the past three years I have also been involved with a project screening biological control agents for FHB suppression. The initial candidate agents tested were isolated from wheat leaves by Dr. Bruce Bleakley (SDSU) and selected for antagonism of the tan spot pathogen in culture. Since that time I have also provided a test site for other scientists working with biological control agents, screening two additional agents two years ago, three agents last year and we anticipate screening ten total potential biological control agents in 2002. In 2001 we also screened the biocontrol agents on barley and intend to do the same in 2002.

I feel that I am well informed in the areas of chemical and biological control in general and I have a fair level of experience working with *Fusarium graminearum* as the causal agent of scab. I believe my background is broad and can represent all workers in the Chemical and Biological Control research area. I have been involved in scab diagnostics and management since the first major outbreaks in 1993 while working as an Extension Associate with NDSU. I look forward to the opportunity to serve the initiative and the wheat and barley industries of the US.

Arvydas P. Grybauskas
Department of Natural Resource Sciences and Landscape Architecture
University of Maryland
College Park, MD 20742-4552
phone: 301-405-1602
e-mail: AG31@umail.umd.edu

Present Academic Appointment:

Extension 63%; Research 27%; Instruction 10%

Publications in refereed Journals (recent)

Ringer, C. E. and A. P. Grybauskas. 1995. Infection cycle components and disease progress of gray leaf spot on field corn. *Plant Disease* 79: 24-28.

Fidanza, M. A., P. H. Dernoeden, and A. P. Grybauskas. 1996. Development and field validation of a brown patch warning model for perennial ryegrass turf. *Phytopathology* 86:385-390.

Krusberg, L. R., S. Sardanelli, and A. P. Grybauskas. 1997. Damage potential of *Heterodora zea* to *Zea mays* as affected by edaphic factors. *Fundamental and Applied Nematology* 20:593-599.

Feng, Y., Dernoeden, P., and Grybauskas, A. 1999. A Simple *Pythium aphanidermatum* Field Inoculation Technique for Perennial Ryegrass. *HortScience* 34:301-304.

b. *Fusarium* Head Blight related activities

Grybauskas, A.P. 2002-2004. Integrated management of *Fusarium* head blight for no-till soft red winter wheat. MD-NRSL-1211 Hatch project. USDA/CSREES CRIS Accession # 0191598.

Grybauskas, A. P. 1999. Relative importance of seed and foliar fungicide treatments on winter wheat production in Maryland in 1997 and 1998. *Phytopathology* 89:S100 Publication no. P-1999-0014-NEA/PTA.

Grybauskas, A. P. 1999. Timing of fungicide applications for *Fusarium* head blight management of winter wheat. *Phytopathology* 89:S30. Publication no. P-1999-0212-AMA.

Grybauskas, A. P., and Wallace, S. F. 2000. Evaluation of foliar fungicides for the management of *Fusarium* head blight in Maryland soft red winter wheat. *F&N Tests* 2001:CF8.

Grybauskas, A. P. 1998-2001. Effects of previous crop, tillage, seed treatment, and seed rate on winter wheat production in Maryland. Maryland Grain Producers Utilization Board grant, \$ 8,750/yr.

Grybauskas, A.P. 1999-2002. *Fusarium* head blight – chemical control. U.S. Wheat and Barley Scab Initiative-USDA grant # 59-0790-9-039.

Grybauskas, A.P. 1994. Determination of risk of the scab disease in winter wheat with no-till planting, and potential for control with fungicides. Maryland Grain Producers Utilization Board Research Grant \$4,000.

Ellis, N. G. 1990. Wheat yield loss related to *Fusarium graminearum* infection levels. M.S. thesis, University of Maryland directed by Dr. A. Grybauskas.

Biography-Scott Halley

I worked with Dr. Marcia McMullen, Extension Plant Pathologist (small grains) at North Dakota State University as a Fungicide Application Technologist. under a grant from the Scab Initiative from May of 1998 through July of 2000. Our research focused on several areas, fungicide application technology (evaluation of spray equipment, adjuvants, timings, gallonages, and fungicide evaluations (including the uniform fungicide trial, research conducted for chemical companies on fungicides, and seed treatments. I also worked extensively with the NDSU Agricultural Engineers developing and testing a method to quantify spray coverage and correlate with fungicide efficacy. We built a field mist system for modifying the environment to improve our fungicide research. The winter months were spent testing nozzles, fungicides, adjuvants, gallonages, sprayers, and numerous other variables in a greenhouse. We utilized a 60 foot track sprayer with both conventional hydraulic spray nozzles and an air assisted type delivery system.

From July 2000 through October 2001 I worked at the Northwestern Agricultural Research Center-Montana State University. We evaluated cultivars on soft and hard winter and spring wheats, barleys (two and six row), and oats. We also had an extensive weed control project evaluating herbicides for control and crop injury on small grains, mint, dill, alfalfa, field pea, and canola.

In November of 2001 I returned to North Dakota to the Langdon Research Extension Center as a Crop Protection Scientist. The principle area of focus will be fungicide research on crops adapted to the region. A major portion of my research will focus on small grains evaluation, emphasis on application technologies and fungicides, with the primary focus on reduction of FHB.

PUBLICATIONS: McMullen M., **S. Halley**, and J. Jordahl. Evaluations of fungicides and a biological agent for control of Fusarium head blight and fungal leaf spots in barley, 2000. Fungicide and Nematicide Tests. 2001:CF1.

Lukach, J., M. McMullen, S. Halley, and J. Pederson. 1999. Evaluation of fungicides for control of Fusarium head blight and leaf diseases on barley, Langdon, ND, 1999. Fungicide and Nematicide Tests. 55:325.

Lukach, J., S. Halley, M. McMullen, and J. Pederson. 1999. Sprayer modifications for enhanced control of Fusarium head blight with fungicides, 1999. Fungicide and Nematicide Tests. 55:346

Lukach, J., S. Halley, M. McMullen, and J. Pederson. 1999. Evaluation of fungicides for control of Fusarium head blight and leaf diseases on wheat, Langdon, ND 1999. Fungicide and Nematicide Tests. 55:344.

Halley, S., J Pederson, and M McMullen. 1999. Comparison of air and ground application methods on head coverage and fungicidal control of Fusarium head blight, 1999. Fungicide and Nematicide Tests. 55:335.

Lukach, J., S. Halley, and T. Gregoire. 1999. Effect of fungicides and sprayer nozzles on control of Fusarium head blight (FHB) in wheat, 1998. Fungicide and Nematicide Tests. 54:332-333.

Lukach, J., S. Halley, and T. Gregoire. 1999. Effect of nozzle type, application volume, and adjuvants on fungicide efficacy in controlling Fusarium head blight (FHB) in wheat, 1998. Fungicide and Nematicide Tests. 54:334.

Louis A. Heaton, Associate Professor
Department of Plant Pathology
Kansas State University
Manhattan, KS 66506-5502

My name is Lou Heaton; I am an associate professor in the Department of Plant Pathology at Kansas State University, and fairly new to FHB research. I grew up in central Illinois (Effingham). I earned my bachelor's and master's degrees in botany at Eastern Illinois University (botany), and my PhD in plant pathology at Purdue University. For my PhD I constructed a physical map of the genome of *Sonchus* yellow net rhabdovirus. In 1986 I went to a postdoctoral position in Jack Morris' lab at the University of California-Berkeley. At Berkeley I constructed a full-length cDNA clone of turnip crinkle carmovirus (TCV) from which infectious RNA was synthesized *in vitro*, allowing reverse genetic research. In 1989 I came to Kansas State University and continued working with TCV. In addition to our TCV work, several of my students worked toward the cloning and bacterial expression of one of the proteinases genes from wheat streak mosaic virus.

In early 2001, I started screening Dr. John Leslie's collection of *Fusarium proliferatum* isolates for the presence of double-stranded RNAs as an indicator of virus infection. Of approximately one hundred isolates screened, four harbored dsRNAs. The screening was extended to Dr. Leslie's collection of *F. graminearum*, and to date we have identified one isolate with dsRNAs. Most recently, as our screening efforts continue, we are working with virus-infected *F. graminearum* isolates generously provided by Dr. K. -H. Kim of the School of Agricultural Biotechnology at the Seoul National University in Suwon, Korea. The Korean *F. graminearum* isolates are infected with mycoviruses that render the isolates hypovirulent on wheat. According to Dr. Kim, inoculations of wheat with a virus-infected isolate result in about half the disease as with non-virus-infected isolates. We are currently trying to move the Korean mycovirus into North American *F. graminearum* isolates. Ultimately, North American isolates will be transformed to express the viral genome from their nuclei. Viral expression from transformed fungal nuclei should further decrease the disease resulting from inoculation with hypovirulent fungal isolates by increasing the proportion of infected mycelia. As we develop virus-infected, hypovirulent fungal isolates as potential biocontrol agents we will begin to address the problems of their deployment.

Curriculum Vitae

Erik L. Stromberg

Education:

B.S., University of California, Riverside, California, 1968

Ph.D., Oregon State University, Corvallis, Oregon, 1977

Dissertation title: "The nature of fusarium wilt disease resistance in tomato"

Professional Experience:

Professor and Extension Plant Pathologist, Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0331, 1994 to present.

Associate Professor and Extension Plant Pathologist, Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0331, 1986-1993.

Professor and Extension Plant Pathologist, Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0331, 1994 to present.

Assistant Professor and Extension Plant Pathologist, Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0331, 1981-1985.

Plant Pathologist and Adjunct Assistant Professor, USDA, APHIS, PPQ, Department of Plant Pathology, University of Minnesota, St. Paul, MN 55108, 1977-1981.

Recent Awards and Honors :

Distinguished Service Award, Potomac Division, The American Phytopathological Society, March, 2000.

The Henderson Award, in Recognition as Outstanding Faculty Member, Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University, May, 1997.

U.S. Patent No. 5,574,210, November 12, 1996. "Gray leaf spot resistant corn and the production thereof" For the use of molecular markers in breeding resistance to *Cercospora zea-maydis* in corn.

The Virginia Small Grains Association, in "Recognition for Developing and Implementing Scientifically Based Economic Recommendations for Wheat Disease Control", August, 1996.

Certificate of Appreciation presented by the National Association of Wheat Growers for "outstanding service and significant contributions in the interests of United States wheat producers", 1989.

Research and Extension Interests :

Refinement of economic thresholds for the control of powdery mildew, stagonospora leaf and glume blotch, and tan spot in soft red winter wheat in Virginia.

Evaluation of various chemical and biological seed treatments for the control of seedling diseases, improve seedling vigor, powdery mildew, and barley yellow dwarf virus.

Reduction of the economic impact of take-all in Virginia wheat production.

Evaluation of wheat germplasm for resistance to fusarium head blight in cooperation with C.A. Griffey, small grains breeder, Virginia Polytechnic Institute and State University.

Biology and control of gray leaf spot of corn, caused by *Cercospora zea-maydis*. Evaluate exotic germplasm for new sources of resistance for use in maize hybrid production.

GARY Y. YUEN

Department of Plant Pathology
University of Nebraska
406 Plant Science
Lincoln, NE 68583-0722

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Education

Associate of Science in Biology, 1975, City College of San Francisco
Bachelor of Science in Biology of Natural Resources, 1977, University of California, Berkeley
Master of Science in Plant Pathology, 1980, University of California, Berkeley
Doctor of Philosophy in Plant Pathology, 1984, University of California, Berkeley

Employment

Assistant Researcher, University of Hawaii at Manoa, 1984 to 1986

Developed monoclonal antibody immunoassays for monitoring the dissemination of bacterial pathogens of crucifers
Research Associate, University of California, Berkeley, 1986 to 1989

Investigated the effects of soil fumigation on rhizoplane microbial populations and root growth dynamics in strawberry
Assistant Professor, University of Nebraska, Lincoln, 1989 to 1995

Teaching related to the ecology of fungi, biological disease control, and fungal plant pathogens. Research focused on biological control of *Sclerotinia sclerotiorum* using blossom-colonizing bacterial antagonists, and on plant density and canopy moisture effects on development of brown patch disease (*Rhizoctonia solani*) in turfgrass.

Associate Professor, University of Nebraska, Lincoln, 1995 to present

Current Research Emphases

Ecology of bacterial biocontrol agents, specifically *Lysobacter enzymogenes* C3 (formerly *Stenotrophomonas maltophilia* C3):

UV-B penetration into crop and turf canopies and its influence on biocontrol agents; phyllosphere population dynamics of biocontrol agents as affected by moisture and nutrient availability.

Mechanisms of biological control by *L. enzymogenes* C3:

The role of lytic enzymes and other antifungal compounds important in biocontrol; host disease resistance induced by biocontrol agents.

Integration of biological control with disease management strategies

Use of *L. enzymogenes* C3 in combination and alternation with fungicides for control of turfgrass diseases.

Research specific to Fusarium head blight (FHB)

2001 - Found *Lysobacter enzymogenes* C3 to be effective in greenhouse trials in suppressing FHB. Identified application parameters to optimize control efficacy.

2002 - Will be conducting field evaluations of in multiple test sites in 3 states. Exploring integration of biocontrol by *L. enzymogenes* C3 with disease resistance in spring wheat.

Select Listing of National And Regional Activities

Associate editor, *Plant Disease*

Phyllosphere Microbiology Committee, the American Phytopathological Society

North Central Regional Project (NC-125): Biocontrol of Soil- and Residue-Borne Plant Pathogens

Formerly:

USDA/ESCAP Working Group on Biological Control

Biological Control Committee, the American Phytopathological Society

Forage crops and turfgrasses section editor, *Biological and Cultural Tests for Control of Plant Diseases*

Biographical Information

Erick D. De Wolf

Department of Plant Pathology
The Pennsylvania State University
204 Buckhout Laboratory
University Park, PA 16802-4507

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Dr. De Wolf holds a Ph.D. from North Dakota State University where his research focused on the development and application of a disease forecasting system for foliar diseases of wheat under the direction of Dr. Leonard Francl. It was during this time in North Dakota he first witnessed the ravages of Fusarium head blight, and had the opportunity to work with this challenging disease. After completion of his Ph.D. Dr. De Wolf accepted a post-doctoral position at Ohio State University/OARDC under the direction of Dr. Patrick Lipps and Dr. Larry Madden. While at the OARDC Dr. De Wolf participated in the multi-state cooperative epidemiology research, and the OSU wheat breeding projects that are currently funded by the USWBSI. During his time in Wooster, Erick played a major role in the development of risk assessment models for Fusarium head blight that were delivered in Ohio for the first time during the 2001 growing season, and are under evaluation in PA, SD, & ND. Now as a faculty member in the Department of Plant Pathology at Penn State, Dr. De Wolf is continuing his involvement with the cooperative epidemiology group, and has further expanded these investigations to include weather factors that influence *Gibberella zea* perithecia development.

Research interests:

Quantitative epidemiology of plant disease; Environmental influences of plant disease epidemics; Statistical modeling of plant disease epidemics; Risk assessment modeling; Integrated Pest Management (IPM) of field crop diseases; Dispersal mechanisms of fungal pathogens; population biology

Professional Service:

- American Phytopathological Society, 1995-present
- President of Plant Pathology Graduate Student Association, North Dakota State University 1996-1999
- Co-organizer of Fusarium Head Blight Epidemiology Workshop, March 18, 2000 Fargo, ND
- Co-organizer of Fusarium Head Blight Epidemiology Workshop, March 16, 2001 Wooster, OH
- NE Soybean Center, Steering Committee, 2001- present.

CV for LEONARD FRANCL

EDUCATION

B.S. Agriculture with high distinction, 1974; University of Arizona
M.S. Agriculture, 1975; University of Arizona
Ph.D. Plant Pathology, 1985; University of Missouri

EXPERIENCE

Assistant, Associate, and Full Professor, Department of Plant Pathology, NDSU, 1990-2002
Research Plant Pathologist, Beltsville, ARS, USDA. 1987_1990.
Postdoctoral Research Associate, Department of Plant Pathology, Ohio State Univ., 1985_1987.

PUBLICATIONS RELATED TO FUSARIUM HEAD BLIGHT

- Larson, C., Francl, L., and Friesen, T. 2001. Evaluation of the Burkard cyclone sampler for ascospore collection efficiency. *Plant Disease* 85:1249-1252.
- Francl, L., Shaner, G., Bergstrom, G., Gilbert, J., Pedersen, W., Dill-Macky, R., Sweets, L., Corwin, B., Jin, Y., Gallenberg, D., and Wiersma, J. 1999. Daily inoculum levels of *Gibberella zeae* on wheat spikes. *Plant Disease* 83:662-666.
- Ali, S. and Francl, L.J. 2001. Progression of *Fusarium* species on wheat leaves from seedling to adult stages in North Dakota. Proc. of the 2001 Natl. FHB Forum, Erlanger, KY.
- De Wolf, E., El-Allef, S., Lipps, P., Francl, L. and Madden, L. 2001. Influence of environment on inoculum level and Fusarium head blight severity. Proc. 2001 Natl. FHB Forum, Erlanger, KY.
- Francl, L.J. 2001. Development and delivery of a wheat disease forecasting system. Proceedings of the Wheat Industry Research Forum, Annual Meeting of the NAWG, New Orleans, LA.
- Francl, L.J. 2001. Past, present, and future of forecasting small grain diseases. Proc. 2001 Natl. FHB Forum, Erlanger, KY. (Keynote oral presentation).
- Markell, S.G., and Francl, L.J. 2001. Inoculum dynamics of *Fusarium* species and levels of *Gibberella zeae* spore-type recovered from wheat spike bioassays. Proc. 2001 Natl. FHB Forum.
- Markell, S. and L. Francl. 2001. Dynamics of *Gibberella zeae* ascospore dispersal. *Phytopathology* 91:S58.
- Francl, L. J. 2000. Implementation of a Regional Wheat Disease Forecasting System. Proc. 14th Conf. Biometeorol. and Aerobiol. Pp. 231-232.
- De Wolf, E., Francl, L., Lipps, P., Madden, L., Osborne, L., and Jin, Y. 2000. Factors affecting the development of wheat Fusarium head blight. Proc. 2000 Natl. FHB Forum, Cincinnati, OH.
- Francl, L.J. Markell, S., Ali, S., and Friesen, T.L. 2000. *Gibberella zeae* population dynamics: A progress report. Proc. 2000 Natl. FHB Forum, Cincinnati, OH.
- Francl, L.J., Larson, C., and De Wolf, E.D. 2000. Description and evaluation of the NDSU regional wheat disease forecasting system. Proc. 2000 Natl. FHB Forum, Cincinnati, OH.
- Markell, S.G., and Francl, L.J. 1999. A comparative time line for dispersal, inoculum level, and environmental conditions in a moderate wheat head blight epidemic. Proc. 1999 Natl. FHB Forum, Sioux Falls, SD.
- De Wolf, E.D., Lipps, P.E., Francl, L.J., and Madden, L.V. 1999. Role of environment and inoculum level in wheat Fusarium head blight development. Proc. 1999 Natl. FHB Forum.
- Markell, S.G., Francl, L.J., and Jordahl, J.G. 1999. Colonization of *Gibberella zeae* in senescent wheat plants. Proc. 91st N. D. Natl. Acad. Sci., Grand Forks, ND, April, 1999.
- Francl, L.J. 1998. Development of Fusarium head blight in relation to environment and inoculum. Proc. 1998 Natl. FHB Forum, East Lansing, MI. (Keynote oral presentation).

BIOGRAPHICAL SKETCH

Andrew M. Jarosz

Department of Botany and Plant Pathology, Michigan State University
East Lansing, MI 48824-1312

Office: 517-432-2942 FAX: 517-353-1926 email: AMJAROSZ@msu.edu

A. Education

Bachelor of Science, Biology, with Chemistry minor, Purdue University, 1976.

Ph.D., Ecology, Evolution and Population Biology, Purdue University, 1984.

Post-Doctoral Research Associate, Duke University, Durham, North Carolina. 1990 to 1991.

B. Appointments

Associate Professor, Michigan State University, East Lansing, Michigan. July 1997 to present.

Assistant Professor, Michigan State University, East Lansing, Michigan. July 1991 to 1997.

Visiting Assistant Professor, Emory University, Atlanta, Georgia. Taught courses in Evolution, Plant Population Biology, Plant Physiology, and Introductory Biology, 1988-1989.

Research Scientist & Senior Research Scientist, Commonwealth Scientific and Industrial Research Organization (CSIRO), Canberra, Australia. 1985-1988.

C. Participation in FHB work. Involved in determining genetic structure for *Gibberella zeae* populations in the United States and Nepal.

D. Five publications most relevant publications

Jarosz, A.M. 2001 (in press). Virulence management in plant-pathogen interactions: Accounting for seasonal variation and metapopulation structure. Pp. 389-400. In: Adaptive Dynamics of Infectious Diseases: In Pursuit of Virulence Management, U. Dieckmann, J.A.J. Metz, M.W. Sabelis and K. Sigmund. Cambridge Studies in Adaptive Dynamics.

Byrne, J.M., M.K. Hausbeck, C. Meloche, and A.M. Jarosz. 1998. Influence of dew period and temperature on foliar infection of greenhouse-grown tomato by *Colletotrichum coccodes*. Plant Disease 82:639-641.

Taylor, D.R., A.M. Jarosz, R.E. Lenski and D.W. Fulbright. 1998. The acquisition of hypovirulence in host-pathogen systems with three trophic levels. American Naturalist 151:343-355.

Balardin, R.S., A.M. Jarosz and J.D. Kelly. 1997. Virulence and molecular diversity in *Colletotrichum lindemuthianum* from South, Central and North America. Phytopathology 87: 1184-1191.

Jarosz, A.M. and J.J. Burdon. 1996. Resistance to barley scald (*Rhynchosporium secalis*) in wild barley grass (*Hordeum glaucum* and *Hordeum leporinum*) populations in south-eastern Australia. Australian Journal of Agricultural Research 47:413-425.

Alexander, H.M., P.H. Thrall, J. Antonovics, A.M. Jarosz, and P.V. Oudemans. 1996. Population dynamics and genetics of plant disease: A case study of anther-smut disease of *Silene alba* caused by the fungus *Ustilago violacea*. Ecology 77: 990-996.

Jarosz, A.M. and A.L. Davelos. 1995. Tansley review no. 81: Effects of disease in wild plant populations and the evolution of pathogen aggressiveness. New Phytologist 129:371-387.

Thrall, P.H. and A.M. Jarosz. 1994. Host-pathogen dynamics in experimental populations of *Silene alba* and *Ustilago violacea* II. Experimental tests of theoretical models. Journal of Ecology 82: 561-570.

D. Other Activities

Senior Editor, Phytopathology. 1999 to present. Associate Editor, Phytopathology, Jan 1997 to Dec 1999.

Michigan Scientific Evolution Education Initiative (MSEEI) Advisory Committee, 1999 to present.

**BIOGRAPHICAL SKETCH
PATRICK HART****EDUCATION**

1978 Ph.D., Plant Pathology, University of California, Riverside, California. Thesis title: "Etiology and Biology of Fusarium Yellows of Celery".

POSITIONS HELD

1988-Present Professor, Dept Plant Pathology, Michigan State University, E. Lansing, MI.

2000-Present Acting Director Center for Integrated Plant Systems, MSU

RESEARCH INTERESTS (appointment 50 % MAES, 50 % MSUE)

- 1) Immunology/molecular approaches to: a) improve diagnostic methodology; b) novel forms of plant resistance to pathogens; c) characterization of receptors/signals involved in host-pathogen recognition.
- 2) Fusarium Head Blight research. Pre- and post harvest sampling strategies to estimate levels of vomitoxin in harvested grain. Investigate role of recombinant antibody and vomitoxin mimic peptides in the development of transgenic wheat with resistance to FHB. Evaluation of chemical and biological control strategies for FHB management.
- 3) Integrated pest management strategies for *Sclerotinia sclerotiorum* on dry beans and soybeans, and *Fusarium* root rot in dry beans. Alternate host concepts in the *Phytophthora sojae*- soybean system. Sudden Death Syndrome in soybeans.

RELEVANT RESEARCH PUBLICATIONS (REFEREED)

Wang, Z, K. Munshi, J. J. Pestka, and L. P. Hart. 200_. Development and application of anti-deoxynivalenol (vomitoxin) recombinant antibody. In preparation.

M. G. Lee, Q. P. Yuan, L. P. Hart, and J. J. Pestka. 2000. Enzyme-Linked immunosorbent assays of zearalenone using polyclonal, monoclonal and recombinant antibody. Eds. M. W. Truckess and A. E. Pohland. Methods in Molecular Biology, Vol. 57: Mycotoxin Protocols, 159-170. Humana Press.

Yuan, Q., W. Hu, J. J. Pestka, S. He, and L. P. Hart. 2000. Expression of a functional anti-zearalenone antibody in transgenic *Arabidopsis* plants. Appl. Environ. Microbiol. 66:3499-3505.

Yuan, Q. Y., L. P. Hart, and J. J. Pestka. 1999. Identification of mimotope peptides which bind to the mycotoxin deoxynivalenol-specific monoclonal antibody 6F5. Appl. Environ. Microbiol. 65:3279-3286.

Hart, L. P., H. Casper, O. Schabenberger, and P. Ng. 1998. Comparison of Gas Chromatography and Enzyme Linked Immunosorbent Assay for Deoxynivalenol in Milled Fractions of Naturally Contaminated Wheat. J. Food Protec. 61:1695-1697.

Hart, L. P. and O. Schabenberger. 1998. Variability of vomitoxin in truckloads of wheat in an wheat scab epidemic year. Plant Disease 82: 625 - 630.

Yuan, Q. Y., J. Clarke, J. E. Linz, J. J. Pestka, and L. P. Hart. 1997. Molecular cloning, expression, and characterization of a functional anti-zearalenone single-chain Fv fragment. Appl. Environ. Microbiol. 63:263-269.

EXTENSION PUBLICATIONS

Hart, P., and R. Ward. 2000. Management of foliar diseases of wheat. CIPS special bulletin #1.

Hart, P. 1998. Management of foliar wheat diseases. Wheat 2000 notebook chapter.

Hart, P., and O. Schabenberger. 1997. How to sample wheat to accurately determine vomitoxin levels. MSU extension bulletin E-2630.

Biosketch for Cynthia A. Henson

Dr. Cynthia A. Henson is a research plant physiologist with the USDA-ARS-Cereal Crops Research Unit and an associate professor in the Department of Agronomy at the University of Wisconsin-Madison. Her research emphasis is on barley and oat enzymes involved in carbohydrate metabolism, including changes in their temporal and spatial expression during growth and development, their responses to the environment and, in the case of barley, their relationships with malting quality. Methodologies employed include protein purification (open column and HPLC chromatography, uv/vis spectrophotometry, 1D and 2D electrophoresis), enzyme characterization (spectrophotometric and coulometric measurements of reaction kinetics), plant and fungal metabolite analyses (GC-MS, HPLC and spectrophotometric), and gene cloning (RT-PCR) and expression.

Although I have not yet published in the area of FHB, I have been involved in a collaborative study, with Dr. Brian Steffenson, to determine the use of preharvest DON and ergosterol concentrations as predictors of levels of DON present in the grains at harvest. My contribution to this research was conducting the DON and ergosterol measurements. Additionally, Dr. Ron Skadsen and I are conducting preliminary studies of the *Fusarium* infection process on barley grains. My contribution to this effort is the determination of changes in the metabolic profiles, via GC-MS, in various kernel tissues as a function of infection.

Bio Sketch of Michelle S. Mostrom

PRESENT POSITION AND ADDRESS

Position: Veterinary Toxicologist
Department of Veterinary Diagnostic Services
186 Van Es Hall
North Dakota State University, Fargo, North Dakota 58105-5406
Phone: (701) 231-7529
FAX: (701) 231-7514

EDUCATION

1978 DVM (Veterinary Medicine), Iowa State University, Ames, Iowa
1986 MSc and Residency (Toxicology), University of Illinois, Urbana, Illinois
1993 PhD (Toxicology), University of Saskatchewan, Saskatoon, Saskatchewan

BOARD CERTIFICATION

1989 American Board of Veterinary Toxicology, Diplomate
1995 American Board of Toxicology, Diplomate

EXPERIENCE

1978-1983 Practiced in a mixed animal practice, in Manly, Iowa.

1983-1990 Intensive diagnostic and research experience in toxicology during graduate school. Experiences include development of analytical methods for immune alterations and for trace nutrients (HPLC and Atomic Absorption methods), field investigations into animal poisonings involving aflatoxicosis in swine and dairy, mycotoxicosis in dairy herds, *Penicillium* mycotoxicosis in a dairy herd, and interactions with animal and plant pathologists, animal scientists, and animal nutritionists.

1990-1998 Section Head and Scientist, Environmental Toxicology Program. Province of Alberta. The program was focused on investigating the impacts of environmental contaminants on domestic and wild mammals. I conducted numerous field studies evaluating the industrial sites, the toxicology of chemicals of concern, exposure parameters and pathways of exposure, and health effects. From 1996 through 1998 I was the project director of a cattle study involving subchronic dosing with petroleum and evaluation of effects, including immunological, biochemical, and pathological findings, and potential tissue residues.

1999-2001 Head of Toxicology at TOXCON HSRC Inc., a private toxicology research center, Edmonton, Alberta. Most research followed GLP guidelines for regulatory submission of studies involving human sensory and pulmonary irritation responses of allergic/asthmatic human subjects to consumer products.

2002-present Veterinary Toxicologist at the Veterinary Diagnostic Services Laboratory, NDSU, Fargo, ND, which involves the evaluation of toxicity cases, supervision of chemists in the diagnostic laboratory, and interpretation of results. I am continuing the mycotoxin testing of grains at the diagnostic laboratory developed by Dr. Howard Casper, and will participate in the current U.S. Wheat and Barley Scab Initiative grant "Diagnostic Services for Vomitoxin (DON) in Wheat" as principal investigator.

Dr Paul Schwarz is an Associate Professor of Cereal and Food Sciences at North Dakota State University in Fargo, where he directs the barley and malt quality program. His responsibilities include quality assessment of malting barley breeders' lines and crop quality assessment, mycotoxin testing of breeder's lines, and teaching and research. Dr Schwarz has published over 50 manuscripts on barley malt quality and malting and brewing. His recent research has been in the area of *Fusarium* Head Blight (FHB), although he also has interests in barley cell wall polysaccharides and lipid metabolism.

FHB-related research has focused on malting and brewing, including the fate of mycotoxins during processing, impact of FHB on barley quality, control of *Fusarium* growth during malting, and enzymes associated with *Fusarium*

Dr Schwarz has worked at the Kurth Malting Corp., Milwaukee, Wisconsin, and has completed practical training/sabbatical at the A. Egger Bierbrauerei, Worb, Switzerland, and the Coors Brewing Co., Golden, Colorado. He holds a B.S. in Agronomy from the University of Wisconsin-Madison and a Ph.D. in Cereal Chemistry from North Dakota State University.

Selected Publications

1. Schwarz, P.B., Jones, B. L., and Steffenson, B.J. 2002. Enzymes associated with *Fusarium* infection of barley. *J. Am. Soc. Brew. Chem.* 60 (3): *in-press*.
2. Wolf-Hall, C.E. and P. Schwarz. 2002. Mycotoxins and fermentation beer production. In *Mycotoxins in Food*, L. Jackson and M. Trucksess (Eds.), Kluwer/Plenum Publishing, NY. *In-press*.
3. Schwarz, P.B., Schwarz, J. G., Zhou, A., Prom, L.K., and Steffenson, B. J. 2001. Effect of *Fusarium graminearum* and *F. poae* infection on barley and malt quality. *Monatsschrift für Brauwissenschaft* 54(3/4):55-63.
4. Salas, B, Steffenson, B.J., Casper, H. H., Tacke, B., and Prom, L.K., Fetch, T.G., and Schwarz, P.B. 1999. *Fusarium* species pathogenic to barley and their associated mycotoxins. *Plant Disease* 83:667-674.
5. Prom, L.K., Horsley, R.D., Steffenson, B.J. and Schwarz, P.B. 1999. Development of *Fusarium* Head Blight and accumulation of deoxynivalenol in barley sampled at different growth stages. *J. Am. Soc. Brew. Chem.* 57(2):60-63.
6. Beattie, S., Schwarz, P.B., Horsley, R.D., Barr, J., and Casper, H.H. 1998. The effect of grain storage conditions on the viability of *Fusarium* and deoxynivalenol production in infested malting barley. *J. Food Protection* 61(1):103-106.
7. Gudmestad, N., Taylor, R., and Schwarz, P. 1997. How healthy is your malt? What you should know about a disease that could affect your beer. *Brewers Market Guide* (Brewing Techniques, Eugene OR) pp 64-69.
8. Schwarz, P.B., Casper, H.H., Barr, J., and Musial, M. 1997. Impact of *Fusarium* head blight on the malting and brewing quality of barley. Proceedings of the Fifth European *Fusarium* Seminar. A. Mesterhazy, ed. *Cereal Research Communications* 25 (3/2):813-814.
9. Schwarz, P.B., Beattie, S., and Casper, H.H. 1996. Relationship between *Fusarium* infestation of barley and the gushing potential of malt. *J. Inst. Brew.* 102:93-96.
10. Schwarz, P.B., Casper, H.H., and Beattie, S. 1995 The fate and development of naturally occurring *Fusarium* mycotoxins during malting and brewing. *J. Am. Soc. Brew. Chem.* 53(3):121-127.
11. Schwarz, P.B., Casper, H.H., and Barr, J.M. 1995. Survey of the occurrence of deoxynivalenol (vomitoxin) in barley grown in Minnesota, North Dakota and South Dakota during 1993. *Technical Quarterly, Master Brewers Association of the Americas.* 32(4):190-194.

P. Stephen Baenziger
Department of Agronomy
University of Nebraska
Lincoln, Nebraska 68583-0915
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PRESENT ACADEMIC RANK: Eugene W. Price Distinguished Professor

Education

B.A. *magna cum laude*, 1972, Harvard University (Biochemical Sciences)
M.S. 1975, Purdue University (Plant Breeding and Genetics)
Ph.D. 1975, Purdue University (Plant Breeding and Genetics)

Employment

Eugene W. Price Professor, University of Nebraska, 1993-Present
Professor, University of Nebraska, 1991-1993.
Associate Professor, University of Nebraska, 1986-1991.
Research Manager, Monsanto Agricultural Products Company, St. Louis,
Missouri, 1983-1986.
Research Geneticist, United States Department of Agriculture, Beltsville,
Maryland, 1976-1983.

Honors and Awards

Crop Science Research Award, Crop Science Society of America, 2000
Distinguished Service Award, Nebraska Crop Improvement Association, 2000
Agronomic Achievement Award-Crops, American Society of Agronomy, 1997
Elected Member, Nebraska Hall of Agricultural Achievement, 1997
Eugene W. Price Distinguished Professor in Biotechnology, 1993
Honorary Professor, Ningxia Academy of Agricultural and Forestry Sciences, 1992
Fellow, American Association for the Advancement of Science, 1991
Fellow, American Society of Agronomy, 1990
Fellow, Crop Science Society of America, 1990
Crop Science Society of America Young Crop Scientist Award, 1987

Elective Offices

President-elect, President, and Past-President of Crop Science Society of America, 2001-2004.
Chair-elect, Chair, and Past Chair, Section O (Agriculture, Food, and Renewable Resources),
American Association for the Advancement of Science, 2001-2003
Member, National Wheat Improvement Committee (1995-2001)
Member-at-Large, Section O, American Association for the Advancement of
Science, 1995-1999.
Chair-elect and Chair, Division C-7 (biotechnology) of the Crop Society of
America (1987-88)

Publications: Total 103 refereed articles, 21 proceedings and symposia, 8 book chapters, and one book edited.

Research on Fusarium head blight (FHB): I am a plant breeder whose responsibilities include breeding lines for FHB and evaluating transgenic lines developed from our biotechnology group for their efficacy against FHB. I have been a grateful recipient of germplasm evaluated by the FHB germplasm efforts and of the expertise of plant pathologists in the hard spring and soft winter wheat growing regions, and have submitted lines to the FHB screening nursery as appropriate.

**Curriculum Vitae
Kimberly Anne Garland Campbell**

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Pullman, WA 99164-6420

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Email: kgcamp@wsu.edu

Present Position

Research Breeder/Geneticist, USDA-Agricultural Research Service, Wheat Genetics, Quality, Physiology, and Disease Research Unit, Pullman, WA (Since 1999)

Research Focus

Improvement of end-use quality, disease resistance, and resistance to abiotic stress in wheat
Identification of quantitative trait loci in wheat
Marker assisted selection in wheat
Germplasm enhancement in wheat

Academic Degrees/Dates

Ph.D., Crop Science, North Carolina State University, 1992
M.S., Crop Science, North Carolina State University, 1989
M.A., Theology, The Lutheran Theological Seminary, Philadelphia, 1985
B.S., Agronomy, Colorado State University, 1979

Past Positions

Assist. Professor, The Ohio State Univ., Wooster, OH 1992-1999
Research Asst, North Carolina State Univ., Raleigh, NC 1988-1992
Teaching Asst, North Carolina State Univ., Raleigh, NC 1985-1987
Research Asst, Univ. of Delaware, Newark, DE 1984
Agronomist, Antiqua Sugar Industry Corp., Caribbean Agricultural Research & Development Instit, Antigua, West Indies 1981-1982

Professional Service

Since 1978, Member, American Society of Agronomy, Crop Science Society of America
Since 1997 Member Wheat Crop Germplasm committee
Since 2000 Member, National Wheat Improvement Committee
Since 2000 Member, Small Grains Advisory Board,
Association of Official Seed Certifying Agencies.
2000 Secretary, WCC-81: Systems to improve end use quality of wheat.
2001 Vice President, WCC-81: Systems to improve end use quality of wheat.
1997-2000 Member Review committee for Crop Science wheat germplasm and cultivar registrations.
1994-1999 Ohio State Univ. Representative to NC-7: Advisory Committee for The Preservation, Maintenance, Utilization, and Enhancement of Plant Germplasm
1993-1999 Board of Directors, Ohio Wheat Growers Association
1993-1999 Member, Ohio Foundation Seeds
1993-1999 Eastern Soft Wheat Technical Board, Wheat Quality Council

Yue Jin
Wheat Pathology
Plant Science Department
South Dakota State University

Research Interests Pertaining to Fusarium Head Blight

1. Developing FHB resistant germplasm:

I have been involved in improving FHB resistance in spring wheat in South Dakota since 1996. I work closely with the breeding program in developing protocols and screening breeding materials

2. Germplasm introduction and evaluation:

I have coordinated the “Germplasm introduction and introgression for spring wheat” project under the USWBSI since 1998. The main objective of the project is to identify new sources of FHB resistance in spring wheat and to facilitate the utilization of the newly identified resistance.

3. Fungal biology and FHB epidemiology:

Since 1996, my project has collaborated with the regional epidemiology group in the studies of inoculum dynamics and environmental effects on inoculum and FHB development. The overall goal is to develop a forecasting system based on environments, inoculum, or both. I have also conducted studies on ascospore production and survival of the FHB fungus.

Germplasm Introduction and Evaluation Research Area Committee:

Biographical Sketch:

Principle Investigator: Anne McKendry, University of Missouri, Columbia, MO

I believe that I can make a significant contribution to the germplasm introduction and evaluation research area within the US Wheat and Barley Scab Initiative because of the long history of scab research we have here at the University of Missouri and the large commitment we have to germplasm research within my program. Outlined below are areas where my program has had significant funding from the initiative.

Scab Resistance Breeding:

Scab resistance was introduced as an objective within the Missouri soft red winter wheat breeding program in 1993 and since that time, we have successfully identified resistance in a number of pedigrees. Among the first scab resistant soft red winter wheat varieties released was 'Ernie'. It serves as the resistant early check in both the northern and southern winter wheat scab nurseries. Since that release, we have developed greenhouse and field screening protocols, that have enabled us to identify a number of additional pedigrees that have genes conditioning broadly based resistance to scab. Of note most recently were two lines that differ from Ernie by descent, MO 980525 and MO 981020, that were shown to have low scores in all 7 resistance measures evaluated in the winter wheat scab nursery. These were the only two lines in the nursery that were considered low in all seven categories. It is anticipated that MO 980525 will be released in 2002. It should make a significant economic contribution to wheat growers in the northern corn belt states where it was not only shown to have excellent levels of scab resistance but also excellent yield potential.

Germplasm Introduction and Evaluation:

Research funded by the National Wheat and Barley Scab Initiative over the past 4 years has led to the systematic evaluation of types I, and II resistance to scab and kernel quality in approximately 4000 accessions from Asia, South America and Eastern Europe. Accessions from these geographical areas were chosen because they represent regions where resistance has been identified or where environmental conditions are conducive to scab development. About 5% of these accessions have been shown to have some level of resistance, either type I, type II or both, that may be useful to breeders. Some of this resistant germplasm (about 20 accessions) has been distributed to interested breeders nationally. Other accessions are in various stages of verification prior to distribution.

Co-PI on the US Wheat and Barley Scab Initiative Partnership with CIMMYT

I serve as the Co-PI on the CIMMYT collaboration with the initiative. To date, approximately 250 wheat lines carrying putative scab resistance genes have been introduced into Missouri. Germplasm (57 lines) introduced in 2000/2001 was distributed to interested breeders in April of 2001. A second group of 170 lines, introduced in December 2001 are currently being quarantined and increased for distribution.

[Note: I am volunteering to serve as a reviewer of proposals for the USWBSI, especially in the plant breeding and genetic resources areas. I do not work with FHB. I would serve on a committee, but my main interest is to assist in identifying and funding good research proposals, and would be pleased to do that without membership on one of the committees. Some biodata and bibliography appear below. Cal Qualset, March 26, 2002]

BIOGRAPHICAL SKETCH

Calvin O. Qualset

Genetic Resources Conservation Program, Division of Agriculture and Natural Resources
One Shields Avenue, University of California, Davis CA 95616-8602
Tel: 530-754-8502, FAX: 530-754-8505, email: coqualset@ucdavis.edu

Education

University of Nebraska, 1954–58	B.S.	Agriculture
University of California, Davis, 1958–60	M.S.	Agronomy
University of California, Davis, 1960–64	Ph.D.	Genetics

Present positions

Director, University of Calif. Genetic Resources Conservation Program (1985–present)
Professor, University of Calif., Davis, (1973-present, emeritus since 1994)

Past positions

Chairman, Graduate Group in Genetics, University of California, Davis (1989–90)
Associate Dean, College of Agric. and Environ. Sci., University of Calif., Davis (1979-80, 1981–86)
Chairman, Dept. of Agronomy and Range Science, University of Calif., Davis (1975–81, 1991-94)
Assistant and Associate Professor, University of California, Davis (1967–73)

Current professional activities

PI, National Science Foundation Plant Genome Prog. Wheat Genomics Proj. (since 1999)
Co-Director, McKnight Foundation Collaborative Crop Research Project (since 1995)
Member, Editorial Board *Experimental Agriculture* (since 1996)
Member, Agronomic Science Foundation Board of Trustees (since 2000)
Member, International Rice Research Institute Board of Trustees (since 1999)

Crop Varieties Developed and Released:

12 wheat, 2 triticale, 2 oat

Selected Publications (since 1994)

Zhong, G-Y., P.E. McGuire, **C.O. Qualset**, and J. Dvorak. 1994. Cytological and molecular characterization of a *Triticum aestivum* x *Lophopyrum* backcross derivative resistant to barley yellow dwarf. *Genome* 37:876-881.

Jafari-Shabestari, J., H.Corke, and **C.O. Qualset**. 1995. Field evaluation of tolerance to salinity stress in Iranian hexaploid wheat landrace accessions. *Genetic Resources and Crop Evolution*. 42:147-156.

Qualset, C.O., P.E. McGuire, J. Dvorak, B.S. Gill, G.E. Hart, and M.E. Sorrells. 1995. Status of the U.S. Triticeae Mapping Initiative. p. 26-32. In: P.E. McGuire and C. O. Qualset eds. *Progress in Genome Mapping of wheat and related species*. Proc. 4th Public workshop of the Int. Triticeae Mapping Initiative. Report No. 15. Genetic Resources Conservation Program. Univ. of Calif.

Damania, A.B., L. Pecetti, **C.O. Qualset**, and B.O. Humeid. 1997. Diversity and geographic distribution of stem solidness and environmental stress tolerance in a collection of durum wheat landraces from Turkey. *Genetic Resources and Crop Evolution*. 44:101-108.

Cenci, A., D. Snidaro, O.A. Tanzarella, M. Ciaffi, D. Vittori, **C.O. Qualset**, G.T. Scarascia Mugnozza, and C. De Pace. 1998. Assignment of genetic markers to *Dasypyrum villosum* (L.) Candargy chromosomes and their introgression into hexaploid wheat. Proc. 9th International Wheat Genetics Symposium, Saskatoon, Canada 2-7 August 1998, Univ. Saskatchewan Press. 2:176-178.

Hoover, D., Chassy, B.M., R.L. Hall, H.J. Klee, J.b. Luchansky, H.I. Miller, I. Munro, R. Weiss, S.L. Hefle, C.O. Qualset. 2000. Human food safety evaluation of rDNA biotechnology-derived foods. IFT Expert Report on Biotechnology and Foods. *Food Technology* 54(9):53-61.

Qualset, C.O. 2001. Wheat evolution and genetics: Discovery and use of genes in crop improvement. *The Linnean*, Special Issue no. 3. 121-126.

Clay H. Sneller

The Ohio State University, OARDC
Department of Horticulture and Crop Science
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email: sneller.5@osu.edu

Education:

Ph. D. - Plant Breeding and Genetics, Michigan State University, 1991
M.S. - Plant Breeding and Genetics, Michigan State University, 1987
B.S. - Agronomy/Plant Protection, The Ohio State University, 1978

Professional Experience:

Associate Professor, Dept. Horticulture and Crop Science, OARDC, The Ohio State University, Feb. 2001-present
Associate Professor of Agronomy, University of Arkansas, July 1997 to Jan. 2001
Assistant Professor of Agronomy, University of Arkansas, April 1991 to June 1997
Research Specialist, Michigan State University, 1990 to 1991
Teaching Assistant, Michigan State University, 1985-1990
Graduate Assistant, Michigan State University, 1984-1989

Professional Interests Pertaining to FHB

Assessing FHB resistance in Balkan germplasm, introgressing diverse FHB resistance genes into SRWW germplasm, mapping QTLs for FHB resistance, using molecular markers to pyramid QTLs and assess their value in adapted germplasm.

Other Professional Interests

Assessing and exploiting genetic diversity for improving disease resistance, quality, and yield of wheat and soybean
Analysis of QTLs in mapping populations and populations with non-traditional structure
Genotype by environment interaction analysis for yield, disease resistance, and quality
Quality parameters for specialty wheats

Publication summary

Book Chapters: 1, Genetic diversity in soybean for ASA monograph
Refereed journals (submitted) by topic:
Genetic diversity: 12
Genotype x environment interaction: 5
Herbicide or disease resistance: 2
Miscellaneous: 4
Variety releases: 9