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Aurora Sporealis



Genes, Genomes, and Genomics

University of Minnesota

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The *Aurora Sporealis* is the alumni news magazine of the Department of Plant Pathology. First published in 1924, it is the oldest, consecutive departmental news magazine in the history of the University of Minnesota.

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Aurora Sporealis is mailed annually to former and current faculty, staff, graduate students and old timers who worked in the Department of Plant Pathology. Items for the next volume can be sent to:

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FEATURE ARTICLES

by Deborah A. Samac

In this volume of the *Aurora Sporealis* we feature the emerging area of biological research called genomics and its potential to influence the science of plant pathology. A growing number of University of Minnesota faculty and students are involved in genomics projects, many focusing on plants and plant-microbe interactions. This number will no doubt increase with the support available from granting agencies and industry. In his article "Coming to Genomics," Dr Richard Zeyen clearly describes the development and features of genomics, and provides a perspective on genomics and the implications for the future from this new area of research. Be sure to check out the Old Timer News to catch up on what friends and colleagues have been doing. We want to hear from *you!* Please send us your news, photos, and philosophies to share with the *Aurora* readers in the next issue. The department has had another outstanding year in terms of faculty hiring, student recruitment, and participation in regional, national, and international events. Read about all of these activities in the Departmental News. As reported in Faculty Activities, the faculty continue to be recognized nationally and internationally for outstanding research, teaching, and service and have been very successful in obtaining extramural funding. This high level of achievement and excellence would have been impossible without the support provided by alumni and friends through the Department of Plant Pathology Endowments. We sincerely appreciate your support and encouragement in the past and thank you for additional contributions you can make to these funds.

GENES, GENOMES, AND GENOMICS: HOW WILL GENOME RESEARCH PROJECTS SHAPE THE FUTURE OF PLANT PATHOLOGY?

by Deborah A. Samac

Genomic research projects are hot topics today in the biological sciences. Everyone seems to be jumping onto the bandwagon of a genome project. But what exactly is genomics and how will this new area of research affect plant pathology?

A genome is the entire complement of genetic material from an organism that directs how that organism will look and act. Genomes contain the coding regions of genes as well as the elements that determine when each gene gets turned on and off. Genomics is the study of the sequence, function, and interrelationships between entire genomes. It is based in large part on the equally new field of bioinformatics, that is, sophisticated computer programs and databases. Genomics can be subdivided into two loose groups, structural genomics and functional genomics. Those working in the area of structural genomics are concerned with mapping chromosomes by identifying and placing markers (specific sequences or genes along a chromosome) with the goal of isolating specific genes. Many are also interested in comparing gene families and genomes across families and genera.

Those working in the area of functional genomics strive to study all the genes involved in a certain function or all the genes in a related family of sequences, such as a family of disease resistance genes. These studies rely on the isolation and partial DNA sequencing of thousands of genes, called expressed sequence tags, or ESTs, expressed in the organism under study. The potential functions of the ESTs can frequently be determined by comparing their DNA sequences to other sequences already in databases. Currently, approximately 50% of newly identified genes show sequence similarity to previously described genes. However, confirming gene identity requires further experimental evidence on when and where the gene is expressed. Mutating or "knocking out" the gene can link the gene to a particular phenotype.

In the not-too-distant future it will be possible to take a non-cultivated variety of a crop plant that shows particularly good resistance to a certain disease and identify all the ESTs that are expressed in that plant as it responds to pathogen infection. That array of ESTs would be compared to the set of genes expressed in non-infected plants and susceptible plants to identify those genes

specific to the resistance response. Because we will know the role of many of the gene products based on their similarity to known products we can infer the role of the ESTs in this specific response. (See "Coming to Genomics" by Richard Zeyen in this issue for a detailed explanation of the use of EST microarrays.) The tools being developed today will allow us to quickly isolate the genes corresponding to the ESTs and confirm that they are indeed critical to disease resistance using plants with gene knockouts. The ESTs could also be expressed in previously susceptible plants using gene transformation techniques. The ESTs or genes themselves can be used in plant breeding programs to quickly and accurately identify progeny plants carrying the genes important to disease resistance. Instead of being limited to studying one or a few related genes that may be individual components of a response, we will be able to study the response in the context of the whole biological system.

These approaches are not limited to plant species. Although much of the current genomics projects is focused on plant species, a growing number of genomics projects concern microorganisms. Genomics projects are developing the tools to unlock the secrets governing all traits, not only resistance, but to answer long-sought questions about what constitutes a pathogen, what genetic differences define species, and how new species evolve.

At the recent genomics retreat at the University of Minnesota, 24 genomics groups were represented. Of these, eight are in the area of animal or human genomics, seven in the area of microbial genomics, four deal with plant genomics and five with informatics and applications. In the Department of Plant Pathology, Dr Nevin D. Young, Professor, and Dr Deborah Samac, Adjunct Associate Professor and USDA-ARS, are involved in genomics projects funded by the National Science Foundation. The team in Dr Young's lab is mapping the genomes of soybean and a model legume, *Medicago truncatula*, an annual relative of alfalfa (*Medicago sativa*). Although the project is less than a year old, they have already identified numerous genes potentially involved in plant-microbe interactions, including an array of sequences with similarities to known resistance genes. In collaboration with Dr Carroll Vance, Department of Agronomy & Plant Genetics and Dr Steve Gantt,

Department of Plant Biology, Dr Samac's lab will develop and use the tools of functional genomics (ESTs, transformation, and gene knockouts) to identify genes in *M. truncatula* involved in disease resistance and in nodulation. Currently 1,500 ESTs have been sequenced with the goal of obtaining 5,000-10,000 different ESTs. *M. truncatula* was chosen as a "nodal species," or central point of comparison with more complex related legume species such as soybean, green bean, pea, and alfalfa for structural genomic research. One of the most striking results of genomics projects with *Arabidopsis*, corn, rice, and tomato is the high degree of colinearity, also called synteny, between the chromosomes of different plant species. Surprisingly, the order of genes along analogous chromosomes of diverse species are quite similar. This means that many chromosome markers developed in a model plant organism like *Arabidopsis* may be useful in mapping the chromosomes of *M. truncatula* and soybean. *M. truncatula* is also a useful model system for functional genomics studies in legumes because of its small relatively simple diploid genome, short generation time, self fertility, and abundant seed production. It is efficiently colonized by important symbionts such as *Sinorhizobium meliloti* (*Rhizobium meliloti*) and mycorrhizal fungi, and shares many of the same pathogens as alfalfa. It is also suitable for transformation using *Agrobacterium*. Moreover, collaborators at Texas A&M University have produced a wide array of mutants and tools for genetic mapping.

In other departments at the University of Minnesota, several exciting plant and microbial genomics projects are underway. In the Agronomy & Plant Genetics Department, Drs Ron Phillips and Howard Rines are mapping the corn genome using oat plants carrying single corn chromosomes. Dr Georgiana May in the Plant Biology Department is involved in both a corn and potato genomics project with the focus on identifying genes related to disease resistance. Also in the Plant Biology Department, Dr Judy Berman is using genomics to study yeast morphogenesis and pathogenesis. Finally, Dr Michael Sadowsky in the Department of Soil, Water, and Climate is participating in the *Bradyrhizobium japonicum* genome project in which the entire genome is being sequenced.

The excitement and questions generated by genomics projects has had a stimulating effect in many areas. The topic of the plant pathology graduate student symposium in the coming year will be in the area of genomics and its impact on agriculture. The excitement around genomics is also reflected in the number of companies involved in genomic enterprises, either independently or with university collaborations. In early September Cargill announced that it will give the University of Minnesota

\$10 million to create a new Microbial and Plant Genomics Institute on the St. Paul campus. The gift, one of the largest in the University's history, will fund half of the proposed institute with the remainder coming from the state legislature.

In the past, researchers interested in plant diseases and disease resistance had to settle for studying one gene at a time. With the advent of genomics, this is no longer true. A single graduate student may well examine every single gene involved in some plant-microbe interaction as part of his or her thesis. It is clear that the Plant Pathology Department is well-positioned to take a leading role in this field. Genomics has already revolutionized the field, but even more exciting discoveries are soon likely to follow.

For further reading on genomics see:

Bouchez, D., Hofte, H. 1998. Functional genomics in plants. *Plant Physiol.* 118, 725-732.



*To see a world in a grain of sand
and a heaven in a wild flower.
Hold infinity in the palm of your hand
And eternity in an hour.*

William Blake

COMING TO GENOMICS

by Richard J. Zeyen

Genomics, the study of the structure and function of genes, and its progeny functional genomics, the use of information and reagents provided by genomics, will revolutionize biology in the 21st century. This is fact, and on an intellectual level all biologists know this will happen; however, intellectual recognition is much different from acceptance and true realization. We often struggle with acceptance even in the face of overwhelming evidence, and I like many scientists of my era have been slow in "coming to genomics."

For almost a decade I watched from a polite distance as genomics was born. As a physiologist-pathologist interested in dynamic, active defense processes of plants against microbes, these early years of genomics lacked practical relevance. This was in spite of the fact that my colleagues and I were involved in plant genetic engineering, hoping to obtain better fungal disease resistance in cereals using transgenic technology. Some would ask, if one was involved with genetic engineering why the lack of enthusiasm for genomics?

Early in its development, the field of genomics was almost exclusively structural and dealt mainly with obtaining DNA sequence information. For me and many other biologists not intimately involved, print outs of sequenced genes were a mind-numbing string of As, Gs, Ts and Cs, shorthand for the nucleotide bases of genetic code. Viewing strings of raw DNA sequence data, and looking for the few known sequences that lent meaning to this data was not a highlight of our professional lives.

Only slightly more exciting was early research where genomic DNA was cut with various restriction enzymes to eventually obtain "probes" for chromosome mapping and painting. Even though high density chromosome mapping promised to be a useful tool in pinpointing and eventually cloning plant disease resistance genes, I remained unimpressed by this geneticists' field of dreams. Advancement through centimorgan increments used to measure "chromosome walking", seemed an arduous and almost stupefying way to make progress. Similarly, obtaining probes for genetic "finger printing", thus allowing taxonomists and those interested in evolutionary and familial relationships to push forward their scientific agendas did little to tweak my curiosity. I found this early era of genomics sterile and filled with jargon and acronyms. In short, conventional genomics and its early scientific progeny did not look like it would unite all life forms and fuel the greatest ever revolution in biology. The

hyperbole surrounding structural genomics made personal acceptance and realization impossible.

Then bioinformatics or computational biology started to come of age. Now I could begin to envisage, in practical terms, how genomics might move toward uniting biology. Bioinformatics allowed the functions of genes, discovered using biochemistry and molecular biology, to be linked to specific DNA sequence data and entered into databases. Now, properly programmed computers could search sequence databases to find regions of known importance or function. With this information one could literally annotate, ascribe known functions to genomic DNA sequences. You could even weave this information into a coherent textual explanation concerning a given gene. Annotation programs also identified the likely role of newly acquired gene sequences. This was accomplished by comparing them to sequences of thousands of other genes of known function. Additional annotation could locate DNA sequences coding for on and off switches, describe various forms of the same gene even though it contained somewhat differing DNA sequences, and identify genes or parts of genes conserved across widely divergent life forms. Best of all, information was available via the Internet. It enabled unwashed and unanointed masses of scientists to use genomic information. Now we did not have to join "Club Genomics" to benefit from genomic knowledge. Like thousands of others we became cyberspace visitors to genomic Internet sites, entering data and searching databases for information on plant defense response genes we were using.

While I considered bioinformatics a huge step forward, it could not answer dynamic, mechanistic questions posed by study of active plant defenses. Which genes are switched on, how do they coordinate and relate to one another, and when and where in cells and tissues are they expressed? Many thought that some answers would come when we learned the function of disease resistance genes. However, disease resistance genes, long known to plant pathologists by their phenotypic reactions and Mendelian inheritance ratios, turned out not to code directly for antimicrobial products. Rather, they were involved in detoxification of microbial compounds used to attack plants, or coded for small portions of complex cellular signal transduction pathways. These signal transduction pathways allowed plants to recognize specific pathogens, and to modulate or regulate other sets of genes leading to active defense processes, including hypersensitive cell death. Simply put, knowing the sequence and putative

function of Mendelian disease resistance genes raised many more questions than it answered. The "who, what, when, where and why" of response genes involved in defense processes still required expensive, cumbersome and time-consuming discovery methodologies. While conventional genomics had deepened our understanding, it did little to speed our research progress.

Our research would be greatly simplified if only we could look at a plant's total genome and actually "see" which genes were switched on during periods of active defense. Personal acceptance of the power of genomics would only come when it delivered a useful research technology. Enter a byproduct of functional genomics, the technology of DNA microarray (DNA Chips); in which microscopy is used to actually see which of the thousands of plant genes are actually turned on (transcribed into messenger RNA – mRNA) at a given point in time. Here, small segments of DNA from known genes are robotically deposited onto indexed locations on microscope slides. Each slide can hold segments of upwards of 10,000 different genes. Next, mRNA (the first products of all the genes switched "on" inside a tissue) is rapidly extracted from a plant and labeled with a fluorescent compound. The fluorescently-labeled messages for individual genes (mRNA) that were "on" in tissue before RNA extraction now find their known counterpart on the microscope slide and attach to it. Then the slides are viewed using a microscope with a specific laser light source. The mRNA from genes that were switched on in the plant tissue is visible as bright spots. Thus, with a series of microarray slides one can monitor a large number of genes being read in defense responses during critical time periods. Essentially one could get serial snap shots of plant genes cooperating and coordinating to bring about active defense. At long last, here was a product of functional genomics we could use in our research. These DNA microarrays were actually miniaturized reverse northern blots! Although we have yet to use microarray technology, I had finally come to accept genomics.

While I was slow in "coming to genomics" others had certainly "gotten it" much earlier. They understood that like a huge blender, genomics would mix and forever integrate biology. Genomic's power is so overwhelming, and the technology of sequencing so advanced, that both public and private sectors are clambering for a piece of the action. Examples include the National Science Foundation National who, when pushed by the National Corn Growers Association and others, announced a 40 million-dollar plant genome initiative in 1998, geared largely toward maize. The USDA also has also targeted substantial resources for agricultural genomic research, and there is a worldwide rice genome cooperative effort. Meanwhile the sequencing of the model plant *Arabidopsis*

continues, and efforts are underway to selectively sequence portions of non-viral plant pathogens. The National Center for Genome Resources in Santa Fe, formed in 1994 by the United States Department of Energy in conjunction with the Human Genome Project, shifted its bioinformatics focus to agricultural genomes including plants, animal, bacteria and fungi.

While many are concentrating on plant genome sequencing activity, others have their eyes on the ultimate prize, exploiting sequence databases in the post-genomic era. In the post-genomic era there will be detailed and explicit mechanistic explanations of how genomes interact with internal and external stimuli, and with this understanding will come increased power and mastery to tailor organisms to match human needs. Thus, many are bypassing gene sequencing entirely and creating new partnerships and alliances for mining existing and future genomic databases. They are creating new annotation programs and other information for getting the most from gene sequence databases. Their goal is to understand a biological process or change in plants, and convert that information to products for healthcare and agricultural industries.

Never has financial investment in life science research reached the fever pitch of the past two years. There is no precedent for the billions of dollars now being spent to establish private conglomerates and non-profit institutions aimed directly at exploitation of the post-genomic era. An example is the Donald Danforth Plant Science Center near St. Louis, which is a non-profit partnership between 3 major universities, a philanthropic foundation and Monsanto. Additional examples are DuPont's working alliances with Pioneer Hi-Bred and CukraGen, and Novartis's Agribusiness Biotech Research operation in North Carolina and its Agricultural Discovery Institute in San Diego.

All the activity and energy generated by genomics means that many more discoveries and opportunities will surely follow. As deeper implications from genomics emerge there will be changes in law, philosophy, education and perhaps religion. Many unforeseen changes are in the offing for the 21st century. For "mature" scientists like me the future looks so intriguing that I yearn to be 20 years old once again, so I could participate more fully in the inevitable intellectual and social post-genomic revolution.

MESSAGE FROM THE HEAD

Dear Friends of the Department:

It is that time of year when I am delighted to share with you news from the department and the College of Agricultural, Food and Environmental Sciences (COAFES).

As we move toward the end of another year, I reflect back on a productive year and realize the many changes that have occurred in the department and COAFES in 1999. First, we have a new dean. As of September 21, 1999, Dr Charles Muscoplat agreed to accept the position of dean of the COAFES, director of the Minnesota Agricultural Experiment Station and vice president of Agriculture Policy. Dr Muscoplat was associated with industry where he was vice president for medical affairs at MGI Pharma, a pharmaceutical company located in the Twin Cities. He has a PhD in veterinary microbiology from the University of Minnesota and holds a tenured professor position in the Department of Animal Science. His primary duties as dean include serving as the chief academic and administrative officer responsible for the college's teaching, research, and outreach programs and for advising on strategic and tactical issues related to the State of Minnesota and its national and international role on global agricultural systems. Dr Muscoplat's science, policy and business experience coupled with technical skills are well suited to the challenges of agriculture in the 21st century. We are pleased that he is dean of our college.

In 1997, President Mark Yudof identified five areas of emphasis for his administration. One of the areas identified was agricultural research and outreach. Of course, we are pleased with this, and plans are underway in the college to develop agricultural initiatives for presentation to the 2000 and 2001 state legislature for consideration of possible funding. In his description of this area of emphasis, he makes references to the importance of control of plant diseases on various crops. I am hopeful that additional funding to support the agricultural emphasis will result, and that our departmental programs and ultimately the citizens of the state will benefit from increased state appropriations. In my next letter to you, I will let you know how successful we were in our funding request to the state legislature.

Let us move on to departmental news and let me begin by saying that the department and its programs continue to grow, adding faculty positions in small grains pathology, extension soybean pathology and disease resistance breeding - the Lieberman-Okinow Endowed Chair. The Cereal Disease Laboratory also recently filled a position

in fungal genetics and is in the process of filling another in the area of disease resistance breeding and epidemiology of Fusarium head blight and rust diseases in wheat and barley.

Small Grains Pathology Position. We received approval from the college to begin the search for a plant pathologist with emphasis in diseases of small grains. This position is located at the University of Minnesota's Northwest Research & Outreach Center, Crookston. Our challenge is to effectively control Fusarium head blight and other diseases of small grains that continue to cause devastating losses in wheat and barley production in the Red River Valley and the Upper Midwest.

Extension Soybean Pathologist. The retirement of Dr Ward Stienstra left a major void in our ability to effectively deal with extension programs in soybean diseases. However, with funding from the Minnesota Soybean Research & Promotion Council and support of the college, I am pleased to report that we are in the process of searching for a pathologist to assume responsibilities of developing a comprehensive educational program on soybean diseases and their management for Minnesota's soybean growers.

The Lieberman-Okinow Endowed Chair. For many years the department has had interaction and collaboration with pathologists at the Tel Aviv University. This collaboration began in the 1950s when Professor Isaak Wahl made regular visits to the department to work with Professor E.C. Stakman. However, the research collaboration between the two universities relied on informal faculty exchanges, Cereal Disease Lab cooperation and grants from the US-Israel Binational Agricultural Research and Development Fund, but no formal long-term effort, or funding was available to link the two universities. That all changed with the construction of the Lieberman-Okinow Germplasm Bank at the Tel Aviv University. Funds from the Lieberman-Okinow Foundation at the University of Minnesota helped make this building a reality. Then in 1986, a proposal submitted to the University requesting Permanent University Funds (PUF) to support this collaborative effort was approved. The PUF funds were used as matching monies with the funds in the Lieberman-Okinow Foundation and this resulted in the establishment of the Lieberman-Okinow Endowed Chair in Cereal Disease Resistance.

In 1999, the Lieberman-Okinow families donated additional funds to the Chair. The family's generosity will allow us to fill the Chair at the assistant professor level.

Thus, a search is currently underway to fill this position. The position is focused on unlocking the genetic potential for disease resistance from wild relatives in small grains through cooperative research with the Institute for Cereal Crops Improvement at Tel Aviv University and its Lieberman Germplasm Bank. We are very excited and pleased that we have this endowed Chair in the department. It adds tremendous strength and visibility to our programs.

Cereal Disease Laboratory – Genetics of Fungal Pathogens. Dr Corby Kistler filled this position and assumed his new responsibilities on July 1, 1999. Dr Kistler's research focuses on the genetics of pathogenic specialization of *Fusarium graminearum*, the fungus that causes scab in cereal crops and on population genetics and evolution of plant pathogenic *Fusarium* species. Dr Kistler is an adjunct professor in the department. We are pleased to have Corby as a member of our faculty.

Cereal Disease Laboratory – Resistance to Fusarium head blight, leaf rust and stem rust in wheat and barley. Responsibilities include conducting research on resistance to Fusarium head blight, leaf rust and stem rust in wheat and barley with emphasis on both host genetics and ecological factors that influence the effectiveness and durability of resistance. The search is underway and our goal is to fill this position soon.

As we come to the end of another growing season, several plant diseases continue to plague our growers and cause major losses. Late blight of potatoes, PVY on seed potatoes, Fusarium head blight (FHB/scab) on wheat and barley, soybean cyst nematode, white mold on soybean, Cercospora leaf spot and Rhizomania on sugar beets, root rots on dry beans, vegetables, greenhouse and nursery crops are examples. Funds from the National and State Scab Initiatives have been directed toward development of a significant effort for controlling scab of wheat and barley. The state legislature also appropriated funds into a program called Rapid Response Fund to support critical issues in Minnesota agriculture. Many of our faculty, along with colleagues in other departments, are involved in research activities to develop effective control measures for the diseases mentioned above.

The faculty continue to be successful at securing external grant funds to support their research and extension programs. Last year the faculty published 3 books, 11 book chapters, 43 refereed publications, 37 abstracts, 32 extension publications, 6 technical reports and applied for 5 patents. As in 1998, over 80% of our research funding comes from various national and international granting agencies external to the University and from various state commodity groups.

Six new graduate students entered our program this year. Students organized a symposium titled "The Impact of Research on International Agriculture" and speakers included several international plant pathologists and agricultural economists, graduate students, and faculty from the COAFES. Hats off to our graduate students as they successfully secured funding from several sources to help support and sponsor the symposium. On another matter, I am pleased to report that the faculty were successful at defeating the graduate students at the annual E.C. Stakman softball game and I must attribute this success to the infusion of new young faculty into the department.

In conclusion, I would like to express my sincere appreciation for the generous contributions from alumni and friends to the department and its programs. As state and federal funds continue to shrink, we rely on the financial and moral support from alumni and friends to support our programs. I am very grateful for your generosity as these funds provide flexibility and clearly, enhance the quality of our programs. Be assured that the faculty are dedicated to continued excellence of this department and are committed to providing high quality research, teaching and outreach programs for our graduate students and for the citizens of the state of Minnesota.

Please know that you are always welcome to stop in and visit us. I would like to acknowledge the efforts of Dr Deb Samac, the editor of this year's *Aurora Sporealis*, and to say thanks to all involved in its production.

Frank L. Pflieger



CALL FOR NOMINATIONS: E.C. STAKMAN AWARD

The Department of Plant Pathology at the University of Minnesota is requesting nominations for the E.C. Stakman Award. The award is granted to individuals of any country and nationality for outstanding achievements in plant pathology. The award may be given for documented achievements in the areas of research, teaching, outreach, international development, or for any combination of these areas. Preference will be given to candidates actively engaged in these areas; only occasionally will lifetime achievement awards be considered. Nominations must include a brief biographical sketch of the nominee and received by February 15, 2000. Please send your nominations to the following address, or fax them to 612-625-9728 or E-mail them to plpa@puccini.crl.umn.edu. Dr. Benham Lockhart, Department of Plant Pathology, University of Minnesota, 495 Borlaug Hall, 1991 Upper Buford Circle, St. Paul, MN 55108-6030 USA.

STAKMAN AWARD RECIPIENTS

- Dr. W.L. Waterhouse**, Professor, University of Sydney, Australia, 1956
- Dr. H.A. Rodenhizer**, USDA, Washington, DC, (formerly Deputy Administrator for Farm Research), 1957
- Dr. T. Johnson**, Head, Canadian Rust Research Laboratory, Winnipeg, 1958
- Dr. J.J. Christensen**, Head, Department of Plant Pathology, University of Minnesota, 1959
- Mr. Jose Vallega**, Argentina Department of Agriculture, FAO in Rome, 1960
- Dr. Norman E. Borlaug**, renown wheat breeder and plant pathologist with the Rockefeller Foundation's agricultural improvement program in Mexico (now in charge of their international wheat improvement program), 1961
- Dr. Helen Hart**, Professor, Department of Plant Pathology, University of Minnesota, 1963
- Dr. J.H. Craigie**, former Head, Canadian Rust Research Laboratory, Winnipeg, 1964
- Dr. J.A. Rupert**, in charge of the Rockefeller Foundation's agricultural improvement program in Chile, 1965
- Dr. I.A. Watson**, Dean, College of Agriculture, Sydney University, Australia, 1966
- Dr. H.H. Flor**, Research Plant Pathologist, USDA, Fargo, North Dakota, 1967
- Sir Frederick C. Bawden**, Director, Rothamsted Experimental Station, Harpenden, Herts, England, 1968
- Dr. Donald G. Fletcher**, former Executive Vice-President, Crop Quality Council, Minneapolis, Minnesota, 1968
- Dr. George J. Harrar**, President, Rockefeller Foundation, 1969
- Dr. H. Asuyama**, Department of Plant Pathology, University of Tokyo, 1971
- Dr. C.S. Holton**, Department of Plant Pathology, Washington State University, Pullman, 1971
- Dr. J.C. Walker**, Professor Emeritus, Department of Plant Pathology, University of Wisconsin, Madison, 1972
- Dr. D.L. Bailey**, Professor Emeritus, Department of Botany, University of Toronto, Canada, 1972
- Dr. C.M. Christensen**, Regents Professor Emeritus, Department of Plant Pathology, University of Minnesota, 1981
- Dr. J.F. Fulkerson**, Plant Pathologist and Microbiologist, USDA, Washington, DC, 1982
- Dr. E.J. Wellhausen**, Special Staff Member, The Rockefeller Foundation, Mexico, 1982
- Dr. J.E. VanderPlank**, Plant Protection Research Institute, Pretoria, South Africa, 1985
- Dr. J.M. Daly**, Department of Agricultural Biochemistry, University of Nebraska, Lincoln, 1986
- Dr. Arthur Kelman**, Department of Plant Pathology, University of Wisconsin, 1987
- Dr. Theodor O. Diener**, USDA, Plant Virology Lab, Agricultural Research Center, Beltsville, Maryland, 1988
- Dr. R. James Cook**, USDA, Regional Cereal Disease Research Lab, Washington State University, Pullman, 1989
- Dr. Thor Kommedahl**, Department of Plant Pathology, University of Minnesota, 1990
- Dr. Allen Kerr**, Department of Crop Protection, The University of Adelaide, South Australia, 1991
- Dr. Luis Sequeira**, Departments of Bacteriology and Plant Pathology, University of Wisconsin, 1992
- Dr. Sanjaya Rajaram**, Germplasm Improvement Subprogram International Maize and Wheat Improvement Center, CIMMYT, Mexico, 1993
- Dr. Malcolm C. Shurtleff**, Professor Emeritus, University of Illinois, and Adjunct Professor, Texas A&M University, 1999

E.C. STAKMAN NOMINATION FORM

Nominee: _____ Date: _____

Address: _____

Phone: (Business) _____ (Home) _____

Educational background:

Employment background:

Significant honors and awards:

Please provide rationale and documentation to explain why you believe this person is deserving of the E.C. Stakman Award:

Nominator name: _____

ALUMNI SPEAK

by Deborah A. Samac

Alumni Speak is a column devoted to news and views from alumni. We are interested in what *you* are doing! All alumni are invited to drop us a line by regular mail (see enclosed envelope) or by E-mail (alumnis-plpa@puccini.crl.umn.edu). We are particularly interested in news from the alumni who graduated during the following decades. Send us your news and photos, tell us what you are doing, give advice to today's students or share a favored reminiscence. We look forward to hearing from you!

YEAR & STUDENT	DEGREE/ADVISOR	YEAR & STUDENT	DEGREE/ADVISOR
1998		1968 continued	
Chad J. Behrendt	PhD Blanchette	Roy V. Sturgeon, Jr.	PhD H.C. Young, Jr., Kernkamp
Andrea M. Moffatt	MS Percich, Nyvall	Franklin H. Tainter	MS French
Kurt D. Stromberg	MS Kinkel	Joseph M. Vargas, Jr	PhD Wilcoxson
1988		1958	
Hamed K. Abbas	PhD Mirocha	Howard Bissonnette	MS King
Robert L. Doudrick	PhD French, N.A. Anderson	Alfredo Campos	PhD Hart
Scott A. Enebak	MS Blanchette	Der-Fen Chen	MS Doslall, J.J. Christensen
David W. Gardner	PhD Krupa	Edgar V. Christensen	MS Wilcoxson
Nezha Khaless	MS Lockhart	Prasanta Kumar Dutta	PhD Kommedahl, Linck
Flavio A. Lazzari	MS Meronuck	Santiago Fuentes Fuentes	MS Eide
Jennifer Lorang	MS N.A. Anderson	William A. Haglund	MS King, Taylor
Melody F. Olson	MS MacDonald, Kommedahl	John B. Kotheimer	MS C.M. Christensen
Beatriz A. Perez	MS Roelfs	John H. Ohman	MS French
Mouna Tajani	MS Roelfs	William Silverman	PhD Hart
Judy A. Thies	PhD Wilcoxson	H. David Thurston	PhD Eide
El Mostafa Toufiq	MS Wilcoxson	Leon S. Wood	PhD J.J. Christensen
Linda M. Treeful	PhD Wilcoxson		
1978		1948	
Brahim Ezzahiri	MS Roelfs	Tewfik Abdel-Hak	PhD Stakman
Michael P. Grisham	PhD N.A. Anderson, MacDonald	Mohamed Ayad	PhD H.K. Hayes, Stakman
Dennis A. Johnson	PhD Wilcoxson	Carlos G. Barbosa	MS Stakman
David S. Lang	PhD Krupa	Michael G. Boosalis	MS Kernkamp, J.J. Christensen
Michael E. Ostry	MS French	Luis C. Felix	MS Stakman
Elmer L. Schmidt	PhD French	Syed Z. Hasanain	PhD H.K. Hayes, Stakman
Joseph W. Southern	PhD Wilcoxson	Harry H. Murakishi	PhD Eide
1968		Rodrigo G. Orellana	PhD Stakman, Eide
Gerald L. Crane	PhD Calpouzos	Morris N. Teller	PhD Stakman, Mader, Landon, Hart
Dexter R. Douglas	PhD Eide		
Cesaria P. Eugenio	PhD C.M. Christensen, Mirocha	1938	
Hemant A. Fansé	PhD C.M. Christensen	Reiner Bonde	PhD Stakman, Leach
Allen S. Heagle	PhD Moore, Wilcoxson, N.A. Anderson	Huey I. Borders	MS Stakman
Richard H. Morrison	MS French	R.C. Cassell	PhD Stakman
Peter T. Onesirosan	MS Banttari	St. John P. Chilton	PhD Stakman
Louis T. Palmer	PhD Kommedahl, MacDonald	Fredrick R. Davies	PhD Stakman, J.J. Christensen
Arthur L. Schipper, Jr.	PhD Mirocha	Milton F. Kernkamp	MS Stakman
Darroll D. Skilling	PhD French	Thomas Laskaris	MS J.J. Christensen, Stakman
Mark A. Smith	PhD Kennedy	Richard Nelson	PhD Harvey
Gilbert F. Stallknecht	PhD Mirocha		

OLD TIMER NEWS

(Alumni Speak)

After receiving the 1998 edition of the *Aurora Sporealis*, **Carl Eide** (MS 1929, PhD 1934) sent us the following letter. "I feel a strong urge to express my sincere admiration of this issue of the *Aurora*. It really is a remarkable job. I haven't read a lot of it - that's a pleasure I can enjoy for some time. Even the familiar figures of J.J.C. and Stakman will give me pleasure."

"I am not sure when I retired. I was 92 years old on August 20. (There was a wonderful birthday party for me in the plant pathology seminar room - I think that was last year). So, it appears that I am losing my so-called mind (to quote C.M. Christensen) and that is probably true. Presently Johanna and I have an apartment in the Rosewood Estates in Roseville, Minnesota. We have a living room with a kitchenette, bedroom, bath and closet. We eat breakfast in the apartment, and have lunch and supper in the main dining room. The meals are generally pretty good (one exception is the mashed potatoes - too sloppy). We have two sons, both in their 60s. Charlie lives in White Bear Lake and David and wife Ann in Roseville. No grandchildren. David is our legal guardian - or whatever you call it - takes care of the finances and keeps us supplied with food and anything else we may need."

"I have a library book about computers and so far it has left me in ignorance about the subject. They must have some virtue; I see *Aurora* lists Internet Sites, WWW addresses and such gobbledegook. Doubtless computers have some virtue, but why can't they explain it in simple English?"

"I recall that when Stak was 68 years old he had to give up the headship of plant pathology and J.J. took over. J.J. was almost 68 and I was next in line. Stak came in my office one day and informed me of that fact. I felt scared. The next day he came in and said, 'Eide, you know darn well you wouldn't be happy doing the things the head does'. In other words, I didn't qualify. I guess Kernkamp or French got the job."

Herb Johnson (PhD 1953) sent holiday greeting to friends in the department last November. He sent news of his wife Jean and sister Hazel, both residing at the Care Center at Presbyterian Homes on Lake Minnetonka, Minnesota. His apartment is located next to the care center with a balcony view of Black Lake, a small bay of Lake Minnetonka. A skyway connects the two building so that he was able to visit both Jean and Hazel each morning. The holidays were to be spent with his children, their spouses and his grandchildren. Later, the department received a note that Jean had passed away on December 12, 1998.

"My copy of the AS arrived and gadzooks, all those professors I had are retiring", writes **John Laurence** (MS 1973, PhD 1976). What's worse is that some of them got to Minnesota about the same time I did. That can't be - they've aged, but I haven't? And Pflieger's moved off the first floor!"

"Well, time does pass, even when one is not really a plant

pathologist anymore. Since leaving Minnesota in 1976, I've been at Boyce Thompson Institute and Cornell University (don't tell them the part about "not really a plant pathologist") where I have fallen under the influence of plant physiological ecologists. I argue that this is not really so far removed from plant pathology since it's sort of "The Way Plants Work" and pathogens play a big role in that. For the past many years I've been interested in how populations of plants respond to environmental stresses, particularly air pollutants. About 15 years ago, I went back to my first interests and started working in forest ecosystems. Currently, I'm on an assignment with the US EPA at the Western Ecology Division in Corvallis, Oregon. I'm heading up a project to figure out how to predict the development of forest stands and landscapes based on what we know about individual trees. I get to work in old-growth douglas-fir, which is pleasant, and also pursue my interest in modeling tree and forest growth."

"For the past four years, I've taught freshman composition in Cornell's writing program. Writing is taught 'across the disciplines' at CU and I really enjoy teaching composition in the context of environmental issues."

"My advice to any of you is - nothing to do with science - if you pass through Tucson, look up Bill Kennedy who, in his retirement, has mastered the margarita and mesquite-broiled steak. And, he still spins a great yarn!"

"I want to thank you for again sending me the *Aurora Sporealis*. It is, as usual, an interesting and informative volume," wrote **Jack Schafer**. "I am most pleased to remain on this mailing list and keep up with the activities of the department. My own activities are more limited, although I am getting more and more qualified as an 'Old Timer'. I do have occasion from time to time to send in rust collections to the CDL."

The following letter was received from **Grant Vest** (PhD 1967). "I always enjoy reading *Aurora Sporealis*, and appreciate the fact that I am still on the mailing list. I want to take advantage of the invitation printed in the last issue to provide some information about myself and give some advice to others. I couldn't pass up an opportunity like that, especially when my name was listed among those in one of the decades of interest. I will give a brief report of my activities for the past 31+ years, and follow that with my thoughts about having been a student in the Department of Plant Pathology at the University of Minnesota."

"I started my career at Beltsville, Maryland, studying the genetics of nodulation and nitrogen fixation in soybeans. After a few years there I joined the faculty in the Department of Horticulture at Michigan State University with the responsibility for a vegetable breeding program for onions, lettuce and asparagus. A switch to administration occurred in 1976 when I became head, Department of Horticulture and Landscape Architecture at Oklahoma State University. Later I became head,

Department of Horticultural Science at Texas A&M University and head, Department of Plant, Soils & Biometeorology at Utah State University. I currently serve as associate director, Utah Agricultural Experiment Station."

"I have always been grateful for the philosophy of education in the Department of Plant Pathology and the breadth of education that I received. It was that education that made it possible for me to do the things I listed above, including being elected Fellow of the American Society for Horticultural Science. I hope this philosophy and education in the department haven't changed. We need graduates with a breadth of training today. I was spoiled by the department's seminar program. As a result, I have been disappointed with seminars every place I have been employed since I left there. Students view me as somewhat odd when I tell them I learned more in seminars at Minnesota than in any single class I took in college. They have a hard time understanding that I spent more time in seminars the three years I was there than I did in any one class. My education was enhanced through the professional interactions between the students and the faculty, and between the students themselves. That is why it is so rewarding to read about many of them in each issue of *Aurora Sporealis*. My advice is to keep the same philosophy of training students, keep the comradery and provide a broad education. If the department does this the graduates will be successful and the department will be able to take pride in their accomplishments."

"I have never regretted my decision to study plant pathology at the University of Minnesota. It was a great learning experience for me. I am indebted to many of the faculty (especially my advisor Neil Anderson), the staff and other students who were so helpful. Thanks to those who are still working to keep the spirit alive."

Julie Beale (MS 1995; head of the Plant Disease Clinic at the University of Kentucky), **Bruce Paulsrud** (MS 1996; in charge of pesticide applicator training at the University of Illinois), and **Kyoko Shimizu** (MS in forest resources/minor in plant pathology, 1994; senior forest pathologist with the Wisconsin Department of Natural Resources) were recently in St. Paul for the APS Shade Tree Wilt Conference. An impromptu "new old timers" lunch ensued, with Andrew Ryan (MS 1994) and Linda Kinkel meeting up with them to talk shop. It is great to see all of our young graduates doing so well!

Congratulations to **Daqun Liu** (PhD 1991) who was recently named president of Hebei Agricultural University. He had most recently served as vice-president for foreign affairs and of the graduate school at Hebei. His new responsibilities will focus on administration of Hebei University. Despite taking on this new position, Daqun assures us that he will continue his active research program, including semi-annual visits to Minnesota to collaborate with Dr Linda Kinkel and others at the University.

NEW DEAN OF THE COLLEGE OF AGRICULTURAL, FOOD AND ENVIRONMENTAL SCIENCES

by Deborah A. Samac

Dr Charles Muscoplat has been named dean of COAFES, vice-president for agricultural policy and director of the Minnesota Agricultural Experiment Station. Dr Muscoplat, started work on September 20, filling the position vacated in October 1998 when former Dean Michael Martin left for a position at the University of Florida. In the interim, the position has been ably filled on an interim basis by our own Dr Phil Larsen who will continue to serve the college as associate dean. Dr Muscoplat has extensive expertise in academia, basic and applied research, teaching, business, technology transfer, administration and public service. He earned his bachelor's degree from the University of Minnesota in 1970 and a doctorate in veterinary microbiology in 1975. After postdoctoral work at Sloan Kettering Institute for Cancer Research, he returned to the "U" as a professor in the College of Veterinary Medicine. In 1983 he and several other faculty members opened MGI Pharma Inc., an agricultural and biotechnology company. In 1984 the company introduced the first biotechnology animal health product called Genecol 99 to prevent diarrhea in newborn calves. Recent products include a vaccine for Lyme disease in dogs, herbicide tolerant corn, and pharmaceutical products for treatment of patients with cancer and arthritis. In an interview for the *Minnesota Daily*, Dr Muscoplat stated that, "I really like the University and had been looking for a position to come back to the University." Dr Muscoplat added that he has many goals for his position as dean, including increasing enrollment, creating biotechnology products for use throughout the country, and preparing students for careers on the international stage. In the area of agriculture, he wants to help students interested in agriculture find suitable careers in the field and he hopes to use the University's resources in dealing with the country's agricultural crises. Of the new dean, university President Mark Yudof said, "Dr Muscoplat combines the talents and perspectives of a first-rate scientist, academician, business person, manager and advocate for agriculture. I believe his appointment as dean and vice president sends a strong signal that the University of Minnesota is committed to the agricultural community, to outreach to support farmers, and to technological innovation. I also believe he will work well with students, faculty and alumni and that he will serve as a strong voice for agriculture in my administration. Dr Muscoplat will be meeting with faculty of the Department of Plant Pathology in the near future to discuss our vision for the future."

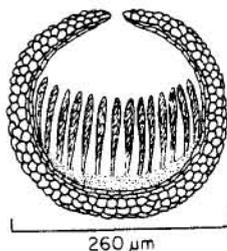
NEW FACULTY



DR H. CORBY KISTLER

by Deborah A. Samac

This past June we welcomed Dr Corby Kistler to the department and the Cereal Disease Lab (CDL) as a research geneticist. His research will focus on the molecular genetics of *Fusarium graminearum*, the causal agent of Fusarium head blight of wheat and barley. Accompanying Corby from the University of Florida to assist him in this work are Dr U. Liane Rosewich, a postdoctoral research associate and research technician, Rodney Pettway. Corby is an internationally recognized expert in *Fusarium* molecular biology. During his 14 years as a professor in the Department of Plant Pathology at the University of Florida, his research unraveled the population genetics and genome of *Fusarium oxysporum* and the molecular biology and physiology of *Nectria haematococca* (anamorph: *Fusarium solani*). His lab was the first to identify pathogenicity islands in a plant pathogenic fungus and the first to transform strains of *Fusarium*. His lab also pioneered electrokaryotyping and telomere-mediated chromosome breakage as research tools. He had recently initiated research into the genetic diversity within *F. graminearum*, work that will continue at the CDL in addition to other research projects. We look forward to many exciting collaborations with this creative and congenial new colleague.



DR JENNIFER JUZWIK

by Neil A. Anderson

The department is pleased to announce the appointment of Dr Jennifer Juzwik to our faculty as an adjunct assistant professor. Jenny is currently the project leader of disease research at the North Central Research Station, USDA Forest Service, located on campus. Her research includes studies on the development of alternatives to methyl bromide for pre plant soil fumigation in forest tree nurseries and methods to disrupt overland transmission of the oak wilt pathogen. A native of West Virginia, Jenny received her BS (1976) in biology at Fairmont State University, Fairmont, West Virginia; her MS degree (1978) with Tommy Hinds at Colorado State University on the sooty bark disease of aspen; and her PhD (1983) with Dave French here at Minnesota on overland transmission of the oak wilt fungus. After a postdoctoral experience with Martin Hubbes at the University of Toronto, Jenny became a forest pathologist in the province of Ontario. She also has served as an adjunct professor in the forestry school at the University of Toronto. Jennifer came to her present employment with the USDA Forest Service, St. Paul, MN in 1989. Her administrative tasks are to direct personnel and forest disease programs covering seven states in the North Central Region. Jenny's appointment is also as an associate member of the graduate faculty. She has already served as co-advisor of two MS students, and working with our faculty and advising students are two of Jenny's strengths. Her research group will move into new office and laboratory space in January 2000. They are already in and doing research in the new headhouse and greenhouses located next to the Cereal Disease Laboratory. Jenny's husband, John, is a computer programmer/systems analyst and they have two children, Laura age 7 and Colin age 5.

DEPARTMENTAL NEWS

DEPARTMENTAL AWARDS 1999

by Deborah A. Samac and Delores H. Huebner

The Department of Plant Pathology's annual awards program was held May 19, 1999. Exceptional achievements by alumni, friends, students, staff, and faculty were recognized. The following people received awards:

DISTINGUISHED ALUMNUS AWARD

Dr Mary Palm

Dr Mary Palm completed her MS in 1979 and her PhD in 1983 with Dr Elwin Stewart. After a brief postdoctoral appointment here at Minnesota, she joined USDA-APHIS in the Systematic Botany and Mycology Laboratory at Beltsville, Maryland. Mary is the national mycologist for the USDA, Plant Protection and Quarantine (PPQ). Her primary responsibility is the identification of fungi entering the US on plants and plant products and her identifications are the basis of accepting or rejecting shipments. She is also responsible for teaching identification skills to PPQ port identifiers, conducting research on quarantine significant fungi, and providing mycological expertise in the development of national phytosanitary policies. In recent work, she developed a technique to identify *Tilletia indica*, the fungus that causes Karnal bunt, from related species. As a result of her research, restrictions on the movement of wheat from the southeastern US were lifted, helping to solve a serious problem affecting US farmers and international trade. Mary has served both the American Phytopathological Society (APS) and the Mycological Society of America (MSA). For MSA she has held a number of positions, most notably, president from 1997-98. Mary is a scientist and leader of whom we can be very proud to call an alumnus of the Department of Plant Pathology.

M.F. KERNKAMP FELLOWSHIP

Ms Consuelo Estevez de Jensen

Consuelo Estevez de Jensen received her BS degree in agriculture engineering from the Central University of Ecuador and an MS in soil science from the University of Minnesota. After completing the MS, Consuelo returned to Ecuador where she conducted research in the Plant Pathology Department at the National Agricultural Research Institute, INIAP-Ecuador. She subsequently became head of the department, conducting research and training undergraduate students. She is currently pursuing a PhD with Drs Percich and Meronuck funded by the Bean/Cowpea Collaborative Support Program of USAID. Her thesis research focuses on the etiology and control of kidney bean root rot in Minnesota and relates to her research conducted in Ecuador. Consuelo has been very active in the Plant Pathology Department at Minnesota, contributing to field days, helping to organize the 1998 and 1999 plant pathology symposia and serving actively on departmental committees. Consuelo is a dedicated scholar with a high regard for professionalism. Her work will directly benefit her home country and be a credit to the University of Minnesota.

FRED I. FROSHEISER SCHOLARSHIP

Ms Rhoda L. Burrows

Rhoda Burrows received a BS in horticultural science from Montana State University and an MS in horticultural science from the University of Minnesota. She worked in a number of positions conducting research with horticultural and field crops. She started her PhD program with Dr Pflieger in 1996 to investigate host plant biodiversity to arbuscular-mycorrhizal fungal diversity and function. Already considered an expert in the area of mycorrhizal fungi, she has given guest lectures in several graduate courses and is a consultant in a mycorrhizae research project in the Department of Agronomy & Plant Genetics. Rhoda has served as the vice-chair and chair of the graduate students in plant pathology and was very active in the University Council of Graduate Students. In addition she has served on the Graduate School Academic Grievance Committee, Faculty Search Committee (turf grass), and Student Computer Room Committee. She is an outstanding graduate student with an admirable record of achievement and a promising professional career.

DISTINGUISHED SERVICE AWARD

Dr Richard J. Zeyen

Dr Richard Zeyen was awarded a special Distinguished Service Award from the Department of Plant Pathology. Although this is not a usual annual award, the department wanted to recognize and applaud his many years of service. Richard received his PhD in plant pathology from the department in 1970 under the direction of Dr Ernie Bantari. He was hired by the department in 1973 to conduct research and teaching and to operate the Minnesota Agricultural Experiment Station's Cooperative Electron Optics Facility. He is an outstanding teacher and for many years was the co-instructor for the core course PIPa 8002 and coordinated the core curriculum. He now teaches the popular course Physiological and Molecular Plant Pathology and has taught PIPa 8200 on Communication between Plants and Microbes and a number of undergraduate honors courses. His research focus is on the defense responses of plants to pathogens and engineering resistance. This research has resulted in over 60 refereed publications and has been well-funded by regional and national funding organizations. Over the years he has served on some of the most critical University and college committees and programs, most notably, he represented the department on the Borlaug Hall Building Committee. He has been an active member of departmental committees and the Faculty Council. Some of his most significant contributions include drafting the departmental constitution and establishing the department endowment funds. Probably his most far-reaching achievement



DEPARTMENT OF PLANT PATHOLOGY

Pictured (from left to right):

- First row: Melinda Dornbush, Julie Jenkins, Gilbert Ahlstrand, Lucy Wanschura, Francis Pflieger, Mary Palm, Delores Huebner, Consuelo Estevez de Jensen, Saruul Purev, Jeff Miller, Roger Jones and Gacheri Muriuki
- Second row: Chris Newby, Andrew Ryan, László Gyenis, James Groth, Deborah Samac, Ramya Mani, Silvia Peñuela, Linda Kinkel, Roxanne Denny, Kathryn Kromroy, Ann Marie Cooper, Grace Bucher, Karen Broz, Sandra Gould, Dawn Foster-Hartnett, Gretchen Nettleton, Richard Meronuck, Karen Ped, Dann Adair, Laurie Brand and Conrad Kent Evans
- Third row: Darryl Krueger, Tessa Goff, Claudia Castell, Silvia Pereyra, Yuhong Li, John Haight, Jennifer Flor, Chad Behrendt, Robert Blanchette, Ann Arendt, Jason Smith and Alan Dyer
- Fourth row: Donald McVey, William Bushnell, Todd Burnes, Warren Kruger, Kurt Leonard, James Percich, Nevin Young, David MacDonald, Alexi Balmuth, Stephen Vilaseca, Ben Held and Joel Jurgens

Not pictured:

- Academic Professional: Jason Brantner, Bruna Bucciarelli, Ganesh Dahal, Mesfin Tesfaye Gebeyaw, Dean Herzfeld, Charles Hu, Mark Hughes, Yan Huihuang, David Long, Joann Mudge, Miriam Newton and Weiping Xie
- AFSCME/Civil Service: Steven Cannon, Marcelo Leon Morelli Colomina, Debra Drange, Mervat El-Araby, Amar Elakkad, Brenda Fuchs, Mark Galatowitsch, Shawn Grivna, Leslie Johnson, Miguel Linares, Janeen Ness, Melissa Pauna, Karin Ped, Rodney Pettway, Tina Seeland, Jonathan Vandervelde, Mel Wiens and Ross Winberg
- Faculty: Neil Anderson, Ernest Bantari, Robert Brambl, Senyu Chen, Ruth Dill-Macky, Jennifer Juzwik, H. Corby Kistler, Thor Kommedahl, Sagar Krupa, James Kurle, Philip Larsen, Benham Lockhart, Chester Mirocha, Robert Nyvall, Jon Powell, Ward Stienstra, Les Szabo, Carol Windels and Richard Zeyen
- Federal Civil Service: David Casper, Jackie Morrison, Gerald Ochocki, Rosalind Richards
- Graduate Students: Charles Barnes, Shawn Bernick, Rhoda Burrows, Britt Johnson, Xiao Kun, Sharon Lewandowski, Jack Maake, Andrea Morse, Marc Neuman, Jon Reinders, Laura Wallach, Lisa Williams and Liying Zhang

Editor's note: The 1999 departmental photograph is the ninth annual group picture. Special thanks to our photographer, Gilbert Ahlstrand. This photo was taken after the annual departmental awards ceremony.

is the development, equipping and staffing of the MAES Electron Optics Facility for the past 28 years. This facility has impacted the research of almost every faculty member in the department and many other faculty on the St. Paul campus.

DISTINGUISHED TEACHING AWARD

Dr David H. MacDonald

Dr David MacDonald was awarded a special Distinguished Teaching Award from the Department of Plant Pathology. Again, although this is not a usual annual award, the department recognized and applauded the many years of dedicated teaching by Dr MacDonald. David has the highest teaching responsibility in the department. His courses include Plant Nematology, Field Plant Pathology, Diseases in Your Garden, and Diseases of Horticultural Crops - all very time consuming courses. Yet, he never hesitates to assist any instructor in the department when asked. He is a regular contributor to sections of Biology of Plant Diseases and Diseases of Field Crops, sections which are very popular with students. He has a commitment to help other teachers to ensure that the students enrolled receive the very best instruction possible. This past year he stepped in to teach most of Diseases of Field Crops during Dr Meronuck's illness. He is always striving to improve his teaching methods and is always looking for opportunities to expose students to learning experiences and challenges. He is more that willing to stay after class to answer questions and often stays past 10:00 PM when he is teaching an evening class. He has even been known to drive a student home at night after the student has missed the last bus.

CIVIL SERVICE AWARD OF EXCELLENCE

Ms Laurie A. Brand

Laurie Brand was awarded the Civil Service Award of Excellence (Office Staff) for her outstanding service to the department. In the area of accounting Laurie is efficient, knowledgeable, competent, always helpful, endlessly patient and invariably pleasant, even at the most stressful times. Her professionalism is a calming influence when stressful conditions exist, which can be often when budgets and time lines are concerned. She has come to play an indispensable role in the functioning of the department that is highly appreciated by the faculty and staff.

CIVIL SERVICE AWARD OF EXCELLENCE

Mr Todd A. Burnes

Todd Burnes was awarded the Civil Service Award of Excellence (Technical Staff) for his excellent research work and service to the department. Todd is a scientist with Dr Bob Blanchette in the area of forest tree pathology and wood degradation. He has authored or co-authored 17 scientific papers for professional journals and is a co-inventor on two recently granted patents. In addition to conducting his own research, he has always willingly helped graduate students and faculty carry out their work. This past year he was a great asset to everyone in the department in his role as safety officer. He has kept the department up-to-date on safety compliance issues, put together lab safety notebooks, led safety sessions and is responsible for safety training for new personnel in the department. Starting this fall, he will help to prepare materials for departmental teaching

laboratories, with the retirement of Grace Bucher. This award recognizes Todd's record of excellence and enthusiasm in his new duties.

DISTINGUISHED FRIENDS OF THE DEPARTMENT

Minnesota Barley Growers Association: Marvin Zutz
Minnesota Soybean Association: Jim Palmer
Minnesota Soybean Research & Promotion Council: Tom Walerak
Minnesota Wheat Council: Dave Torgerson

In appreciation for their untiring efforts and interaction with the Minnesota Legislature that resulted in increased support to the University of Minnesota and agricultural science programs.

Dean Flanders, Unix Systems Administrator, Electronic Commerce Group, Fingerhut Companies, Inc. For his friendly, professional, and enthusiastic support and assistance to graduate students and faculty in their computing needs. Dean has spent many hours of his free time developing and expanding our computer hardware and support systems. He has continued to be a valuable resource for the department, after leaving the University. A true friend indeed!

Sue Shepard, Director of Development, College of Agricultural, Food, and Environmental Sciences, University of Minnesota. For her untiring efforts and enthusiasm in fund raising for the Lieberman-Okinow Endowed Chair for Disease Resistance Breeding in Cereal Crops.

MENTOR OF THE YEAR

Ms Grace Bucher

Grace Bucher was recognized by the plant pathology graduate students for her dedication and enthusiasm for teaching. Grace has spent untold hours preparing material for lab classes and assisting students and professors in the labs. Grace interacts with all the students in the department and is known as a valuable resource for culturing and identifying pathogens. Her able advice has guided many a student through their graduate school careers and beyond.

DISTINGUISHED TEACHING AWARD

Dr Richard J. Zeyen

The graduate students also recognized Richard Zeyen as an outstanding and dedicated teacher. Dr Zeyen takes his teaching responsibilities very seriously and strives to find creative and effective teaching methods. The time and attention he takes in his teaching speaks volumes for his concern for the success of each of his students. The information and skills learned in his classes will benefit the students throughout their careers.

HONORS AND RECOGNITIONS

- Robert A. Blanchette**, Editorial Board, International Biodegradation and Biodeterioration Journal Councilor, Mycological Society of America, 1998-2000
- Senyu Chen**, Associate Editor, Journal of Nematology, 1998
- Mark E. Hughes**, USDA-ARS Certificate for Quality Performance, 1998
- Kurt J. Leonard**, USDA-ARS Certificate of Merit for Outstanding Performance, 1998
- Benham E.L. Lockhart**, Joint recipient, J. Merrill & Adeline Wallace Award, International Organization of Citrus Virologists for the outstanding research paper on virus diseases of citrus, 1998
- Benham E.L. Lockhart**, American Phytopathological Society International Service Award, 1998
- David L. Long**, USDA-ARS Certificate for Quality Performance, 1998
- Jacolyn A. Morrison** and daughter, Volunteer Family of the Year Award, City of Fridley, March 1999
- Robert F. Nyvall**, Minnesota Cultivated Wild Rice Council, Outstanding Service Award, 1998
- Gerald Ochocki**, USDA-ARS Certificate for Quality Performance, 1998
- Rosalind Richards**, USDA-ARS Certificate of Merit for Outstanding Performance, 1998
- Deborah A. Samac**, USDA-ARS Certificate of Merit for Outstanding Performance, 1998
- Deborah A. Samac**, USDA-ARS Certificate of Appreciation for Safety Service, 1998
- Carol E. Windels**, President, American Phytopathological Society, 1998
- 1999 Nominees to Sigma Xi, The Scientific Research Society**
Full Members: Rhoda L. Burrows, Jeffrey S. Miller
Associate Members: Charles W. Barnes, Jill M. Calabro, Consuelo Estevez de Jensen, Warren M. Kruger

Civil Service Length of Service Recognition
Roxanne L. Denny, 20 years

DR ROBERT A. BLANCHETTE APS FELLOW

by Neil A. Anderson

Department members and the *Aurora Sporealis* staff are pleased to announce that Professor Robert A. Blanchette was installed as a Fellow of the American Phytopathological Society at the 1999 annual meeting in Montréal, Canada. So that all of our old timers can appreciate and celebrate Bob's accomplishments and to honor Bob, we present this biographical sketch.

Dr Robert A. Blanchette was born July 30, 1951, in Lowell, Massachusetts. He received his BA degree in 1973 from Merrimack College, North Andover, Massachusetts in biology and botany. His MS degree in 1975 was in forest pathology from the University of New Hampshire and Dr Alex Shigo was his

advisor. He obtained the PhD in 1978 in plant pathology from Washington State University with Dr C. Gardner Shaw as advisor. Bob is married to Bonnie Lee nee Carignan, a gifted gardener, author and plant geneticist, and they have two sons now in high school. After a two year research and teaching postdoctoral, 1978-80, at Washington State University, Dr Blanchette became an assistant professor in the Department of Plant Pathology, at the University of Minnesota. Bob was promoted to associate professor in 1984 and professor in 1988.

Dr Blanchette has had a very productive career. His accomplishments include 13 patents, authorship on 123 refereed papers, 23 book chapters, 85 abstracts, and co-author of two books.

Dr Blanchette's personal research has focused on wood decay. He has been especially interested in the white rot decay fungi and their ability to degrade lignin. His 1991 *Annual Review of Phytopathology* paper, "Delignification by Wood Decay Fungi," summarized his research up to that point. He is a member of the Biopulping Research Consortium, a government-industry-academic effort to utilize white rot fungi and their enzymes to degrade lignin prior to the papermaking process. Related research has involved using fungi to eliminate or reduce resins from logs to be used for paper and to prevent blue stain fungi from colonizing sapwood of pulp logs by inoculating with colorless mutant strains. Most of Dr Blanchette's research on wood decay has been to understand the basic processes of decay by fungi. His knowledge of mycology and biochemistry along with his skills in transmission and scanning electron microscopy have greatly clarified the interactions of fungi with wood and the micromorphology of wood decay.

Dr Blanchette's research with his graduate students has covered a wide range of forest tree diseases. All of Bob's students speak highly of their adventure learning to do research under his tutelage and all have published their research results promptly.

Because of Dr Blanchette's reputation as the foremost researcher on wood decay, he is sought out for consultation and research on decay of archaeological wood. His travels in this regard have taken him to many museums in the United States and to Turkey, Egypt and Japan. He recently spent several weeks in Antarctica studying decay in wooden huts built by explorers at the turn of this century. He also is an ethnomycologist and has identified sacred objects made from fungi and used by Native Americans in the Pacific Northwest and Northern Plains. He currently has a research project in Viet Nam and Laos involving an endangered tree that when wounded and infected by a fungus produces resins that are used as incense by native peoples.

Dr Blanchette teaches a class on Forest Pathology annually and his student evaluations have been among the highest in the department. He enjoys teaching and has a gift for presenting information in a clear, accurate, manner. This past term with help from graduate student László Gyenis, he put his course on-line. He has also taught a graduate course on Defense Mechanisms in Woody Plants, and an evening course on Urban Tree Diseases for Practitioners.

Dr Blanchette is a member of nine professional societies and served as an associate editor of *Plant Disease* from 1985-88 and

was a member of the editorial boards of *Applied and Environmental Microbiology* (1987-92) and *International Biodeterioration and Biodegradation* (1996-99). He is a Fellow of the International Academy of Wood Science, elected in 1989, received the Distinguished Service Award from the American Society of Microbiology in 1996, and shared a group award for Research in Environmental Science with scientists at the USDA Forest Products Laboratory from the USDA in 1997.

At only the midpoint of his career, Dr Blanchette's contributions to plant pathology and the department are truly remarkable. The entire Minnesota family of plant pathology worldwide join in congratulating Bob on achieving this award and wish you continued success in your career and all that is best to you and your family in the days ahead.

RETIREMENTS

GRACE BUCHER

by Bruna Bucciarelli

Grace Bucher retired from the Plant Pathology Department on June 13, 1999, after 13 years of service. Grace first came to the department as a graduate student in 1986 under the direction of Dr David French. Her thesis evaluated various isolates of *Hypoxyton mammatum* on numerous genotypes of willow and aspen. She showed that willow trees might be a source of inoculum for hypoxylon canker of aspen because certain isolates are pathogenic to both genera. This was a significant contribution to the wood fiber industry because aspen is a common source of wood fiber in Minnesota and *H. mammatum* is the most important pathogen of aspen in this area. She completed her degree in 1989 and continued working with Dr French on various projects until his retirement in 1992. After a brief period working in the Dial U Clinic, Grace returned to the Plant Pathology Department in 1993 as the laboratory service coordinator. Her duties involved preparing materials for numerous introductory and advanced plant pathology laboratory courses. She also co-facilitated the labs to these courses.



Staff and faculty who worked most closely with Grace honored her at her retirement party. Left to right: Todd Burns, Jim Groth, Jim Percich, Grace Bucher, David MacDonald, Fred Bucher and Bob Blanchette.

Grace not only took pride in her work but overall was dedicated to the field of plant pathology. She sincerely cared about the people she interacted with and her enthusiasm was contagious among the students she encountered. Graduate students often consulted with her and her advice was greatly respected. In 1998 the graduate students honored her with The Mentor of the Year Award in appreciation for the genuine personal interest she expressed towards them and for her untiring assistance. In 1997 she received the department's Civil Service Award of Excellence. Both awards are a tribute to her sincere commitment to service and her willingness to share her knowledge with others.

Grace is currently leading an active life at home with periodic trips with her husband to their lake home in Wisconsin. She is also planning various overseas trips to visit relatives and friends. We all wish her the best as she enters this new phase in her life. And thank her for such dedicated service to the department and to the field of plant pathology. Her presence and her many contributions will be missed.

NORTH CENTRAL RESEARCH AND OUTREACH CENTER

by Robert F. Nyvall

Dr Robert Nyvall is the principal investigator aided by Laura Carey, senior laboratory technician. Research is also conducted in cooperation with Dr Paul Bloom and several wild rice growers. Research activities continue to center around diseases of cultivated wild rice and, to a lesser extent, development of mycoherbicides. Determination of the etiology of fungal brown spot, caused by *Bipolaris oryzae*, and spot blotch, caused by *B. sorokiniana*, consume most of the time but other diseases such as scab (*Fusarium* spp.) and stem rot (*Nakatea sigmoidea*) also receive attention. Fungal brown spot is a disease that continues to cause extensive damage to cultivated wild rice fields but its impact is lessening due to the determination of overwintering sites and movement of primary inoculum. It has been determined that residue appears to be the major means of overwintering. Additionally, it has been found that plants do not become susceptible until they are in the reproductive phase. These findings have allowed growers to avoid less serious disease injury.

Work on mycoherbicides had focused on purple loosestrife. The emphasis on mycoherbicides has now changed to work on water plantain, a serious weed problem in many rice fields. Research is currently underway exploring the feasibility of utilizing the fungus *Rhynchosporium alismatis*, a common fungus on water plantain, as a potential biological control agent. Much of this work is in cooperation with Dr Ric Cother of the New South Wales Department of Agriculture.

Besides research, investigators are involved in several outreach activities including wild rice field day and horticulture day where presentations are made and disease questions answered on a variety of plants. Additional activities have included horticultural garden visits throughout the summer, primarily



with Master Gardeners and garden clubs. Numerous walk-ins of people with disease problems on a variety of plants occurs on a daily basis besides phone calls from people seeking information on plant disease problems. A newsletter on disease updates is distributed to interested wild rice growers.

Other activities the past year have included visitors from Australia. Dr Ric Cother spent two weeks at the station and investigated several wild rice fields for the presence of water plantain.

NORTHWEST RESEARCH AND OUTREACH CENTER

by Carol E. Windels

Recently, the Northwest Experiment Station (NWES) was renamed the Northwest Research and Outreach Center (NWROC) to more accurately reflect its activities. The other University of Minnesota stations at Grand Rapids, Lamberton, Morris, Rosemount, and Waseca also were renamed research and outreach centers. Change, however, is not without consequences - locals used to refer to the NWES as the Crookston Experiment Station, but now refer to it affectionately as a CROC (Crookston Research and Outreach Center)!

This summer, the plant pathology project completed establishing an *Aphanomyces* disease nursery (*A. cochliformis* is widespread in sugar beet fields in the immediate area). It is located on an isolated crop production range on the station and measures 500 feet long and nearly 135 feet wide. Plot equipment has been dedicated for exclusive use in the nursery and an equipment cleaning pad also has been installed.

Several visitors were hosted this summer. Dr Mitch McGrath, Sugar Beet Research Geneticist, USDA-ARS, Michigan State University, East Lansing, met to discuss breeding sugar beet for resistance to *Rhizoctonia* root and crown rot and *Aphanomyces* diseases. Dr Julian Ward, plant pathologist with KwaZulu-Natal Department of Agriculture in South Africa visited for a couple of days to learn about the development, application, and nuances of the *Cercospora* leaf spot prediction model on sugar beet. He will be developing a prediction model for gray leaf spot (caused by *Cercospora zeae-maydis*) on corn, a devastating disease in South Africa. Dr Hans Schneider from the Institute of Sugar Beet Research in The Netherlands also visited for a couple of

days to learn about the plant pathology research program. Discussions centered on *Rhizoctonia* root and crown rot of sugar beet, which is a major disease in his country and the primary focus of his research.

This summer marked the seventh consecutive year of unseasonably high precipitation in the region. At Crookston, 18.3 inches of rainfall occurred from May through August compared to a 109-year average of 12.1 inches for the same months. Excessive moisture has resulted in adverse conditions for planting, growing, and harvesting of crops, especially in certain regions of northwest Minnesota. For instance, 60% of 350,000 acres of agricultural land in Roseau County (next to the Canadian border) either was not planted because of flooding or crops will not be harvested because of severe water damage.

Diseases have been common on crops grown in the region, although the overall prevalence and severity of *Fusarium* head blight (FHB) on wheat and barley was mild. This was welcome news after six consecutive years of FHB (1993-98), which frequently resulted in greatly reduced yields, quality, and production of the mycotoxin deoxynivalenol. Leaf diseases, however, have increased with the introduction of wheat and barley varieties that are less susceptible to FHB.

Excessive rainfall, plant diseases, poor crop yields and reduced quality - in combination with a number of other factors that contribute to low commodity prices (government policy, less export demands, stiffer global competition, surplus production of certain commodities worldwide) - are escalating the farm crises, especially in northwest Minnesota and northeast North Dakota. Some producers are retiring early. Some are quitting. Others are reducing the number of acres farmed, or are renting out their land, and seeking full-time employment. Farm auctions are becoming increasingly common in the region. In the spring of 1998, farm auctions increased by over 50% compared to 1997. As of July of this year, auctioneers reported an increase of 20% compared to 1998. Minnesota lost 1,000 farms in 1998 and many were in northwest Minnesota. Earlier this year, the Minnesota Farm Service Agency estimated that delinquent loans would number 1,115 and potential farms quitting would number 970 statewide, again with the majority in northwest Minnesota. Those remaining in farming are approaching it in new ways. They are expanding their operations by purchasing or renting more land and some are contracting with large agricultural companies. Others are pursuing organic farming or producing specialty crops. Farmer-owned cooperatives that provide marketing outlets for crops also are developing. These changes in Minnesota agriculture also are changing the research, extension, and teaching activities of the University.

SOUTHERN RESEARCH AND OUTREACH CENTER

by Senyu Chen

The nematology program at the Southern Research and Outreach Center, formerly Southern Experiment Station, continued to focus on the soybean cyst nematode population biology and management. Field experiments have been expanded in 1999 in

various areas including biological control of the nematode with fungal parasites, use of crops to reduce nematode population density and interaction of soybean root rot with the cyst nematode. Our research involved collaborations with faculty at the Southwest Research and Outreach Center, Departments of Agronomy & Plant Genetics, and Plant Pathology in the University of Minnesota, and scientists in other universities in the North Central Region and Canada.

Dr Xingzhong Liu accomplished two years of his research program as a postdoctoral research associate. His research focused on biological control of the soybean cyst nematode with fungal parasites of the nematode. Xingzhong tested fungi in laboratory, greenhouse, and fields for their biological control potential and the results are promising. He returned to China on September 17, 1999, and resumed a position in the Biological Control Institute, Chinese Academy of Agricultural Sciences, in Beijing. Yuhong Li started her PhD program in September 1998. She will work on resistance in soybean to the soybean cyst nematode in Dr Nevin Young's laboratory on the St. Paul campus and Dr Senyu Chen's laboratory at the Southern Research and Outreach Center in Waseca.

We continued our outreach activities through field days, winter crop days, county field tours, various growers meetings, extension education meetings, and various extension publications. A workshop was hosted on April 6, 1999, at the center to provide training on soybean cyst nematode soil sampling and nematode extraction methodology to agricultural professional personnel from private companies in Iowa and Minnesota. Dr Patricia Donald from the University of Missouri was invited to present the results of the North Central Soybean Cyst Nematode Research Project at the summer field day at the center on June 22. During her stay at Waseca, she visited the nematology laboratory and field plots at the center.

Since installation of the elutriator, about 4,500 soil samples from farmers in Minnesota, Iowa, and North Dakota have been processed in the nematology laboratory at the center. The soybean cyst nematode has been detected in an additional seven counties in 1998 and 1999 with a total of 46 counties confirmed for infestation of the nematode. The nematode has been observed in the Red River Valley in Grant and Stevens Counties, indicating its continuous spread in northern Minnesota.

USDA-ARS CEREAL DISEASE LABORATORY

by Kurt J. Leonard

With the expansion of the Cereal Disease Laboratory's mission to include research on *Fusarium* head blight, Bill Bushnell redirected his program to include approximately 50% time on infection processes in barley by *Fusarium graminearum*. Bill also shifted to a ¾ time appointment in 1999.

Scientists at the Cereal Disease Lab made several international trips during the past year. Bill Bushnell was the keynote speaker at the First International Conference on Powdery Mildews at Avignon, France. Les Szabo attended the International Congress

on Plant-Microbe Interactions in Amsterdam. Kurt Leonard visited the Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, and presented an invited paper at the Brazilian Oat Conference. Don McVey and Dave Long traveled to Egypt to collect wheat leaf rust samples and plan cooperative research with Dr M. Nazim at Minufiya University, Shibin el-Kom. Dave went on from Cairo to Tel Aviv, Israel, to meet with scientists at the Institute for Cereal Crops Improvement, and he attended the Aaronsohn Lectures on Wild Emmer Wheat, an 80 Years Memorial Symposium at Zikhron Ya'akov.

The Cereal Disease Lab added several new employees in the past year. Dr H. Corby Kistler was appointed to the new fungal genetics position for research on *Fusarium* head blight of wheat and barley in June 1999. In his move to the University of Minnesota from the Plant Pathology Department at the University of Florida, Corby brought along a postdoctoral research associate, Dr U. Liane Rosewich, and a research technician, Rodney Pettway, to work with him in his new lab. Alexi Balmuth, a geneticist, was hired in December 1998, to work with Les Szabo on molecular genetics of cereal rust fungi. Alexi came to the Cereal Disease Lab from a research position at Monsanto in St. Louis. Sharon Lewandowski and Tina Seeland, joined Bill Bushnell's group as junior scientists working on host response genes and cytology of infection by *Fusarium graminearum* in barley. Lucy Wanschura, research technician, transferred to the Cereal Disease Lab from the USDA-ARS Plant Science Research Unit at the University of Minnesota to work with Don McVey on resistance to stem rust and leaf rust in wheat.

In September 1999, Dave Casper retired from the USDA-ARS after more than 30 years as a research technician with Alan Roelfs and later with Don McVey. Tessa Goff, who worked in Bill Bushnell's lab resigned in June to begin graduate school in the Environmental Science and Management Program at the University of California, Santa Barbara. Eric Swann, a postdoctoral research associate with Les Szabo, completed his appointment at the end of August. Also in August, Eric Smith, who began working at the Cereal Disease Lab as a high school student in the summer of 1994, moved to Madison, Wisconsin, where he will continue to do part-time computer work for the Cereal Disease Lab while he completes his BS in Management Information Systems at the University of Wisconsin.

Among the visitors to the Cereal Disease Lab during the past year were C. Lee Campbell and Paul Peterson of the Department of Plant Pathology, North Carolina State University, who worked with CDL scientists in studies of Minnesota sites in which common barberry survived the barberry eradication program. Paul will continue this effort with CDL support after Lee Campbell's untimely death this year.

Stephen Poe, USDA-APHIS, Riverdale, Maryland, invited three Canadian officials, Marc Faille, Ian MacLachy, and Maria-Claude Forest, of the Canadian Food Inspection Agency, Nepean, Ontario, to meet with Dave Long, Alan Roelfs, and Kurt Leonard at the Cereal Disease Lab in May. The purpose of the meeting was to review procedures used in testing barberry cultivars for resistance to *Puccinia graminis* and to set up a pilot program for approving US barberry cultivars for sale in Canada based on recent test results from the Cereal Disease Lab.

Other international visitors to the Cereal Disease Lab in the past year included: Yehoshua Anikster, Institute for Cereal Crops Improvement, Tel Aviv University; Zahir Eyal, Institute for Cereal Crops Improvement, Tel Aviv University; Brahim Ezzarihi, Institute Agronomique et Veterinaire, Hassan II, Rabat, Morocco; Akos Mesterhazy, Cereal Research Institute, Szeged, Hungary; M. Nazim, Minufiya University, Shibin El-Kom., Egypt; Hisham Nagaty, Minufiya University, Shibin El-Kom., Egypt; Robert Park, Plant Breeding Institute, Cobbitty, University of Sydney, Australia; Janice Pittis, AgrEvo UK, Chesterford Park, UK; Monica Rebuffo, INIA, LaEstanzuela, Colonia, Uruguay; Roberto Tuberosa, Dipartimento di Agronomia, Universita di Bologna, Italy; and Ramon Warzecha, Plant Breeding and Acclimatization Inst., Radzikow, Poland.

USDA and US university visitors included: Floyd Horn, USDA-ARS Administrator, Washington, DC; Chuck Murphy, USDA-ARS National Program Staff, Beltsville, MD; Adriana Hewings, USDA-ARS Midwest Area Director, Peoria, Illinois; Ann Blechl, USDA-ARS Western Regional Research Center, Albany, California; James Kolmer, USDA-ARS, North Carolina State University; Robert Bowden, Plant Pathology Department, Kansas State University; Leonard Francl, Plant Pathology Department, North Dakota State University; Brian Steffenson, Plant Pathology Department, North Dakota State University; Yue Jin, Plant Science Department, South Dakota State University; Ken Johnson, Department of Botany and Plant Pathology, Oregon State University; Jan Leach, Plant Pathology Department, Kansas State University; Tim Murray, Plant Pathology Department, Washington State University.

MINNESOTA HEALTH ENVIRONMENTAL AND PESTICIDE SAFETY PROGRAM (MN-HELPS) PESTICIDE APPLICATOR TRAINING (PAT)

by Dean E. Herzfeld

Pesticide Applicator Training manual production remains a high priority for MN-HELPS/PAT. In the past five years we have upgraded 11 of the 19 separate PAT training manuals and are at work on rewriting Mosquito/Black Fly, Journeyman Structural Pest Control, and have a US-EPA/USDA grant to produce a national PAT manual for pressure-treated wood. This fall we are starting on a new Rights-Of-Way (pest management in vegetation along roads, railroads, pipeline, and utility lines) and a Field Crop/Fruits/Vegetable PAT manuals through a joint venture with Iowa State University. The Corporate Local Recertification program has had a successful second year. This nationally unique program utilizes specially trained Master Gardeners to provide prepared PAT recertification training modules in a small group cooperative learning format with instructional design for many learning styles. Corporate L-PAT are highly focused on customer service and are provided on-site at nursery, greenhouse, interiorscape, or commercial lawn and landscape care businesses locations.

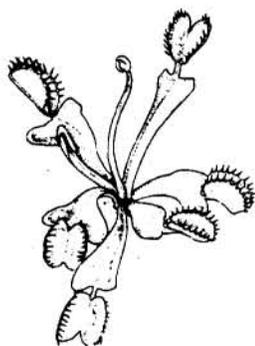
PLANT PATHOLOGY 5204 FIELD PLANT PATHOLOGY SUMMER 1999

by David H. MacDonald

Seven students, all from plant pathology, participated in the department's summer field pathology course. We had 10 field trips that began with an introduction to plant disease management and control as practiced by the rose and specialty cuts growers in the greenhouses of Len Busch Roses of Plymouth, Minnesota. Our next trip was to the St. Paul and Rosemount Experiment Stations where Ruth Dill-Macky, Gerald Ochocki and Dave Long told us about their work with Fusarium head blight and loose smuts of cereals, the buckthorn-crown rust of oat nursery, and rusts and diseases of wheat, respectively. Our next trip introduced us to two quite different approaches to plant disease management. We started out at Keller Golf Course with a session with Paul Diegnau, its very successful superintendent. The course, which had severe turf quality problems in the past, provided all of us with an excellent opportunity for learning how the superintendent has employed a holistic approach for growing plants that has made that golf course one of the local success stories and showplaces. We then traveled a short distance northeast to Red Cardinal Farm, an organic vegetable farm, where Everett Meyers introduced us to the principles that he believes are most important for disease management in a situation where only a few inorganic pesticides may be applied. Our fourth session tapped the talents, knowledge and experiences of Jim Kurle, the department's soybean pathologist. We managed to avoid getting stuck in muddy situations around Rosemount as we learned about white mold, brown stem rot, seedling diseases - root rots, and the soybean cyst nematode. The fifth tour was led by Julie Jenkins who took the group to the Minnesota Landscape Arboretum. Jody Fetzer, the IPM specialist there, provided her usual fine "show and tell" that was augmented with challenges that she gave the students to come up within the field and in her lab diagnoses. Todd Burnes, the department's new laboratory teaching coordinator, "drove the bus" and supported Mark Stennes, a consulting arborist and graduate of the department, who took charge of our next field trip by providing a demonstration (with aerial pruning acrobatics) of chemotherapy treatment of a Dutch elm disease-infected American elm on the state fairgrounds. Mark also made sure that the students could recognize the symptoms of oak wilt, that they were aware that infected bur and white oaks could be treated, that they understood something of the etiology of the disease and that the class was exposed to his convincing theories about plant health. Our seventh trip for 1999 was also a new one for the class since we were led by Jeff Miller, the department's relatively new potato pathologist, who was in the midst of his first research season in Minnesota. Jeff laid the groundwork in a session at his plots at the Sand Plain Research Farm at Becker for the important potato problems. His efforts prepared us to appreciate the potato information and concerns that were shared later that afternoon by both Rick Gilbertson, a professional crop consultant, and John Wojtanowicz, the owner of Prairie Potato Farms of Rice, Minnesota.

Our next field trip was our "big one" to Wisconsin. We left early

on a Thursday morning and returned after dark on the following Saturday evening. Although the University of Wisconsin's Al Elingboe had led his summer class on its northern Wisconsin trip several weeks earlier when we could not participate, UW faculty members from the Horticulture Department went way out of their way to "say it again" as they helped provide us with an excellent educational experience. We started our sessions near Wisconsin Rapids at one of the cranberry marshes operated by Northland Cranberries. Jonathan Smith led the field session and followed that with a session at the company's receiving-processing facility in Wisconsin Rapids. We then traveled to the ginseng research gardens in Marathon County near Wausau. Mike Drilias did an excellent job of introducing us to his program and the characteristics of a very effective research-extension effort. We spent the night at Kemp Natural Resources Station where the swimming and especially the "rowboating" provided a very welcome change of pace. The following day we had a very informative session at the Lelah Starks Elite Foundation Potato Farm with Bob Coltman. We continued with another very unusual on-time arrival. This time it was at the Peninsular station in Door County where Dick Weidman introduced us to both the plant pathological as well as other aspects of his station's programs. We still had time on Friday evening to do a little sightseeing and take in a "fish boil" at Bailey's Harbor. Our outstanding educational good fortune continued on Saturday morning when Dick Weidman came back out (on his bright red motorcycle), to lead "the charge" up the peninsula to a cherry processing plant where we learned from its owner about its operation and the business of producing tart cherries under Wisconsin's economic and environmental conditions. We then crossed back to the Lake Michigan side of the peninsula where the students "botanized" as they hiked the trails at the Ridges Sanctuary.



The following week we traveled to Bailey Nurseries at Newport where we were introduced to the plant disease problems that were associated with the cold storage of bare root plants, the challenges of bringing in plants produced under the greatly different climatic conditions of Oregon, the root rot and other disease problems that can develop as cuttings are rooted in ground beds in greenhouses, and a little bit about the diseases that occur in the "traditional" nursery setting. The most impressive and "instructionally-valuable" diseases of our afternoon at Bailey's dealt with container-grown stock and its great potential for plant disease problems. Our last trip was another "overnighter" that started in wild rice paddies near Aitkin. Jim Percich had been the "presenter" by means of slides

that he showed earlier in the summer and through his wild rice case studies that he used in his Biology of Plant Disease course during the previous fall quarter. Because the wet weather of August delayed the harvest, we were able to see symptoms on standing plants. The grower who hosted our visit "sent mixed signals" that left us uncertain as to whether paddy production of wild rice is an art or a science or what. And then the fun really began. As we traveled east toward Cloquet on TH210, which has very narrow shoulders, we had the first flat tire (a blowout no less) that has been experienced by any PIPa 5204 class. When we looked more closely at the remaining 4 tires we discovered that 2 of them did not look very safe. We were blessed to discover an unexpectedly proficient tire-changing crew among the student pathologists. But we persevered and continued on (more slowly you may be sure than before the blowout) to Spirit Lake where Jason Smith introduced us to the beauty and biology of dwarf mistletoe infestation, the nearby growth of sphagnum moss that is slowly but surely covering over Spirit Lake, and THE WETNESS OF A BLACK SPRUCE BOG. Jason continued as our teacher at the Cloquet Forestry Station where we were introduced to several other diseases including white pine blister rust, Nectria canker, and Armillaria root rot. We climbed the somewhat rickety fire tower and learned how such structures have been used for fire control. We made "S'mores" and then had a course review as we waited for it to get dark enough so that we could determine if what is said about the mycelial fans of *A. mellea* was really true. And it is!! Our course concluded the next morning when Jenny Juzwik led a very informative session at the General Andrews Forest Nursery near Willow River. In summary: our class benefitted by being able to learn from and interact with at least 12 University or USDA employees, 6 professionals employed in commercial enterprises, and 6 owners and/or growers. We gratefully acknowledge their efforts and contributions!

DEPARTMENTAL SEMINARS 1998-99

- October 5. **Dr Mesfin Tesfaye**, Visiting Scientist, University of British Columbia. *Rhizobium* x *Trifolium* Interactions: Characterization and Symbiotic Effectiveness.
- October 19. **Ms. Julie Jenkins**, Graduate Student. Epidemiology of Fusarium Head Blight.
- October 26. **Dr David Ragsdale**, Professor, Department of Entomology. Interactions of Late-Blight Fungicides with Entamopathogenic Fungi.
- November 2. **Dr Don Wyse**, Professor, Department of Agronomy & Plant Genetics, and Director, Minnesota Institute for Sustainable Agriculture. Opportunities for Integrating Sustainable Agriculture and Biotechnology.
- November 23. **Mr Charles Barnes**, Graduate Student. Genomic Clustering of Plant Disease Resistance Genes.

November 30. **Mr Carmen Fernholz**, Minnesota farmer, member of the MISA Board, and former member of the COAFES Endowed Chair in Agricultural Systems. Sustainable Agriculture in Practice.

January 11. **Ms Kun Xiao**, Graduate Student. Use of *Trichoderma harzianum* for the Biological Control of *Pythium ultimum*.

February 1. **Ms Silvia Pereyra**, Graduate Student. Current Status of Crop Loss Assessment.

February 8. **Ms Gacheri Muriuki**, Graduate Student. Development of Mycoherbicides.

February 15. **Ms Rhoda Burrows**, Graduate Student. Using Crop Residues as Organic Fungicides.

February 22. **Ms Consuelo Estevez de Jensen**, Graduate Student. Methyl Bromide: Alternatives for the 21st Century.

February 25. **Dr Jan Leach**, Visiting Scientist, Kansas State University. Lessons in Self-defense: How Rice Defends Itself from Pathogens.

March 1. **Mr László Gyenis**, Graduate Student, Diseases and Control Strategies Important for Expanding Hybrid Poplar Plantations.

March 8. **Dr Caitilynn Allen**, Visiting Scientist, University of Wisconsin. Dissecting Virulence in the Bacterial Wilt Pathogen, *Ralstonia solanacearum*.

**MEETINGS:
LOCAL & INTERNATIONAL
SYMPOSIUM:
THE IMPACT OF RESEARCH ON
INTERNATIONAL AGRICULTURE**

by Alan T. Dyer

"What a day! Wonderful symposium! Graduate students of plant pathology, U of M did a wonderful job! Congratulations!"

Dr Sung Soo Kim
Visiting Professor of Agricultural Education
Seoul National University

Judging from comments given by a diverse audience, the 1999 Graduate Student Symposium entitled "Impacts of Research on International Agriculture" was a great success. Introduced by Dr Steven Clarke, Director of International Agricultural Programs, the symposium consisted of ten internationally recognized speakers discussing four main topics: Benefits of International Collaborations; International Agricultural Programs at the University of Minnesota; Resources Available for International Agriculture; and The Future of International Agriculture. Three of the speakers were brought in special for the symposium.

These were: Dr Greg Forbes, Senior Scientist for the International Potato Program (Ecuador); Dr Malcom Iles, Executive Secretary of IPM Europe (United Kingdom); and Dr Emmy Simmons, Foreign Affairs Officer for USAID (Washington, DC).

Program

Benefits of International Collaboration

Motivations, Purposes and Benefits of International Agriculture
Dr Benjamin Senauer, Professor of Agricultural Economics

Support for Integrated Pest Management (IPM) as a component of Sustainable Agriculture

Dr Malcom Iles, Economist and Executive Secretary,
IPM Europe

International Programs at the University of Minnesota

The Bean/Cowpea CRSP (Collaborative Research Support Program) in Ecuador

Dr Peter Graham, Professor of Soil Sciences
Consuelo Estevez de Jensen, Principle Investigator
(Host Country)

International Collaboration in Plant Disease Diagnosis: a Two-way Street

Dr Benham Lockhart, Professor of Plant Pathology

The Uruguay- University of Minnesota Project

Dr Deon Stuthman, Professor of Agronomy

Resources Available for International Agriculture

The Role of USAID and the Resources for International Agriculture

Dr Emmy Simmons, Foreign Affairs Officer for
US-AID

Tapping the Funding Networks

Dr John Vreyens, Training Coordinator for International
Agricultural Programs (University of Minnesota)

Future of International Agriculture

Managing Late Blight of in the Next Century

Dr Greg Forbes, Senior Scientist for International
Potato Program (Ecuador)

The Transition to Agricultural Sustainability: Is There Time?

Dr Vernon W. Ruttan, Regents Professor of Economics
and Agricultural Economics

Countless hours were required to pull off the symposium as at least 24 volunteers from our department pulled together to execute the program. Activities included raising over \$5000 for expenses, providing snacks and beverages for the two breaks and one social, setting up the rooms and audiovisual equipment, making travel arrangements for three guest speakers and so much more. (For future reference, a book was written detailing the activities involved in setting up the symposium). Every speaker and volunteer deserves praise for this year's symposium.

1998-99 Student Symposium Committee: Alan Dyer, Consuelo Estevez de Jensen, Gacheri Muriuki, and Silvia Pereyra.

**AMERICAN PHYTOPATHOLOGICAL
SOCIETY ANNUAL MEETING
AUGUST 7-11, 1999
MONTRÉAL, QUÉBEC**

by Ruth Dill-Macky

The 1999 meeting of the American Phytopathological Society was held jointly with the Canadian Phytopathological Society in the Palais des Congrès de Montréal. Thirty-two members of the department attended, 18 faculty, 6 academic professionals, and 8 students. Members of the department were involved in presenting oral presentations and poster papers. Dr Carol Windels, president of APS for 1999, gave an address titled "Fusarium Head Blight: Changing Farms and Communities in the Northern Great Plains" along with her opening remarks in the plenary session. Her address was a moving reminder of the devastating economic and social impact of plant disease. Dr Robert Blanchette was honored as a Fellow of the American Phytopathological Society, a reflection of the high esteem that his contribution to forest mycology and forest product pathology is held by his colleagues. Drs Nevin Young and Dariush Danesh presented an all-day short course prior to the meeting on "An Introduction to Molecular and Genomic Techniques." Warren Kruger a graduate student from the University of Minnesota represented the North Central Division of APS in the de Bary Bowl. Dr Kurt Leonard presented a paper "Selection in Relation to Virulence Polymorphisms in Cereal Rusts" in a symposium on the selection processes in plant pathogen populations and Dr Richard Zeyen presented a paper "Chemical Elements in Epidermal Cell Defense of Cereals Against *Blumeria graminis*" in a symposium "Plant Cell Biology Related to Defense Response Pathways." László Gyenis, a graduate student advised by Dr Neil Anderson, presented a paper on the biological control of Septoria leaf spot and canker of hybrid poplar under field conditions. Dr Jennifer Juzwik, presented a paper "Nitidulid Species Associated with Fresh Wounds on Red Oaks During Spring in Minnesota." Dr Juzwik presided over the session on forest pathology in which her paper and that of László Gyenis was presented. Dr Nevin Young discussed microsatellite-based screening for soybean cyst nematode resistance in a symposium on the use of molecular markers in breeding for resistance. Consuelo Estevez de Jensen presented a paper "Biocontrol of Kidney Bean Root Rot in Minnesota" coauthored by her advisors Dr Richard Meronuck and Dr Jim Percich. Faculty, students, old timers and guests attended the hospitality party jointly sponsored by the University of Minnesota and University of Wisconsin on Monday, August 9.

APS TRAVEL AWARD ESTABLISHED

In memory of Janell Stevens-Johnk (PhD 1993), colleagues and friends have established a named travel award with the American Phytopathological Society. Janell was an assistant professor and extension specialist at the Texas A&M Research and Extension Center at Dallas, Texas. She died in a automobile accident in 1998 en route to a field day. Those interested in donating to the fund may send contributions to: APS Foundation, 3340 Pilot Knob Road, St. Paul, MN 55121-2097. Checks should be made out to the APS Foundation and sent with

a note indicating that they are for the Dr Janell Stevens-Johnk Travel Fund. As of June 30, 1999, approximately \$1,150 of the \$2,500 needed to make the first award from this fund had been collected.

GREENHOUSE ACTIVITIES

by Dann K. Adair

In November of 1993, I provided a report to the then College of Agricultural, Food, and Environmental Sciences (COAFES) Associate Dean Mike Martin recommending that much greater attention be given to two aspects of the St. Paul greenhouses: 1) the need to significantly renovate the facilities, and 2) that management could be enhanced by centrally providing access and service. This report, along with other efforts such as the suggestion by Facilities Management to condemn our oldest greenhouses, put a greater emphasis on this aspect of the University. Consequently, the greenhouses at the St. Paul campus have been managed by a multi-departmental team since January 1998 and the University is poised to request \$18 million from the year 2000 state legislature to renovate and replace some of our facilities.

Centralized management was implemented before major renovations begin so that users and staff can more easily transition to the improved facilities. Competition for space and services will surely be strained during construction. Management is now conducted as a team effort, except for one full-time employee and several student employees who maintain a "home" department yet contribute to the whole by providing service in individual areas of specialty. Space is assigned on an as needed basis though most historical use patterns continue. Service charges are assessed to research projects as a function of bench area used. The research projects in turn put these charges against the grants they receive. Expenses for supplies, repairs, small equipment, and some labor are then handled by a single account.

The greenhouse staff is overseen by a committee of faculty from each of the departments that regularly use the greenhouse. To date, the new system has been well received, greenhouse use is much higher than ever, and communication between researchers and staff is enhanced. This is not to dismiss the problems that occur in providing service, assigning space, or in asking long-time users to adapt to a new way of operating. Yet complaints have been minimal and several users have expressed unsolicited praise for the operations.

The greenhouse renovation and replacement project formally began in 1996 with a pre-design study that identified needs through extensive polling of faculty and staff. This study was completed in January 1998 and has been the basis of the current design effort. As the pre-design was verified this year, some departments realized that their needs for teaching facilities attached to the greenhouses were of much greater importance than was understood in 1996. Therefore the current design reflects this need with a proposed classroom section in the headhouse in addition to the needs of the greenhouses previously outlined.

Renovation and replacement activity consists of five major elements: 1) replacement of the circa 1920 Northwest Greenhouse with institutional quality research greenhouses, 2) replacement of existing greenhouses whose renovation costs would match the cost of replacement, 3) renovation of existing greenhouses to address current state laws regulating pesticides and fertilizers, 4) construction of a quarantine greenhouse for exotic insect containment that will be shared with the Minnesota Department of Agriculture/Biological Control Program, and 5) construction of new teaching classrooms in the headhouse. All of these items can be completed under the proposed \$18 million request. The new greenhouses will routinely serve not only COAFES but the Colleges of Biological Sciences and Natural Resources as well. Any researcher, though, is welcome to request space.

In addition to this project, a large outreach and teaching greenhouse with accompanying collection rooms and additional classroom and meeting space is proposed at a cost of an additional \$4 million. Funding for this project is being sought from private sources in anticipation that a benefactor(s) could name this building. Upon completion of the total project, the University of Minnesota will have world-class greenhouse facilities for teaching, research, and outreach in the plant sciences - a great compliment to the world class researchers at the "U".

SOCIAL EVENTS

DR. CARL EIDE TURNS 95

by Robert A. Blanchette

On August 20, 1999, Dr Carl Edie turned 95 years old. A large group of well wishers packed a cake, flowers, cards, and gifts to celebrate Carl's birthday at Rosewood Estates, the retirement community where Carl and Johanna are living. Carl Eide praised and thanked all his friends for making his day special. Carl has very fond memories of his interactions with students and colleagues in the department and recently set up the Carl and Johanna Edie Endowment Fund for future graduate students in the department. Anyone wishing to write Carl can reach him at Rosewood Estates, 2750 Victoria Street, Roseville, MN 55113.



Debra Drange and Delores Huebner celebrate Carl Eide's 95th birthday with Johanna Eide and guests.

HALLOWEEN PARTY

by Debra B. Drange and Ann M. Arendt

The Departmental Social Committee had goodies available in the administrative office throughout the day on October 30th, in celebration of Halloween.



Groovy staff: Leslie Johnson, Ann Arendt, Debra Drange, Mikhail Vandenberg, Laurie Brand and Stephen Vilaseca.

The theme of the day: The 1960's. Remember hippies? Flower children? Lava lamps? Macramé? Bean Bag Chairs? VW buses? Woodstock? Communes? Love? Peace? Tie-dyed clothes? All those groovy, far-out things?

If you have ever made your own sandals, burned incense, started a petition, worn Birkenstocks, sang Bob Dylan's songs, been to San Francisco, worn love beads, worn flowers in your hair, are over the age of 40 and still have not cut your hair, wish your parents had named you "Windsong" or "Freedom". If the word "trip" does not make you think of a vacation....Then, yes, you may have a little bit of "hippie" in your blood.

Faculty, students and staff showed that they were "like cool, man" and joined the social committee in dressing up and having a groovy time throughout the day. Special thanks to Dean Herzfeld for the groovy '60s CD, Roxanne Denny for supplying the dry ice for the punch, Jim and Joanne Groth for the delicious kitty litter dessert (definitely the biggest hit of the party!) and Jennifer Nelson for sharing her lava lamp.

1998 INTERNATIONAL HOLIDAY CELEBRATION

by Debra B. Drange

The department held its International Holiday Celebration on Friday, December 18, in 491 Borlaug Hall. A buffet of delicious food from all over the world topped the tables at the party. The department spread its holiday cheer by collecting presents for Toys for Tots and food for the Merriam Park Food Shelf.

MID-WINTER PARTY HAWAIIAN POTLUCK

by Debra B. Drange

Departmental members and their families attended the Plant Pathology Hawaiian Potluck on Thursday, March 25 (Norm Borlaug's birthday). The majority of the participants were dressed in their favorite Hawaiian attire. Food and company was great. Ukulele music provided by Don Ho truly made the event festive.

Special thanks to Leslie Johnson for all of her unique decorations; i.e., hanging fish, parrots, pineapples, etc.. The decorations added a taste of Hawaii to Borlaug Hall.

Once again, Joanne and Jim Groth outdid themselves with a surprise hotdish (do you remember White Castle hamburgers?), yes that was the main ingredient. Super!!

1999 E.C. STAKMAN SOFTBALL GAME

by Ross M. Winberg

The annual E.C. Stakman softball game was a hard fought battle between the graduate students and the faculty and staff. Youth versus experience. The "youth" in the department were apparently hard at work in their labs at the time of the game given that it was necessary to bestow upon several academic staff members the title of "honorary graduate student" in order to even up the teams. The students dominated early in the game as the faculty spent a good deal of time in the field working on their interpersonal communication skills as countless errors allowed the students to run up the score. The faculty eventually got their act together and shut down the student heavy hitters Charlie "Slugger" Barnes and Yuhong "I've never played this game before" Li. The faculty were led by the "softball king", Jeff Miller, whose potato sack lifting workouts in the off-season paid off big time. In the end, the faculty pulled out a narrow one run victory over the students to retain the prestigious E.C. Stakman trophy.

VITAL STATISTICS

BIRTHS

June 18, 1999. Daniel Gyenis born to László Gyenis and Silvia Pefuela, 8.2 lbs, 20 inches long in at 9:57 PM at the United Hospital, St. Paul.

August 16, 1999. Dawn Foster-Hartnett and Tom Hartnett welcomed baby boy Nathaniel, 8 lbs, 6 oz.

MARRIAGES

Alan Dyer and Joan Schimmel were married on August 6, 1999. (Interesting sideline: Joan used to work at APS headquarters). Karen Broz and Jason Hilburn were wed on August 27, 1999. Karin Ped and Michael Larson were wed on September 11, 1999.

Britt Johnson married Doug Peyer on September 25, 1999.

DEATHS

March 25, 1998. Richard H. Shimabukuro, MS 1962, PhD 1964.

February 26, 1999. Dexter R. Douglas, PhD 1968.

July 22, 1999. Ayodhya P. Misra, PhD 1947.

July 29, 1999. Dr Zahir Eyal.

August 4, 1999. Orville Bielenberg.

OBITUARIES

ORVILLE M. BIELENBERG

by Roy D. Wilcoxson

Orville Bielenberg was a modest unassuming man who made significant contributions to plot research at the Rosemount Agricultural Experiment Station of the University of Minnesota. He was the man on the spot largely responsible for developing the research facilities at the plant pathology farm. This contribution along with application of efficient farming techniques to field research made it possible for expansion of plant disease research in the field during his period of service in the department.

He began work in the department in 1960 as plot coordinator for the department's Rosemount farm, shortly after Herb Sachs passed away. We thought Herb could hardly be replaced but Orville filled the requirements for the position with his pleasant personality and thorough knowledge of farming. He performed his duties until he retired in 1983.

Dr. Milton Kernkamp, head of the department, hired Orville. He was involved in obtaining the department's farm at Rosemount and was keenly interested in success of field operations of the department. He had known Orville as a successful farmer for many years and had confidence in his ability to work with a wide variety of people, including professors, graduate students, and laborers from the department as well as other departments. Many of these people knew little of Minnesota farming but all were interested in developing disease resistant crop varieties as well as other plant disease control measures requiring field experiments. Orville was their resource for farming as well as for well prepared and carefully maintained field research plots.

Shortly after Orville began his work, I was assigned as his principal contact within the department and to provide him with scientific advice when that was necessary for his work. Shortly after he started work he made several suggestions to facilitate plant disease research at Rosemount. After these suggestions were accepted by Dr. Kernkamp, Orville and I undertook the task of persuading people doing research at Rosemount that they were reasonable and would facilitate the research. Orville consistently and conscientiously applied these suggestions and created a plant disease research station that was perhaps without equal in the nation.

Orville's suggestions for managing field work at the plant

pathology farm are listed below.

- (1) Fields to be used for plot work were to be 10 acres in size, a policy established by Herb Sachs. Each year all plots were to be arranged in one 10 acre field, if possible.
- (2) The fields were to be uniformly managed with a rotation of crops to facilitate weed control and uniform fertility. Weeds were also to be controlled with herbicides when necessary. Fertilizers were to be used according to guidelines provided by soil testing.
- (3) Plots were to be planted and managed with a minimum of hand labor. Farm field equipment and special designed plot equipment were to be used as much as possible to reduce work loads.
- (4) Fields were to be used for plot work once every 5 years.
- (5) Fields not used for plot work were to be planted in a rotation of soybeans, alfalfa, corn, and wheat. Soybeans were to be used as frequently as possible because this crop yielded the highest income when sold. Alfalfa was to be planted the year prior to the field being used for plots and was to be plowed under as a green manure.
- (6) Income from sale of crops was to be used for improving operations at the Rosemount farm.
- (7) All equipment for spraying plots was to be cleaned, and excess spray chemicals disposed of, as a central facility designed to permit safe handling and storage of spray materials. This policy was to prevent contamination of fields with miscellaneous chemicals.

Orville managed the farm to make it a pleasant place to work or visit. He wanted visitors to be attracted to research on the farm rather than to an unsightly farm yard and unkempt roadways. He kept roadways planted with grass and mowed them on a regular schedule and kept them straight. Rows in plots were straight and spaces between plots were kept weed-free. Buildings were kept in good repair, concrete floors were provided in each building, and building contents were kept orderly. When visitors came to the General Farm they were often shown the plant pathology farm because of its neat appearance and orderly arrangement of experiments.

Being especially interested in plot experiments, Orville knew what was being attempted with each set of plots and often made constructive suggestions for efficient plot management. Despite his interest in the plots, he always was careful to follow the wishes of persons responsible for experiments being made. Persons hired to assist him were thoroughly indoctrinated by him concerning the importance of following instructions from persons doing the experiments.

The lack of irrigation facilities was a major deficiency at the plant pathology farm. This was corrected when funds became available for a deep well and pipe for taking water underground to sites near the major experiment fields. Orville designed the system, supervised its construction, and bought aluminum pipe to lead water from outlet sites to experimental plots. This

improvement permitted irrigation of plots during drought and facilitated inoculations and development of plant disease.

Buildings at the plant pathology farm consisted of a small office and a machine shed when Orville began. Under his supervision a bathroom was added to the office building, concrete floors were added to the machine shed and a second machine shed was constructed. He built the chemical building with its adjacent facilities so toxic chemicals could be safely handled and stored.

Orville pioneered in the department to obtain machinery for efficient work in plots. He built a cone planter for planting small grains in short rows or hills. He constructed spray rigs for accurate application of fungicides to plots where different fungicides were being compared. He also made spray rigs for applying inoculum under pressure to field plots. Orville bought the first plot combine for harvesting plots at the plant pathology farm.

Because operations at the plant pathology farm were efficient and because Orville became known as a knowledgeable and pleasant cooperator, requests came from people outside the department for some of their plots to be under Orville's supervision. As a result, cooperative studies with the Departments of Agronomy & Plant Genetics, Entomology, Forestry, and Horticulture became routine. Cooperation with entomology was extensive because this department did not have an experimental farm but had requirements for plots that were similar to those of plant pathology. Entomology supplied equipment for plot work in exchange for plots and general supervision of their operations at Rosemount.

Always interested in young people and especially in students, Orville used his position at Rosemount to befriend and assist them. He was especially interested in young men from European countries who were exchange students in Minnesota. He hired them to assist with experimental work and routine duties at the plant pathology farm. He took many of them home for meals and to sometimes stay overnight. He even visited them in their home countries on several occasions. Graduate students of the department always found him friendly, considerate and a source of ready information to solve problems with their plot experiments. He even helped several Boy Scouts raise fields of corn to satisfy requirements for their badges.

Orville loved social relations that came with supervising work at Rosemount. He especially liked the Corn Bust that was held each fall. This festival was started in fall of 1957 but participation was modest until Orville arrived on the scene. He expanded the Corn Bust into a fall picnic. It included pot luck items provided by different families, along with barbecued chicken, watermelon, soft drinks and corn supplied by Orville. He produced the sweet corn in several plantings with seed obtained from the Green Giant Company. Therefore, choice corn was fresh and at its peak of sweetness for the Corn Bust. Wagon rides were provided for family members who wished to be shown the farm to learn about work being done in the various experimental areas. He also encouraged people to come to the Corn Bust in early afternoon to play volleyball before feasting began. This annual Corn Bust became a feature on the department's calendar.

So we say thank you and bid a fond farewell to an old friend.
We wish him every good thing in the celestial realms.

The following is an excerpt from his memorial service program provided by Dr. Dave MacDonald:

Orville Bielenberg was born on December 16, 1917, to parents Herman and Mathilda. With his brother, Harold, and sister, Mildred, he grew up with all the chores and fun of country life: playing baseball, attending dances, getting up to milk the cows, and sleigh rides. He graduated from Harding High School in 1935. On June 10, 1944, he married Bernice, beginning a loving union of 55 years. They had two sons, Richard and Thomas.

Orville expressed his strong sense of community through his community service and volunteerism. Organizations to which he contributed his time and efforts included the Woodbury Community Club, Woodbury 4-H Club, the Washington County Soil Conservation District, and the Woodbury Heritage Society. He often said to his family that he believed in a community where neighbors helped neighbors. He was an active member of Salem Lutheran Church where he served in many positions on the church council most of his adult life. He was both president of the congregation and served on its building committee when the new church was built in 1989.

Orville was appointed to the Woodbury Town Board in 1960. In 1967, when Woodbury incorporated as a city, he became its first mayor, an office he held for 15 years. Orville's service to Woodbury spanned the 1960s, when he hosted town board meetings at his home with coffee and cookies served, to the 1980s with Woodbury's growth into a suburb. He was particularly proud of Woodbury's park system.

From 1960-83, he worked for the Plant Pathology Department at the University of Minnesota as a senior plot coordinator. In the summer, he tended the fields at the Rosemount Experiment Farm. The University work and friendships he made were very fulfilling to him and besides, he did not have to get home in time to milk the cows.

A high point of his life was his eight year association with the Agricultural Exchange Program at the University. Every year a young farmer from Denmark, Germany or Sweden lived and worked on the farm to learn American farming practices. They became part of the family and community. It was an annual event for them to show pictures of their home countries at the Woodbury Community Club meetings. Orville maintained his friendships with them for the rest of his life and twice visited Europe to see them.

All of us privileged to do research at the Rosemount Agricultural Experiment Station when Orville was our research plot coordinator remember him for his good work and helpfulness. The tribute to this wonderful old timer on the program of his memorial service and to which we all agree was, "Well done, thou good and faithful servant."

DR. DEXTER R. DOUGLAS

by Neil A. Anderson

The *Aurora* editors are sad to report the death of old timer Dexter Douglas (PhD 1968) of Moore, Idaho, on February 26, 1999. Dexter was born November 14, 1937, in Benton, Ohio. He grew up in Ohio and graduated from high school in Fredricksburg, Ohio in 1955. He obtained his BS degree from Kent State University and that same spring married Bernadine Bresson on May 26, 1962, at Wooster, Ohio. His military service was in the US Army Veterinary Corps in Georgia. Dexter then went west and studied plant pathology at the University of Wyoming obtaining his MS degree in 1965. His doctoral studies were with Dr Carl Eide and not on potatoes. His thesis title was "Factors influencing the survival and infective capabilities of *Fusarium oxysporum* f. sp. *melonis* in the soil," and his PhD degree was awarded in 1968. Dexter's first job after leaving Minnesota was as a plant pathologist with the USDA at the University of Idaho, Aberdeen, Idaho. He remained at this position until 1976 when he tried the private sector with employment at the Chemical Supply Company, Jerome, Idaho. Dexter remained in this work until 1978 when he began what was to be his major life's work, the Hi Alta Seed Potato Farm, Moore, Idaho. Here Dexter raised high quality seed potatoes for the seed, processing and table stock industries. A competent scientist, Dexter could guide the technology necessary to produce high quality seed potatoes and with his friendly, outgoing, confident, demeanor he could sell his product. And not only his, but as chairperson of the Idaho Crop Improvement Association, he helped all of Idaho's growers improve and market their crops.

A marvelous golfer, Dexter participated in the University of Minnesota Golf Bugs group as a graduate student and won enough golf balls in the weekly long drive competitions to last a career. He was robust and agile enough to participate even into his midyears in one of life's most difficult athletic events, riding and roping calves in various rodeos. An Eagle Scout, he was also an avid hunter, sportsman and small plane pilot. Dexter loved nature and especially those western vistas which he often enjoyed from the saddle of his favorite horse. He is survived by his wife Bernadine, two daughters (Laura and Syndy), their spouses and one granddaughter, Carsen.

DR. ZAHIR EYAL

by Frank L. Pflieger

Dr Zahir Eyal, a plant pathologist and professor in the College of Life Sciences and Director of the Institute for Cereal Crops Improvement (ICCI) at Tel Aviv University died July 29, 1999 of cancer. Zahir was a strong supporter of the department and of the Lieberman/Okinow Endowed Chair. He was instrumental in the continued growth and development of the ICCI, and in fact, a second floor was being added to the ICCI when I visited Zahir at Tel Aviv University in April of this year. He was very proud of the new addition to the building; this new space will be dedicated to cereal crops improvement through the use of molecular biology. This was a vision that he had for a long time, and I am glad that he was able to witness the reality of his dream

prior to his death. We have lost a friend and distinguished scholar. I will miss him.

DR. AYODHYA P. MISRA

by Deborah A. Samac

Professor Ayodhya Misra (PhD 1947) died on July 22, 1999, at the age of 82 years after a serious illness. He enrolled at the University of Minnesota in 1945 after being awarded the Government of India scholarship for higher studies. For his thesis research he worked under the direction of E.C. Stakman and J.J. Christensen on linseed rust. Later in India he served as assistant systematic mycologist in the Directorate of Plant Protection, Quarantine and Storage (1948-57), professor of plant pathology, Bihar Agricultural College (1957-67), and dean (Agriculture) Rejendra Agriculture University (1967-75). He retired from active service on July 29, 1975, but continued an active interest in plant pathology as an emeritus scientist at ICAR (1976-86). During his career, Dr Misra studied the epidemiology of wheat rust in India and *Helminthosporium* diseases of cereal crops. In a country-wide survey, he described 40 species of *Helminthosporium* occurring on 62 graminaceous hosts, including 5 new species. His many honors and professional positions held included: president of the Indian Phytopathological Society, councillor of the International Society of Plant Pathology, Fellow of the Indian Phytopathological Society and editorial board member, Indian Phytopathological Society. During a 37 year span of active research, Professor Misra inspired and guided a number of MS and PhD students who hold key positions and are spread throughout India and abroad. He will be remembered by them as a gifted teacher, able administrator and a gentleman *par excellence*.



Drs A.P. Misra and E.C. Stakman, New Delhi,
October 20, 1957.

DR. RICHARD H. SHIMABUKURO

by Deborah A. Samac

Dr Richard Shimabukuro, Plant Physiologist, USDA-ARS,

Biosciences Research Laboratory, Fargo, North Dakota, died unexpectedly on March 25, 1998. Dr Shimabukuro was born September 20, 1933, in Hakalau, Hawaii. He graduated from the University of Hawaii with a BS in Agriculture. He taught vocational agriculture for one year and then enlisted in the US Army, where he served in the Chemical Corps. Following two years of military service, Dr Shimabukuro enrolled as a graduate student in the Department of Plant Pathology at the University of Minnesota. He received his MS in 1962 and PhD in 1964 both under the direction of Dr A.J. Linck. His PhD thesis was entitled: "Studies on the effect of atrazine on oat (*Avena sativa* (L.) var. Minhafer)." He is survived by his wife (Mary Abrahamsen, MS 1962, PhD 1964). He joined USDA-ARS directly after graduation and spent his career at the Bioscience Research Laboratory. He was also an adjunct professor of the Department of Plant Science, North Dakota State University, teaching graduate level courses, class lectures and seminars. Dr Shimabukuro was internationally recognized for his pioneering research on herbicide detoxification in higher plants and the mode of action of herbicides. At the time of his death he was conducting research on the mode of action of diclofop-methyl and had evidence for collapse of plant cellular transmembrane electrochemical proton gradients followed by free radical oxidation, a process similar to that observed in senescence and during the hypersensitive response of plant to pathogens. Dr Shimabukuro received many awards during his career including the Japanese Government Research Award for Foreign Specialists, USDA Superior Service Award, Weed Science Society of America Outstanding Research Worker, Ciba-Geigy Corporation Outstanding Agricultural Scientist Recognition Award and was a Fellow of the American Association for the Advancement of Science.

DEPARTMENTAL ENDOWMENT TRUST FUNDS: GIFTS THAT KEEP ON GIVING

by Richard J. Zeyen

The Department of Plant Pathology at Minnesota is deeply indebted to its alumni, friends, and faculty for their continuing support of the departmental endowment fund effort. These funds have made it possible for us to maintain our efforts to support and educate tomorrow's leaders. The department is among the top five plant pathology departments in the nation. We have a world-class and very successful graduate program. The department's faculty excel in teaching, research, and outreach, and are recognized as among the best in the world. This high level of achievement and excellence would have been impossible without the continued support provided by alumni, friends, and faculty.

It is clear that in this era of down-sizing and funding fluctuation in all aspects of higher education, that the department cannot rely solely on public funding to support its programs. Our endowment trust funds now form the backbone of support for the plant pathology library and student scholarship funds.

Gifts to departmental endowments are invested as trust funds. Each year a portion of the interest they generate is used for the

specific objectives intended by the donors. The remainder of each year's interest is reinvested in the principal of each fund, insuring growth and continuity. Thus, the objectives of donors are carried out in perpetuity. They are truly gifts that keep on giving. Please see the enclosed information on Plant Pathology Endowments for more details on specific funds and how to make a donation.

Many donors have found creative ways to contribute to this vital effort and to benefit their personal financial goals and plans at the same time. Below is a brief summary of some of these, provided by Susan Shepard, Development Officer of the College of Agriculture, Food, and Environmental Sciences.

THE MANY BENEFITS OF A GIFT TO PLANT PATHOLOGY

by Susan Shepard

There are many ways that you can make a gift to the Department of Plant Pathology and, at the same time, further your own financial or estate-planning goals. Our government, recognizing the importance of education to the nation's future, has enacted laws that encourage charitable giving to universities. The following suggestions present just a few ways of giving.

Gifts of appreciated stocks and other securities can result in tax savings for you. You can deduct their current market value, up to 30% of your adjusted gross income, over five years if necessary. You will avoid the capital gains tax which you would pay if you sold them.

Cash gifts compared to gifts of appreciated stock

	Cash	Stock
Amount of gift	\$10,000	\$10,000
Income taxes saved	\$2,800	\$2,800
Capital gains tax saved	0	\$1,400
Cost of gift (to donor)	\$7,200	\$5,800

Appreciated stocks and other securities may be given to the Department of Plant Pathology through the University of Minnesota Foundation. Then your gift is invested to pay an income to you, your beneficiaries, or to whomever you designate. The payments can continue for a lifetime. Upon death of the last surviving beneficiary, the Department of Plant Pathology may use the assets as you have directed.

Gifts of real estate can include homes, cabins, land, farms or portions thereof, or commercial property. You may decide to give land outright or give it to establish a Charitable Remainder Trust or other income-producing plan. With the Charitable Remainder Trust, you receive an income tax deduction, income for life, plus a reduction in the amount of your estate.

Some qualified retirement plans may be appropriate gifts that work effectively in your estate planning.

Income-producing gifts provide income for you, a substantial tax deduction, an estate-planning tool, and a significant

contribution to the department. For further information, contact Sue Shepard at 800-775-2187 or 612-624-3625.

HONOR LIST OF PAST AND PRESENT CONTRIBUTORS TO PLANT PATHOLOGY ENDOWMENTS

INDIVIDUALS

A

Gilbert G. Ahlstrand
Quazi A. Ahmed
Geoffrey Ainsworth
Axel L. Andersen
Barbara A. Anderson
Gerald W. Anderson
Helen H. Anderson
John T. Anderson
Neil A. Anderson
William H. Anderson

Markus W. Andres
Mark Andrews
Yehoshua Anikster
Anonymous
Deane C. Army
Edith B. Army
Frederick P. Army
H. Asuyama

B

C.W. Backhus
Robert H. Backstrom
Katherine C. Baker
Kenneth F. Baker
Ernest E. Banttari
Marlene J. Banttari
Henry D. Barker
Jacob J. Barnett
Frederic C. Battell
Gertrude S. Battell
Ruth L. Bean
Eldon A. Behr
Carol A. Berge
David K. Berninghausen
Frances S. Berninghausen
Robert B. Bertram
Bernice Bielenberg
Orville Bielenberg
Margarita F. Billings
Howard L. Bissonnette
Karwin Bissonnette

Margaret R. Blair
William J. Blair
Bonnie L. Blanchette
Robert A. Blanchette
Michael G. Boosalis
Russell N. Booth
Mohammed Boulif
A.M. Boyce
Robert Brambl
Kevin J. Brandt
L.A. Brinkerhoff
Mary A. Brock
Grace Bucher
Ann C. Bulger
William O. Bulger
Vera M. Bullis
Todd A. Burnes
Ann H. Bushnell
William R. Bushnell
Edward E. Butler
Mildred N. Butler

C

Lucille P. Caldecott
Richard S. Caldecott
Dr Robert & Mrs. Campbell
H. Edwin Carley
J.J. Castano
A. Dale Chapman
Junping Chen
Senyu Chen
Yong Sup Cho
Clyde M. Christensen
Doris Christensen
The family of J.J. Christensen
Katherine Christensen
Renee E. Christensen
Wallace Christensen

Hoo Sup Chung
James A. Clemens
Marguerite M. Clemens
Marlys M. Cleveland
Olaf Cleveland
G. Eleanor Clifton
Carolyn S. Collins
W. Andrew Collins
Vergel C. Concibido
Ethel L. Conrad
Steven J. Cook
Ralph Cotter
Lorraine Cox
J.H. Craigie
John E. Cross

D

Susan M. Dabelsteen
 Dr & Mrs Dariush Danesh
 Delight S. Darley
 Ellis F. Darley
 R.S. Davidson
 Ruth E. Davidson
 Barbara Davis
 Maria L. de Bauer
 Eilisa H. de Mazoti
 James E. de Vay
 Josephine E. Delger

Eduardo Casas Diaz
 Patricia A. Donald
 William Donald
 Joanne E. Dorsher
 Alicia Drage
 Camilla Drage
 Miriam Drake
 Wayne Drake
 Dana L. Drees
 John Dueck
 Kasia M. Duellman

E

Byron R. Egeland
 Carl J. Eide
 Johanna L. Eide
 Helen M. Elling
 Laddie J. Elling

Albert H. Ellingboe
 Scott A. Enebak
 Sara W. Engh
 Conrad K. Evans
 Marshall P. Evans

F

Pedro Figueroa
 Greg Fisher
 Lawrence L. Fisher
 Leslie Fisher
 Marion K. Fisher
 Harold H. Flor
 Iva H. Flor
 Boyd R. Forrest
 Phyllis Forrest
 Marilyn J. Forseth
 Stephen W. Forseth
 John S. Fowler
 Marjorie C. Fowler

Andrew C. Fraser
 Catherine M. Fraser
 Audrey S. French
 David W. French
 Donn D. French
 Mary E. French
 Lily-Beth Frenzt
 Esther L. Frosheiser
 Fred I. Frosheiser
 James D. Froyd
 Leonard Fucikovsky
 Hiroshi Fujii

G

Keno Gard Skandinaviska
 Enskilda Banken
 David Gardner
 Robert T. Gast Jr
 Caroline F. Gebhard
 Dennis E. Gebhard
 Tom Gessner

Edith L. Gille
 Asimina Ginis
 Kazuo Goto
 Sandra L. Gould
 Thomas W. Graham
 Carol E. Green
 James V. Groth

H

George Hafstad
 Winston M. Hagler Jr
 Margaret Hanish
 Earl D. Hansing
 Earle W. Hanson
 Alice K. Hardecopf
 Georgetta S. Harrar
 J. George Harrar
 Michael L. Harris
 Eugene B. Hayden Jr
 Marian M. Hedstrom
 Grace Herberg
 John C. Herberg Jr
 Thomas Hernandez
 John P. Hertsgaard
 Louise A. Hertsgaard

Louis J.A. Hewer
 Vivian H. Hewer
 Lee Hines
 Elisa Hirschhorn
 Unji Hirua
 Edward Hoffman
 Patricia W. Hoffman
 Florence W. Holmsten
 C.S. Holton
 Hugh H. Hotson
 German Hoyos
 Delores H. Huebner
 Warren Huebner
 Gray Huston
 Keith Huston

I

Tadaoki Inaba
 Wathena M. Ingham

Katherine L. Ingwalson

J

Jacob Janzen
 Barbara A. Johnson
 Dorothy C. Johnson
 E.M. Johnson
 Gordon L. Johnson
 John R. Johnson Jr
 Karen L. Johnson

Leighton W. Johnson
 Lillian V. Johnson
 Lois E.B. Johnson
 Marvin B. Johnson
 Virgil L. Jons
 Nina Jorgensen

K

Helen M. Kernkamp
 M. Carolyn Kernkamp
 Marjorie G. Kernkamp
 Melvin W. Kernkamp
 Milton F. Kernkamp
 Lois Kitchell

Ted R. Knous
 Hironori Koga
 Faye Kommedahl
 Thor Kommedahl
 Kathryn M. Warlich Kromroy
 Thomas W. Kromroy

L

Steven A. Laddie
 Philip O. Larsen
 Sandra L. Larsen
 Thomas Laskaris
 John Laurence
 Martinus E. Laursen
 Vivian L. Laursen
 Jeannette W. Lazam
 Jean D. Lee
 Roger B. Lee
 Camille L. Lefebvre
 Shirley A. Legvold
 Duane LeTourneau

Diane M. Levy
 Adele Lieberman
 Dr and Mrs. Albert Linck
 David C. Linde
 Frances L. Line
 Roland F. Line
 Dr and Mrs. Larry Littlefield
 Charles E. Logsdon
 David L. Long
 Patricia H. Long
 Shih-I Lu
 Frank Lucier

M

Anna Lea MacDonald
 David H. MacDonald
 Dean K. Malvick
 Jacob Manisterski
 Luanne B. Martell
 Weston J. Martin
 Dennis N. McDougall
 Carolyn J. McKay
 Gerald R. McKay
 Mary E. McKay
 Lorraine E. McPherson
 Donald V. McVey
 Louise L. Meltaus
 John A. Menge
 Richard A. Meronuck
 Rose M. Meronuck
 James E. Merrick
 Mary Merrill
 William Merrill
 Ardene Meshbesh
 Annabell Mew
 T.W. Mew

Helen E. Meyer
 Charlene P. Miller
 Helen MillerAlexander
 Henrietta N. Miller
 Lawrence I. Miller
 Mary McBryde Miller
 Philip J. Miller
 Chester J. Mirocha
 Ayodhya P. Misra
 James Mital
 Monica A. Molander
 Dorothy H. Moore
 The family of Matthew Moore
 Richard H. Morrison
 Robert S. Mullin
 David Mumford
 Donald Munnecke
 Harry H. Murakishi
 Robert W. Murman
 Helen C. Murphy
 Roger R. Musick

N

Shehla H. Naavi
 Stephen L. Nelson
 Margaret Nesgen
 Beverly A. Ness
 Harlan J. Ness
 Anne E. Newberry
 Josephene Newberry
 Allen G. Newhall

Robert Noble
 David M. Noetzel
 F. LaVonne Noetzel
 Catherine M. Northrup
 Mary Ann F. Nowak
 Piotr Nowak
 Robert K. Noyd
 Robert F. Nyvall

O

Carlos N. Ochoa
 Seung H. Ohh
 Janet H. Olfelt

Philip J. Olfelt
 Conrad J. Olson

P

Mary E. Palm
 Louise T. Palmer
 Jack B. Pavilke
 Vivian D. Pavilke
 Annette H. Pearson
 Mryna W. Pederson
 Joseph N. Pedretti
 Clarene J. Peterson
 Dorothy Petty

Anne D. Pick
 Herbert L. Pick Jr
 Jill D. Pokorny
 Connie J. Post
 J.M. Prescott
 Shari L. Pribble
 Spencer G. Pribble
 David Punter

R

Judith A. Ranheim
 Ned Raun
 Curtis D. Reese
 Susan Riley
 H.D. Ripley
 Curtis W. Roane
 Martha K. Roane
 Lewis Roberts
 Esther L. Rode
 Stella D. Rodenhiser
 James R. Roebke

Alan P. Roelfs
 Sylvia A. Roman
 E. John Rosenwald Jr
 Athalie C. Rossow
 Jane E. Rothman
 Paul G. Rothman
 Sigrid K. Rothman
 Alice Rowell
 John B. Rowell
 Paul O. Rudoff
 Frances M. Rudolf

S

Joseph N. Salvino
 Deborah A. Samac
 Parker Sanders
 Marjorie Schad
 Joyce A. Schafer
 John F. Schafer
 Myrtle Scheiderhan
 Paul J. Scherman
 Elmer L. Schmidt
 Janet Schottel
 Maria de Los Angeles
 Schroeder
 John W. Schwandt
 John R. Schwartz
 John Sethre
 Clyde P. Shumway
 Malcolm C. Shurtleff
 Delores Sigel
 Melvin E. Sigel
 Carolyn D. Silflow
 Savel Silverborg

John Skelly
 Bent Skovmand
 Dale L.K. Smeltzer
 Eric C. Smeltzer
 Frisby D. Smith
 E.C. Stakman
 M.C. Stanford
 George Starr
 Josephine K. Steele
 John Stevenson
 Donald M. Stewart
 Elwin L. Stewart
 Marion G. Stewart
 Sara A. Stewart
 Dr and Mrs. Ward Stienstra
 Deon D. Stuthman
 Judy A. Stuthman
 Theodore W. Sudia
 Subramaniam Sundaram
 Sharon Sussmilch
 Les Szabo

T

Sally Tai
 James Tammen
 Gary L. Tankenoff
 Marsha Tankenoff
 Raymond J. Tarleton
 Patricia A. Taylor
 Morris N. Teller
 Paul S. Teng

Judy A. Theis
 Walter D. Thomas Jr
 W.H. Thornberry
 H. David Thurston
 A. Tjokrosudarmo
 Ester M. Tolaas
 Camille M. Tuite
 Lawrence Tyner

U

Arnold C. Uhlig
 Agnes A. Ulliyot

Lloyd L. Ulliyot

V

Barbara S. Vance
 James R. Venette

Gerald T. Vigue

W

Isaak Wahl
 Isaak Wales
 Monica K. Wallace
 Gloria M. Warner
 Lloyd L. Wasnick
 I.A. Watson
 Erling M. Weiberg
 Richard A. Weinberg
 Edwin J. Wellhausen
 Kenneth Wernimont

Andrea M. Westegard
 Dewey J. Whitmer
 Ruth J. Whitmer
 Katharine D. Widin
 Iva W. Wilcoxson
 Roy D. Wilcoxson
 Margaret M. Winkel
 Chester A. Wismer
 Leon S. Wood

Y

Diane C. Young
 Harry C. Young

Nevin D. Young

Z

Robert A. Zabel
 Richard J. Zeyen

Elverne W. Ziemke

BUSINESSES

A

American Cyanamid
 Anderson & Koch Ford Inc.
 Anheuser-Busch Companies Inc.
 Area II Potato Growers
 Atochem North America Inc.

B

BASF Corporation
 BASF Wyandotte Corporation
 Bane Holtzclaw & Company
 Bear Sterns & Company Inc.
 Bentech Laboratories Inc.
 Big Stone Inc.
 Biotol Inc.
 Border Corp. Consulting

C

Campbell Soup Company
Cargill Inc.
Cenex/Land O'Lakes
Cenex/Land O'Lakes Ag. Services
Chapman Forestry Foundation
Christian Services Inc.
Ciba-Geigy Corporation
Clariant Biotech Research Corporation
The Coca-Cola Company
Cooperating Fund Drive
Cornell University

D

Del Monte Corporation
The Dow Chemical Company

E

E.I. Du Pont De Nemours & Company
Elf Atochem North America Inc.
Executives Association of St. Paul

F

Faribault Foods
Felhaber Larson Fenlon & Vogt
Fermenta ASC Corporation
First Bank System Foundation
Forest - Ag. Corporation

G

General Foods Manufacturing Corporation
General Mills Foundation
Goodhue Canning Company
Grace-Sierra Corp Protect Company
Griffen Corporation
Grossman Founder
Gustafson Inc.

H

Horticulture Rsch. Inst. Endowment

I

ISK Biosciences
ISK Biosciences Corporation
International Video Entertainment Inc.

J

J.R. Johnson Supply Inc.
Janssen Pharmaceutica

L

Lakeside Packing Company
Land O'Lakes Inc.
Lieberman Enterprises Inc.
Lieberman-Okinow Foundation
Lieberman-Okinow Family Fund

Lipha Chemicals Inc.
Lipha Tech. Inc.

M

Mallinckrodt Inc.
Midwest Food Processors Association
Miles Inc. Ag. Division
Minnesota Barley Research
Minnesota Crop Improvement Association
Minnesota Flower Growers Association
Minnesota Golf Course Superintendent Association
Minnesota Wild Rice Council
Mobay Corporation Animal Health Division

N

Nor-Am Chemical Company
Northharvest Bean Growers Association
Northern Illinois Hosta Soc.
Northrup King Company

O

Olivia Canning Company
Owatonna Canning Company

P

PBI/Gordon Corporation
Pennwalt Corporation
Pennwalt Agchem.
The Pillsbury Company
Piper Jaffray & Hopwood Adv. Fd.
Piper Jaffray Companies Inc.
Pitman-Moore Inc.
Plant Health Associates Inc.
Potato Chip Snack Food Association

Q

The Quaker Oats Company
The Quaker Oats Foundation

R

The Rainforest Project Foundation
Rhone-Poulenc Ag. Company
Ringer Corporation
Rohm & Haas Company

S

Sandoz Agro. Inc.
Seneca
Seneca Foods Corporation
Seymour & Barbara J. Leslie Foundation
Shifan Family Charitable Foundation
Standard Fruit Company - Costa Rica

U

Union Carbide Ag. Products Company
Uniroyal Chemical Company Inc.
United Foods Inc.

W

W.K. Kellogg Foundation
Westbridge Ag Products
Wilbur-Ellis Company

Z

Zeneca Agricultural Products

NEW EMPLOYEES

by Delores H. Huebner

Anne M. Cooper, Junior Scientist, hired March 23, 1999, assists with research in plant genomics in Dr Nevin Young's laboratory. She completed a BA at St. Olaf College, Northfield, Minnesota, majoring in biology and minoring in environmental studies.

Mervat E. El-Araby, Junior Scientist, was hired to work in Dr James Kurle's laboratory on June 21, 1999. She is working on research and disease screening of soybean fungal pathogens. Mervat holds a PhD in plant pathology from the University of Minnesota.

Brenda L. Fuchs, Junior Scientist, provides technical support in Dr Deborah Samac's laboratory as of June 21, 1999. She assists with experiments in DNA sequencing and evaluating disease resistance. She received a BS degree from the University of Wisconsin, Plattville.

Mark W. Galatowitsch, Scientist, provides computer support services for the Departments of Plant Pathology, and Agronomy & Plant Genetics. He came to us from Dr Burle Gengenbach's crop genetics laboratory. He earned his MS degree in plant physiology at the University of Minnesota.

Mesfin T. Gebeyaw, Research Associate, joined Dr Deborah Samac's laboratory on November 30, 1998. He is working on aluminum tolerance in alfalfa. Mesfin holds a PhD from the Plant Science Department at the University of British Columbia.

Shane T. Grivna, Junior Scientist, began working in Dr. Nevin Young's laboratory June 15, 1999. He assists with genetic mapping and bioinformatic DNA sequence analysis. He holds a BS degree in biochemistry from the University of Minnesota.

Sharon M. Lewandowski, Junior Scientist, started working in Dr Bill Bushnell's laboratory as of January 5, 1999. Sharon's responsibilities include the study of fungus infecting barley plants. She holds a BA in biology from the University of Wisconsin, River Falls.

Marcelo Leon Morelli Colomina, Senior Laboratory Technician, assists with laboratory and fieldwork for Dr Ruth Dill-Macky's small grains pathology project. He holds an agronomist degree from the University of Buenos Aires, Buenos Aires, Argentina.

Janeen A. Ness, Account Specialist, transferred to our

department from the University of Minnesota Disbursement Services Office on August 3, 1999.

Christine C. Newby, joined Dr Ruth Dill-Macky's laboratory on September 28, 1999. She assists in the study of cereal diseases in laboratory, greenhouse and field experiments. Chris worked previously at the USDA-ARS Cereal Disease Laboratory. She earned her BS degree in IPM at the University of Minnesota, St. Paul.

Karin L. Ped, Junior Scientist, began work in Dr Nevin Young's laboratory September 24, 1998. Karin assists in plant genomics and positional gene cloning experiments. She received a BS degree in biochemistry at the University of Minnesota.

Rodney E. Pettway, Junior Scientist, hired June 7, 1999, came from the University of Florida. He works on Dr Corby Kistler's project in the Cereal Disease Laboratory, assisting with experiments in *Fusarium* molecular biology. Rodney holds a BS degree in zoology with a biochemistry minor from Texas A&M University, College Station, Texas.

Tina M. Seeland, Junior Scientist, started working in Dr Bill Bushnell's laboratory on June 17, 1999. She performs a variety of tasks in the lab, growth chambers and greenhouse, doing physiological research on plants. Tina received her BS degree in plant biology from the University of Minnesota, St. Paul.

Ross M. Winberg, Assistant Scientist, came here from the University of Wisconsin, Madison and joined our department on January 4, 1999. Ross splits his time working in the laboratories of Drs James Groth and James Percich. He earned a BS degree in plant pathology at the University of Wisconsin, Madison.

NEW GRADUATE STUDENTS

by Delores H. Huebner

Bernick, Shawn C. HS, Spencer, WI; BS, University of Wisconsin, River Falls, WI. Fall 1999, Dr. Jon Powell.

Castell, Claudia V. HS/BS, Pehuajo, Argentina; Agronomist Engineer, University of La Plata, Argentina; MS, Mediterranean Agronomic Institute of Zaragoza, Spain; MS, University of Minnesota, St. Paul, MN. Winter 1999, Dr. Deborah Samac.

Lewandowski, Sharon M. HS, Frank B. Kellog, Roseville, MN; BS, University of Wisconsin, River Falls, WI. Fall 1999, Dr. William Bushnell.

Morse, Andrea C. HS, Anoka, MN; BS, University of Minnesota, St. Paul, MN. Fall 1999, Dr. Robert Blanchette.

Nettleton, Gretchen C. HS, Anoka, MN; BA, University of Minnesota, Morris, MN. Fall 1999, Dr. Jeff Miller.

Neuman, Marc F. HS, Park Senior High, Cottage Grove, MN; BS, University of Minnesota, St. Paul, MN. Fall 1999, Dr. Jennifer Juzwik.

NEW EMPLOYEES



Anne M. Cooper



Mervat E. El-Araby



Mark W. Galatowitsch



Mesfin T. Gebeyaw



Shane T. Grivna



Janeen A. Ness



Christine C. Newby



Karin L. Ped



Rodney E. Pettway



Tina M. Seeland



Ross M. Winberg

Not pictured:

Marcelo Leon Morelli Colomina
Brenda L. Fuchs
Sharon M. Lewandowski

NEW GRADUATE STUDENTS



Shawn C. Bernick



Andrea C. Morse



Gretchen N. Nettleton



Marc F. Neuman

Not pictured:

Claudia V. Castell
Sharon M. Lewandowski

EXAMINATIONS PASSED

1998-99

December 18, 1998	Mary Moberg	PhD final
April 29, 1999	Alan Dyer	MS
May 25, 1999	Kathy Komroy	PhD final

DEPARTURES

by Deborah A. Samac

Grace Bucher, after many years of dedicated service to the department as laboratory services coordinator, Grace retired July 28, 1999, to enjoy gardening, grandchildren and all the fine things in life.

C. Kent Evans, a research associate working on Fusarium head blight of barley with Drs Ruth Dill-Macky and Don Rasmusson (Agronomy & Plant Genetics Department) left Minnesota in July, for Baton Rouge, Louisiana where he accepted a position as assistant professor with the Department of Plant Pathology and Crop Physiology at Louisiana State University. Kent's new responsibilities include developing a research program addressing the diseases of small grains and corn as well as teaching and graduate student advising.

Sheila Lutz, a USDA-ARS biological science laboratory technician with Deborah Samac, resigned her position in October 1998 in order to complete her MS in plant breeding. She will be married in October of 1999 and will be moving to a job at the University of Michigan.

Hong Ma, who was a research associate working with Drs Ruth Dill-Macky and Robert Busch (Agronomy & Plant Genetics Department) on the mechanisms of resistance in wheat to Fusarium head blight resigned his position in December 1998. Hong now works as a research scientist at the Hughes Institute in St. Paul.

Jamie Mork, left his position as the departmental computer support specialist to work for Parametric Technology Corporation, Bloomington.

Stephen Vilaseca, left his position as a senior account assistant in the main office to pursue a graduate degree in Spanish literature at the University of Minnesota.

Lisa Williams, a junior scientist in Ben Lockhart's lab resigned her position to pursue a PhD in immunology at Colorado State University.

COMPUTER SUPPORT

by Mark W. Galatowitsch

The computer lab has undergone quite a few changes in the past year. Jamie Mork resigned as user services specialist in May of

1999. Mark Galatowitsch, a research scientist (plant tissue culture and transformation) with a strong background in computer support replaced Jamie. Also joining the computer support staff this past year was Shawn Pierce. Shawn is a student lab assistant who has been working part-time during the school year and full-time this past summer.

New chairs and carpeting have spruced up the computer lab! Many of the lab computers have been updated with faster processors, larger hard drives and more memory. The department web and file servers will also be getting an increase in disk storage space this fall that will triple our storage capacity.

Please check out the sites our webserver is currently hosting:

www.plpa.agri.umn.edu - Plant Pathology
www.agro.agri.umn.edu - Agronomy & Plant Genetics
www.crl.umn.edu - Cereal Disease Lab
www.crc.agri.umn.edu - Computer Support
www.misa.umn.edu - MISA (Minnesota Institute for Sustainable Agriculture)

GRADUATE STUDENT AFFAIRS IN PLANT PATHOLOGY

by Alan T. Dyer

I must admit I continue to be impressed with our student body. We are an active group of individuals, striving to improve our training and experience here at the University of Minnesota and that of those coming after us. Going into 2000, the graduate students are pursuing a broad array of new initiatives and are maintaining many cherished old ones. The initiatives are designed to ease the transition of new students into the department (welcome picnic, student hosts), improve participation, collaboration, and communication (Graduate Students Events Calendar, Brown Bag Seminars, student web page) and provide important learning opportunities (fungal foray, internship initiative, and Symposium for Fall 2000).

Below are brief descriptions of a few of these initiatives. As you read them please keep in mind the selflessness the volunteers have displayed and their commitment to contributing to the school and department.

Student Initiatives

Graduate Students Events Calendar. The source of information on events important for graduate students has become inconsistent as information is publicized in E-mails, flyers, posters, and newsletters. Along with little forewarning of events, inconsistency has led to less student participation in events. To remedy the situation, the graduate students have established a monthly graduate students events calendar. *Ramya Mani* and *Karen Broz* have spearheaded the development of the student calendar and are doing an excellent job. The second edition is already out and with new design changes quickly conveys important information to students. Kudos to Karen and Ramya!

Graduate Student Welcome Picnic. The graduate students just

held their second annual picnic to welcome new graduate students to the department. Approximately 20 people attended the event organized by *Claudia Castell*, *Consuelo Estevez de Jensen*, *Jason Smith* and *Yuhong Li*. With lessons learned from last year's picnic and a lot of work by the organizers, this year's picnic was improved and a greater success. While the picnic was for the students, *Warren Kruger* and *Claudia Castell* are hoping to organize a coffee social between faculty and students in the coming month.

Graduate Student Hosts. Although the department and university put considerable effort into orienting new students to the department there are recognized gaps in the orientation. In an effort to fill these gaps, six students volunteered to act as "guides" and "hosts" to incoming graduate students. These students are: *Warren Kruger*, *Xiao Kun*, *Alan Dyer*, *Laura Wallach*, *Silvia Pereyra*, and *Claudia Castell*. In addition, *Consuelo Estevez de Jensen* and *Britt Johnson* have organized a guide for "hosts" of practical information that new students need that is not already provided in the orientation programs.

Internships. As the department has recognized the importance of internships in new curriculum requirements, *Ramya Mani* and *Rhoda Burrows* along with *Dr Richard Zeyen* have volunteered to explore ways and means of improving opportunities for student internships and how to effectively integrate them into a student's graduate program. Alumni wishing to discuss these possibilities should contact *Dr Zeyen*.

Brown Bag Seminar Series. *Charlie Barnes* and *Silvia Pereyra* are intensely interested in encouraging collaboration and cross discipline interactions within the department and are the driving force behind the development of an informal lunch time affair where students will be describing their research and the difficulties they are encountering. It is *Charlie's* and *Silvia's* hope that through this informal venue problems will be solved and collaborations encouraged. The seminar series is hopefully going to start in late October. The organizers of the series will be *Yuhong Li* (chair), *Charlie Barnes*, *Gacheri Muriuki*, *Silvia Pereyra* and *Alan Dyer*.

Fungal Foray. The annual fungal foray was held on September 4, 1999. This year's foray, lead by *Dr James Groth*, explored and collected a variety of specimens that will be used later in the Biology of Fungi class taught this fall. As always, *Dr Groth* was a gracious, amiable, and knowledgeable host and made the foray an enjoyable affair. Thank you *Dr Groth*.

Symposium for 2000. Building on past experience, the annual graduate student symposium will be delayed until fall of 2000 a time when more funds should be available. The graduate student committee will be lead by *Claudia Castell* (chair) and includes *Jason Smith*, *Karen Broz*, and *Shawn Bernick*. The committee has already chosen a timely topic, bioinformatics, and is now striving to put together a quality, professional program. Developing a symposium requires a lot of energy and time and we really appreciate their volunteering for this project.

Student Web Page. The first graduate student web pages were designed by *László Genyis* and included biographical information on each student. Currently, *Jack Maake* has volunteered to learn web page design and to update the pages.

Student Officers. As president, I just wish to thank *Charlie Barnes* (vice-president) and *Silvia Pereyra* (secretary/treasurer). I cannot imagine working with two better team players. A lot is being expected of them and their hard work and can-do-attitude are making this a great year for graduate students.

FACULTY ACTIVITIES

A few highlights of faculty activities from the past year are printed in the profiles below.

Dr Chad J. Behrendt, Assistant Professor & Extension Educator. As an assistant professor/extension educator in the department, one of my job responsibilities is Master Gardener training. The plant pathology section of the Master Gardener core course was well received throughout Minnesota. Hands-on training, along with traditional lecturing, made this course entertaining and educational. In addition, the Master Gardener course was taught very successfully this year as an on-line course.

I have also been involved with a variety of workshops and training sessions including Pesticide Applicator Training and the Traveling Nursery Seminar. In addition to the other statewide committees I serve on, I was elected to serve on the Community Forest Health Steering Committee. This statewide committee was implemented and is headed by the Minnesota Department of Natural Resources. Its function is to develop guidelines for the disbursement of state forest health dollars.

The most noteworthy project I was involved with was the development and implementation of the new Plant Disease Diagnostics web site. This site provides information as well as control measures on the most common diseases in Minnesota in a simple user-friendly, diagnostic form. This web site is intended to provide information and support to Master Gardeners and county agents. The URL is: <http://www3.extension.umn.edu/projects/yardandgarden/diagnostics/>. The tree section is complete and work continues on the rest of the site.

Dr Robert A. Blanchette, Professor. Robert and research associate Benjamin Held spent 3 weeks in Antarctica last January on an international cooperative project to assess the deterioration taking place in several historic huts (actually large buildings) erected by early 20th century south pole explorers Robert F. Scott and Ernest Shackleton. The huts, built in the Ross Sea Region between 1901 and 1911 (located at Hut Point, Cape Evans and Cape Royds), were abandoned after the expeditions were over leaving the buildings intact and thousands of artifacts. The huts are now internationally protected monuments containing furniture, unused stores of food, scientific apparatus, clothes, etc., and provide a remarkable view into the past. Over the past decades, microbial (unusual fungi) and chemical deterioration (UV light and salt as well as severe wind erosion) have taken a serious toll on the huts. This cooperative project with conservators from the Antarctic Heritage Trust and researchers from the University of Waikato, New Zealand, will help to develop long-term conservation plans for the preservation of these important historic structures and artifacts. In December 1999, *Dr Blanchette* will return to Antarctica to set up field tests to evaluate treatments for use on

the buildings and to continue investigations on the unusual types of deterioration occurring there.



Bob Blanchette stands in front of a Cape Evans hut in Antarctica built by R.F. Scott in 1911 during the Terra Nova Expedition to the South Pole.

This past summer Dr Blanchette gave presentations at the Gordon Conference on Applied and Environmental Microbiology and a symposium on archaeological wood at the 11th International Biodeterioration meetings. He also became a Fellow of the American Phytopathological Society at the 1999 annual meeting in Montréal, Canada.

Dr Senyu Chen, Assistant Professor, Southern Research and Outreach Center. Dr Senyu Chen attended the Joint Meeting of the American Society of Parasitologists and the Society of Nematologists in Monterey, California, on July 6-10, 1999, and presented one paper and four posters. His presentation was an overview of the research of biological control of the soybean cyst nematode in Minnesota. On August 4-7, 1999, Dr Chen attended the World Soybean Research Conference VI in Chicago and presented a paper on the effect of cropping system on fungal parasites of the soybean cyst nematode. He is a representative of the University of Minnesota Agricultural Experiment Station to the Southern Region Cooperative Research Project (S-282) and attended the meeting held in Dallas, Texas, on October 28, 1998. Dr Chen served as associate editor for the *Journal of Nematology* and Biological Control Committee of the American Society of Nematologists.

Dr Ruth Dill-Macky, Assistant Professor. My small grains pathology lab had a successful year in the field with screening nurseries for Fusarium head blight at St. Paul, Morris, and Crookston. Other research activities included studies in the effect of inoculum on the development of Fusarium Head Blight and on the survival of *Fusarium* in crop residues. The two research associates working on my program, Drs Hong Ma and C. Kent Evans left the University of Minnesota for challenging new positions elsewhere. As a result of their departure I am currently advertising for a research associate. This year I attended the Western Coordinating Committee for small grains in Bozeman, Montana and the APS meeting in Montréal, Canada. Silvia Pereyra, whom I am advising for her MS degree, also attended the APS meetings, presenting a poster on her research. At present two laboratories in Stakman Hall, 201 and 209, are undergoing renovation and I hope to move into these labs from my present lab (201 Christensen) by Halloween 1999.

Dean E. Herzfeld, Associate Professor & Coordinator Minnesota Health, Environmental, and Pesticide Safety Programs. I continued my elected position on the National Board of Directors of the American Association of Pesticide Safety Educators. This last year I was named to chair the association's National Membership Committee. I am a principle investigator (and Minnesota is the lead state) with extension services in Virginia, Arizona, and Washington of a national \$100,000 competitive grant awarded by the Agricultural Distance Education Consortium. The grant was awarded in order to create a national system for developing electronic educational modules (Internet, computer, CD-ROM, etc.) as a model for the larger extension system. I am continuing my work in public ethics of non-formal environmental and extension education. I was selected as a 1999 Administrative Fellow in the Dean and Director's Office of the University of Minnesota Extension Service (at 50% FTE) to research the public ethics of educational entrepreneurialship and enterprise in extension education. I am also the leader of a multi-state group which has designed and provides a professional ethics development workshop through examination of controversial environmental and extension public interventions. In 1999 we were invited to conduct the workshop at two national conferences.

Dr Linda L. Kinkel, Associate Professor. We have had a great year in the lab and in the field. Our work on the biological control of soilborne plant pathogens continues as we study both inoculative biocontrol and the potential for green manures to enhance indigenous soilborne microbial antagonists. We are presently investigating these approaches on potato, alfalfa, and soybean, with collaborative support from Drs Deborah Samac, Jeff Miller, and Jim Kurlle. Thanks to a large four year grant from the National Science Foundation, we are in the process of expanding our studies on the population dynamics of indigenous antibiotic-producing bacteria to native prairie soils at the Cedar Creek Natural History Center. Additionally, Dr Kurt Leonard and I have continued our research and quantitative modeling of bacterial competitive interactions on wheat leaves. These projects have been ably supported by Andy Ryan, Jen Flor, and Miriam Newton, by graduate students Kun Xiao and Ramya Mani, and by undergraduate and high school summer research fellows Maren Olson, Melanie Spoor, and Tashi Chomzom. I presented an invited talk, "Implications of Environmental Heterogeneity for Microbial Interactions on Leaves" at the APS meetings, and continue to serve on the College Faculty Consultative Committee. And finally, serving as director of graduate studies for the past 6 months has convinced me that administrative work is not my forte nor my pleasure. I look forward to a renewed focus on research and teaching over the coming year.

Dr Sagar V. Krupa, Professor. During May, Dr Krupa participated in the UN-ECE workshop on "Critical Levels for Ozone - Level II" held in Gerzensee, Switzerland. He was the only invited participant from the US. On the way to Switzerland, he stopped in Germany to meet with his research collaborators at the University of Giessen. In September he delivered one of the keynote addresses at the 40th Anniversary of the Research Institute of Natural Resources, Colegio de Postgraduados de Agricultura, Montecillo, Mexico. During that four day trip, he also taught an intensive course on "Global Climate Change and Terrestrial Ecosystems." His host for the course was old timer

Maria Lourdes de la Isla de Bauer (MS 1957). During November, Dr Krupa will teach a one-week course at the International University, Menendez Pelayo, Valencia, Spain. The course topic is "An Integrative Analysis of the Role of Atmospheric Deposition and Land Management Practices on Nitrogen in the Agricultural Sector." He continues to serve as the vegetation effects science coordinator in the West Central Alberta Regional Airshed Management Research Program in Canada. Recently he also served as a peer reviewer for the US EPA's National Ambient Air Quality Standard Draft Criteria Document for Particulate Matter. He has also assumed the role of series editor for a new series of books to be published by Elsevier Science, Oxford, England titled Developments in Environmental Science. During 1999-2000, in the fine tradition of other plant pathologists preceding him such as Professors Thor Kommedahl and Neil Anderson, Dr Krupa serves as the President of the University of Minnesota Chapter of Sigma Xi, the Scientific Research Society.

Dr Jim E. Kurle, Assistant Professor. Dr Kurle assumed the position of assistant professor in the department and began work on December 1, 1998. His principle responsibility is research on management of major pathogens of soybeans in Minnesota, including *Sclerotinia* stem rot, *Phytophthora* and *Fusarium* root rots, and brown stem rot. His major research effort this year has been initiation of studies examining the effect of management practices and variety selection on *Sclerotinia* stem rot. These studies were established in cooperation with Drs Jim Orf and Seth Naeve of the Agronomy & Plant Genetics Department. Dr Kurle also has cooperative research projects with Dr Senyu Chen, investigating the interaction of soybean cyst nematode with root rotting fungi, and with Drs Dick Meronuck and Jim Percich examining the effects of crop rotations with root rotting fungi. In addition to his research responsibilities, Dr Kurle has participated in numerous educational programs and field days in order help fill the gap that was left in the department's extension and outreach efforts when Dr Ward Stienstra retired.



Dr Kurt J. Leonard, Professor, USDA-ARS-Cereal Disease Lab. During the past year, Dr Leonard attended several international meetings. At the 8th International Symposium on Microbial Ecology, Halifax, Canada, August 10-14, 1998, he gave an invited presentation on "Competition Between Strains of a Pathogenic Fungus in Plant Leaves." In Porto Alegre, Brazil, on March 30 - April 1, 1999, he attended the Brazil Oat Conference, and delivered an invited presentation on "Genetics of Virulence in Oat Crown Rust and Resistance to Crown Rust in Oat." Most recently at the American Phytopathological

Society/Canadian Phytopathological Society joint meeting in Montréal, Canada, August 8-12, 1999, his invited presentation was on "Selection in Relation to Virulence Polymorphisms in Cereal Rusts."

Dr Richard A. Meronuck, Professor. This was an exciting year. My research activities were in the area of grain storability, dry edible bean and canola diseases. The grain storability research is a co-operative effort with the Department of Biosystems & Agricultural Engineering. The dry bean research was centered on white mold, root rot and rust. All projects here involved the cooperation of faculty in the Departments of Soil, Water & Climate, and Biosystems & Agricultural Engineering. Canola research was centered on the control of white mold by variety selection and chemicals and was done in cooperation with the Canola Research Center at Roseau.

My extension programs were concentrated in the area of dry bean and canola diseases. Presentations at a series of meetings and field days informed growers about the latest information in disease control. An extension publication on IPM for the control of white mold is now in press. This publication contains recommendations collected over an eight year period. Drs Percich and Consuelo Estevez de Jensen and I have cooperated with Dr George Rehm and Jerry Wright on root rot in kidney beans. Dr Rehm and Mr. Wright are in the Departments of Soil, Water & Climate, and Biosystems & Agricultural Engineering, respectively. This work involved minimizing root rot in kidney beans by cultural and biocontrol techniques. All this material is presented in our extension programs.

Currently I teach the course Introduction to Field Crop Diseases. This course has an annual enrollment of 12 to 22 students. The course covers basic disease biology along with field and laboratory techniques for the major crops in Minnesota and the North Central Region.

Dr Jeff S. Miller, Assistant Professor. Dr Jeff Miller joined the faculty last year in October. Since arriving in Minnesota, Dr Miller has spent time meeting with potato growers from around the state. He also spent time this winter consulting with the 3M Company relating to their work with antimicrobial compounds which may be used in the potato industry some day. Additionally, he was invited to speak at the University of Idaho Winter Commodity Schools on ongoing research related to whole field disease management practices designed to reduce the impact of potato late blight. Experiments were initiated with potato growers in Minnesota this summer and Dr Miller has accepted his first graduate student, who will be working on population dynamics of *Verticillium dahliae*.

Dr Bob F. Nyvall, Professor, North Central Research and Outreach Center. Research this year focused on the etiology of several diseases of cultivated wild rice and development of mycoherbicides. Dr Nyvall will spend a two and one-half month faculty improvement leave in Dr Cother's laboratory in Orange, New South Wales, studying the use of *Rhynchosporium alismatis* as a possible mycoherbicide for water plantain in Minnesota, and investigating mutual diseases of white rice and cultivated wild rice. A faculty improvement grant from the University of Minnesota and from the New South Wales Department of Agriculture was received to fund the semester

leave. The 3rd edition of *Field Crop Diseases* by R.F. Nyvall was published in June by Iowa State University Press. The book includes information on 1,614 plant diseases on 24 field crops. Bob continues to be editor-in-chief of the American Phytopathological Society Newsletter and serves on the national council of APS. This past year he also taught a special topics course for graduate students on mycoherbicides.

Dr Jim A. Percich, Professor. Jim Percich has been involved in a project directed towards the management of bean root rot caused by a complex of organisms involving *Fusarium solani*, *F. oxysporum* and *Rhizoctonia solani*. The project scientists represent soil science (Dr George Rehm) and plant pathology (Drs Jim Kurle, Dick Meronuck and Dave MacDonald). This disease complex affects potatoes and corn which are grown in rotation with beans. Grower concern and support of the root rot project has been outstanding. The disease has been increasing in the past several years in Minnesota, North Dakota and elsewhere. Jim's PhD student, Consuelo Jensen de Estevez, identified the causal organisms, what each contributes to the disease complex and has evaluated biological control seed treatments in both the laboratory and field. After two years of field evaluation it appears the bacterium, *Bacillus subtilis* results in significant increase in yields and reduces disease severity. She has also screened the available bean germ plasm for possible sources of disease resistance to the root rot complex and has identified several that demonstrate some disease resistance. The use of chemical and biological seed treatments, resistant cultivars and other rotational crops in an integrated way may be the best means of managing this root rot complex. Further studies will focus on the role of nematodes in the root rot complex. Jim also has assumed the responsibilities of dealing with vegetable diseases. He will be working with faculty members in the Departments of Horticulture, Soil, Water & Climate and Agronomy & Plant Genetics. He will continue his *Aphanomyces euteiches* research and expand into other disease problem areas.

Dr Jon F. Powell, Assistant Professor. This September 1 marked the completion of my first year with the Department of Plant Pathology. Much of my effort over this past year has focused on getting laboratory activities up and running along with welcoming my first graduate student, Shawn Bernick. Most of the research that has been started this year has been conducted in collaboration with Dr Don White of the Horticulture Department and Dr Nancy Ehlke of the Agronomy & Plants Genetics Department. During this first year I have had the opportunity to make presentations to a range of audiences including the APS annual meeting in Montréal, the United States Golf Association statewide meeting in Minnesota, the Minnesota Turf and Grounds Foundation Annual Conference, and several presentations to Master Gardeners. This has been a good year for diseases of turf which has presented many opportunities for me to serve as a resource for turf managers to provide disease diagnoses (both on-site and submitted samples). My role in the turf community has been developed through efforts in conjunction with the Minnesota Golf Course Superintendents Association, membership on APS's newly formed Turfgrass Pathology Committee, and membership on the board of the Minnesota Turf and Grounds Foundation. Plans are underway to develop an annual turfgrass field day to be held here at the St. Paul campus to expand the relationship between turfgrass

researchers at the University and turfgrass managers throughout the state.

Dr Deborah A. Samac, Associate Professor, USDA-ARS-Plant Science Research. The research in my lab using biotechnology for alfalfa improvement has expanded significantly during the past year. With the goal of increasing the use of alfalfa in US cropping systems, we are using molecular genetic techniques to increase aluminum tolerance in alfalfa, produce a high value biodegradable plastic polymer in alfalfa leaves, increase resistance to nematodes and fungal diseases, and increase digestibility of alfalfa for ruminant animals. With new graduate student Claudia Castell, we are investigating the genetic and pathogenic diversity of the spring blackstem fungus, and with Linda Kinkel, I continue to investigate biological control of alfalfa diseases. I have recently become active in the International Seed Testing Association, helping to develop an international standard phytosanitary test for the alfalfa bacterial wilt pathogen in alfalfa seed. We have also recently entered the field of genomics research and are isolating expressed sequence tags from pathogen-infected leaves and roots of *Medicago truncatula*, an annual relative of alfalfa. And, after years of saying I would, my lab group made sure that I rode the ejector seat at the Minnesota State Fair. What a ride!!! I will continue thrill-seeking by hiking the Grand Canyon from rim to rim in October in a 5-day backpacking and birding trip.

Dr Carol E. Windels, Professor, Northwest Research and Outreach Center. Since the last issue of the *Aurora Sporealis*, most of my professional involvement has focused on serving as president of the American Phytopathological Society (APS). My term spanned nine months: from the end of the annual meeting in Las Vegas, Nevada in November 1998, through the annual meeting Montréal, Québec, Canada in August 1999. Major responsibilities of the president are to provide leadership and supervision of all APS affairs and to establish policy for conducting society business - with the assistance of the council, the executive vice-president of APS headquarters, and others.

Serving as APS president was a very challenging, enriching, productive, and gratifying experience - and considerable process was made in many APS activities. Some significant landmarks achieved include: revising and approving the new APS Strategic Plan (a blueprint for the next 4-5 years), developing an Implementation Plan based on goals and objectives of the APS Strategic Plan, advancing the development of APSnet III and a proposed electronic journal (*Plant Health Progress*), merging the APS Foundation into APS, approving a wood import resolution, expanding media coverage for the 1999 APS/CPS meeting in Montréal, implementing page charge reductions for *Phytopathology* and *Plant Disease*, and formalizing a joint meeting of APS with the Society of Nematologists and the Mycological Society of America in 2001 in Salt Lake City, Utah. These achievements, and other ongoing projects and initiatives, are the result of the enthusiasm, creativity, energy and dedication of APS members and headquarters staff. These have been fruitful partnerships and as a result, real success stories!

Examples of my other activities include: making many appointments and writing letters to incoming and outgoing members of various boards, offices, publications, affiliates,

division officers, etc.; forming, guiding, and dissolving various ad hoc committees; providing input and comments on major issues including the proposed EPA Plant Pesticide Rule, Freedom of Information Act, various items in the Federal Register that affect plant pathologists; and keeping membership informed by writing monthly columns in *Phytopathology News*. Society business also meant travel to meetings held at Tennessee, North Carolina, Maryland, Washington D.C., St. Paul and other locations.

My sincere gratitude is extended to APS members, officers, councilors, and headquarters staff, who made my term so enjoyable and productive. It has been a privilege and honor to serve as president of APS. Thank you for the opportunity.

Dr Nevin D. Young, Professor. In a busy year, Dr Young's lab began work on two National Science Foundation-funded genomics projects focused on soybean and the model legume, *Medicago truncatula*. Nearly everyone in the lab attended the annual Plant and Animal Genome conference in San Diego last January, presenting or co-authoring seven posters and talks. Later in the year, Joann Mudge completed her PhD in the plant breeding graduate program with Dr Jim Orf as co-advisor. Dr Young continued to collaborate closely with the National Center for Genome Resources (NCGR) in Santa Fe, New Mexico. He also presented a full day workshop at this year's APS meeting in Montréal along with Dr Dariush Danesh, and attended a Food and Agriculture Organization meeting on "Genomics and Germplasm." With the transition to semesters, Dr Young has recently initiated a new course entitled, Plant Genomics. This is part of the University's growing commitment to the field of genomics and bioinformatics.

Dr Richard J. Zeyen, Professor. At the annual award's program this spring Dr Zeyen received two awards, a Teaching Award, the first ever awarded for teaching in the department and presented by the graduate students in plant pathology: "With our appreciation for his dedication to creative and effective teaching methods and for his concern for each of his students"; and a Distinguished Service Award, presented by the department. He was a visiting research scientist - "Cell Defenses of Gramineae Against *Blumeria graminis* Attack" at the Institute for Grassland and Environmental Research, Aberystwyth, Dyfed, Wales, UK from May 20-June 5, 1999. He was invited to present "Chemical Elements in Epidermal Cell Defense of Cereals Against *Blumeria graminis*" for the Symposium on the Biochemistry of Cell Defenses - Joint American and Canadian Phytopathological Society Meeting, Montréal, Canada, and "Papillae and Localized Inorganic Chemical Elements in Defense" at the First International Powdery Mildew Conference, Avignon, France. He continues as chair of the Microscopy and Imaging Consortium, St. Paul campus of the University of Minnesota. This consortium links all the advanced microscopy and imaging facilities in the Colleges of Biological Sciences; Veterinary Medicine; Agriculture, Food & Environmental Sciences. This year he has worked on a potential physical consolidation of the MAES Cooperative Electron Optics Facility and the Microscopy and Imaging Center in the College of Biological Sciences.

YARD AND GARDEN CLINIC (FORMERLY THE DIAL U CLINIC)

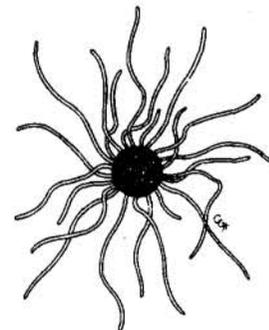
by Chad J. Behrendt

The Yard and Garden Clinic, established on April 15, 1998, after one year of operation appears to be running smoothly. The former Dial U Clinic is now a component of the larger Yard and Garden Line. This menu-driven phone system provides information on gardening, landscaping, insects, plant disease, soil testing, water quality, and animal pests through one toll free number (888-624-4771 or 612-624-4771 in the metro area).

A variety of materials including bookmarks, posters, phone menus, and point of sale materials for retail stores have made using the Yard and Garden Line user-friendly. These materials can be obtained by calling the Yard and Garden Line Project Coordinator at 612-625-5232. As a result of these materials increasing public awareness, the volume of calls has increased over the last year. The Yard and Garden Line coordinator and staff conducted this public relations effort.

Crystal Floyd (technician) and Chad J. Behrendt (supervisor) staff the plant pathology section of the clinic. Some of the more frequent problems diagnosed by the clinic this year included apple scab, oak anthracnose, oak wilt, and necrotic ring spot on turf. A variety of environmental problems were also diagnosed including environmental injury to white spruce (loss of needles from the top half of the tree), and oaks (oak tatters). These environmental problems were the result of the unusual temperatures in December (60°F) and an unusual spring.

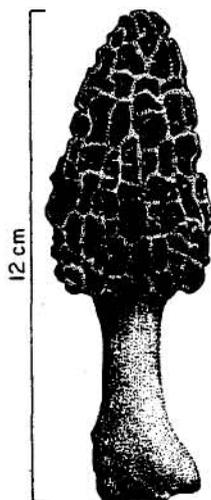
A continuation of last year's "Bugs and Blights" workshop was conducted in greater Minnesota and again in the metro region. These workshops were designed to help train Master Gardeners and county agents accurate diagnostic techniques. Nine workshops were held. Sciences.



PLANT DISEASE CLINIC

by Sandra L. Gould

The Plant Disease Clinic had an increase in samples again in 1998. With the help of two part-time students, 3900 samples and phone questions were processed. The increase in samples was mainly due to an increase in ELISA tests for impatiens necrotic spot virus and tomato spotted wilt virus on greenhouse crops and an increase in grain storage samples. During the winter season, the staff performed greenhouse bioassays for *Aphanomyces* root rot and Rhizomania on sugar beet soils. Soil samples were also processed for the golden nematode for a Minnesota Department of Agriculture survey. A few changes occurred in 1998-99. With the retirement of Dr Stienstra, Dr Meronuck was named the faculty advisor for the clinic. We are also in the process of installing a new data entry and retrieval system.



PLANT DISEASE HERBARIUM

by James V. Groth

The much neglected Plant Disease Herbarium will get a new life when it will soon be moved and combined with the fungal herbarium located in the Department of Plant Biology. A grant was obtained from the state LCMR (Legislative Commission on Minnesota Resources) fund to purchase cabinets, a computer and help to develop a database on holdings of the combined fungal herbaria. Moving all of the approximately 55,000 specimens will entail a period of freezing to kill insects. Collation and computer access will be the biggest tasks in the move. The combined herbarium will rank with the largest in the country, and will be particularly strong in rust collections. Our rust holdings were recently upgraded and increased by Dr John McCain, a rust expert who came to us from the Arthur Herbarium at Purdue. The Plant Biology Fungal Herbarium contains the important Holway collections. Curating the herbarium will be Dr David McLaughlin. To maintain contact with the collections, Jim Groth will have a part-time appointment in the expanded Bell Museum,

and will curate the plant disease specimens. The herbarium has been maintained for years in the old library space in Stakman Hall, after it had been resurrected and reorganized by Dr Elwin Stewart in the late '70s. Unfortunately it did not enjoy a great deal of use, partly because access was limited due to a lack of resources. This move should remedy some of these problems.

FAIR PLANT PATHOLOGISTS

by Linda L. Kinkel

The Department of Plant Pathology was again well represented at the Minnesota State Fair. This year, the University of Minnesota acquired new digs at the fair, and we were lucky to be part of a newly renovated maroon and gold building in the center of fair action on Dan Patch Avenue. Drs Kurle, Blanchette, Meronuck, and Kinkel all staffed the COAFES booth and answered countless questions on tree diseases, home economics, swine confinement facilities, and other broad-ranging topics (some with more accuracy than others). Though we had a tough time competing with the athletics folks (an air-conditioned parlor showing continuous football highlights) and with the live birds on display by the Raptor Research facility, we held our own with an endless supply of free water. The booth was very professionally put together by COAFES public relations staff, and included a computer connection to the Internet - permitting us to highlight our own department's web pages when we were staffing the booth. In addition to being an enjoyable experience, the fair offers a great way for us to let Minnesota know what we do. Stop by and see us next year!

MOROCCO COLLABORATIONS

by Linda L. Kinkel

Andy Ryan traveled to Morocco during October 1998 to initiate a collaborative research effort between the laboratories of Drs Linda Kinkel and Fatmi M'Barek (Complexe Horticole Agadir IAV Hassan II). During his visit to Morocco, Andy instructed Moroccan personnel in techniques for studying pathogenic *Streptomyces scabies*. He stayed in Agadir, in the southern part of Morocco, for much of his visit, but also visited the Loukos region in northwestern Morocco, which is the primary potato production area in Morocco. Potato scab has become a very serious disease in Morocco, especially in northern seed production areas. Dr Kinkel's lab has studied the epidemiology and biological control of potato scab, and continues to focus on management strategies for reducing pathogen populations and disease in the field. The joint Minnesota Morocco effort will focus on evaluating the prospects for scab biocontrol using US and Moroccan antagonists in Moroccan soils and on quantifying the density and aggressiveness of pathogen populations in soils relative to disease development and biological control in both Minnesota and Morocco. The collaboration is being furthered by the recent arrival of Mr. Mohammed Bougsiba to Dr Kinkel's lab. Mr. Bougsiba is a research technician in Dr Fatmi's lab, and will stay in Minnesota for one month.

UNIVERSITY OF MINNESOTA

Department of Plant Pathology



Mission of the Department



Faculty and Research Interests



About the Department



Graduate Education



History of the Department



Other Departmental Information



Current Research Areas



Alumni of the Department



Graduate Student Post-Degree
Employment



Graduate Students



USDA, ARS Cereal Disease Laboratory



USDA, North Central Forest Experiment Station

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