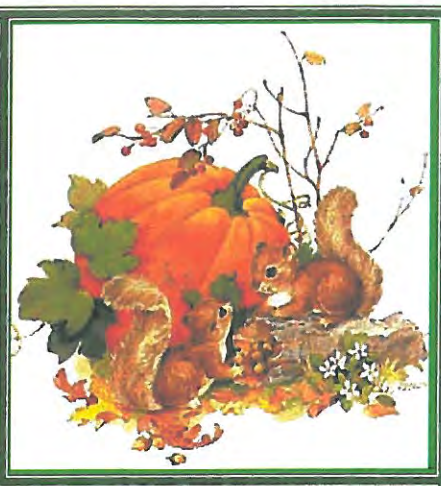
Plant Science Says



October, 2005

Vector/Virus Disease Workshop, Great Plains Diagnostic Networks Annual Meeting
By Nina Zidack

Nina Zidack

F rom September 27-30, Plant Science and Plant Pathology and Entomology welcomed 35 diagnosticians and Extension Specialists to MSU for an Insect Vectored Disease Workshop and business meeting of the Great Plains Diagnostic Network (GPDN). The Insect Vectored Disease Workshop featured Mike Ivie on mite preservation for identification, Will Lanier on development of a Lucid key for insects, Nina Zidack on ELISA techniques for plant disease diagnostics, Eric Gillitzer on PCR techniques for plant disease diagnostics, Sue Brumfield on Electron Microscopy and a review on the discovery of Barley Stripe Mosaic Virus, and Mark Young on viruses as plant pathogens and important virus diseases in Montana. A section on leaf hopper ID and diagnostics of phytoplasmas was conducted by Astri Wayadande of Oklahoma State. The most popular feature of the workshop was a dinner prepared by Jack Riesselman, roving Plant Pathologist and entertainment specialist. After dinner, the crowd thoroughly enjoyed a performance by the Ringling 5.

Will Lanier

The workshop was organized to bring together insect and plant disease diagnostic specialists in the GPDN together in a mutually beneficial learning environment. The GPDN is a region of the National Plant Diagnostic Network, the plant component of The Animal & Plant Disease and Pest Surveillance & Detection Network, which was established by the Secretary of Agriculture in the Cooperative State Research, Education, and Extension Service (CSREES) to develop a network linking plant and animal disease diagnostic facilities across the country. The network is a collective of Land Grant University plant disease and pest diagnostic facilities from across the United States.

The mission of the network is to enhance national agricultural security by quickly detecting introduced pests and pathogens. This will be achieved by creating a functional nationwide network of public agricultural institutions with a cohesive, distributed system to quickly detect deliberately introduced, high consequence, biological pests and pathogens into our agricultural and natural ecosystems by providing means for quick identifications and establishing protocols for immediate reporting to appropriate responders and decision makers. The network will allow Land Grant University diagnosticians and faculty, State Regulatory personnel, and first detectors to efficiently communicate information, images, and methods of detection throughout the system in a timely manner. Lead universities have been selected and designated as Regional Centers to represent 5 regions across the country. Regional Centers are located at Cornell University (Northeast region), Michigan State University (North Central region), Kansas State University (Great Plains region), University of Florida at Gainesville (Southern region), and University of California at Davis (Western region).

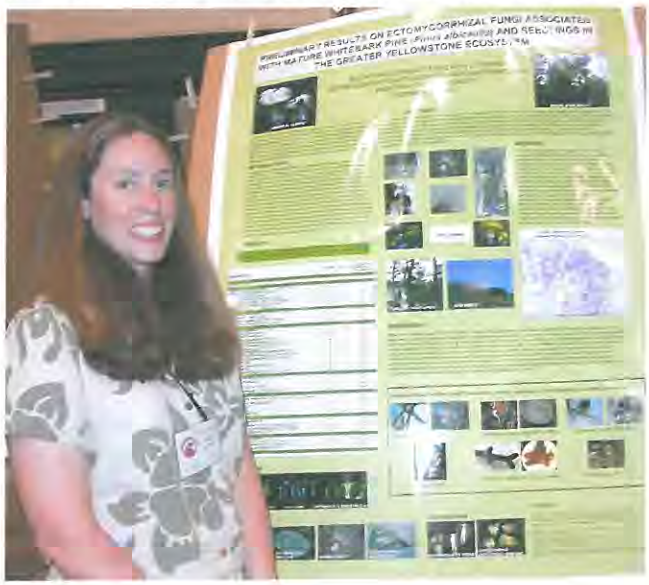
Summer Mycological Activities: from the Tropics to the Arctic!
by Cathy Cripps

Last August my airplane ticket read: Bozeman, Hawaii, Norway, Bozeman! How did that happen! Well, this year the Mycological Society of America held its annual meeting in Hawaii in conjunction with the Japanese Mycological Society. What a great venue for joining with our Asian colleagues to exchange information on fungi! Hawaii was selected as the perfect "half-way" point in the middle of the Pacific Ocean. The meeting was held at the University of Hawaii campus in the quiet town of Hilo on the eastern end of the Big Island. This location helped avoid the usual tourist traps and giant high rise beach hotels. My husband and graduate student Kate Mohatt joined me on this leg of the trip.

On takeoff from Seattle we were instantly flying over rolling ocean for hour upon hour, which gave me a lasting impression of just how isolated these islands really are strewn like tiny green jewels in the middle of the Pacific. How do the inhabitants get their gas? How is electricity produced? Where does the garbage go? Island living must be claustrophobic to the uninitiated! The imagined natives bearing fresh flower lei's never materialized on our arrival; instead we found ourselves deposited in a small, hot, sticky airport crowded with people---and on the wrong side of the island! A 3 hour drive brought us to the shaded Shangri-La of the Dolphin Bay Inn nestled in a residential area, complete with shaded verandas, tropical vegetation, and avocados and papayas free for the picking. The incessant croaking of the coquis sounded most of the night and the only cooling was from a slow ceiling fan. Coquis are small brown non-native frogs that have invaded the islands that whistle at 80-90 decibels (comparable to a lawn mower). The sound can either lend ambiance to a tropical evening or drive you crazy.

The meeting was a combination of exciting talks, poster sessions, workshops and a plethora of tropical food. Since there were no restaurants in the vicinity, evening meals were provided in the form of Hawaiian poo-poos (appetizers) and huge mounds of noodles and salads. As the councilor of Ecology-Pathology I was required to spend my first sunlight hours in an all day meeting of the MSA council gazing longingly out the window at the ocean view. I had the "opportunity" as Chair of the Biodiversity Committee to develop one of four main international symposia. It was titled: "Mycobiota of the Pacific Rim" (not exactly my area of expertise) and featured MSA speakers on Hawaiian fungi led by Dennis Desjardin and Don Hemmes (authors of *Mushrooms of Hawaii*) interspersed with Japanese presenters on Asian island fungi. The session ended with a rousing talk by Ron Peterson who posed the question "What is a Biological Species for Fungi?" followed by denigration of those who thought it had something to do with clades!

Highlights of the meeting were Fungi and Insects, Advances in Fungal Morphogenesis, Advances in Fungal Phytogeography, Industrial Applications of Fungi, Fungal genetics and Evolution, Fungi of High Latitudes and an excellent session on Mycorrhizae chaired by T. Bruns of Berkeley. I presented on the genus *Amanita* in the high alpine areas of the Rocky Mountains, including a new species from Montana and the first record of *Amanita nivalis* (an arctic species with a circumpolar distribution) from the very southern reaches of the Rockies in the San Juan Mountains of Colorado (it was strange to be speaking on cold climate



fungi in Hawaii). Kate was able to attend the meeting through a substantial MSA Mentor Travel Award. She presented her preliminary results on the Mycorrhizal status of Whitebark pine (a tree in peril) for the Greater Yellowstone Ecosystem at a lively evening poster session. Mid-week, a field trip to the lava fields of Volcanos National Park (where it was cold enough for coats!) ended with a walk through deep lava tunnels and dense tropical vegetation. Native ectomycorrhizal fungi are absent from the islands (no native host trees), but we did see a few small decomposer fungi and the ubiquitous *Rhodocybe* with a long Hawaiian species epithet which I can't spell. Earthstars (*Geastrum*) are plentiful and like the Hawaiian silverswords (or Darwin's finches in the Galapagos), are noted for their island diversity. The meeting culminated in the annual Mycological Auction where hand drawn plates of ascomycetes by a famous mycologist went for over $1500 and a tie with a mushroom pattern was bid out at over $300! This event is a good way to recycle mycological material, memorabilia and kitsch and to make money for the organization. After 5 days on the island and a brief sojourn on the beach (Kate even managed a day of diving), I flew off to Norway on August 5th.

Here, I attended the International Symposium (and workshop) on Arctic-Alpine Mycology (ISAM 7) funded by a faculty development grant. It was quite a change from the tropics, but a day of adjustment in Oslo before I headed by train to the field station at Finse helped readjust my internal time clock and reset my temperature gage. It seemed sudden…flying back across the Pacific and then the Atlantic…to enter a world of ice and snow (more to my taste than tropics). The symposium was limited to 25 researchers of Arctic Alpine mycology, and consists of daily travels into the field for collecting and evening presentation sessions. Housing at the field station was cozy with all wood walls and furniture and sparse accommodations (no napkins ever and one towel the size of a dish rag). The lab was equipped with microscopes and dryers and was crowded but pleasant

with international camaraderie. Arctic-alpine researchers from about 12 countries, including Norway, Denmark, The Netherlands, Greenland, Japan, Romania, Estonia, Russia, France, Austria, USA, Finland and Sweden attended. As the only North American, I was able to glean a sense of how Europeans view U.S. politics when they forgot I was around. One of the memorable field trips from Finse was to the Bläu (blue) Glacier, a spectacular monolith of ice reached by a long hike of boulder-hopping and crossing swinging bridges with no hand rails over rushing rivers. The open tundra proved fertile ground for collecting, and each day more Inocybes (little brown mushrooms of great interest to me) were revealed hidden deep in moss or lichen and below miniature arctic willows. Each attendee had a specific interest such as the snow mold *Typhula* (Tomatsu), *Russula* (Pierre), *Cortinarius* (Ursula and Torborn), *Mycena* (Steen), *Galerina* (Gro) and several of us were experts on Inocybes! It is not often I get to talk about this genus in interested company (my husband tries, but well….). In one area that contained *Dryas octopetala*, a lot of the species were similar to those of the southern Rockies! All in all, I returned with about 100 described collections. The final dinner culminated in a layout of traditional Norwegian food including flatbread, boiled potatoes, salmon, venison, mutton sausage, goat cheese, salad, and a pile of *Rozites caperata* (the gypsy mushroom). Perhaps I should have limited my alcohol intake that last evening (was it aquavit?). The next thing I knew, I was voted in as president AND in charge of organizing the next ISAM meeting (ouch) plus editing and finding a publisher for the next ISAM book (didn't I vow no more books after the last one?). Sigh. Well, I guess it is all in the light of developing international relations. The interaction with other mycologists was energizing and the fungal treasures will hopefully be of use in deciphering the distribution of our alpine species here. Travels are exciting and valuable, but our Montana mountain living is still pretty sweet.

Malian Graduate Students

As part of a three year USAID funded Ag-BioTech Program, six mid-level scientists have come from Mali, West Africa to pursue graduate studies at MSU. All the participants have MSU faculty mentors. The PI for the program is Florence Dunkel.

Assa Kante

Madame Kante is a food scientist with an M.S. from Texas A&M. She currently is Director of Training for all of l'Institute d'Economie Rurale (IER) in Mali (this is similar to the USDA here in the U.S.). She has been chosen as an ALO participant to obtain training in evaluation of adult education in order to direct the innovative outreach portion of the Agribusiness

Entrepreneurial Incubator Center for Mali. She is pursuing graduate studies at MSU in Adult Education. Assa is accompanied by her son, Karim who is five. Karim is attending a local Montessori program.

Aissata Thera
Madame Théra is an IER plant pathologist with a M.S. in plant protection from the University in Havana, Cuba. She has worked for many years with the tomato yellow leaf curl virus management in Mali and other IPM programs. She has been chosen as an ALO participant to obtain training in developing and directing a self-sustaining disease-free seed potato program in collaboration with local farmers. She is currently enhancing her English with the ACE Institute. Aissata is accompanied by her 3 month old daughter, Hawa.

Keriba Coulibaly
Mr. Coulibaly is a IER scientist working with seed selection and seed technologies at the Sikasso station. He was chosen as an ALO participant to obtain training in plant-based projects related to seed development and technology. Keriba will determine the usefulness of these technologies in Mali. He is currently enhancing his English with the ACE Institute.

bdoulaye Camara
Mr. Camara is an IER plant pathologist with a M.S. in plant protection from the University in Havana, Cuba. He has worked for many years with the tomato yellow leaf curl virus management in Mali and other IPM programs. He has been chosen as an ALO participant to obtain training in developing and directing a soil microbiology program in collaboration with the soils unit at IER-Sotuba and local farmers. Mr. Camara will work collaboratively with Dr. Stefan Jaronski USDA ARS-Sidney and the microbiology program on campus. It is hoped that some of Abdoulaye's results will be useful to the Agribusiness Center in Mali related to information on soil fertility, the effect of neem on soil microbes, and the role of soil microbes in plant crop production. He is currently enhancing his English with the ACE Institute.

Abdoulaye Camara and Adama Berthe

Adama Berthe
Mr. Berthe is a professor of plant biotechnology (University of Bamako, Institute of Agriculture) subspecializing in disease-free tissue culture techniques, particularly for seed potatoes. He has been chosen as an ALO participant to obtain training in developing and directing a self-sustaining disease-free seed potato program in collaboration with local farmers. Currently he is refining his English at the ACE Institute.

Sidy Ba
Mr. Ba is an instructor in agricultural hydrology (University of Bamako, Institute of Agriculture), particularly water hydraulics. He has been chosen as an ALO participant to obtain training in Environmental Engineering and Business Management in order to assist in development of an Agribusiness Center in Mali. Currently he is refining his English at the ACE Institute, and is also studying environmental engineering related to water quality.

Visiting Post Docs from Egypt
Sameh El-Sayed Hassanein
My name is Sameh El-Sayed Hassanein. I am a Ph.D. student from Egypt. I am here on a joint project between the Agricultural Genetic Engineering Research Institute (AGERI), where I work as an assist. researcher, and the Plant Sciences and Plant Pathology Dept. MSU. I am working in Dr. Sherwood's Lab. Dr. Thamir Alniemi is

supervising my research. I am doing research on wheat transformation with genes related to fungal resistance in wheat. Till yesterday I was enjoying the warm weather in Bozeman, I didn't expect to see the snow so soon. It seems like I will be able to enjoy some winter weather before I go back home at the beginning of December. I am enjoying working and living in Bozeman so much except missing my lovely wife and my 6month old daughter Basma.

I am enjoying my stay in Dr. Sherwood's lab - learning, getting wonderful guidance and help in my research and having the great company of the people of the lab. Having this much fun in this Department, I definitely would like to come back again if I have the opportunity for Post Doc training.

Ahmed Shorky

My name is Ahmed Shokry. I am here on a joint project between the Agricultural Genetic Engineering Research Institute (AGERI) where I am working as a researcher and this department. I am working in Dr. Bill Dyer's Lab. I am also doing some experiments in Dr. Tom Blake's Lab. I am doing research on identification and characterization of some barley ESTs related to salt stress. I am also trying to make a genomic library from barley. I am enjoying my stay in Dr. Dyer's Lab. Learning and getting wonderful guidance and help in my research, especially when I have great company like the research groups in the Dyer and Blake Labs.

Actually, yesterday was my first experience with snow as it does not snow in Egypt. I enjoyed it very much. I am enjoying working and living in Bozeman so much except for missing my family. My hobbies are reading, swimming and listening to music.

Grants

David Sands, "*Enzymatic Production of High-Grade Motor Oil Using Common Vegetable Oil(s)*", Charles A. and Anne Morrow Lindbergh Foundation.

Dr. David Sands, Montana State University

"Producing Biolubricants from Common Vegetable Oils in Order to Reduce Costly and Toxic Petroleum Motor Oil Use"

Approximately 8 billion quarts of motor oil lubricants are consumed in the United States annually. Nearly all of it is refined from petroleum. Reducing our dependency on petroleum and non-renewable energy sources would benefit the environment and the consumer. However, the current process for converting vegetables into biolubricants is costly and the chemical techniques cause considerable pollution, negating the positive benefits of bio-based materials. Using state of the art molecular techniques and mushrooms as the host organism, Dr. Sands plans to produce an enzyme that can convert ordinary vegetable oils like canola, safflower and others into special high value bio-based lubricants like axel grease and motor oil. This novel and non-toxic bio-refining technology will enable the oil to be produced at a lower cost, reducing environmental pollution, strengthening our rural agricultural economy, and offering the potential to move our fossil fuel dependent world toward a system where oil can be sustainably and renewably produced through agriculture.

Mark Young: "*Characterization of Novel Viruses from High Temperature Acidic Enironments*", Goddard Space Flight Center.

"2005-06 Plant Viruses as Platforms for Biomaterials", Scripps Research Institute.

Barry Jacobsen, "*Commercialization of BmJ as a Broad Spectrum Microbial Plant Disease Control Agent*", Montana Board of Research and Commercialization.

Alice Pilgeram, "*Camelina sativa: A low-input oil crop for omega-3 culinary oil and animal feed*", Montana Board of Research and Commercialization.

"Vegetable oils as feedstock for fuel cells and innovations", MSU Biobased Institute.

Chaofu Lu, "*Canola Oil Fuel Cell*", MSU Office of Research

Norm Weeden, "*Evaluation of Fusarium Root Rot Tolerance in the Afghanistan Pea and Pisum Staivum SSP*", USDA ARS.

Tom Blake, "*2005-06 Feed Barley for Rangeland Cattle*", USDA/CSREES.

Patents

Strobel, G. - # 6,911,338 on Muscodor albus and its uses and #6,926,892 on serratamolide and oocydinA and its agricultural applications.

Book Chapter:

Strobel, G.A. Daisy, B.H., Castillo, U., and Harper, J. 2005. Natural Products ed. L Zhang and A. Demain. Natural Products from Rainforest Endophytes. Humana Press Book Chapter. p.329-352.

Bob's Byte

By Bob Johnston

Remote desktop – an easy way to connect to your office computer if you have a 256K or faster internet connection.

If you have a need to connect to your office machine to access files, email or programs remote desktop is the easy way to do this. Once you connect to your office computer your home computer will display your office desktop and it appears as if you are actually working in your office.

To setup a remote desktop connection on a Windows XP machine – do the following:

On your office machine -
right click on my computer
select properties
click on the remote tab
put a check mark in the box marked allow users to connect remotely
click on the computer name tab and make note of the full computer name –
It will look like this – PlantXX.msu.montana.edu
click on ok and close out of all open menus

To access your computer from home – do the following:

click on start and select programs
click on accessories and select communications
select remote desktop connection
enter your full machine when asked
your screen should now go blank with a yellow bar at the top indicating that you have access to your computer. you will get a logon screen asking for a user name and password. Use the name and password you normally use when you logon to your machine.

That's all there is to it. When you are ready to exit back to your home computer, just click on the X in the yellow bar at the top of the screen. If you need to move back and forth between computers, just minimize the connection to your office machine by clicking on the – on the yellow bar.

Why do potatoes sprout and how can I keep them from doing so?

By Bob Gough

The potato tuber is a modified stem and, as such, it has formed buds along its length. These we call the "eyes". The buds remain in a state of dormancy for about 3 months after digging. This is characterized by very low respiration and minimal production of heat and water vapor. The length of dormancy is cultivar dependent but, in general, early maturing cultivars such as 'Norland' and 'Superior' have a very short dormancy period, while late maturing cultivars, such as 'Russet Burbank' have a long dormancy period.

During the latter part of the storage period, the tubers begin to break dormancy, its respiration rate increases and internal changes lead to rapid cell division in the growing points, resulting in sprouting. Metabolic activity increases, resulting in increased oxygen demand, generation of much heat, and emission of water vapor. In other words, the potatoes go to pot quickly, but all of this is normal.

To prolong the life of your tubers, store them at about 37 to 39°F and 90 to 95% relative humidity. Inspect them regularly and cull soft or sprouting ones for immediate use. Commercial sprout inhibitors are available but I don't recommend them for the homeowner. Also, preliminary investigations by USDA have shown that the essence of jasmine will inhibit potato sprouting. More work needs to be done, but I am going to try hanging a jasmine-scented air freshener near my potatoes to see if it will reduce sprouting.

By the way, if you plan to use your potatoes for chips or sliced fried potatoes, don't store them below 50°F. They will deteriorate more quickly at these higher temperatures, but spuds stored at lower temperatures will convert much of their starch back into sugar, which will caramelize in the hot oil used for frying and give you a dark brown or black chip.

Recipe of the Month

Fall Salad with Cranberry Vinaigrette

1/2 cup cider vinegar
1/4 cup cranberries
1/4 cup olive oil
2 teaspoons white sugar
1/8 teaspoon kosher salt

1 pinch freshly ground black pepper
2 heads romaine lettuce - rinsed, dried, and torn into bite-size pieces
2 medium heads Belgian endive - washed, dried and chopped
red Anjou pears
1/2 cup toasted walnuts, chopped
1/2 cup crumbled Gorgonzola cheese

In a saucepan, combine vinegar and cranberries. Cook over medium heat until cranberries soften. Remove from heat; add olive oil, sugar, salt and pepper. Place in blender and mix until smooth. Refrigerate until chilled. Core and julienne one pear, core and dice the other. In a large bowl, combine the Romaine lettuce, endive, diced pears, walnuts and Gorgonzola. Toss and drizzle with enough dressing to coat. Divide among salad plates and garnish with julienned pear. Top with any additional walnuts as well.

October Birthdays

Hope Talbert	05
Bob Sharrock	11
Jamie Sherman	20
David Parrott	27

A New Meyer!

Congratulations to Fletcher and Julie Meyer! Their son, Ethan James, was born September 13 at 6:00 p.m. He weighed 7 lbs, 10 oz and is 20 inches long.