Plant Science Says

Happy Valentine's Day!

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New Extension Entomologist

Dr. Kevin Wanner is joining our faculty in April as Extension Entomologist. He comes to us from the University of Urbana-Champaign in Urbana, Illinois. His lab and office will be in Marsh Lab. We will hear from Dr. Wanner in our April newsletter.

Welcome to the Department, Dr. Wanner!

CCX Montana New Release
By Ron Larson

Employees of the Montana Seed Growers Association (MSGA) recently conducted field inspections to verify that land enrolled in the Chicago Climate Exchange (CCX) carbon credit trading program meets the requirements of this expanding market. MSGA provided the verification services for AOSCA , the Association of Official Seed Certifying Agencies. These field inspections are conducted to verify that the landowner is successfully capturing carbon from the atmosphere by maintaining a no-till cropping system or approved grassland cover. Land enrolled in the CCX programs earns annual payments at rates based on the amount of atmospheric carbon it sequesters.

"Working with Montana Seed Growers Association highlights the increased efficiency our system brings to this project by managing it from a central point of contact through the AOSCA office," said Chet Boruff, CEO of AOSCA, located in Moline, IL. "AOSCA delegates responsibilities regionally across the country to capable people with expertise in field inspection such as the employees of MSGA."

This program is currently available in roughly the eastern half of Montana (28 counties are currently eligible). Landowners who enroll in the agricultural carbon credit program through CCX commit to no-till farming practices and permanent grassland establishment. These practices are credited with capturing and sequestering a certain amount of carbon per acre in each of the CCX zones across the United States. The landowner is then paid annually by CCX for that amount of carbon storage, based on a five year contract time frame.

For more information on this program, contact Ron Larson at the Montana Seed Growers Association, the AOSCA office, or the Chicago Climate Exchange. For a general overview of Chicago Climate Exchange services, their website is located at www.chicagoclimateexchange.com.

Research, Extension and the Sites in Scotland
By Mary Burrows

In December, I visited Edinburgh, Scotland and the Scottish Crop Research Institute (SCRI) in the village of Invergowrie, near Dundee. I went to visit my old friend Peter Palukaitis, who was in town briefly before heading to India, and to learn more about agricultural research and extension in Europe. I visited with a number of different people, including virologists Lesley Torrance and Stuart MacFarlane, and aphid ecologist Brian Fenton. I learned that instead of trying to eliminate all weeds, researchers such as Roger Humphrey are actually measuring the biodiversity that weeds contribute to the landscape and subsequent pest control. I learned about LEAF (Linking Environment And Farming) from Nick Birch, a program farmers can join to encourage integrated farming practices and which strives to educate the

public on where their food comes from. They do this via brand marketing, demonstration farms and innovation centers (http://www.leafuk.org/leaf/). The most innovative extension program I learned about was The Living Field (http://www.scri.ac.uk/livingfield/), which Geoff Squire started a number of years ago to teach kids about science, genetically modified organisms, and biodiversity. His theory is that kids will teach their parents about environmental stewardship and where their food comes from. They have a garden near SCRI with farm animals, plants, and numerous activities.

Narcissus bulbocodium, an alpine daffodil.

Dionysia, a cushion flower blooming in the Alpine House.

Of course while visiting Edinburgh I saw the sites: Hollyrood Palace, Edinburgh Castle, The National Galleries, and best of all, the Royal Botanic Gardens. Even in the dead of winter the garden was blooming! They have a series of 9 glasshouses with different ecological zones, including a tropical palm house with a really incredible orchid collection. Also fascinating was the alpine house, with hundreds of very small and delicate plants, many of which were blooming when I was visiting. They keep the alpine plants in glasshouses because their preferred growing conditions do not always match the Scottish climate. Overall it was a fun and productive trip, but I do not recommend visiting in the winter, when it gets dark at 3:00 pm.

The tropical palm house, built in 1834.

Dunkel and Sun attend National Entomology Meeting

Zhitan Sun, PSPP Ph.D. student and Dr. Florence Dunkel attended the national meetings of the Entomological Society of America, San Diego, California, December 9-12, 2007. Zhitan competed for the President's Prize in Section C, Insect Pathology, Microbial control, and Quantitative Ecology with the presentation, "*Fusarium* species cause larval mortality of the wheat stem sawfly, *Cephus cinctus* Norton, in winter wheat". This presentation was co-authored by Dr. David Weaver, Dr. Bill Grey, Dr. Alan Dyer, and Dr. Wendell Morrill. During the meetings, Dr. Dunkel completed her 4-year term as a member of the Editorial Board of the American Entomologist. She represented Section B, Physiology, Biochemistry, Toxicology, and Molecular Biology on the Editorial Board and this year served as Chair.

After the ESA meetings, Dr. Dunkel gave a special seminar, December 13, 2007, for the Department of Entomology at University of California Riverside entitled, "Natural Product

Toxicology using Participatory, Holistic Process."

The Mali Agribusiness *Network*: An Entrepreneurial Incubator Is Launched
By Florence Dunkel

Thanks to Montana State University, their partner, University of St. Thomas-St. Paul MN, and particularly to the faculty and staff of the MSU Department of Plant Sciences and Plant Pathology, The Mali Agribusiness *Network* was launched!

On September 25 “pre-launch” activities began in Mali. Because this *Network* is subsistence farmer, village-based, these activities began in villages. Assa Kante (M.S. in Agricultural Education at MSU 2007) led these demonstrations of how the Agribusiness Network interacts in a holistic, participatory way in two target villages. Observers saw a “slice in time.” Americans and Malians observed the *Network* assisting a women farmers’ cooperative in the village of Zantiebougou meet their holistic goals of US export and high quality for their wild-collected, hand-crafted shea butter. On September 26, observers traveled to the Bambara farming village of Sanambele to watch Agribusiness *Network* members interact with village elders to move closer toward their holistic goal of no more malaria in their village. Former PSPP students Abdoulaye Camara and Keriba Coulibaly were *Network* members participating in this demonstration.

Americans at the Launch and pre-Launch activities included: Dr. Florence Dunkel, PSPP, Director of the USAID project that initiated the Mali Agribusiness Network; Dr. Ada Giusti, MSU Department of Modern Languages; Dr. Dean Drenk, adjunct professor of finance, MSU College of Business; Robert Diggs, information systems instructor MSU-Great Falls College of Technology, retired MSU College of Business; Dr. Ronald Bennett, Dean of the School of Engineering, University of St. Thomas; and Dr.George Ayittey, professor of economics at American University-Washington D.C. and author of *Africa Unchained: Blueprint for the Future.* All Americans and Malians of the entire Accelerated Economic Growth Group at USAID-Mali attended the launching. In addition, representatives attended from most related Malian organizations as well as the international research center, ICRISAT, teachers from the American International School of Bamako, and farmers chosen by their villages of Zantiebougou and Sanambele.

The actual launching event was held from 9 a.m. to 5 p.m. at the National School of Engineering (ENI) in Bamako, Mali, the capital city. The keynote address “Africa’s Future” was given by the African (Ghanian) author, Professor Ayittey. The rest of the program was entirely by Malians. Presidents of ENI and the national agricultural university (IPR/IFRA), Dr. Moussa Kante and Dr. Fafre Samake, respectively, opened the launching event. Dr. Kadiatou Gamby, national director of Fruit and Vegetable Research for Mali served as moderator. Aissata Thera (PSPP 2007 M.S. graduate in Plant Pathology) gave a presentation as well as Adama Berthe regarding their MSU potato research, training, and their resulting program underway in Mali to develop a disease-free, seed potato industry for Mali. Keriba Coulibaly presented

his legume research results and future plans, Abdoulaye Camara summarized his research skills obtained at MSU. MSU undergraduates and MSU graduate students from Mali provided ten of the 19 posters presented at the poster session.

At the poster session for the network launching, Dr. Florence Dunkel, PSPP Entomology professor with Dr. Nancy Beckage (UC-R), and women farmers of Sanambele chosen by their village to participate in the launching of the Agribusiness Network event in Bamako.

The launching was covered by national Malian TV and international, English-speaking radio. Following the event, Mr. Sidy Ba (MSU M.S. student in Environmental Engineering) and his family hosted a dinner for the US visitors and the *Network* team.

The Mali Agribusiness *Network* mission is to improve quality of life for small-scale Malian farmers. The tools *Network* members are committed to are holistic, participatory process. These tools must value farmer knowledge and be sustainable, scalable, replicable with no foreign aid, only fee-for-services. The motto for the *Network* is "Of Malians, For Malians, By Malians."

These seven Malian *Network* leaders are now hard at work helping their dream become a reality in the first 4 villages. Thanks to a new USDA Higher Education Challenge Grant, these seven are now serving as mentors for our MSU graduate and undergraduate students as they learn and practice participatory, holistic processes at the village level (see also Newsletter article on New Paradigm grant for MSU and its partners).

The *Network* concept was proposed by Dr. Dunkel and a team of MSU faculty in 2004 as a solution to the low success of USAID's program for graduate training of sub-Saharan Africans (AFGRAD) which was abolished in the 1990s. Dr. Dunkel conceived and served as P.I. for the competitive grant which led to the creation of the *Network*. PSPP faculty that made major contributions to its success are: Dr. Barry Jacobsen, Dr. Nina Zidack, Dr. Norm Weeden, Dr. David Sands, Dr. Mike Sun, and Dr. John Sherwood. The *Network* grant was awarded by USAID-Washington via Higher Education for Development (HED). This project was successfully completed September 2007. USAID-Washington made an on-site visit to the *Network* in Mali December 2007 and is now considering the MSU *Network* model for possibly reinstating their graduate training program for sub-Saharan African countries.

Cereal Chemistry Editor's Pick from Dr. Carl Hoseney, Editor-in-Chief

The following article, "Influence of Puroindolines A and B Individually and in Combination on Wheat Milling and Bread Traits", H. W. Wanjugi,[1] J. M. Martin,[1] and M. J. Giroux[1,2] from the November/December, 2007 issue of *Cereal Chemistry* was Editor, Dr. Carl Hoseney's pick.

Endosperm texture in wheat (*Triticum aestivum L.*) is determined by the *Pina* and *Pinb* genes located within the Hardness (Ha) locus on chromosome 5D. We have previously shown that *Pina* and *Pinb* can act alone to produce intermediate-textured grain or act together to produce soft grain. The objective of this article was to isolate the role of these genes.

Tan Receives Ph.D.

Zhitan Sun received his Ph.D. on January 25 , 2008. The title of his thesis was, "The Pathogenicity of *Fusarium* spp. to Wheat Stem Sawfly,*Cephus cinctus* Norton (Hymenoptera: Cephidae)."

Tan's future plans include working on a post doc with Fabian Menalleed, David Weaver and Alan Dyer.

Congratulation Tan!

What's the Buzz?
David Baumbauer

Inspecting a hive

Fifty people will gather in PBB 108 for the fourth annual beginner's beekeeping workshop on February 2nd. Sponsored by MSU's College of Agriculture and the Montana Department of Agriculture, the beginner's beekeeping workshop has proven to be extremely popular with aspiring apiculturists. This year's offering filled by January 11th, attracting participants from across Montana and Northwestern Wyoming.

Sara Baumbauer uncapping a frame of honey

Presenters include Jeff Littlefield from LRES, Dick Molenda from Western Bee Supplies in Polson, MT, Patty Denke from the Department of Agriculture, and Sara and David Baumbauer co-owners of "Bumbler's Bees". The origin of the workshop can be traced back to a conversation I had with Patty Denke in 2003. When I inquired why an aspiring Montana beekeeper had to travel to Washington or Oregon for training, Patty immediately replied "that is an excellent idea, you find a room and handle registration and I'll find the speakers". The rest is history.

Farewell to Bobby Bear

Bobby will be leaving us and starting a new position on February 4 as the Project Manager/Fiscal Administrator for the Vice President for Research Office. In her new position, she will be responsible for the oversight and budgeting of large corporate contracts to multiple departmental PIs working primarily in energy research. She will be located in Faculty Court #11 and can be reached at ext. 6555.

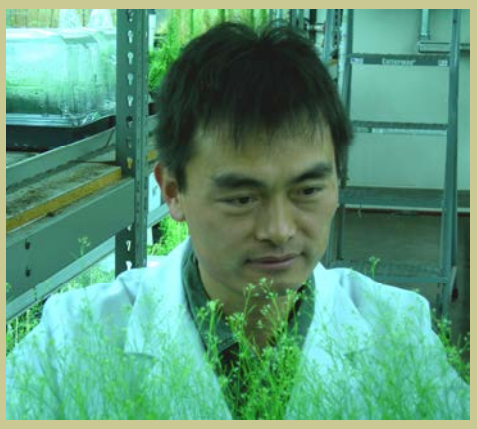
Best Wishes Bobby in your new position!

New Employees
Lance Stott – Li Huang

Many of you may already recognize me, but Irene asked me to tell you all a little bit about myself and what I am still doing here. I am originally from Choteau, MT and grew up on a cattle ranch there, but always seemed to be more drawn to the plant kingdom. I enjoy gardening, home improvement and outdoor activities. I earned a B.S. in Landscape Horticulture degree from BYU-Idaho in 2004 and came here in May of 2005 to work on a Master's degree with Tracy Dougher. I finished that in August and officially graduated in December. SO, I was

applying for jobs and trying to figure out what I wanted to do when I grew up. Simultaneously, Li Huang was looking for a research associate and Alan Dyer was kind enough to refer us to one another. (Thank you Alan!) So, currently I am working with Li and am learning a lot of new things. I will be working on stem rust in Wheat and making sure things run smoothly in the lab. I am finally growing plants in the greenhouse again! I am very excited to remain home in Montana and be here in the PSPP department. Many of you have already assisted me in this new position and I am thankful. Most of you already know me; but, if you don't, feel free to introduce yourself.

Dr. Ren – Chaofu Lu



My name is Zhonghai Ren, a postdoctoral fellow in Dr. Lu's lab. I come from China (mainland), and got my Ph.D. at Shanghai Institute of Plant Physiology & Ecology, Chinese Academy of Sciences. During my first postdoctoral training in UCR, my project was the mapping and cloning of the QTLs related to salt stress in Arabidopsis. Here my research mainly focuses on screening the genes that contribute to hydroxy fatty acid accumulation in transgenic Arabidopsis seeds. In my free time, I enjoy reading the Holy Bible, a book of life. I can get life and what I need to live my life from the word of God.

New Graduate Students

Jill Grenon (Cathy Cripps)

Before graduating from Humboldt State University with a degree in Botany, I spent my life romping and skiing around NH. At Humboldt I discovered many fascinating things including lichens and "Sierra cement" (a vast improvement over "East-coast ice"). After college I worked several years in Oregon and Washington monitoring air quality using lichens. I moved to Montana a few years back and since have lived in various locations working odd jobs, sampling the "cold smoke" (yes, I also mean the beer), and learning new passions such as hunting. Over the past few years the desire to return to graduate school had been growing and growing and growing, and thus here I am, a graduate student of Cathy Cripps, working with fungi and Whitebark pine.

Brekke Peterson (Bill Hoch)

I moved to Bozeman three years ago to attend MSU. I obtained a B.S. in Biotechnology - Animal systems. While at MSU I had the opportunity to work with David Sands and Alice Pilgeram, both of who have been guiding lights in my decision to further my education in plant science. I will be working on camelina with Bill Hoch for my graduate studies.

I am an avid fly fisherman and outdoor enthusiast in my home state of Wyoming. I grew up around Sheridan, Wyoming and went to college there where I majored in microbiology and ceramics. My free time is spent with my dog, traveling, reading, and snowshoeing seeing how we finally have had a winter! During the summer months, I have been a caretaker for Tongue River Reservoir State Park and Rosebud Battlefield State Park in the southeast corner of Montana. Recently I embarked on a soap business adventure

with my mother. I look forward to the next step in my education at MSU.

Grants

M. E. Burrows, “Uniform Fungicide Trial for Fusarium Head Scab Control in Montana Spring Wheat.” US Wheat and Barley Scab Initiative.

F. Menalled, W. Lanier, M. Burrows. “Expansion of the online High Plains IPM guide to include agricultural, rangeland, and wildland weed recommendations.” Western Region IPM Center Addressing Western issues. 2 y.

F. Dunkel, “New Paradigm for Discovery-Based Learning: Implementing Bottom-up Development by Listening to Farmers’ Needs and Using Participatory, Holistic Processes.” USDA-CSREES Higher Education Challenge Grant Program.

Windes, J., A. Dyer, E. DeWolf, J. Petrisko, M. Burrows. “Adapting Existing FHB Models to New Environments: the Potential Threat of FHB in ID and MT.” USWBSI. 1y.

Publications

Jukanti A.K., Heidlebaugh N.M., Parrott D.L., Fischer I.A., McInnerney K. and Fischer A.M. (2008) Comparative transcriptome profiling of near-isogenic barley (*Hordeum vulgare*) lines differing in the allelic state of a major grain protein content locus identifies genes with possible roles in leaf senescence and nitrogen reallocation. New Phytologist **177:** 333-349 (doi: 10.1111/j.1469-8137.2007.02270.x)

Yang, X., T. Thannhauser, M.E. Burrows, D. Cox-Foster, F. Gildow, and S. Gray. 2008. Coupling genetics and proteomics to identify aphid proteins associated with vector-specific transmission of Polerovirus (Luteoviridae). Journal of Virology. 82:291-299.

Feiz, L., J.M. Martin, and M.J. Giroux. (2008) The relationship between wheat (*Triticum aestivum* L.) grain hardness and wet-milling quality. Cereal Chemistry 85(1):44-50.

Humphrey Finds a Bride

Humphrey Wanjugi and Sabina Muthoni were married on December 22, 2007, in Nairobi, Kenya, well before the general election chaos started. They live in Albany, CA, where Humphey is doing a post doc with the USDA-WRRC and Sabina works as an accountant.

My houseplants are not doing well. Are they diseased?

By Cheryl Moore-Gough

They might be, but it's not always a disease that causes the problem. Here are some things to consider.

Water your plants when the potting soil feels warm. Watering too often can saturate the

soil, shutting off the air supply to the roots. The roots die, no water gets to the foliage, and the plants wilt. This is a common problem. Of course, watering too infrequently causes plants to wilt too. Water with high soluble salts can also make it tough for the plant to extract enough "good" water to meet its needs. It wilts. Use light potting mixes for houseplants; stay away from heavy unamended garden soil. Poor soil aeration restricts root growth, making it difficult for the plant to extract enough water from the soil. And then the plant wilts.

Heavy salt buildup on the surface of the soil can signal salt problems due either to using salty water or overfertilizing. In either case, repot the plants into fresh media or at least scrape off the salt buildup. Flushing the media with at least 4 inches of clean water per 1 inch of pot depth is another alternative, provided you use non-salty water.

Bob's Byte
Should You Turn Off Your Computer When You Aren't Using It?
By Bob Johnston

There are two different schools of thought on this. One is that computers use energy and should be turned off when not in use. The other is that the hard drives and electronics are stressed more by the power up process and changing temperatures than by a constant temperature, and turning it on and off actually shortens the life of the computer.

Peter Norton, an acknowledged technical expert, responds to this question in his book, "Inside the PC." He states that "The real question is not 'Should you turn off you PC when you aren't using it?' but 'For how long do you have to anticipate that you won't be using your PC before it is clearly better to turn it off rather than leave it on for your next use?'"

He responds that if you expect to be using your computer within 8 hours, it makes sense to leave it on. If longer, you should power down.

If your computer is on the MSU domain, you should probably leave it on over-night. ITC pushes operating system updates to your computer around 2 AM. If your computer is turned off, these updates will be installed when the computer is restarted and may slowdown the boot-up process. Also: if you use remote desktop to access your computer at night or weekends, it must be left on!!

If you opt to keep your computer on, you can still save power.

The monitor usually uses more power than the computer and all the rest of the accessories put together (other than a laser printer). You can simply turn off the monitor and turn it back on when you want to use it.

Many newer computers have automatic power saving features that minimize the power used. If the screen goes black when you aren't actively using the PC, it probably already has its power saving features enabled.

Some computers have a button on the keyboard that puts the computer into Sleep Mode. This doesn't power it down completely, but it does minimize power consumption.

If you would like to check out how much power your computer hardware uses, I have a monitor which will allow you to determine your usage.

Thanks to janescomputersmadeeasy.com for this hint.

Recipe of the Month

Pretzel Strawberry Salad
2 c crushed pretzels
¾ c butter
3 T white sugar

1 8 oz container frozen whipped topping, thawed or use real whipped cream, whipped
2 small packages strawberry flavored gelatin
2 c boiling water
2 10 oz packages frozen strawberries

Preheat oven to 400 degrees F. Stir together crushed pretzels, melted butter and 3 T sugar; mix well and press mixture into bottom of 9 x 13 inch baking pan.

Bake 8-10 minutes, until set. Set aside to cool. In a large mixing bowl, cream together cream cheese and 1 c sugar. Fold in whipped topping. Spread mixture onto cooled crust.

Dissolve gelatin in boiling water. Stir in still frozen strawberries and allow to set briefly. When mixture is about the consistency of egg whites, pour and spread over cream cheese layer. Refrigerate until set.

February Birthdays

Mike Sun	2
Jeff Johnston	2
Norm Weeden	12
Alan Dyer	15
Phil Bruckner	17
Pam Border	23