

Plant Science Says



Happy Thanksgiving!

Volume 14, No. 10

November, 2011

Ag Appreciation Weekend

Friday afternoon of Ag Appreciation Weekend found several PSPP employees over at the SUB educating the public on turf, seeds, alternative products and energy, plant diseases and plant and insect identification. Mark Young also gave an excellent talk entitled "Plant Viruses: Making Friends from Old Enemies". Other Departments also had a variety of interesting displays/activities including a horse skeleton (Animal and Range Science) and a chance to win a pair of MSU football game tickets if you guessed the number of sawfly eggs in a jar (LRES). In

addition, David Baumbauer was ready to impart his considerable knowledge on beekeeping.

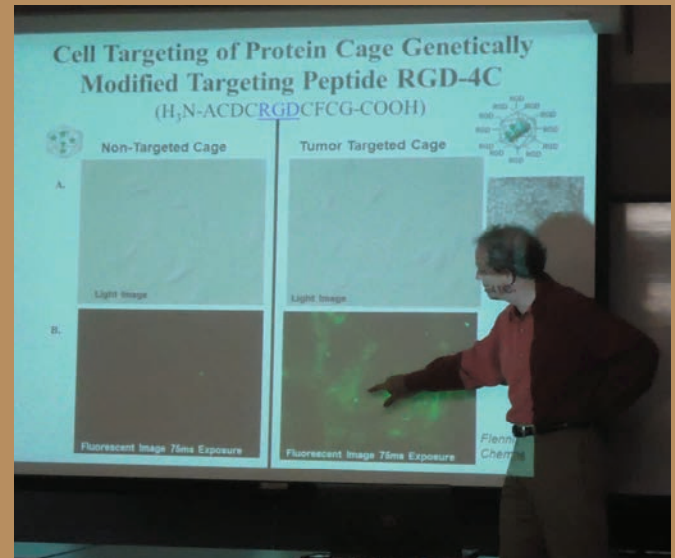
If you did not attend this year, be sure to check it out next year!



Kathryn Gause and Valerie Riter. Kathryn displayed her poster, "Screening for Mutations in Starch Synthesis to Create High Amylose Durum"



Oscar Cantu, one of the winners of a PSPP mug for getting a hole in one on our putting green. His daughter, Sarita, received a degree in Horticulture from our Department.



Mark Young giving a talk on "Plant Viruses: Making Friends from Old Enemies"



Amanda Riter, Nick Hall, and Bryan Bailey, educating the public about the work performed in the Cereal Quality Lab.

MAES Seminars - 108 PBB

Bill Dyer – Monday, Nov. 7, 8-10, "Molecular Approaches to Weed Physiology"

Florence Dunkel – Tuesday, Nov. 8, 10-12, "Community-Based Natural Products for In-

tegrated Pest Management: By the Community, for the Community”

Mary Burrows – Monday, Nov. 14, 1-3,
“Management of diseases in Montana Crops”

Li Huang – Tuesday, Nov. 22, 1-3,
“Functional Analysis of Rust Resistance in Wheat”

Matt Lavin - Wednesday, Nov. 30, 1-3,
“The Grasses of Montana and Phylogenetics of Legume Crop Species”

North to Alaska: MSA meeting in Fairbanks August 2011 **By Cathy Cripps**

When I learned that the annual Mycological Society of American meeting was to be held in Fairbanks, I knew that I would attend. Alaska contains some of the most extensive arctic and alpine habitats in the USA and what better place to extend my work on alpine fungi. Then I was invited to participate in the main symposium on “Molecular Ecology and Biodiversity of Arctic, Alpine and Boreal Fungi” and jumped at the opportunity! My husband Don and I flew North on a flight that crossed the boreal forests of Canada and the temperate rainforests of southern Alaska, to what is called the Alaskan interior. The vastness of the lands north of Montana is difficult to imagine until one flies over what seems to be an infinite landscape of forests, mountains, and glaciers. Once in Fairbanks, we settled ourselves into a small student apartment.

The meeting was sponsored by MSA, the University of Alaska and the Institute of Arctic Biology. Dr. Gary Laursen, one of Dr. Orson Miller’s (my mentor) first graduate students was our host. Gary and Orson had spent years studying arctic fungi from Barrow south to the Wrangle Mountains, and I had heard all the stories and read their papers so I wanted to retrace a portion of their research journeys. The meeting was held at the University of Alaska in the new Art Center and the campus itself was surrounded by excellent mushroom habitat. The mushrooms were fruiting so it was sometimes difficult to stay focused on the talks, but lots of other attendees were

gathering mushrooms as well, so no excuses were necessary.

Highlights of the meeting were an excellent opening lecture on “The Evolution of Sex in Fungi” and hot topics for the sessions were: fungal phylogenetics, deuteromycete taxonomy (should they have one name or two----a topic often followed by heated discussions), fungal genome analysis, environmental molecular sampling, ectomycorrhizal fungal diversity via molecular techniques and emerging fungal diseases.



Kate Mohatt at her MSA poster presentation.

The meeting culminated with an Alaskan salmon dinner followed by an auction. The annual mycology auction is an event that is an odd eclectic event to those of us familiar with it. It is usually prefaced with a wine-tasting contest to loosen up wallets. Then items with a mycological theme are auctioned off for small and large amounts of money by the flamboyant Dr. Hal Burdsall (another ex-Orson student). Objects range from rare mycological books and literature to kitsch such as mushroom salt and pepper shakers. The new president is almost required to out-bid everyone for the ugly “mushroom tie” which usually goes for around \$300 dollars. My

new book "Arctic and Alpine Mycology 8" was auctioned off for \$275 dollars!

One of the best parts of the meeting was that I got to see two of my ex-graduate students. Todd Osmundson received his M.S. degree at MSU (alpine *Laccaria*) and then went on to complete a PhD at Columbia University (Biogeography of Boletes). He is now a Post-doctoral student at Berkeley working on bar-coding of microfungi on



Todd and Cathy at MSA meeting.

coastal islands. Kate Mohatt received her M.S. in the mycology lab at MSU (whitebark pine mycorrhizal fungi) and is now with the USDA Forest Service as the Ecologist for the whole Prince William Sound area. Kate also developed the Girdwood Mushroom Fair that hosted over 1,000 people last year and is one of the first fungal events supported by the USFS. Todd, Kate and I had some great evenings catching up on life events, research and fermentation preferences.

After the meeting, Don and I drove up to Eagle Summit outside of Fairbanks. This was where Orson Miller had collected alpine fungi with his wife Hope. The weather turned nasty with a strong biting wind, but the fungi were out and collecting was fantastic. There were mycorrhizal fungi everywhere fruiting in *Dryas*, dwarf birch and dwarf willow. The scene was nostalgic in that Orson had passed away rather unexpectedly a few years ago, yet the connection was still strong through finding some of the same fungi he had recorded years

before in his papers. This included observation of the famous King Bolete (*Cep, Steinpilz*) coming up in the mats of *Dryas*. In Montana and elsewhere, this large edible mushroom associates with conifer trees. But here the giant boletes towered over their miniature mycorrhizal plant partner. We had no way to cook them so we left them for others.

Then we flew south to Anchorage and on to Girdwood, Alaska where Kate and her husband Dan hosted us for a few days of foraging in Alaskan habitats. First we hit the temperate rainforest which was a misty grey fairyland filled with mushrooms, large



Cathy and Kate in the Alaskan alpine.

and small amidst copious green mosses and hanging lichens. The forests seemed primeval and even the rain did not penetrate to the forest floor. In the next few days, we headed to the high country around Girdwood, the true alpine above the trees. Here we collected wonderful alpine specimens among the mats of dwarf willow and around high alpine lakes. The iconic fungus of Arctic-alpine habitats, *Arhenia auriscalpium* was discovered even though it is only a couple millimeters high. It is the topic of one of my papers and it was wonderful to see it in the flesh in Alaska! The fungi were dried and sent via mail

to Montana for further study. We did not have any problems with bears or mosquitoes and the weather was fine despite a spitting of snow.



Amanita mushrooms in the alpine.

We also had time to drive the Seward Highway where Don had worked 30 years ago as an avalanche consultant during a winter of significant snowfall. Much of his work involved preventing avalanches from impacting traffic by controlled blasting of the starting zones with artillery to clear the snow slopes, sometimes from a helicopter. We even made it to Seward and Whittier, topped with a final Alaskan seafood meal. All in all, the Alaskan adventure only whetted my appetite for more: collecting and fresh seafood. Hopefully, return is possible in the near future!

Successful Collaborations on Crow Reservation Organic Community Garden By Florence Dunkel

A traditional buffalo feast arranged by former PSPP 465R student, Francesca Pine greeted current AGSC 465R students on the Little Big Horn College (LBHC) campus Thursday, 20 October 2011. Francesca, a registered Apsaalooke (Crow) tribal member and also part Northern Cheyenne, learned the holistic process in PSPP 465R and LRES 421 in 2009 and 2010. In 2011 she became greenhouse manager and community garden outreach specialist on the Crow Reservation and is putting her skills and knowledge to use to help her people. Francesca and her team on the LBHC campus supply: fresh vegetables and flowers for the campus reservation; and



AGSC 465R students with former PSPP student Francesca Pine and Crow Elder at the Buffalo

advice, seeds, and seedlings for the people of her Tribe. Soon her team will commercially market fresh tomatoes to the Crow Mercantile, the only grocery store on the Reservation. Francesca has involved local children who show an intrinsic concern for the plants.

Francesca has now engaged this semester's AGSC 465R students in the holistic process involving the Crow Community Garden. Since our first visit there July 2011, grasshoppers have been a serious threat to productivity. AGSC 465R students are exploring grasshopper bait crops, locally produced botanical repellents, and logistics for marketing fresh food grasshoppers to Montana specialty markets.



Grasshopper infestation of "three sisters" traditional planting. The Hidatsah tribe plants corn, beans, and squash together using traditional ecological knowledge.



AGSC 465R student, Alex Martens, collects hoppers for lab studies.

The organic community garden is a means to an end—a healthier community, physically, mentally, spiritually. Reconnecting with traditional foods and medicinal plants, pre-“Commodities”, pre-frybread is Francesca’s goal. Raising sweet grass and traditional medicinal plants is a natural for Francesca who comes from an important line of Apsaalooke medicine women. Alma Snell was her great grandmother and Pretty Shield was her great, great, great grandmother. Francesca’s office is in the student union of LBHC in Crow Agency MT and welcomes your visits. On December 8, 4-8pm in Room 108 PBS and atrium you are all invited to the Health, Poverty, Agriculture Student Symposium and reception/dinner during which graduate and undergraduates will present their community-based research, including the grasshopper work with Francesca in the community garden.

Saving Seeds

What do Cheryl Moore-Gough and Martha Stewart have in common? Apparently saving seeds. Cheryl was interviewed live on seed saving on the Martha Stewart Radio Network, and was then asked to appear on her TV program. While she declined the opportunity, the seed saving segment still ran. The most recent book she and her late husband, Bob Gough wrote (The Complete Guide to Saving Seeds, Storey Publications) was heavily promoted by Martha Stewart on that segment and each studio audience member

received a copy of the book. Now THAT’s publicity!



Martha Stewart and Jack Algieri with Bob and Cheryl’s new book, “Saving Seeds”. Jack oversees cultivation of over 200 varieties of produce year-round in 6.5 acres of outdoor fields and gardens and a 22,000-sq-ft minimally heated greenhouse.

Class Focus

BIOM421 Concepts in Plant Pathology by Alan Dyer

You are the person who jumps out of a pickup truck in front of a thousand acres of potatoes devastated by plant disease and yells “This is awesome...!” How do I know this? I know this because I have done it and as you start your journey in plant pathology, you too will witness the devastating impact plant diseases can have on crop production. So expect that it will happen to you as well and get used to it.....and ask your friends, husbands, wives and family to get used to it too.....because it’s going to happen a lot. Plant diseases are amazing!

Ok now! Let us be clear, plant pathology is not about the devastated potato field. Plant pathology is about the grower whose field you just examined. You see, plant pa-

thology is ultimately about people. If you choose a career in plant pathology, you will witness catastrophic crop losses and come to understand the impacts plant diseases can have on human lives and communities. You will talk with the grower distraught over losing his crop and possibly his land and livelihood. You will meet with the mental health professional from a small rural community and they will tell you about the pressures crop failures place on family and community structures. While barely a blip on the American psyche, you will understand why plant pathologist/breeder, Dr. Norman Borlaug, was awarded the Nobel Peace Prize in 1998. It is because on a global scale, plant sciences and plant pathology are important, and that is why they exist!

Given the human impacts alone you should be interested in plant pathology but it is more than that. Plant pathology is complex and fascinating; relating to a plethora of disciplines to provide practical understandings of complex situations. Where else may one talk about chemistry, physics, ecology, zoology, botany, microbiology, mycology, virology.....and still be talking about a single scientific discipline. Regardless of your interests....your curiosities... or scientific passions, you should be able to find a place in plant pathology.

To start your journey as a budding plant pathologist, BIOM 421 "Concepts in Plant Pathology" is an excellent first step. The course provides a global view of plant pathology as well as a foundation of understanding for agricultural producers and anyone serious about the plant sciences. The course starts with a brief introduction into the amazing field of plant pathology, its history and primary concepts. It continues with sections delving into "fungal", bacterial and viral pathogens as well as parasitic nematodes, parasitic plants and abiotic injuries. Because fungal pathogens cause the majority of plant diseases, they receive the majority of the focus; therefore, you will obtain a rudimentary training in mycology as well. The lectures for this course start with a brief review of the previous lecture

followed by new materials and concepts. Throughout the review and lecture, you will be expected to orally answer questions relevant to the current materials. Lectures are reinforced by laboratory materials organized by Mareike Johnston, Mina Talajoor and myself. Ultimately, as a student in the



Mareike Johnston and Alan Dyer.

class you will become familiar with the major groups of plant pathogens, how plants defend themselves and how disease concepts can be applied to achieve successful disease management. We strive to keep this course fresh, simple and practical.

Grants

Jacobsen, Barry. "Integrated management of potato virus". Rutgers University. \$20,710.

Wanner, K.W. (PI). "Providing Comprehensive Honey Bee Disease and Arthropod Pest Testing Services in Montana". MDA Specialty crop block grant, Nov. 1 2011 - Nov. 1 2013. \$50,000.

Publications

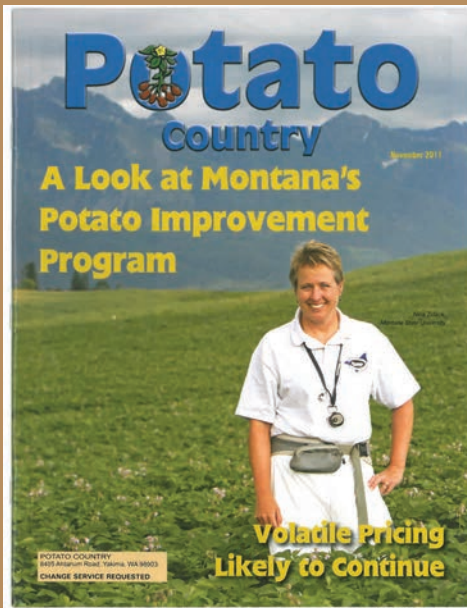
Microbial Ecology Cover

The photograph on the following page, taken by Gary Strobel, was featured on the cover of the October, 2011 issue of Microbial Ecology, Vol. 62, Number 3. It shows a beautiful pattern of plant decay by an unknown fungus in the upper amazon (Napo River region of Ecuador). Plant litter on the rainforest floor is minimal as compared to that of those forests in more temperate regions of the world. Leaves such as this one are immediately consumed by fungi and



bacteria. A leaf such as the one illustrated may be completely consumed in a matter of weeks. Although the processes of nutrient recycling is critical to the overall health of the forest, some of these microorganisms once carefully examined may find utility in one or more aspects of microbial biotechnology.

Zidack Makes Cover of Potato Country



Nina Zidack, Director of the Seed Potato Certification Program was featured on the cover of the November, 2011 issue of "Potato Country". The picture was taken near Ronan, Montana, where Nina, Eileen Carpenter, Kim Prosek, Bob Johnston, Lucy Cook

Photo courtesy of Susan Lake.

and Don Bradshaw were inspecting Jack Lake's potato fields.

Martin Appointed Associate Editor

Jack Martin has been appointed to a three year term as Associate Editor for the Agronomy Journal. The Journal is an international publication through the American Society of Agronomy.

International Master Gardener Conference

By Toby Day

Flathead County Extension agent Pat

McGlynn and I recently attended the International Master Gardener Conference in Charleston, West Virginia October 11-14. Master Gardeners and Master Gardener coordinators from throughout the U.S., Canada, and even a contingency from South Korea gathered for tours and seminars on various subjects on gardening and yard and garden maintenance. Attendance for the conference topped 1000 people.

Keynote speakers at the "Color it Green in a Wild and Wonderful Way" Master Gardener conference gave great informative and inspirational talks. They included Anna Caroline Ball, CEO of the 105 year old Ball Horti-



Anna Caroline Ball of Ball Horticulture Company, address nearly 1000 Master Gardeners

cultural Company, which specializes in all aspects of horticulture, including breeding, biotechnology, production, and marketing of hybrid flower seeds and other floriculture crops, Joe Lamp'L, author of The Green Gardener's Guide, and Rick Darke, published author, photographer, lecturer and consultant focused on regional landscape design, planning, conservation and enhancement.

Highlights for the conference for me include sharing gardening information, learning the rich history of the Appalachian region, and

spending time with different Master Gardener state coordinators. Many ideas and ways Master Gardener is administered in other states is always an eye opener for me as well and knowing that in uncertain times, the Montana State University Extension Master Gardener program is stronger than ever. It's nice to know that the Master Gardener program in Montana is growing as many Master Gardener programs are being cut due to budgetary issues.

As the state coordinator from Montana, I have been asked to be on the planning committee for the 2012 Master Gardener Coordinators conference in Washington State and will be representing the West on the International Master Gardener Conference Committee.

Recipe of the Month

Thai Salad with Whole Grain Brown Rice and Chicken

1 1/2 tablespoons grated ginger

2 cucumbers

1/3 cup vegetable oil

1 1/2 tablespoons sugar

1 1/2 tablespoons garlic, minced

1/2 cup red onion, finely chopped

6 ounces fresh spinach, cut into strips

3 cups cooked chicken, cut into 1/2-inch cubes

1/2 cup fresh basil, cut into strips

3/4 cup peanut butter

1/2 cup rice vinegar

1/2 poblano chile, seeded and chopped

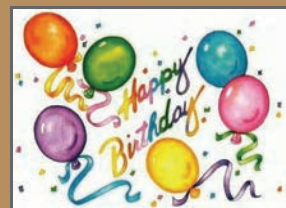
1/3 cup lite soy sauce

1 1/2 cups UNCLE BEN'S® Natural Whole Grain Brown Rice (uncooked)



November Birthdays

Jim Berg	4
Jack Martin	8
Emby Davich	15
Harvey TeSlaa	15
Adam Richman	22
Peggy Bunger	27



Cook the rice according to package directions, set aside and chill. Whisk the peanut butter, vinegar, oil, soy sauce, sugar, ginger, garlic, and poblano peppers in a small bowl, set aside. Cut the cucumbers in half lengthwise before cutting them into 1/2-inch slices. Combine the rice with cucumber, dressing, chicken, and onion. Cover and chill. Just before serving, toss the salad with the spinach and basil.