

Plant Science Says

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Welcome Back Students!

The Department of Plant Sciences and Plant Pathology started the 2011-2012 school year with 134 undergraduate students. Many of these students are majoring in Environmental Horticulture with 34 in the Landscape Design option and 31 in the Environmental Horticulture Science option. Thirteen students are studying Crop Science, seven in Plant Biology and 21 in Biotechnology. The Crop Production option of the Sustainable Foods & Bioenergy Systems major increased their total number of student to 28. This is the third year of the SFBS program and it continues to grow.

We have two new graduate students this semester, bringing the total to 15. Six students are working toward their Master of Science in Plant Science, two students are studying for a Master of Science in Plant Pathology, and one student is enrolled in the Master of Science in the Entomology program. The department has six PhD students; five in the Plant Science program and one in the Genetics option.

Welcome to all our undergraduate and graduate students!

Plotter Update

By Jill Scarson

To facilitate better access for faculty and staff, the plotter has been moved from the Design Lab in 29A Linfield Hall to my office in 324 Leon Johnson Hall. Send all PDF or Power Point documents to jscarson@montana.edu or bring your files to my office to be printed. Due to time restrictions, I can only accept printing requests from Plant Sciences and Plant Pathology faculty, staff and students. Please allow at least an hour for each printing. Plotter fees are as follows:

Plain Bond- Black & White: \$0.25/Sq. Ft.

Plain Bond- Full Color: \$2.00/Sq. Ft.

Matte Film- Black & White: \$2.00/Sq. Ft.

Matte Film- Full Color: \$3.00/Sq. Ft.

Heavy Coated Bond- Full Color: \$4.00/Sq. Ft.

Glossy Photo Quality- Full Color: \$6.00/Sq. Ft.

If you have any questions, please contact me at jscarson@montana.edu or 994-4832.

BREAD Annual Meeting: Opportunities and Challenges

By Li Huang

The BREAD (Basic Research to Enable Agricultural Development) Program funded by the National Science Foundation and the Bill and Melinda Gates Foundation supports basic research that has a direct impact on agriculture in the developing world. Fortunately, we won the first competition and were awarded \$1.32M over three years to focus on research of wheat rust disease resistances with the emphasis on understanding why some of the rust resistance genes are suppressed in the wheat genome. The 2nd annual meeting was held at the Gates Foundation campus in Seattle on July 13-15. The meeting had two agendas: Announce the five winners from the 2nd competition and evaluate the progress of the 15 projects from the first competition that received awards. The meeting provided wonderful opportunities for scientists to learn about each other's projects and initiate new collaborations in a small group setting.

Prior to the BREAD meeting, Bill Gates and his co-leaders spent two hours meeting the scientists involved in the five BREAD projects in which they were most interested. Our project was one of the five. During the 20-minute meeting with Gates, I gave a brief

introduction about the project and highlighted what we do differently from others. My Co-PIs, Dr. Evans Lagudah from CSIRO, Australia and Dr. Junhua Peng from the Chinese Academy of Science were there with me to answer questions from Gates and his co-leaders. This Microsoft genius asked many intelligent questions, showing he was very interested in why wheat possesses genes that suppress disease resistance genes, and why EMS mutants are not GMO. Visiting with Mr. Bill Gates was a fun experience; we were all able to share in a big laugh.



The mycology crew: Ed Barge, Don Bachman in back and Mary Jones, Cal Cummins, Cathy Cripps and Erin Lonergan in front.



Bill Gates and Li Huang along with other attendees at the BREAD meeting.

Now the Bill & Melinda Gates Foundation is accepting grant proposals that take innovative and unconventional approaches to protect crop plants from biotic stresses from field to market. It is an opportunity and a challenge.

A Prairie Polypore --- and no trees in sight

By Cathy Cripps

In June, our lab attended a Bioblitz on the American Prairie in Central Montana, a difficult to reach area where there are few people and fewer still willing to drive the 50 miles of dirt roads that turn to gumbo in wet weather. We were fortunate in that the spring rains have been uncharacteristically consistent this year and that a dramatic thunderstorm moved in the night before the Bioblitz. A thunder and lightening storm on the open prairie with no place to



Hunting for fungi at the Yurt Camp in the American Prairie.

hide is a seriously memorable event, but it brought the rain we needed to find fungi. In all, 28 species of fungi were collected by myself, my husband, graduate students Erin Lonergan and Ed Barge, and two citizen volunteers. Overall, 480 species of birds, bats, mammals, invertebrates, insects, plants, and fungi were recorded in a 24 hour period.

One fungus seemed an unlikely candidate for special attention. It was a tiny polypore with a pale cap less than a centimeter across and a central black stem one cm tall. At first we thought it was just a small version of one of the black-footed polypores (*P. varius*, *P. badius*, etc). But the diamond-shaped pores were evident even on such a small fruiting body and the next designation was *P. arcularius* which is distinguished by this type of hymenium. However, there was one troubling aspect--it was terrestrial and not on wood. An anomaly perhaps, but after finding several fruiting bodies nestled in the grass and al-



The rare prairie polypore is 1 cm tall.

ways on the ground, a pattern began to emerge. The caps looked like small white coins lying on the prairie that might be mistaken for flattened puffballs. It keyed to *Polyporus cryptopus* (1896) using North American Pol-

ypores. But I had never heard of it---so it quickly became a fungus of interest. What did we know about it? The substrate was stated as "terrestrial, fruiting on the ground in pastures or prairie habitats. According to Overholts, it is attached to dead grass roots." Here was a polypore that had found a unique niche on the tough roots of prairie grasses! The books further stated that "it is likely to be found in the Great Plains region in grassland ecosystems. It is not known elsewhere in the world."

A search in the National Fungus collection and NYBG herbarium revealed a few more records, including 8 from Kansas, 3 from North Dakota, one from Washington and one from Montana all reported from 1895 to 1917. The 1917 specimen from Montana was anomalous as it was on lodgepole pine; photo examination of the voucher at the National Fungus Collection revealed it to be in poor condition (pieces) and couldn't be confirmed. Two later collections were made by Clark T. Rogerson in Kansas in 1956; he found the polypore to be common in two prairie areas that year associated with bluestem grass clumps. Rogerson collected it not far from where the type collection was made. These appear to be the last reports of the fungus in North America as least as far as we could discern.

However, a check of Index Fungorum found the new and synonymized name of *Polyporus rhizophilus* (Pat.). Armed with the new

name, several interesting papers turned up including one on the rhizophilic species of *Polyporus*. Now we learn that *P. rhizophilus* is a well known species from prairie habitats on a global scale. It is reported on "steppe grasses such as *Stipa*, *Agropyron*, *Rudbeckia*, *Elymus* or *Cynodon*, etc" and from Poland, Hungary, Czechoslovakia, Romania, Tajikistan, Kazakhstan, Morocco, Ukraine, Mongolia with one possible report from Argentina. Interestingly, it is on Red Lists of many of these countries as a species of concern. A related species has been reported with bamboo from Japan. While Nunez and Ryvardeen (1995) casually synonymized the two names, the North American *P. cryptopus* is kept separate from *P. rhizophilus* in Sotome's key. Whether the two taxa are one in the same or not, the 'prairie polypore' appears to have been forgotten in North America and so we bring it to light here. If you visit the prairie, look for it! The Great Prairies of the world appear mycologically united by this unique little fungus that is either common but overlooked or substantially rare. Let us know if you find it!

PSPP and "Grub" in The New Yorker By Florence Dunkel

So have you heard about "Grub"? This is the article in The New Yorker (August 15 and 22, 2011) featuring a certain MSU-PSPP professor or did you read the response by Frank Bruni in his column in the New York Times August 27, 2011 edition entitled "The Fall This Summer"?

What was your very first reaction? Be careful. Your Millennial Generation students or colleagues may be using your reaction to this topic as an intercultural competency litmus test.

Underlying the levity surrounding edible insects is a series of serious issues: Food security, food safety, nutrition, bio-energy/renewable energy, and sustainability of life on Earth. Where are you on the continuum of intercultural competency? At the "Eew, no one does that" stage of ethnocentricity or the "Let's share some recipes" stage of ethnorelativism?"

As I write this I am munching on insect products I bought in a candy vending machine in the MSU Marsh Laboratory lobby, Scooby-do fruit flavored snacks filled with flakes of wax from bee bodies and cochineal, crushed whole bodies of female insects of the species *Dactyloplus coccus* that thrives on the cactus *Opuntia*. Double checking the label, I found this fruit snack manufacturer actually chose the synthetic substitute of cochineal, red dye #40.

When you hear from people who have read the thorough, factually correct New Yorker article, remember to share with them the five basic essential understandings:

1. Cultures of European Origin are the "odd ones." Fifteen to eighteen hundred species of insects are documented to be used for food insects somewhere in the world.
2. Land shrimp (insects) are found in clean not decaying habitats as their ocean-living cousins, crabs and lobsters.
3. Insects are nutritious. Some are excellent sources of zinc, calcium, copper, iron, magnesium, manganese, B-vitamins, 20-carbon fatty acids, omega 3 fatty acids, and many other micro- and macro-nutrients.
4. Gram per gram, raising insect meat uses less land, water, and fuel than beef. Insects are delicious.

Now is a good time of year, depending on your location, to gather grasshoppers and cicadas for the freezer to use through the winter.

Yes, New Yorker writer Dana Goodyear with her writing skills and tenacity to a subject may have helped Western Culture entomologists save face by finally giving them an acceptable venue to discuss with the public the seriousness of edible insects. To do this, she followed Florence Dunkel and her edible insect colleagues for nine months from the San Diego national entomology meetings program symposium to Bozeman in the midst of the chill of the year to Los Angeles and Mexico.

Text of the New Yorker article is located at <http://www.newyorker.com/>

[reporting/2011/08/15/110815fa_fact_goodyear](http://www.newyorker.com/reporting/2011/08/15/110815fa_fact_goodyear)
Stay tuned for follow-on articles such as in Bloomberg Businessweek magazine with a piece on entrepreneurial opportunities unleashed by "Grub."

New Employees

Rebekah VanWieren



Hi, I am a new Adjunct Faculty, teaching "Environmental Planning & Design: issues and concepts" within the Landscape Design option. The course looks at human-environment interactions in the context of how land development and community design has occurred in the

past and how it should look in the future to effectively address environmental issues, ecological integrity, and sustainability.

I recently moved from Ann Arbor, Michigan where I was working for Conservation Design Forum, an ecological design firm that is a leader in green technologies. I received my Masters of Landscape Architecture and Masters of Natural Resource Planning at the University of Michigan's School of Natural Resources and Environment (whose school colors are also maize and blue!), and taught courses in Ecological Restoration and Landscape Planning. My research focuses on brownfield redevelopment, green technologies for stormwater management, and landscape ecology in the context of shrinking cities.

I am thrilled to be teaching in PSPP and feel honored to be working with such a renowned and welcoming group of people. Feel free to stop by my office (Plant Bioscience 213) anytime – I look forward to meeting you! When I'm not in the office, you can probably find me spending time with my family outdoors, fishing, or at MacKenzie River Pizza.

New Graduate Students

Ed Barge (Cathy Cripps)



Hi, my name is Ed Barge. I grew up in Bozeman and received a bachelor's degree in biology from MSU in the spring of 2011. I enjoy fly-fishing, mushroom hunting, hiking and

many other outdoor activities. In graduate school, I will be working under Dr. Cathy Cripps and plan to study Russulaceae in the Rocky Mountain alpine zone.

Rosemary Keating (Tracy Dougher)



Rosemary Keating has taken the 'long way around' from California's Aggie school, UC Davis, to MSU's Masters program in Plant Sciences. She spent many years teaching junior high math and sciences before moving to Glacier

National Park, where she worked as a Naturalist and in the Native Plant Nursery there. In 1995, she and her husband, Kim Keating, moved to Bozeman with their son Tyler (BHS 2005). You may have seen her working retail at Cashman's Nursery or, before that, at the MSU Potato Lab. The Master Gardeners Program here, along with Rosemary's continuing interest in education, have brought her happily back to school.

Planters in the Mathre Courtyard

Last spring Deanna Nash offered to plant five containers of flowering plants for the Department in the Mathre Courtyard. They have been enjoyed by many over the summer. If you are curious as to what some of the plants are, please see the following.



Planter one

- 1) Petunia
- 2) Clarkia
- 3) Licorice
- 4) Blue Lobelia
- 5) Purple Salvia
- 6) White Verbena
- 7) Cuzco yellow Sanvitalia
- 8) Pineapple Mint



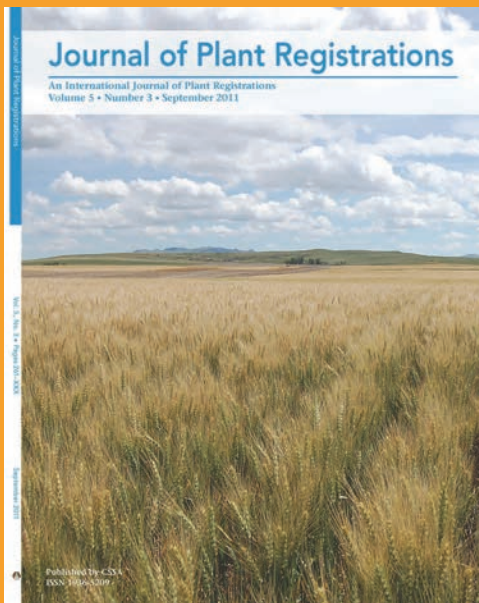
Planter two

- 1) Akita Dahlia
- 2) Cherry Tidal Wave Petunia
- 3) Orange Geranium
- 4) Blue Lobelia
- 5) Yellow Bidden
- 6) Red Verbena
- 7) Licorice

Publications

Jim Berg

The cover of the latest issue, September, 2011, of the Journal of Plant Registrations has a picture of 'Decade' winter wheat that I took at NARC last July. We also had two articles in the Journal regarding the



release of 'Decade' Winter Wheat and a winter wheat germplasm release.

Bob Gough and Cheryl Moore-Gough

Bob and Cheryl's latest book, entitled "The Complete Guide to Saving Seeds", has just been published by Storey Books (\$24.95). This comprehensive work is arranged in two sections. The first contains discussions of fruit and seed morphology and physiology, genetics, including crop isolation and home breeding techniques, proper harvesting and cleaning techniques and storage conditions, pre-germination requirements, including stratification and scarification, and proper general germination requirements. The se-



cond part of the book, called appropriately enough "The Handbook", provides the reader with detailed instructions for harvesting, storing, and propagating seeds of 322 species of woody ornamental and fruit plants, flowers, vegetables, and herbs.

Finally, there is a chapter-long overview of the history of the seed industry in the United States, including a lengthy discussion of the USDA "Free Seed" program that for nearly a century provided farmers with seeds of newly introduced varieties from around the world while at the same time providing congressmen and senators with votes. The book contains an extensive glossary of terms and is richly illustrated with color photos, tables, charts, and graphs on over 300 pages.

Bob and Cheryl would not allow their work to be "dumbed-down" to a beginner's level; this book is written at an advanced gardener/introductory college-level and has been called the most comprehensive book of its kind in print. Although the book has been available for about a week (at this writing) Bob and Cheryl have already given interviews to the syndicated garden writer for the Chicago Tribune and have done a live call-in half hour radio broadcast on the subject from Halifax, Nova Scotia, serving the entire Canadian Maritimes.

Managing Outlook Data

By Matt Rognlie



One of the most common calls Chris and I get is from users having issues managing their Outlook data. Most often, it's simply that their mailbox is full and they can't find the larger messages. Because of this common problem, Chris

created a help document for users to learn how to manage their Outlook mail and server quotas more effectively. Please see <http://ag.montana.edu/infotech/OutlookHelp.htm> for more information. The document should answer any questions you have.

Canning

By Toby Day, Master Gardener Meeting Tuesday, the Montana Master Gardeners



invited Bernice Mason, the Extension Family and Consumer Science Agent in Yellowstone County, to give a talk on food preservation with an emphasis on canning, freezing and food safety. We figured that this was applicable to the Master Gardener class because many of us gardeners preserve from our garden by canning or freezing our fruits and vegetables. Little did we (mostly I) know that much of what we had been doing was wrong, and even worse, unsafe.



I, along with others in the seminar didn't adequately understand the importance of making sure, when canning, that the right amount of time in a water bath or the right pressure in

a pressure canner was so important for food safety. I realized that many of the recipes that I was using off the internet provided canning times and pressures for sea level only. Since we are at 4000' elevation or higher, the times and pressures need to increase. Even worse, as many of you know, I give a lot of my canned foods away at Christmas! Ugh, I could have made people sick!

The main safety concern in preserving is botulism. Botulism is a food borne illness caused by toxin buildup from the bacterium *Clostridium botulinum*. In fact, this is one of the most deadly food borne poisons. Thankfully, I and the other Master Gardeners got the right information on canning pressures and times. Here is what one Master Gardener said about the class:

"The class was very informative. I realize what a danger I've been to my family and

friends. I knew enough to be dangerous. I'm sure my friends and family would thank you too, if they knew how dicey some of the stuff I've been serving them really is."

So, if you have been canning or freezing from your garden, I want you to be safe also. Safety is the first priority. Be sure that you have the right times and pressures when preserving any food. You can find the "Home-Canning Pressures and Processing Times" MontGuide from MSU Extension at <http://msuextension.org/publications/HomeHealthandFamily/MT200905HR.pdf>

For other preserving questions that you might have concerning everything from freezing fruits and vegetables (and, how many minutes do you blanch them first?) to canning meats and fish, all the preserving MontGuides are available at <http://www.msuextension.org/store/>

Recipe of the Month

Raspberry Cream Cheese Coffee Cake

This is delicious!

2 1/4 c unbleached flour

3/4 c butter

1/2 t baking powder

1/2 t baking soda

1/4 t salt

3/4 c sour cream

1 t almond extract

1 egg

8 oz pkg cream cheese, softened

1/4 c sugar

1 egg

3/4 c to 1 c high quality raspberry preserves

1/2 cup sliced almonds

Heat oven to 350. Grease and flour bottom and sides of 9 or 10 inch springform pan.

Combine flour and 3/4 c sugar. Using pastry blender cut in butter until mixture resembles coarse crumbs. Reserve 1 c of crumb mixture.

To remaining crumb mixture, add baking powder, baking soda, salt, sour cream, almond extract, and 1 egg; blend well.

Spread batter over bottom and 2 inches up sides of greased and floured pan (batter



should be about 1/4 inch thick on sides).

In small bowl, combine cream cheese, 1/4 c sugar and 1 egg; blend well. Pour into butter-lined pan. Carefully spoon preserves evenly over cream cheese mixture. In small bowl, combine reserved crumb mixture and sliced almonds. Sprinkle over preserves. Bake at 350 for 45 to 55 minutes or until cream cheese filling is set and crust is deep golden brown. Cool 15 minutes. Remove sides of pan. Serve warm or cool. Refrigerate leftovers.

September Birthdays

Tracy Dougher	1
Irene Decker	5
Rosemary Keating	15
Gary Strobel	23
Judah Davich	23
Mary Bateson	24
Bill Dyer	26
Mark Young	27
David Baumbauer	27

