



PSPP Graduation Ceremony

The PSPP Department will be having its annual graduation ceremony and reception for graduating undergraduates and graduates on May 4, 2012, from 3:00 to 5:00 p.m. in 108 PBB. Those receiving Teaching Awards and Outstanding Student Awards will also be recognized.

Employee Recognition Awards



President Waded Cruzado and David Baumbauer

For this year's Employee recognition awards, David Baumbauer, Manager of the Plant Growth Center and Heather Rimel, Project Coordinator for the Montana Seed Grower's Association were nominated from our Department.



President Waded Cruzado and Heather Rimel

David Baumbauer was one of the five chosen as one of MSU's five exceptional employees. He won \$500, a custom gold pin from Miller's Jewelry, a \$50 gift certificate, a certificate of recognition and his name was added to a plaque outside

President Cruzado's office. Congratulations David and Heather!

Toby Day Receives Pure Gold Nomination and 2012 First Lady's Math and Science Award

Toby Day is an Extension Horticulture Specialist in our Department. One of his

duties is to instruct the Master Gardener course. One of his students, Jill Davis, a member of the English faculty, wrote the following about Toby for MSU's Pure Gold nomination, "He truly is a master teacher who knows his subject matter inside out and can convey it to his students in the clearest of terms using humor, examples, moving from known to unknown concepts. with grace and ease. I am amazed watching him teach how interesting he can make some of the most rudimentary material."

In addition, The Nancy's Garden Team including Andrew Olcott of Montana Correctional Enterprises, Marc Williams of Eleanor's Garden, Lorri Brenneman of the Department of Agriculture, Toby Day of MSU Extension, Katie Bark of Montana Team Nutrition, and Judy Fisher of Fisher's Garden Store received a 2012 First Lady's Math & Science Award for developing the Nancy's Garden project to provide a gardening experience for Montana classrooms. Governor Schweitzer & First Lady's Math and Science Awards are given to outstanding volunteers (individuals, groups,



Heidi Williams, First Lady Nancy Schweitzer, Nancy Matheson, Katie Bark, Toby Day, Andrew Olcott, and Lieutenant Governor John Bohlinger

organizations, or businesses) that promote Math and Science education in Montana. Nancy's Garden is the newest feature of the Governor and First Lady's Math & Science Initiative. The governor and First Lady wanted Montana students and teachers to have an opportunity to grow gardens inside their classrooms. Toby Day of Montana State University Extension and Judy Fisher of Fisher's Garden Store helped Grow Gardens by developing a technical guide of growing instructions and tips and by donating seed packets. Across Montana, more than 6,800 students are able to enjoy a gardening experience because of the work of this team.

Congratulations Toby!

Gunnick wins Excellence Award

Forty of Montana State University's top seniors and their faculty or staff mentors were recognized Tuesday, Feb. 21, at the 30th annual Awards for Excellence banquet held on the MSU campus. The MSU Alumni Foundation and the Bozeman Area Chamber of Commerce sponsor the banquet for seniors who have been selected by the academic college Deans for their outstanding records of achievement in academics, extracurricular activities and service to the University and the Bozeman community. In turn, each student chooses a faculty or staff person who has served as an inspiration and mentor during the

student's time at MSU to also receive an Award for Excellence.

Among this year's Award for Excellence winners was Erin Gunnick, a senior in the Environmental Horticulture Science program. Erin recognized Dr. Bill Hoch as her faculty mentor. Congratulations Erin and Bill!

MSU Author's Reception

Cheryl Moore-Gough and Chaofu Lu will be among a dozen MSU employees to be honored at the MSU Authors' Reception on Tuesday, April 10 in the Renne Library. Chaofu edited a book entitled cDNA Libraries: Methods and Applications and Cheryl co-authored with Bob Gough a book entitled The Complete Guide to Saving Seeds.

This event is hosted by Friends of the Library, a group that consists of about 300 people. They seek out the MSU authors, editors, and artists who have had their work published in the last year and a half with the goal of recognizing those accomplishments.

Congratulations Chaofu and Cheryl!

Western Region State Liaison Representative meeting for the IR-4 Project

By Mary Burrows

I recently went to Boise, ID to attend the IR-4 Project meeting. This group facilitates pesticide registrations on minor crops. The reason they exist is that chemical companies produce pesticides for markets where they will receive a profit (namely, the major crops such as wheat, corn, soybean, etc.). They must pay fees to agencies including the EPA, and often neglect to register products on small acreage crops where they will not realize enough profit to cover the costs of registration. The IR-4 Project prioritizes requests from all over the US, facilitates the research needed for efficacy, yield, and residue data, and works with the registrants and the requesting party (often universities or commodity groups) to facilitate getting crops on a product label. Other activities including standardizing



Pictured are the 2012 Award for Excellence winners from the College of Agriculture (left to right): Nora Smith (Assistant Dean), Hannah Bigelow, Rebecca Mattix, Erin Gunnick, Bill Hoch, Geoffrey Poole and Megan Podolinsky.

MRLs (maximum residue limits) to facilitate trade with international partners. The issue is that many of our trading partners have lower thresholds for pesticide residue in grain than the U.S. If enforced, this results in rejection of grain that was raised according to the U.S. label but does not meet the standard of the importing country. IR-4 has also expanded into the human health arena, facilitating registrations of public health pesticides (mainly mosquito controls).



Carrot seed, anyone?

Some registrations I have facilitated by IR-4 include tebuconazole (Folicur) for fusarium head blight on wheat (after a 13-year section 18 emergency use exemption by Montana) and sethoxydim (Poast) on camelina. I am currently supporting uses for products for honey production, seed alfalfa, sunflowers, peas, camelina, potatoes, safflower, sugarbeets, and of course, mint. For those of you aware that Montana has a mint industry (okay, 1 grower now), Rocky Lundy's term as the chair of the IR-4 Commodity Liason Committee recently ended. But don't worry, he's as fiery as ever and is leading an effort to protest NIFA's proposal to roll IR-4 into the new 'Crop Protection' funding structure. We heard a lot about that at this



I'm hoping the Montana hops growers never have to deal with this one – California prionus (Prionus californicus Motschulsky (Coleoptera: Cerambycidae)

meeting.

The best part of this meeting is the local ag tour. In Boise, we visited the Water Center, where we saw a massive stream replicator that researchers use to model different things including the composition of mud

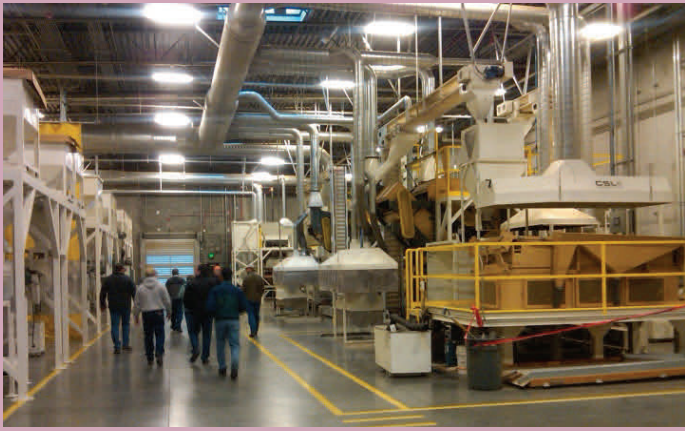


We wore our safety glasses here...

huts to withstand flooding from glacial lakes; the Food Technology Center, where they do research and help small business owners produce a lot of locally sourced foods like salsa, wrap sandwiches, and kombucha in a USDA approved food production facility; the Parma Research and Extension Center, where we met Jim Barbour and learned about his work with leafcutter bees and prionus; and Nunhems (a subsidiary of Bayer) – essentially a seed cleaning and packaging plant on steroids. We also went to dinner and had a beer tasting. Always good to support those minor crops such as malt barley!



Jim Barbour shows us a sample of leafcutter bees. Rocky Lundy, Joe DeFrancesco, and Becky Sisco look on. The Parma lab characterizes the larvae for viability before sale/use, providing a valuable service to the alfalfa seed industry.



Just a few of the seed cleaning machines in a quiet factory. Each one must be disassembled (4h+) between each seed variety. to prevent contamination.

Recruitment Trip By Jamie Sherman

At the end of February I had a wonderful opportunity to visit two of our TCAP collaborating institutions—University of Arkansas Pine Bluff and Rust college in Mississippi, both of which are historically black colleges. At Pine Bluff, undergraduate students working with Dr. Matute introduced me to nematodes collected from Washington State University soil samples. I learned how to count, isolate, and differentiate the parasitic nematodes from the free feeders. Next Dr. Onyilagha and his student introduced me to their work on identifying new phenotypic measures of drought tolerance. They are testing some spring wheat lines from Montana. Dr. Okiro introduced me to his cow pea breeding project, and is interested in future collaboration. At Rust College I met all of the science and math faculty at lunch hosted by the department chair Dr. Yeh. Several of the faculty expressed interest in collaborating with us. Dr. Zhu introduced me



Jamie Sherman, second from right and Dr. Matute's students at Pine Bluff

to her students bioinformatics search for drought tolerance.

At both institutions, I showed the film "Plant Breeding: The future in the palm of your hand", gave a seminar to over 100 students, and handed out TCAP brochures. Most students felt their awareness and understanding of plant breeding increased and several students expressed an interest in graduate school.

Thanks to everyone involved for their lovely, warm hospitality. I was hosted to meals and met with department heads from both schools. The faculty were generous in showing their projects and introducing me to potential graduate students. Students have contacted me for more information about graduate school or internships. Faculty looking for students should contact Jamie Sherman at jsherman@montana.edu.

The Montana State University 2012 Bug Buffet

By Florence Dunkel

One hundred and thirty seven people signed the guestbook at the 24th annual Bug Buffet in the Plant Growth Center on February 24. On the menu this year was boiled "land shrimp" cocktail served on a bed of cilantro with various sauces; *Acheta* (cricket) stirfry; *Tenebrio* quesadilla; lemon-basil fritters (also with *Galleria*); cinnamon-apple fritters with *Galleria*; and *Tenebrio* dream bars.

Many guests began the event by hearing Plant Growth Center Manager and beekeeper, Dave Baumbauer explain honey production with his new portable demonstration hive. In high production years, even honey production can result in a by-product, bee brood, which is a delicious edible insect product used worldwide. Then guests sampled 17 honey products while BIOL 162CS Insects and Human Societies students did an official sensory evaluation. Meanwhile students from AGSC 465R cooked up and served the "land shrimp," edible insects, and cousins of ocean shrimp.

More young children, ages 10 and under, were at this event than ever before. Western



David Baumbauer telling the story of bees



"Chef" Taylor Stuck, MSU student in AGSC 465, introducing both her 465 class and BIOL 162 to acheta stirfry.

cultures, that is those of European origin, are some of the few cultures in the world growing up without a history of using edible insects. With the increasing numbers of kids at the buffet, this may be changing. Even at MSU, some guests from MSU staff are "regulars." Susan Kelly, went straight for the "land shrimp" and verified that the new item this year, *Tenebrio* dream bars with a layer of sautéed mealworms was a winner. (*Tenebrio* are beetle larvae.)

Beginning as a surprise event during a unit on beneficial insects in the Multicultural Global Core course, Insects and Human Societies, the Bug Buffet is still officially a surprise for the students in the course, but no surprise for the community of the University, Bozeman, and surrounding areas. This year, families with young children came from Hot Spring, MT, Three Forks, MT, and Bozeman. A regional representative of the Peace Corps came from Seattle WA and shared stories of what it is like eating mopane, larvae of the emperor moth, for 3 days straight. Mopane are a delicacy throughout southern Africa and contain about 17 times the amount of iron as beef.

Chefs for the day were Environmental Studies students, Nick Miles, Hannah Fraser, James Schaberg, and Taylor Stuck. Florence Dunkel who organized the event

and the previous 23 events, teaches the two University Core courses, BIOL 162CS and AGSC 465R Health, Poverty, Agriculture: Concepts and Action Research. Based on the response this year, Dunkel accepted the suggestion of the USDA Office of the Chief Scientist to give a Brown Bag seminar in Washington DC for staff in the Whitten Building. Yes, in her brown bag were *Galleria* land shrimp and a Dijon mustard sauce with fresh spinach ready for sharing!

Not only are Montana youngsters interested, but so are the USDA and US entrepreneurs. In March, the United Nations/FAO released a report that livestock production now accounts for one-fifth of the world's greenhouse gas production. Peer-refereed nutrition studies verify that many of the 1,700 species of insects used as food worldwide are not significant methane producers and moreover are gram per gram more nutritious and better at converting their food to useable protein than a cow. March 23, these convincing reports summarized by Dunkel in her TEDxBozeman presentation, led most of the 200 guests at the TEDxBozeman event in the Emerson Cultural Center to sample the *Galleria* quesadillas cooked and served for lunch at the Emerson by the 2012 Bug Buffet MSU student team of chefs.

What is *Galleria*? *Galleria* is a land shrimp. Some folks like to call land shrimp "insects." Do you like ocean shrimp? Well, you will love land shrimp, just add a little sea salt, it will taste the same. *Galleria* lives on land. Actually, it lives as a pest in bee hives. Bug Appetit!

5th Annual Horticulture Open House & 25th Anniversary of the Plant Growth Center

By Tracy Dougher

On Monday, April 16, from 1-4 p.m., Environmental Horticulture Science and Landscape Design students will be displaying projects from this past year's classes in landscape construction, sustainability in commercial plant production, greenhouse models, flower arranging, careers in horticulture, environmental conditions growth comparisons, and much, much more! Students will be demonstrating propagation techniques and teaching middle school students about horticulture. All are invited to participate in the 'How Green is Your Thumb?', recycled container gardening competition (see flier on page 10).

General Botany Course



This fall, Andreas Fischer will be teaching B100 220 General Botany, a 3 credit lecture course that will provide a thorough overview of the fundamentals of plant and fungal biology from evolutionary, ecological, and physiological perspectives.

The course prerequisite is

BIOB 170.

Class Focus

AGSC 342 – Forages - Larry Holzworth



The Montana 2011 Agricultural Statistics show cash receipts from marketing cattle and calves as the 2010 number one commodity. Wheat came in second.

Harvested forages support Montana's billion dollar livestock

industry. Most livestock operations in Montana rely on rangelands – about 70% of our land area - to supply a portion of the feed. However, livestock producers need a supply of hay to get through the winters. Winter feed is the largest cost in livestock operations. Furthermore, high quality forages are required to supplement and complement the roughages available on range. The average 2010 hay yield was 2.5 T/acre. A slight improvement in forage yield and quality can significantly reduce costs and increase profit margins.

AGSC 342 Forages is designed to:

- 1) Acquaint students with tame pasture forage crop species alternatives, their attributes, culture and management;
- 2) acquaint students with the integration of forage resources and land use options that meet livestock production goals, e.g. extended grazing periods, use of legumes in lieu of fertilizer for economic sustainability and forage quality, etc.;
- 3) provide the student an opportunity to develop a ranch plan as an exercise to apply the knowledge gained in class to improve the productivity of a farm or ranch; and
- 4) introduce practical application methods to all aspects of grassland agriculture.

The course integrates all aspects of grassland agriculture including range, crop, pasture and hay land. Forage integration, the development of the most profitable combination of forage resources from all land uses are used to balance the forage resources with the livestock demands for sustainable production, while maximizing profits from labor and management of natural resources. Animal Unit Months (AUM's), stocking rates and Animal Use Factors (AUF) are discussed. Forty-one species of tame grasses and legumes are discussed. Their origin, description, specific soil and climatic requirements, cultural needs for stand establishment, limitations, multiple uses, stand maintenance and sustainability, and hay and grazing management options are specified. The information is presented as a multi-disciplinary approach including agronomic practices, soil science, climate, general biology, plant morphology/physiology,

species selection, management, etc. Practice implementation techniques such as seedbed preparation options, drill calibration, seed inoculation, seed placement and seed distribution options, purchasing seed, evaluating seed lots, calculating seeding rates for pure and mixed grass-legume stands, and evaluating stand health are demonstrated. Guest lecturers discuss interrelated topics specific to pasture and hay land production agriculture such as the use of certified seed, soil fertility, nitrogen fixation, forage quality, cropping systems, integrated pest management, animal nutrition, grazing management, etc.

It is the goal of the instructor to encourage an open interactive fun class atmosphere where information, personal experiences and farm and ranch testimonials can be shared. Grassland agriculture is an art and science involving several disciplines. Utilizing our natural resources of soil, water, climate and plants to their fullest potential without environmental degradation is an ultimate goal. The various disciplines are all connected and must be used in combinations that support and improve forage resources in order to sustain a viable livestock enterprise.

AGSC 342 is taught each fall semester. It is a 3 credit hour course meeting on MWF. The only pre-requisite is PSPP – 102 Plant Science, Resources and the Environment. A \$500 Montana Forage Legacy Scholarship is awarded each year to the student with the best ranch plan.

AGSC 342 Forages should be a core course for students majoring in animal production and husbandry.

**REMINDER: Come Attend the 2012 Diagnostics Webinar Series
Linnea Skoglund**

Just a reminder about the diagnostic webinars in Rm 134 of Animal BioSciences Bldg. Webinars take place at 9:00 a.m. and run about 50 minutes. Everyone is welcome.

APRIL SCHEDULE

April 4

Spotted wing drosophila - *Amy Dreves*
Research and Extension Specialist-IPM
Entomologist – Oregon State University

April 11

Rust Alternate Hosts - *Tim Murray*,
Professor, Plant Pathology – Washington
State University

April 18

Bacterial Diseases: *Xanthomonas*
translucens and Drippy Nuts - *Ned Tisserat*,
Professor and Extension Specialist, Plant
Pathology - Colorado State University

April 25

Zebra Chip - *Phil Nolte*, Extension Seed
Potato Specialist - University of Idaho

Montana Ag Live! Schedule

April 1

George Haynes, MSU agricultural
economist, "Montana's Rural Poverty
Issues".

April 15

Cecil Tharp, Montana State University's
pesticide education specialist, "Herbicide
contamination issues in manure, a potential
hidden problem" or "Know Your Manure".

April 22

Tim Fitzgerald, MSU agricultural economist,
"Leasing your farm or ranch for energy
exploration"

April 29

Professor Geoff Poole, MSU's Land
Resources and Environmental Science
Department, "Stream Habitat Restoration
from a fish eye's view and how it positively
impacts agriculture".

Invited Talks

Two of our faculty, David Sands and
Florence Dunkel, gave TEDxTalks in Room
125, Linfield Hall on Friday, March 23. The
title of Florence's talk was, "What's for
Lunch: Sustainable Food Practices" and the
title of David Sand's talk was "Rainmaker
named Sue".

Go to this website to view both talks. Click

on Session 1. Florence's talk begins at 1 hour and 15 minutes and Dave's talk is right after that.

http://www.livestream.com/tedx2/video?clipId=pla_9ae4e1d9-6c47-43d6-9a2b-04ee07d4d238&utm_source=lslibrary&utm_medium=ui-thumb.

Grants

Chaofu Lu, "Enhancing Biofuels from Genetically Enhanced Camelina", U.S. Department of Energy. \$221,317.

Publications

Cathy Cripps and Leslie Eddington. 2012. "What Do We Know About Fungi in Yellowstone Park?" *Yellowstone Science* 20:8-16.

Zhaohui Hu, Zhonghai Ren, and Chaofu Lu. 2012. "The Phosphatidylcholine Diacylglycerol Cholinephosphotransferase Is Required for Efficient Hydroxy Fatty Acid Accumulation in Transgenic Arabidopsis." *Plant Physiology* 158: 1944-1954.

Planting Bare Root Trees

By Toby Day, Extension Horticulture Associate Specialist



Bare root tree. Picture obtained from Tree Associate website

I'm a big proponent of planting bare root trees, those sold without soil around the roots. Why? Mostly because they normally cost 80 percent less than containerized or B&B (Balled and Burlapped) trees, and they are easy to handle, easy to

plant. Also, their survival and establishment in our landscapes (either as specimen trees or in shelterbelts) is better than containerized and B&B if planted and cared for correctly.

When you purchase bare root trees, make sure that they are still completely dormant. Bare root trees are usually only sold in the spring because they are dug when dormant

and can only be held in storage for so long. If the tree is budding leaves or needles before it is planted, it will likely dehydrate due to water loss. To keep the tree from budding, retail nurseries will normally keep it in a cool and dark location until it is sold.

When you purchase a bare root tree, make sure the nursery packages the root system in wet newspaper or sawdust wrapped in a plastic bag. This will ensure that the roots do not dry out from the time they are in storage to the time that you plant. Bare root trees should be planted as soon as possible. If you are unable to plant the trees right away, make sure that you keep them in a cold, dark and moist environment to keep them from budding out.

When planting the tree, make sure that the hole is at least two times the diameter of the root system. However, the hole should be no deeper than that soil line on the trunk (where it was grown in the field) to the lowest root (usually no more than 8 inches deep!). Before you place the tree in the planting hole, make sure to prune any dead or diseased roots or those that are too long (never "wrap" the roots around the hole). Place the tree in the hole and gently separate any tangled roots. If roots cross or they are too long for the width of the planting hole, simply prune them back. Be sure that the planting collar (the old soil line where the tree was planted before) is at least at the soil line, or even better, slightly higher. Many times trees are planted too shallow and they experience issues or even failure years down the road. Refill the hole with only the soil that you removed from the planting hole. It is not recommended that you add amendments at this time (compost, fertilizer, etc). If you need more soil, take it from a garden or flower bed. When filling, be sure to add water periodically to the hole to remove air pockets. A mulch circle around the tree is encouraged to retain soil moisture. Add three to four inches of mulch around the tree taking care to keep the mulch away from the trunk (keep back at least 6 inches) as this could lead to disease. The mulch will nearly double the tree's growth and

establishment. And, be sure to keep the tree well watered the first year.

Staking of the tree is only required if you live in a windy area. If you stake the trees, make sure not to stake them too tightly, or too high, and use something wide that doesn't cut into the bark. Remove the staking in the fall.

Finally, there is no need to prune anything other than dead, dying or diseased branches at the time of planting. If you want to prune the tree, wait until the next winter – the more branches the tree has at planting the more food it can produce. The roots also will develop faster and the tree will establish faster.

Recipe of the Month

Moist Lemon Tea Cakes

1-1/2 cups butter, softened
1 package (8 ounces) cream cheese, softened
2-1/4 cups sugar
6 eggs
3 tablespoons lemon juice
2 teaspoons lemon extract
1 teaspoon vanilla extract
1-1/2 teaspoons grated lemon peel
3 cups all-purpose flour



GLAZE:

5-1/4 cups confectioners' sugar
1/2 cup plus 3 tablespoons 2% milk
3-1/2 teaspoons lemon extract

In a large bowl, cream the butter, cream cheese and sugar until light and fluffy. Add eggs, one at a time, beating well after each addition. Beat in the lemon juice, extracts and lemon peel. Add flour; beat just until moistened.

Fill greased miniature muffin cups two-thirds full. Bake at 325° for 10-15 minutes or until a toothpick inserted near the center comes out clean. Cool for 5 minutes before removing from pans to wire racks to cool completely.

In a small bowl, combine glaze ingredients. Dip tops of cakes into glaze; place on waxed paper to dry.

Yield: 8-1/2 dozen.

Birthdays

Ryan Quire	8
John Sherwood	12
Mike Giroux	12
Toby Day	15
Matt Lavin	20
Andreas Fischer	25
Nina Zidack	26
Martha Peters	30



See the following two pages for an invite to The Horticulture Open House and pictures of Bernie Schaff's Retirement Party.

How green is your thumb?

Recycled Container Garden Competition
at the Horticulture Open House, April 16th, 1-4pm

AWARDS!

jury award

people's choice award



PRIZES!

MSU bookstore
gift certificates
(\$50 each)

Rules

1. anyone can enter
2. choice of container(s) is up to you!
3. must be able to move the garden by yourself
4. any size up to 3ft x 3ft
5. you supply your own plant materials and growing space
6. gardens to be delivered to the Plant Growth Center from 10am-1pm, April 16th
7. gardens must be removed 4-5pm, April 16th
8. obtain an entry form from Tracy Dougher (tracyaod@montana.edu)



We wish you a Happy Retirement Bernie. You are missed!



The grillers,
Mike Giroux and
Andy Hogg



Cheryl giving
Bernie a little
something to
remember her by.



Bernie sharing some thoughts
about his 25 years of service.



John Sherwood thanking
Bernie for all his years of
service to MSU.



Bernie, Nancy Blake,
Ron Larson, and Getz,
Bernie's replacement



Don Mathre, Barbara Prescott (Bernie's fiancé), Bernie,
Getz, Kevin Grey, Bill Grey, and Jack Martin enjoying
their lunch)



Susan Lanning, Perry Hofer-
ber, and Ron Ramsfield