

# Plant Science Says



Volume 14, No. 5

June, 2011

## PSPP Celebrates Graduation

On May 6, the Plant Sciences and Plant Pathology Department held a reception and awards ceremony for our graduates with approximately 100 people in attendance. The Landscape design graduates received the book, "The Artful Garden: Creative Inspiration for Landscape Design"; Crop Science graduates received "Weeds of the West"; and the Horticulture graduates received loupes (magnifying glass). All the graduates received a coffee mug, MSU pin, cowbell from the College of Agriculture and a grapevine plant. Pictures of this event are on page nine. Following are the names of all those that received degrees and awards.

## Undergraduates

### Environmental Horticulture - Horticulture Science

Taven Anderson - B.S., Honors, ASHS Collegiate Scholars Award

Andrew Beland - B.S.

Bethany Flikkema - B.S., ASHS Collegiate Scholars Award

Kathryn Gause - B.S.

Karissa Liddell - B.S.

Kristen O'Brien - B.S., Honors

Lee Olesen - B.S., Jacobsen Future Turf

### Managers' Seminar

Paul Purdom - B.S.

### Environmental Horticulture - Landscape Design

Kyle Begger - B.S., Honors, ASHS Collegiate Scholars Award

Brett Bond - B.S.

Jeremy Currer - B.S.

Justin Fabricius - B.S.

Jeremy Federer - B.S.

Agatha Frisby - B.S., ASHS Collegiate Scholars Award

Margaret George - B.S.

Dillon Graham - B.S.

Jada Krusniak - B.S.

Karson Lucas - B.S.

Stefan McElroy - B.S.

Yana Neely—B.S., Honors, ASHS Collegiate Scholars Award

Jeffrey Noe - B.S.

Timothy Obstar - B.S.

Jodi Redfield - B.S., Honors, ASHS Collegiate Scholars Award, ASHS Outstanding Undergraduate Horticulture Student Award

Micah Stonehocker - B.S.

Hannah Sukut - B.S., Honors

Kyle Trembley - B.S.

## Plant Sciences - Crop Science

Ryan Haidle - B.S., Honors

Valerie Riter - B.S., Highest Honors, Plant Sciences & Plant Pathology Outstanding Senior Award

## Plant Sciences - Plant Biology

Kelsey Huber - B.S., Honors

## Graduate Students

Jean Allen - M.S., Plant Science

Dai Ito - M.S., Plant Pathology

Jay Kalous - M.S., Plant Science

Yukiko Naruoka - Ph.D., Plant Genetics

Ernesto Moya - Ph.D., Plant Pathology, E.L. Sharp Award

## Teaching Awards

Tracy Dougher, PhD - NACTA Teacher Fellow Award

Florence Dunkel, PhD - Honorable Mention, MSU Teaching & Learning Award

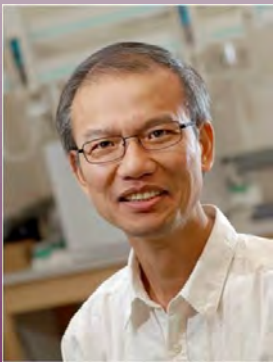
William Dyer, PhD - ACTA Teaching Award of Merit

## Promotion and Tenure

Congratulations to the following faculty on their rise in the ranks of promotion and tenure: Andreas Fischer - Professor, Chaofu Lu and Kevin Wanner - Retention.



*Isabelle Fischer, Andreas Fischer, and President Waded Cruzado*



*Chaofu Lu*



*Kevin Wanner*

## **School Integrated Pest Management Inspection Tour**

**By Ruth O'Neill, Schutter Diagnostics**

On May 18, the Schutter Lab capped off a year-long survey of pests at several Bozeman School District Facilities with the "School IPM Training and Inspection Tour". The morning session was a hands-on inspection and insect-monitoring circuit through three district facilities. In the afternoon, two guest speakers from other western states with exemplary School IPM programs delivered slide presentations.

The goal of the Bozeman School IPM tour, and of the Montana program as a whole, is to teach ways to soften pesticide use in schools through improved pest identification, pest exclusion, and recognition of pest-friendly building conditions. The program is part of a national effort to protect children's health, sponsored by the EPA and the Montana Department of Agriculture.

The morning portion of the Bozeman School IPM tour had 25 participants, in-

cluding Gallatin County Health Department and MT Department of Agriculture personnel, as well as ten registered government pesticide applicators who currently work in schools or plan to do so. Participants shared various duties, including glue trap pick-up and replacement, record-keeping, and notes on facility conditions. We were graciously accommodated by the staff at Whittier Elementary School, Sacajawea Elementary School, and the district kitchen at the Support Services building. Bozeman is fortunate to have dedicated custodians and other staff keeping the bugs out. So far no cockroaches, bed bugs, or fleas have been picked up in the monitoring traps – common problems in many school districts nationally.

For the afternoon audience of 42, Ricardo Zubiarte, Custodial Supervisor for the School IPM Award-winning Salt Lake City School District, talked about "The Salt Lake City Experience", sharing the many beneficial changes his school district has made, and underscoring the important role that custodial staff can have in child safety and the education of school district staff. Dr. Dawn Gouge, Urban Entomologist at Arizona State University, talked about "Bed Bugs and Other Bad Bugs: Why We Need School IPM" and stressed the importance of systematic monitoring and pest prevention.

## **Farm Fair, 2011**

**By Joanna Gress**

The Wanner Lab hosted a Bee/Pollination Booth for the 2<sup>nd</sup> year at the 7<sup>th</sup> annual Gallatin Valley Farm Fair May 10-12 at the Brainards' ranch northwest of Belgrade. This year's Farm Fair hosted 900 local area 4<sup>th</sup> graders over three days (an increase over last year's 650 students) and taught them about agriculture. Groups of about 20 students rotated through 16 different agricultural stations every 15 minutes and participated in a variety of activities including learning how and when bees pollinate, milking cows and goats, identifying weeds, learning about 4H, seeing how farm animals work, and making ice cream.

I hosted the honeybee station at this event and with the help of undergraduate Emily Rohwer and fellow presenters Laura Roe, Casey Delphia, and Kevin Wanner. We educated over 900 students about the importance of honeybees as pollinators for agriculture. This was the second year that the bee station was at the Farm Fair and even **though we didn't have live bees to show** the kids, it was still a big hit. I brought lots of things for the students to feel and touch including an empty hive with empty frames with drawn comb, containers of beeswax, and a honey extractor as well as lots of pictures of bees inside the hive for the students to see.



*Joanna Gress educating 4th grade students at the Farm Fair*

I asked the students what bees do and my top three answers were 1) make honey 2) sting, and 3) pollinate plants. I was regaled with stories of stings by the students, but I made the point that bees are usually very peaceful and just want to be left alone to do their business, so if you leave bees alone they will leave you alone. I focused on the pollination and asked them what it was and why it was so important. Honeybees pollinate over 130 crops in the U.S. and bee pollination is a \$15 billion industry. In Montana, beekeeping is the 10<sup>th</sup> largest economy and we are the 6<sup>th</sup> largest honey producing state. I used almonds as an example; almonds are one of the most honeybee pollination-dependent crops in the United States. Every year two thirds of all the commercial beehives in the U.S. are trucked to California to pollinate the almond orchards, which is approximately 1.3

million of the 2.4 million hives. I next asked the students how bees make honey. They do so by collecting nectar from flowers and evaporating it down. Nectar is about 70% water while honey is only 20%. I had them guess how many visits to a flower it would take to make one pound of honey. They loved to guess and were shocked to find out it was 2 million visits. We then focused on why bees make honey — it is not just for us to eat but also for them to eat in the winter when it is cold and they need food to create metabolic energy to produce heat to maintain the core temperature of the hive. A typical hive needs to make around 70 pounds of honey to survive the cold Montana winters so that means they need to visit at least 140,000,000 flowers. A hive of bees will fly 90,000 miles, the equivalent of three orbits around the earth to collect 2 lbs. of honey.

The kids really liked the station and really enjoyed taking apart the empty hive and spinning the honey extractor. They asked a lot of questions about bees, how long the queen lives for (2-5 years), how long workers live for (4-6 weeks in the summer), was there a king bee (no such luck guys), and how many bees are in a hive (around 70,000). This was a very rewarding experience and as I was able to enlist **volunteers this year, I didn't have to talk the entire time so I wasn't hoarse by the end of the three days.** I had a great time educating the next generation on the wonders of honeybees and pollination and maybe got a few of them thinking about keeping bees in the future.

### **Field Days**

June 28 8:30 a.m.	Northern ARC Field Day Havre
June 29 9:00 a.m.	Western Triangle ARC Field Day Conrad
July 7 9:30 a.m.	Central ARC Field Day Moccasin
July 12 9:00 a.m.	Post Farm Field Day Bozeman
July 26 9:00 a.m.	Eastern ARC Field Day Sidney

## Montana Ag Live Schedule

June 5— Cathy Cripps, MSU Mycologist, "Mushrooms to Avoid"

June 12— Mark Mattix, Consulting Veterinarian, "Problem poisonous plants in Montana and their effect on livestock"

## Montana State Seed Testing Lab Operates under New Law

Change is in the air for the staff and customers of the Montana State Seed Testing Laboratory due to the passage of Bill 195 by the Montana State Legislature. The result is that the Director of the Agricultural Experiment Station, currently Dean Jeff Jacobsen, will appoint an advisory board made up of five people - three from seed industry related organizations, one from the Department of Agriculture, and one from the Montana Agricultural Experiment Station. The Board will make recommendations to Dr. Jacobsen regarding rates to be charged for seed analysis, staffing levels, budget matters, and operational procedures for the laboratory. The law went into effect upon passage.

## Course Focus

### BIOB 160 Principles of Living Systems By Luther Talbert



This course introduces students to basic cellular and molecular biology. In fact, that was the name of the course before the current ambiguous title was assigned in 2010. The first half of the semester focuses on

Cell Biology and is typically taught by faculty external to PSPP. Genetics is the focus of the second half. Drs. Sharrock and Talbert in PSPP currently enjoy this assignment. There are typically 150-250 students in the class, some of whom have an interest in genetics and are willing to expend a certain amount of intellectual energy to become acquainted with the subject. Seriously, the introduction to cellular biology and genetics is interesting for many of the students, and they are usually fun to interact with. Teaching the class sometimes even helps the instructors remember that biology is interest-

ing, sometimes amazing, and in fact almost unbelievable the way life works. The instructors may even be reminded why they chose biology as a career path in the first place.

Teaching a large class has its own challenges, which a retired colleague, whom we will refer to as RS, likened to fishing on a big river. Standing beside the Madison and viewing the river from bank to bank makes it hard to know where to throw your worm (or **your 'fly' if you are a more sophisticated angler**). However, if you look at the river as a series of creek-sized corridors, you see the same fish habitat as you would on small creek. By analogy, surveying a class of 200 as a whole also presents a challenge in focus, which can be overcome by seeing the class as a series of smaller blocks. This gives the instructor a place to focus attention – a target for the lure to see if anyone will rise to the surface. I suppose one difference is that when the fish become inattentive you can go to the cooler for a cold beer, while it is frowned upon to pack up and go to the bar when students are inattentive. Fortunately, complete absence of focus from students only sometimes happens.

The instructors for this class have an added incentive to make sure students learn something, which is that they will see many of them later in Genetics. A surprising observation is that retention time for certain subjects, such as meiosis, does not always extend much beyond the final exam! If that far! However, one hopes that the introduction received in BIOB160 makes higher level classes more sensible for those students that continue to study biology. BIOB160 may also be the last biology course for many students, who may better understand genetic and cell biology topics that arise in society and their own lives. These are the primary reasons that the class has a high enrollment. Incidentally, BIOB160 is required for many majors.

## Invited Lectures

Gary Strobel was invited to speak at the Royal Golden Jubilee PhD Program in Bangkok, Thailand. The story behind this is that

10 years ago, the King of Thailand wanted to **have more Phd's in Thailand so raised** 100 million to fund doctoral students. Each student is required to have foreign advisor. Currently there are advisors from forty countries. Gary Strobel was an advisor to Jitra Kokaew.

Gary also gave the plenary lecture at the National Meeting of the American Society of Microbiologists in New Orleans on May 23.

David Sands was invited to speak at the The Food Innovation Center and CAFFRE Center for Advanced Functional Foods Research) in Columbus, Ohio. The summary of his talk was as follows: The human diet has a tremendous impact on health and disease. Our current diet has contributed to alarmingly high incidence of a number of diseases including type 2 diabetes, heart disease, and obesity. We propose that there is great opportunity for agriculture in continued development and production of crops that are more desirable for consumers, provide enhanced human nutrition, and for reduction of chronic diseases. With concerted production of more nutritious crops, the healthier we can make our food, and the less we might need to spend on treating chronic health problems that are aggravated by our current dietary intake. This goal will require considerable innovation and coordination. These topics were the focus of the presentation. Dr. Sands has been involved in the development of new grains, new lysine producing microbes for bread making, and design of new more nutritious proteins, all targeting production of more nutritious foods to mitigate celiac disease, obesity, protein malnutrition, and diabetes. The Plant Breeder's Dilemma: Optimal human nutrition and the production of plant-based foods (D.Sands, E. Dratz, C. Morris and A. Pilgeram).

## **Grants**

**Mike Ivie, "Small Grains and Shelter Belt Pests and Emerald Ash Borer,"** Montana Department of Agriculture

**Cindy Morris, "Bioaerosols in the Earth System",** NSF

**Mike Giroux, "Durum Wheat with Value-added Starch Properties,"** Dow Agri-Sciences LLC.

## **Video**

### THE SPECIES PROBLEM

A movie by MSU student film maker **Christina Choate** covers "**The Species Problem**" in a unique way. Several MSU professors including four from our department are interviewed in this student film. This is a Vimeo film in high-definition and plays on **most computers, but if you can't view it, try another computer or update your flashdrive. If you haven't heard about the controversy regarding the definition of the word species, view the 16 minute movie at:** <http://www.vimeo.com/23326869>

## **Tree Care by Toby Day**

Proper tree care starts with choosing the right tree for your needs and planting it in the right location. How you care for your tree, especially in its first few years of life, will affect its strength, shape, and the **tree's life span. Trees can be enjoyed for many generations** so it pays to heed good planting and maintenance techniques to ensure your tree will prosper for years to come.

Once you have chosen the proper site for the tree you want to plant, you likely have three choices in purchasing your specimen: bare root, balled and burlapped (B&B), or containerized. There are a few details to observe when planting each type.

Bare root trees should only be planted when dormant, which is usually in the spring and is not recommended for conifers. When planting bare root, you want the planting hole to be two times as wide as the root spread and the soil level to be at or slightly below the crown of the plant, where the trunk emerges from the roots. Also for bare root stock you need to build up a mound of soil in the center and bot-

tom of the planting hole, no higher than 1/3 depth of the hole. This allows the tree to grow properly, much like it was before it was dug in the field and sold at the nursery. Prune out any diseased or broken roots on bare root trees prior to placing them in the hole.

Containerized trees should be planted at the same depth as they were grown in the pot with the planting hole twice as wide as the diameter of the pot. Once the pot is removed, you may find that the containerized tree has become root-bound. Root-bound trees in containers will have roots circling around the bottom of the pot. If the tree is root-bound, use a sharp, clean **knife and cut an "X" in the bottom of the root ball.** You will also need to cut or **"butterfly" the sides of the root ball to encourage the roots to grow outward** instead of continuing to grow in a circle. Roots that remain growing in a circle may girdle the tree cutting off the flow of sugars flowing through the phloem, eventually killing the tree.

Balled and burlapped (B&B) trees are usually larger trees and might require a professional to plant them. When planting B&B tree stock, make sure the tree is planted in a hole two times as wide as the root ball, and that the tree is picked up by the root ball and not the trunk. Once it is sitting at the acceptable level, the same soil level as it was grown in the field, cut the twine away from the trunk. Cut and remove the twine and burlap down to about half of the root ball. If your B&B tree is caged in wire, push the ears (top of the cage where the twine was tied) down as far as you can into the planting hole and remove as much burlap as you can reach. The wire cage and much of the burlap will remain in the planting hole and will be covered with soil. The cages and the burlap are designed to break down over time and should not hinder root growth. Once the trees are placed, the remaining planting methods are fairly similar for all three types of purchased trees: Bare root, containerized or B&B. Begin to backfill the planting hole with the same soil you re-

moved without adding amendments to the soil. Trees establish better in the long run if they are grown in the native soil they are being planted in. Remove any rocks and debris and continue backfilling while lightly compressing the soil as you do so to remove any air pockets. This is easily done by compressing the soil around the tree with your foot or fist. Additional topsoil may need to be added to achieve the desired level of soil around your tree.

Minimal pruning is needed on a newly planted tree. Only prune out dead, diseased or broken branches and remember to properly clean your tools with alcohol after every pruning to reduce the spread of diseases.

It is a good practice to create a temporary water well around the drip line of the tree to hold moisture. This is simply a berm of soil, **roughly 4" tall,** around the base of the tree below the drip line. Lastly, add a thick layer (at least 2-4") of mulch inside the berm, but be careful not to let the mulch touch the trunk which encourages diseases. Water the tree immediately by filling the well several times to make sure the tree has plenty of water. Water deep and often the first year until the tree is established.



Staking or guying your tree is not necessary unless the tree is located in a windy area or you have poor soil conditions. Regardless, stakes or guy wires should only be left on for one year, any longer and you risk damaging the tree and stunting its development. If you must stake your newly planted tree use two stakes on either side

of the tree placed toward the prevailing wind. Guying involves tying the tree to stakes located in the ground. Guying is most often used for conifers. Make sure **the material tied around the tree won't** gouge the bark causing a wound. Ask your local nursery about proper staking methods when you purchase the tree.

## Updating Non-Windows Software by Matt Rognlie, College of Ag IT Coordinator



This month's column is a simple reminder of the importance of updating non-Windows software. I remind everyone that while Microsoft Windows updates are automatic on nearly every machine, other software often needs attention. I notice that many people leave Java and Adobe updates pending for very long periods of time. If **Java needs updating, you'll see an icon in your 'system tray' (lower right hand corner of your monitor)** that looks like this:



It is important to keep Java updated as many Web sites use the plug-in to show **you dynamic content. It's also a major target of malware writers and hackers. The current version is "Java 6 Update 25."** Any time this icon appears, please click on it and install the update. Sometimes the update window also suggests you install additional software, like a toolbar or backup software. I strongly recommend not installing any additional software it recommends. If you use Banner, and **have heard people say you shouldn't use Java updates until they are tested with Banner, please update anyway. In the very outside chance an update affected Banner usability, it's very easy to revert to a previous version of Java.**

The second, common icon you'll see in your system tray is for Adobe updates. It will look like one of these:



These icons will notify you about updates to Adobe (Reader, Acrobat, etc.) and Macromedia products. These are also important to install. Updates for Adobe Flash Player usually pop up in a separate window and not the system tray. Flash is also very important to keep updated. Thanks for paying close attention to these. Yes, **sometimes it seems like they "come out every other day and you're really annoyed"** but trust me, it's important to do these.

Do you use a Mac? Good news – you **don't need to update! That is a common perception among Mac users and it is completely wrong!** There is just as much malware and hacking targeting Macs as Windows PC's these days so you are not off the hook.

Finally I want to update you on the **progress of MSU's new firewall implementation. We've gone a huge step forward in turning away attacks on our systems and we system administrators are breathing easier. However the need for you to update your software hasn't lessened one bit. The reason for this is because, believe it or not, you ask for malware and hacking most of the time! Yes, when you visit a malicious or hacked Website, you've unknowingly (or knowingly perhaps) asked for the intrusion merely by visiting. The firewall does not protect against things you legitimately ask for.**

Hope that helps! Enjoy your summer, or whatever this is.  
Matt

## Passwords

Please see the short article below for good advice regarding passwords.  
[http://www.securingthehuman.org/newsletters/ouch/issues/OUCH-201105\\_en.pdf](http://www.securingthehuman.org/newsletters/ouch/issues/OUCH-201105_en.pdf)

## Recipe of the Month Strawberry Cobbler

1/2 c white sugar (depending on sweetness of berries)  
1T cornstarch

1/3-1/2 c water  
 4 c strawberries, hulled  
 2 T butter, diced  
 1 c flour  
 1 T white sugar  
 1 1/2 baking powder  
 1/4 t salt  
 3 T butter  
 1/2 c heavy whipping cream



Preheat oven to 400 degrees. Butter a two qt baking dish. Combine sugar, corn-starch, and water. Cook over medium heat, stirring constantly, until thick and hot. Stir in strawberries, and remove from heat. Pour mixture into the baking dish and dot with butter. Stir flour, sugar, baking powder, and salt together. Blend in 3 T butter. Stir in cream. Mixture should be fairly soft. Spoon on top of berries. Bake for 25 minutes.

### June Birthdays

Israel Davich	2
Jill Scarson	3
Zach Miller	4
Ron Larson	12
Li Huang	12
Jennifer Britton	12
Ron Ramfield	15
Jackie Kennedy	15
Luther Talbert	18
Eileen Carpenter	22
Bill Hoch	25
Stan Bates	28



**On pages 10 and 11 of this newsletter are drawings of the roundabout at College and 11th.**



# CONGRATULATIONS!



Kyle Begger



Jay Kalous



Valerie Riter



Hannah Sukut



Andrew Beland



Bethany Filkköma



Florence Dunker, Faculty



Bill Dyer, Faculty



Jada Krusniak



Jodi Redfield



Kelsey Huber



Agatha Frisby



Yana Neely



Margaret George



Kathryn Gause



Valerie Riter



Taven Anderson



Stefan McElroy



Yukiko Naruoka



Lee Olesen

Plant Sciences and Plant Pathology, Class of 2011





SY#	REVISION	BY	APPR.	DATE

BRAD THOMPSON  
DESIGNED BY  
DATE 3/2/2011

BRAD THOMPSON  
DRAWN BY  
PROJECT NO. 08510.000

TOM CAVANAUGH  
CHECKED BY  
FILE ..\DESIGN\108510sdp

PROJECT TITLE  
**COLLEGE AND 11TH STREET ROUNDABOUT**  
Bozeman, Montana

SHEET TITLE  
**SIGN INSTALLATION PLAN**

SHEET  
**46 OF 50**

