



Faculty Excellence Awards

Three PSPP faculty have had their Faculty Excellence Grant Proposals funded. They are Cathy Cripps, Rebekah VanWieren and Jennifer Lachowiec. They will each be using their grant dollars as follows: Cathy - travel expenses to collect alpine fungi in Alaska, Rebekah - travel expenses and research site visits to support current research on vacant land regeneration, and Jennifer - purchase of equipment needed to obtain data for NSF proposal. Congratulations to each of you!

Vetch Awarded Scholarship



Justin Vetch was awarded an American Association of Cereal Chemistry Professional Development Student Research Program Scholarship. The scholarship will provide supply funding for his research along with a travel award enabling him to present his

results at the 2019 Cereal Chemistry National Meeting in Denver, Colorado. Congratulations Justin!

WERA-1017

By Mary Burrows

In May, I had the opportunity to attend the WERA 1017 (Coordination of Integrated Pest Management Research and Extension/Educational Programs for the Western States and Pacific Basin) meeting in Portland, Oregon.



Melodie Putnam, Oregon State University diagnostician, shows off her microscope setup.

Since I arrived early, I drove down to Oregon State University in Corvallis to catch up with my old friend Jerry Weiland with USDA-ARS and to visit Jay Pscheidt and Melodie Putnam. Melodie and I had a great conversation about the National Plant Diagnostic Network and I had some serious clinic space envy. Melodie processes about the same number of samples as we do every year, but on much higher value crops such as hazelnut, Christmas trees, peonies, and a wide variety of vegetable and fruit crops.

WERA-1017 is the annual meeting for state IPM coordinators in the west. For the first time in many years, we had



WERA-1017 meeting attendees. Mark Wright from Hawaii and Bob Schlub from Guam were a bit chilly, which is normal when they visit the continental U.S.

learned about pollinator programs in Oregon from the lively and engaging Andony Melathopoulos, had a tour of the pear orchard, then went to Bonneville Lock and Dam and Fish Hatchery. All of the scientists, administrators and extension folks were amused by the windows into the fish ladder where we could see fish swimming upstream. It was a quick meeting, but I learned a great deal about new programs and came back with some exciting ideas.



Montana county extension agents may see these in offices this fall, an educational tool used by UC-IPM.

AOSCA Annual Meeting By Doug Holen

The Western Region's Association of Official Seed Certifying Agencies (AOSCA) had their annual spring meeting in April. This group consists of Foundation Seed Programs, Crop Improvement Agencies, and Seed Grower Associations across the Western United States including Hawaii, Alaska, Arizona, New Mexico, California, Oregon, Washington, Idaho, Montana, Utah, Colorado, Wyoming, Nevada, and Kansas. The host state rotates every year with 2018 in Nevada at Lake Tahoe on April 11 and 12. Montana hosted last year in Whitefish and New Mexico takes their turn in 2019 in Albuquerque.

I traveled with Heather Unverzagt and Rebecca Papke of the Montana Seed Growers Association to Reno and over to Tahoe to meet up with our colleagues. We had a full agenda including discussions regarding relationships with Plant Material Centers, Breeder Seed tags, field and seed standard change proposals, uniform pulse crop standards, hybrid wheat and rye, hemp production, PVP and Title V, and working

representatives from Alaska to Guam. A couple of the coordinators were new and there were many other familiar faces. The purpose of the meeting is to share information, network, and touch base with the Western Region IPM Center and USDA-NIFA, which funds many of our activities. The University of California system was represented in force and Rubella Goswami represented USDA-NIFA and gave us an update. Our tour brought us to many places including the Mid-Columbia Extension Center in Hood River where we

cooperatively across states. During the unstructured time, the 45 attendees enjoyed discussing work topics, playing some pretty competitive card games, and swapping historical stories.

Other regional AOSCA groups include Northern and Southern with everyone coming together at the National meeting in Atlanta, Georgia, in June of this year. The big 100 year anniversary will be held in June of 2019 back where it all started in Chicago, Illinois.

All MSU Foundation seed and field standards have national guidelines outlined with state standards commonly more stringent. Standards are set for all crops ranging from forages to small grains to row crops.

A little About AOSCA from their website:

The Association of Official Seed Certifying Agencies, (AOSCA) is dedicated to assisting clients in the production, identification, distribution and promotion of certified classes of seed and other crop propagation materials. Established in 1919 as the International Crop Improvement Association, AOSCA's membership includes Seed Certifying Agencies across the United States and Global membership including Canada, Argentina, Brazil, Chile, Australia, New Zealand, and South Africa.

Mission Statement:

To promote and facilitate the movement of seed or plant products in local, national, and international markets through the coordinated efforts of official seed certification agencies acting to evaluate, document, and verify that a seed or plant product meets certain accepted standards.

The major purposes of AOSCA are:

- To establish minimum standards for genetic purity and identity and recommend minimum standards for seed quality for the classes of certified seed.
- To standardize seed certification regulations and procedures, and

operational procedures in inter-agency seed certification.

- To periodically review agency genetic standards and procedures to assure compliance with the Federal Seed Act.
- To cooperate with seed regulatory agencies in the determination of policy, regulations, definitions or any procedures relating to the labeling and distribution of seed moving in intra-state, inter-state or international commerce.
- To cooperate with the Organization of Economic Cooperation and Development (OECD) and international organizations involved in the development of standards, regulations, procedures, and policies to expedite movement of seed and encourage international commerce in improved varieties.
- To assist member agencies in promotion, production, identification, distribution and use of the certified classes of seed and other propagating materials of crop varieties.

The Voice of Montana Farmers By Hikmet Budak

The Cereal Genomics, Targeted Breeding Program from the Department of Plant Sciences and Plant Pathology organized the



Lyle Benjamin interacting with Dr. Perry Miller, Professor in the Department of Land Resources and Environmental Sciences.

third workshop of "The Voice of Montana Farmers" on Friday May 11, 2018, at 1:30 PM at the Plant Bioscience Building. The speaker at this workshop was Mr. Lyle Benjamin, a fifth generation farmer from Sunburst, Montana. Mr. Lyle provided insights into German agriculture in modern times focusing on the German/American Trans-Atlantic Dialogue, an **instance** where farmers from the United States and Germany share visions, experiences, challenges, and opportunities for agriculture practiced in their countries. As in previous instances, this workshop had a good audience of farmers from Montana, faculty and staff members, and graduate students from MSU.

Farm Fair at Brainard Ranch Courtesy of ABC Fox News

In early May, 1,200 fourth graders from all around the Gallatin Valley found a new classroom at the Brainard Ranch, where the lessons ranged from crops to cows. Farm Fair host Ed Brainard states, "The message was about Montana's cultural heritage. They find out where a lot of their food comes from. We have a water cycle; they learn that water comes out of the sky and goes into the ground and goes back into the sky".

Brainard has hosted the Gallatin Valley Farm Fair for its 14-year run. He says one of his favorite parts is seeing former fourth graders return as volunteers, members of 4-H, or even with a class of their own.

Hands-on experience is key at the Farm Fair. Students get to pet animals, go on carriage rides and even make their own ice cream. It's a special event only for fourth graders. Farm Fair Chair Patti Soares says, "It takes an entire school year's worth of planning to make it happen".

This year set a new record for attendance, a sign of how rapidly schools in the valley are growing.

"This valley is just exploding, and we can feel the growing pains the schools are going

through because it's causing growing pains for our program," Soares says. "But we're going to do it as long as we can for as many kids as we can." Brainard echoed those sentiments.

Below are the topics covered at the fair:

Water cycle
Bees/pollination
Weeds identification
Irrigation/soil conservation
Forestry
Beef cattle
Dairy and cow milking
Dairy goats/cheese
Sheep (ewe to you)
Gallatin Valley crops
Safety
Making "tin can" ice cream
Pigs
Potatoes
4-H
Story of wheat (field to table)
Draft horses

PSPP folks that had a station include the following:

Michelle Flenniken, Marie Pizzorno, Brian Ross, and Alex McMenamin
Laurie Kerzicnik
Nina Zidack, Susie Siemsen, Eileen Carpenter, Anna Jespersen, and Steve Hystad
Jessica Rupp
Doug Holen
Jim Berg
Randy Taylor – PSPP student
Mary Burrows
Jason Cook
Ron Larson

2018 Field Days

Southern Agricultural Research Center,
Tuesday, June 19: The field day begins at 3 p.m. and includes dinner. The center is located at 748 Railroad Highway in Huntley. 406-348-3400.

Northern Agricultural Research Center,
Thursday, June 21: The field day begins at 3 p.m. with tours before and after dinner. The center is located about seven miles southwest

of Havre on U.S. Highway 87. 406-265-6115.

Western Triangle Agricultural Research Center, Tuesday, June 26: The field day begins at 11:30 a.m. and will include lunch. The center is located at 9546 Old Shelby Road in Conrad. 406-278-7707.

Northwestern Agricultural Research Center, Tuesday, July 10: The field day begins at 2 p.m., with dinner following the tour. NWARC is located near Creston on State Highway 35. 406- 755-4303.

Central Agricultural Research Center, Thursday, July 12: Registration begins at 8:30 a.m. with coffee and doughnuts. The field day starts at 9 a.m. and includes lunch. The center is located 2.5 miles west of Moccasin on U.S. Highway 87. 406-423-5421.

The MSU Arthur H. Post Agronomy Farm, Friday, July 13: The Post Farm will begin tours at 8:30 a.m. followed by lunch. The Post Farm is located eight miles west of Bozeman on U.S. Highway 191. 406-586-6819.

Eastern Agricultural Research Center, Tuesday, July 17: The field day begins at 9 a.m. and will include lunch. The center is located one mile north of Sidney on State Highway 200. 406-433-2208.

Western Agricultural Research Center, Thursday, July 26: The field day starts at 4:30 p.m. with dinner at 5 p.m. and tours following. WARC is located at 580 Quast Lane, Corvallis. 406-961-3025.

Montana Ag Live June Schedule

June 3 - Blake Wiedenheft, MSU Virologist, "The differences between GMO and genome engineering in terms of agriculture".

June 10, Cathy Cripps, MSU Mycologist, "Montana Mushrooms, the Good, the Bad, and the Ugly".

Grants

Ryan Thum, Michigan Department of Natural Resources, "Identifying high-risk hybrid and Eurasian watermilfoil genotypes to improve control".

Ryan Thum and Greg Chorak, Midwest Aquatic Plant Management Society, "Research Award".

Cathy Cripps, Puget Sound Mycological Society, "Systematics of *Russula* in the Rocky Mountain alpine Zone".

Hikmet Budak. USDA-ARS support for wheat, barley, rye, and oats for conducting research on gene curation and annotation (3 years). The Cereal Genomics Lab Targeted Breeding program obtained financial support from the United States Department of Agriculture – Agricultural Research Service (USDA-ARS) for conducting research on gene annotation and curation on wheat, barley, rye, and oats. The support, over a three year period. will enable the Cereal Genomics Lab to advance its research agenda on a key topic associated with the characterization of useful genes in these cereal crops.

Florence Dunkel. Nathaniel Sisson was awarded an INBRE (IDeA Networks of Biomedical Research Excellence) grant through NIH and will be working with Florence Dunkel as his advisor. The title of his project is "A Novel Treatment Strategy for Kwashiorkor in a Malian community."

Publications

Akpınar B.A., Biyiklioglu S., Alptekin B., Havránková M., Vrána J., Doležel J. (2018). Chromosome based survey sequencing reveals the genome organization of wild wheat progenitor *Triticum dicoccoides*. Plant Biotechnol J. 2018 May 4. doi: 10.1111/pbi.12940.

Yüce M., Kurt H., Hussain B., Budak, H. (2018). Systematic Evolution of Ligands by Exponential Enrichment for Aptamer

Selection. Biomedical Applications of Functionalized Nanomaterials, 211-243.

The Journal of Fungi (April , 2018 issue) is dedicated to the biology and biochemistry and uses of endophytic fungi. The chief editor of this issue is Gary Strobel. His introductory invited article is at the following site. -

Opinion: The Emergence of Endophytic Microbes and Their Biological

Promise: <http://www.mdpi.com/2309-608X/4/2/57/pdf>. The journal is a relatively new one that is dedicated to all aspects of the biology and utility of fungi. It fills an important niche in covering all aspects of this important group of organisms.

Bibi F, Strobel GA, Naseer MI, Yasir M, Khalaf Al-Ghamdi AA and Azhar EI (2018).

Halophytes-associated endophytic and rhizospheric bacteria: diversity, antagonism and metabolite production. Biocontrol Science and Technology. <https://doi.org/10.1080/09583157.2018.1434868>.

Dong-Hui Yan, Xiaoyu Song, Kaiying Wang, Hongchang Li, Gary Strobel, Shishou Lou (2018). Antifungal activities of volatile secondary metabolites of four Diaporthe strains isolated from *Catharanthus roseus*. J of Fungi. <http://www.mdpi.com/2309-608X/4/2/65/pdf>.

Invited Talks

Jamie Sherman, Nashville, TN, May 1, 2018, National Craft Brewing meeting, "New Barley Varieties from Grower to Glass".

Mike Giroux, Rochester, NY, April 11, 2018, LeClair Ryan, "Starch branching enzymes involved in amylose biosynthesis".

Water Efficiently This Year By Toby Day, Horticulture Extension Specialist

I'll be the first to admit that I waste water when irrigating my landscape. As I drive around Bozeman, I see that I am not alone. I see lawns being watered at night rather than in the morning, which is more efficient. I see water running down the sidewalk, driveways, down the street, and into the drain. I also

visit with area folks who don't know how much water they are applying on their lawn, garden or flowerbeds. Often what I hear is "about 30 minutes." For anyone who knows anything about irrigation, "30 minutes" usually means they have no idea *how much* water they are applying.

I plan to change my irrigation digressions this year. First, I plan to replace my ancient irrigation system. When I say ancient, the controller is a mechanical controller from the 80's. When researching what to replace it with, I found that the city of Bozeman will give rebates for new and retrofitted systems. <https://www.bozeman.net/government/water-conservation/rebates-incentives/outdoor-sprinkler-system-rebate-program> If you are in the city, TAKE ADVANTAGE OF THIS PROGRAM!!!

In addition, the city has a great publication called "Water Smart Planting Guide" that is full of great information on how to reduce water consumption. https://issuu.com/bozchron/docs/wc18-009_watersmartplantingguide_r4

The Bozeman Daily Chronicle reported that Bozeman could see a population increase of 55,000 people by 2045. They are rightfully concerned about our water supply. And, if you live in the county and are on a well, you too may watch your water levels drop, and may have to drill deeper and deeper to find water. If the city of Bozeman will increase by 55,000 people in 27 years, how many people do you think will be in the county? You are not exempt in thinking about your water consumption.

Technology has finally caught up in the landscape irrigation world. If you've had an irrigation system installed prior to 10 years ago, it is time to do a tune-up. There are now inexpensive weather stations you can retrofit to most controllers that will increase or decrease the water applied, depending on the weather. Have your system audited so see if there are issues. The city has trained several irrigation



My irrigation controller is really outdated and inefficient.



Irrigation weather stations are now around \$150.

professionals to do water audits. You can even do a DIY audit using the procedures outlined in this document from the City of Bozeman.

<https://www.bozeman.net/Home/ShowDocument?id=5283>

Do your part, whether you live inside or outside of the city of Bozeman. With all the flooding we are experiencing currently, we may not be thinking about irrigation. But come July, it will be hot and dry, and we'll be frequently watering our lawns. If you are still watering with hoses and sprinklers, you too can find ways to reduce your water usage. If you want to install an irrigation system this year, contact the local suppliers and professionals and find out how you can water more efficiently.

Recipe of the Month

Chipotle Orange Chicken Legs

1 cup fresh orange juice, divided
5 tablespoons soy sauce, divided
3 tablespoons brown sugar
2 tablespoons olive oil
6 garlic cloves, pressed
1 tablespoon orange zest
1 1/2 teaspoons kosher salt
1 teaspoon ground chipotle chile pepper
2 pounds chicken drumsticks (about 8 drumsticks)
2 teaspoons brown sugar
2 teaspoons cornstarch
2 teaspoons cornstarch



Preheat grill to 350° to 400° (medium-high) heat. Combine 1/4 cup orange juice, 3 Tbsp. soy sauce, 3 Tbsp. brown sugar, and next 5 ingredients in a shallow dish or large zip-top plastic freezer bag; add chicken. Cover or seal, and chill 10 minutes. Remove chicken from marinade, discarding marinade.

Grill chicken, covered with grill lid, 10 to 12 minutes on each side or until done. Remove from grill; cover with aluminum foil, and let stand 10 minutes.

Meanwhile, whisk together 2 tsp. brown sugar, remaining 3/4 cup orange juice, and 2 Tbsp. soy sauce in a small saucepan. Whisk together cornstarch and 2 tsp. water, and whisk into orange juice mixture. Bring mixture to a boil over medium heat, whisking constantly for 1 minute or until thickened. Brush sauce over chicken.

Birthdays

Jill Scarson	3
Li Huang	12
Jennifer Britton	12
Mac Burgess	13
Ron Ramsfield	15
Luther Talbert	18
Eileen Carpenter	22
Bill Hoch	25





Sheyenne & Dylan Mangel are happy to announce that they welcomed a baby boy into their family. On May 10th, 2018, Bannack Allen Mangel was born. He weighed 7 lbs 6 oz and was 20 inches long. Bannack and Sheyenne are both in great health and we wish to thank everyone in the department for all their support.