AgLink
Linking the College of Agriculture with its Alumni and Friends
Spring 2010

Research in the corners of Montana

From the northwestern corner of Montana to the eastern edge of the state, MSU's Research Centers (RCs) are conducting research in and for the agricultural and natural resource communities of Montana. Agronomists from the RCs, working with other MSU scientists, are finding ways to protect Montana's crops from insect and disease infestations. They are breeding new varieties of crops to better serve the needs of Montana producers and global customers.

In Flathead County, a 2006 outbreak of orange wheat blossom midge (OWBM) cost spring wheat producers over $1.5 million. Instead of getting 80 bushels per acre, producers saw yields of two or three bushels per acre.

In an effort to identify a spring wheat with a natural OWBM resistance, agronomist Bob Stougaard, of the Northwestern RC near Kalispell, grew 64 entries of spring wheat and dissected their heads to count midges. He found that some varieties (McNeal, Thatcher and Choteau) are very susceptible to the OWBM, while other varieties (those with Reeder in their parentage) were less attractive to adult female midges.

Stougaard then shared his work with Bozeman-based researchers from the Plant Sciences and Plant Pathology (PSPP) and Land Resources and Environmental Sciences (LRES) Departments. PSPP spring wheat breeder Luther Talbert bred a spring wheat population derived from crosses between Reeder (non-preferred by the midge) and Conan (preferred by the midge).

Orange wheat blossom midge on wheat. Photo by Bob Stougaard.

Jamie Sherman, a PSPP molecular geneticist, used Talbert's population to genetically map and identify a major gene that appears to control the level of plant attractiveness to the OWBM. This non-preference gene could potentially serve as a new form of resistance. The use of this trait has recently become more plausible as Sherman has identified molecular markers. The markers may be used to screen and select genetic material carrying this gene.

Next, LRES entomologist David Weaver will sample selected experimental lines grown at NWARC for volatile organic compounds. The goal is to identify the molecules responsible for the non-preference.

Stougaard will continue to screen more spring wheat cultivars in hopes of identifying additional forms of plant resistance.

"OWBM is a problem in spring and winter wheat around the world, not just in Flathead County," said Stougaard. "An OWBM resistant cultivar will benefit many growers."

In the other corner of the state, Joyce Eckhoff is developing low-cadmium durum wheat varieties for production in Montana. Durum wheat is used to make pasta.

The agronomist at Eastern RC in Sidney is developing a European market for durum. The World Health Organization

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What Do You See?

Most of us are blessed with the ability to see, feel, hear, think, reason and enjoy the richness of life and its up and down experiences. As one person out of 300+ million in the United States, the connection between my senses (if I have any) and my life experiences are unique in one sense, not unique in others. What one does with these experiences is what defines us and increases our knowledge and appreciation for the world. This is particularly true when you are in the smallest of minorities, individuals with some interest in, and connection to agriculture.

As we come out of winter into spring, is there anything better than a favorite wool sweater that took the chill off? Now, as spring comes, it goes into a neatly folded pile of other favorites to return in the future clothing mix. I wonder about the experiences of the fiber-producing lamb. Was this wool from a flock that learned how to graze noxious weeds for their sustenance? Did all of the siblings make it from birth to shearing? Were they from Montana, as indicated by the high quality fiber? There is a richness and lore behind the wool.

As I travel throughout Montana, there are a lot of fences that trace the landscape. Are these fences borders from one family to the next or barriers that say "keep out?" They are a line that says "we are here," possibly for generations upon generations. One wonders about the people who built the fence, their values, beliefs, toughness, self-sufficiency and like the fence, what they stand for as people and their experience. The fence, like the people that built it, is part of a unique element of cowboy life with an eye on survival, through thick and thin.

Having just finished breakfast, I look at the box of cereal and think about how it will fuel me for the next four hours. But occasionally I think a little deeper and imagine the wheat and barley waving in the field. It must survive not having enough water at the right time and the attack of mother natures' pests. The farmer and his family make thousands of decisions needed to produce this high quality grain and there is a frenzy to harvest it and get it into the bin before it is taken away. There is more to that box of cereal than we will ever know, particularly if we do not wonder.

Sometimes I see the surface, sometimes I intuitively go below the surface, and sometimes I attempt to connect the complexities surrounding life. The wool sweater, the fence and the cereal box all lend value to agriculture and its experiences, challenges and successes. Agriculture is connected to the core fabric of who we are and is one small part of the population that makes a difference for the masses. I see small miracles every day. What do you see?

Jeff Jacobsen
Dean and Director

Awards for Excellence

Three of MSU's top College of Agriculture seniors and their mentors were recently recognized during the 28th annual Awards for Excellence banquet. The MSU Alumni Association and the Bozeman Area Chamber of Commerce sponsor the banquet each year. The Awards for Excellence program recognizes students who have outstanding records of achievement in academics, extracurricular activities and service to the University and the Bozeman community. Student nominees must have a cumulative grade point average of 3.5 or above. These awards are among the most prestigious honors bestowed by MSU.

Honored students are nominated by faculty in their college or department. In turn, the award-winning students each select mentors who have provided them with guidance and inspiration. These mentors are honored alongside the student achievers.

The 2010 College of Agriculture Excellence Award honorees are Lauretta Hill of Dillon, Alexey Kalinin of Bozeman and Rhiannon Spaw of Bozeman.

Hill is an agricultural education major and named Carl Igo, an assistant professor in the Division of Agricultural Education, as her mentor. She is the daughter of Norman and Estelle Hill.

Kalinin is a soil and water science major and named Jill Davis, an adjunct instructor in English, as his mentor. He is the son of Gary and Elena Turner.

Spaw is an environmental horticulture major and named Bill Hoch, an assistant professor in the Department of Plant Sciences and Plant Pathology, as her mentor. She is the daughter of Raymond and Vickie Spaw.

Photo by Megan Walthall.

Kevin O'Neill, a professor in the Department of Land Resources and Environmental Sciences, was also recognized as a mentor by Nathaniel Julian, a secondary education major.

Economics professor to retire

Economics professor Doug Young began teaching at Montana State University in 1977.

"I was attracted to MSU by the combination of teaching, research and outdoor recreational opportunities," Young said. "More than 30 years later I still appreciate those things."

Young will be retiring on June 1.

About half of Young's research has involved state and local finances. He has worked on issues such as implications of a sales tax on Montana, school finance, and teacher salaries. He has worked with policy makers on many different levels, including the Montana Legislature.

His writing has appeared in academic journals including the National Tax Journal and Public Finance, and local outlets such as Montana Business Quarterly and Montana Policy Review. He was a member of the 2002 Governor's Income Tax Advisory Council and served on the Department of Revenue's Tax Reform Review Group.

Doug Young. Photo by Kelly Gorham.

"I received a lot of satisfaction from real-world research," Young said.

Young has been a visiting professor at Carnegie Mellon University in Pittsburgh and three universities in Africa (the University of Botswana, Al Akhawayn University in Morocco and the American University in Egypt). In 2003-04 he was a Fulbright Professor at the University of International Business and Economics in Beijing, China. In 2009, he was a visiting professor at the Indian Institute of Technology in Mumbai.

"Those experiences stimulated my interest and ability to teach our students," Young said. "They were also great family adventures."

Young plans to teach a few classes at MSU after retirement and looks forward to being on campus and maintaining his connection with the university and his colleagues.

Bob Lee to speak at ag commencement

Bob Lee of Judith Gap—a longtime rancher who is widely recognized for his stewardship of the land—will give the 2010 commencement address for the College of Agriculture.

The ceremony will be held at 8AM Saturday, May 8, in the North Gym-PE Complex on the MSU campus. Lee said he plans to talk about the graduates and the future of agriculture. His address will both challenge and encourage.

"I still believe there's a lot of sizzle in agriculture," Lee said, "it's our future."

Lee and his wife, Kathy, own and operate the Robert E. Lee Ranch Co. in the foothills of the Snowy Mountains. He loves what he does and considers it a privilege to care for "our greatest renewable resource—grazing land and farmland."

Lee has served in a variety of leadership positions from the local to national level and has won numerous awards. Among them was the national Environmental Stewardship Award from the National Cattlemen's Beef Association. In Montana, he was named Range Man of the Year, Soil and Water Conservationist of the Year and MSU Agriculturist of the Year, to name a few of his many honors.

Lee acknowledges that agriculture is facing challenges, with one of the biggest being communication with consumers.

"We all have to step up and address the issues," he said.

Lee didn't attend MSU, but his three children—Kim, Krista and Kenny—all graduated from MSU with honors in the 1990s. Because of their involvement and MSU's strong commitment to agriculture, Lee said he is an avid supporter of the College of Agriculture.

"Agriculture is our lifeblood," he said. "Agriculture is what we do."

Bob Lee. Photo by Kathy Lee.

Wrappin' it up

With the close of another academic year, MSU's College of Agriculture will award diplomas to students that have elected to enrich their lives and increase their earning power through education. As we say goodbye to these students, we wish them success in their careers. With every graduation, new chapters of great stories begin. Just as our outstanding alumni before them, College of Agriculture graduates will go on to start businesses, raise families, feed our nation, lead companies and lead governments.

As supporters and alumni, you play a big role in the success of our graduates. Many College of Agriculture students rely on scholarships to finance their education. Often times, without scholarship support, students are forced to delay their education or work hours that prolong or jeopardize their studies. Because scholarships are so important to students, the way scholarship endowments are managed within the MSU Foundation is critical.

As many of us are painfully aware, the economic challenges of 2008 and 2009 were hard on investment portfolios and the investment pool of the MSU Foundation was not immune. While the pool performed better than the Standard and Poor index and those of many peer institutions, it declined by nearly 20 percent from July 1, 2008 to June 30, 2009, amounting to a loss of $18,349,925.

Given these challenges, our generous supporters stepped up. Our friends and alumni responded by making gifts that allowed us to meet scholarship commitments and provide the support necessary for our outstanding students to continue making progress toward MSU degrees. This generosity reminded me of how lucky we are to be a part of an agriculture community that maintains its commitment, even in lean times.

With all of the bad news we have had to bear in the last couple of years, I am thrilled to report some good news. During the calendar year 2009, the MSU Foundation's investments gained 29 percent. On the College of Agriculture level, this growth equates to a $75,000 increase in the amount of scholarship dollars reaching students.

This is welcome news and a reason to be optimistic. However, it is the generosity of our supporters that is a true cause for celebration. Even while dealing with personal economic challenges, you stood with us, and that is a shining example of how commitment can lead to great accomplishment. Thank you for your loyalty and encouragement.

Tyler Wiltgen
Director of Development
Class of '05 (BS) Ag Education & '07 (MS) Applied Economics

Corners continued from cover

places a 0.2 parts per million cadmium limit on durum wheat intended for human consumption. Montana durum wheat must meet that limit for export.

Durum currently grown in Montana can be high in cadmium, a nonessential heavy metal that can cause health problems in some people. Diet is the main source of cadmium for nonsmokers, with cereal products accounting for up to 20 percent of daily intake. In Montana, cadmium accumulates in the durum grain and is transferred to wheat-containing products like pasta.

"By chance, varieties of durum that grow well in Montana have a genetic predisposition to absorb more cadmium." Eckhoff said.

Eckhoff crossed high quality lines as female parents and low cadmium accumulation lines as male parents. The progeny were grown in the greenhouse at EARC and the subsequent generation was grown in the field. Using a genetic marker, these third generation plants were screened for the low cadmium accumulation gene at the USDA-ARS Western Regional Small Grains Genotyping Laboratory in Pullman, Wash.

Eighty-seven lines had the low cadmium accumulation gene. These lines are now growing in the field and will be evaluated for agronomic and quality characteristics. They will also be used as parent plants to maintain populations.

In the next few years, the low cadmium cultivar will be grown at RCs around the state and evaluated for yield.

Low cadmium durum in the EARC greenhouse. Photo by Joyce Eckhoff.

Researchers weigh the risks, benefits of spraying mosquitoes

Collin Preftakes with Tyvek man. Photo by Bob Peterson.

Evening maneuvers and a mannequin named "Tyvek Man" are involved in MSU research weighing the risks and benefits of spraying mosquitoes.

To conduct their field work, Bob Peterson, associate professor of entomology, and his students drive a pickup truck across an MSU research field and release a cloud of insecticide. Then they return to the spot to collect dead mosquitoes and insecticide droplets that landed on the ground or on Tyvek Man's white overalls.

The researchers take their samples to the lab to determine whether it's riskier to use a specific pesticide or not to use it, Peterson said. They look at the pesticide's effect on the environment, and the potential impact on water, soil, animals, and people. They also consider the diseases that could spread if the pesticide isn't applied.

Peterson and his team conduct their field work during summer evenings when adult female mosquitoes are most likely to fly. That's generally July and August in Montana, and early- to mid- June in California, where Peterson also conducts experiments. The scientists focus on adult females, because they're the mosquitoes that bite humans and others. In the process of obtaining blood to nourish their eggs, some of the mosquitoes transmit diseases like West Nile Virus.

MSU researchers in the Biological Risk Assessment program have analyzed the benefits and risks of pesticides for mosquitoes since 2002, Peterson said. That's when West Nile Virus became a major public health concern in western North America.

The group has found, so far, that the risks from exposure to mosquito insecticides are among the lowest the group has estimated or observed. If insecticides are used according to the product label, the risks will remain well within current levels of concern.

"The risks from West Nile Virus are very real and exceed the risks from exposure to the mosquito insecticides used to control this public health threat," Peterson said.

MSU bakes a better bread

For undergraduates looking for a part-time job, the Cereal Quality Laboratory (CQL) might be the place to look.

"We hire six to nine students a year," said CQL manager, Deanna Nash. "It's great for them because they get paid while learning lab skills and scientific methods, but they also learn how to balance work and school."

The CQL cooperates with MSU's wheat breeders, field technicians, research center scientists, and others to ensure that high quality wheat is released and recommended by the Montana Agricultural Experiment Station. Additionally, the CQL assists with the development of new markets for Montana wheat and other small grains.

"MSU's wheat breeders are improving wheat varieties. They grow new plant crosses all over the state," said Nash. "In the fall, they send the harvest samples to us to test."

Nash and the CQL staff conduct 17,000 analyses for protein and moisture levels on the harvested crosses. This ensures that Montana will maintain its reputation for high protein and high quality wheat.

Student working in the Cereal Quality Laboratory. Photo by Kelly Gorham.

Using the CQL's results, MSU's plant breeders can focus on varieties that meet these protein and quality standards. Advanced varieties are tested again at CQL.

CQL tests the end products of the wheat by milling flour and test baking breads. They also evaluate noodles, since some Montana wheat is sold to the Asian noodle market.

"Every single test we do matters to someone along the line: farmers, elevator operators, millers and bakers," Nash said.

The tests matter to the student staff, too.

"Most of the students start as freshmen and continue working here through graduation," Nash said. "It's nice to know they enjoy their time at CQL."

AGED students organize State FFA Convention

In late March, over 1,000 FFA members attended the 2010 State FFA Convention on the MSU campus. The event was organized and hosted by students in the AGED class, "Agricultural Youth Event Management."

"We give the students some rope and let them run the event," said ag education professor Marty Frick. "We are still there to support them, but the students do the lion's share of the work."

The seminar class was established in 1998 for students who wanted to get academic credit for organizing the convention. Students plan all aspects of the event including the recruitment of over 100 judges, managing contests, compiling contest results and acquiring the appropriate materials.

About half of ag education students plan to become high school agriculture teachers, while the other half go on to work as extension agents, according to Frick. In either career, they will likely put on events similar to the State FFA Convention.

Each student in the class is assigned one event to manage. The head chair of the event is elected by the Collegiate FFA organization.

"The students practice leadership, organization and communication," said Frick. These are important skills regardless of the career students choose."

FFA convention. Photo by Kelly Gorham.

MSU students score in top five on range management test

An MSU student and the MSU team finished in the top five at the 2010 Undergraduate Range Management Exam in Denver.

Out of 209 students from 24 universities, Kailee Bickford of Havre, a senior in natural resources and rangeland ecology, tied for third place in the individual category. She and a student from the University of Wyoming each earned 220 points. The first- and second-place winners came from Brigham Young University and Colorado State University, respectively.

MSU students at the Undergraduate Range Management Exam in Denver. Photo courtesy of Bret Olson.

MSU's team tied for fourth with Texas A & M University. Each earned 579 points. The top three teams came from Brigham Young University, the University of Wyoming and the University of Alberta, respectively.

MSU students who took the undergraduate exam, in addition to Bickford, were Daniel Pratt of Miles City, Daisy Garverich of Butte, Lynne Buckles of Wyola, Schaun Lingohr of Malta, Jennifer Esp of Big Timber, Elizabeth Smith of Glen, Ben Lynn of Clyde Park, Lindsay Wilsey of Big Timber, Tara Turnbull of Brockton, Brandon Hartz of Gallatin Gateway and Jordan Rice of San Francisco. Ten team members major in natural resources and rangeland ecology, and two major in animal science.

Merrita Fraker-Marble, MSU's coach and a research associate in the Department of Animal and Range Sciences, said the two-hour test covered range ecology, grazing management, range improvements, range regions, range inventory and analysis, and multiple use. The students also solved problems in grazing management, range improvements, and range inventory and analysis.

In addition to completing the test, Pratt was elected to a one-year term as Student Conclave President. His term began in February.

New MSU President connected to ag

Agriculture is recognized as an important focus of land-grant universities like Montana State University. To emphasize this importance, MSU President Waded Cruzado is planning to visit the Montana Agricultural Experiment Station's (MAES) seven research centers across the state in the not-too-distant future.

Cruzado, MSU's 12th president, says the College of Agriculture and MAES are especially important to the people of Montana.

"Our agricultural teaching, research and outreach programs are focused on meeting the changing needs of Montanans," Cruzado said. "These programs provide important knowledge and technological solutions. They improve the quality of life of thousands of citizens across the state."

Land-grant universities date back to the middle of the Civil War, when the country's leaders decided to create a higher education system. The Morrill Act—named after Vermont Congressman Justin Morrill—was signed into law in 1862 by President Abraham Lincoln. The Act allowed revenue from the sale of federal lands to be used for the establishment of universities across the nation.

Cruzado has a strong history with land-grant institutions.

Prior to coming to MSU, Cruzado was executive vice president and provost at New Mexico State University and served for a year as its interim president. Before that, she was at the University of Puerto Rico - Mayaguez. Both are land-grant universities.

Waded Cruzado. Photo by Kelly Gorham.

Today there are more than 100 institutions that are designated as land-grants. MSU was established in 1893 and recently celebrated its 117th anniversary.

Grad student receives fellowship from heart association

Sara Wezensky. Photo by Jackson Harris.

Sara Wezensky, an MSU graduate student working on her Ph.D. in veterinary molecular biology, has won a two-year fellowship from the American Heart Association.

The Pacific Mountain affiliate, pre-doctoral fellowship will allow her to continue researching the mechanisms of drug resistance. She is specifically focusing on the gene srbA and a common mold called Aspergillus fumigatus. The mold can invade the lungs of humans and cause dangerous diseases, including Invasive Pulmonary Aspergillosis. Patients with compromised immune systems, especially organ transplant patients, are particularly at risk. The srbA gene allows molds to thrive during infections, but when the gene is removed, the mold becomes much more vulnerable.

Wezensky wants to understand how the gene regulates resistance and how it orchestrates the activities of other genes.

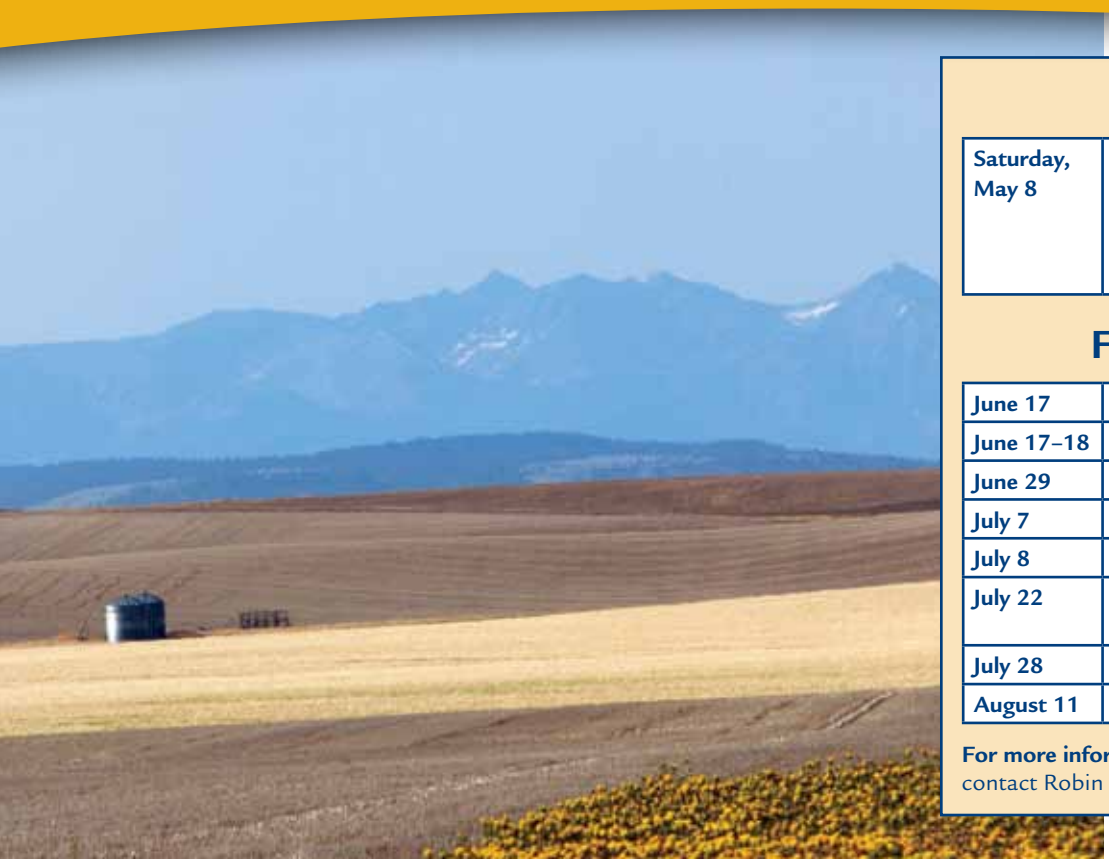
"I'm totally enthralled with my project," Wezensky said.

Wezensky works on basic research that has clinical relevance. Both aspects appeal to her, she said.

"The evolution of drug resistance is of great interest to me, and this as a topic of research has the more immediate potential to be applicable in the clinical setting," she commented.

Wezensky earned her undergraduate degree from the University of Louisville before coming to MSU where she completed her laboratory rotation in the Department of Veterinary Molecular Biology (VMB). She joined Robert Cramer's lab in May 2009.

Appreciative of Cramer and the entire VMB department, one thing that drew Wezensky to MSU was the low ratio of principal investigators to graduate students. "It appeared I wouldn't get as much hands-on training as I felt I would need at other institutions with higher ratios," she said.



Calendar

Saturday, May 8	**College of Ag Commencement ceremony** 8 a.m. North Gym-PE complex. **Main commencement ceremony** 10 a.m. Brick Breeden Fieldhouse.

Field Days 2010

June 17	**Central Ag Research Center,** Moccasin
June 17–18	**MAES Summer Conference,** Moccasin
June 29	**Northern Ag Research Center,** Havre
July 7	**Southern Ag Research Center,** Huntley
July 8	**Post Farm Field Day,** Bozeman
July 22	**Northwestern Ag Research Center,** Creston
July 28	**Eastern Ag Research Center,** Sidney
August 11	**Western Ag Research Center,** Corvallis

For more information,
contact Robin or Lisa at 994-3681.

Photo by Kelly Gorham.

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