

# Linked to Agriculture

## Inside:

Students Recognized for Excellence

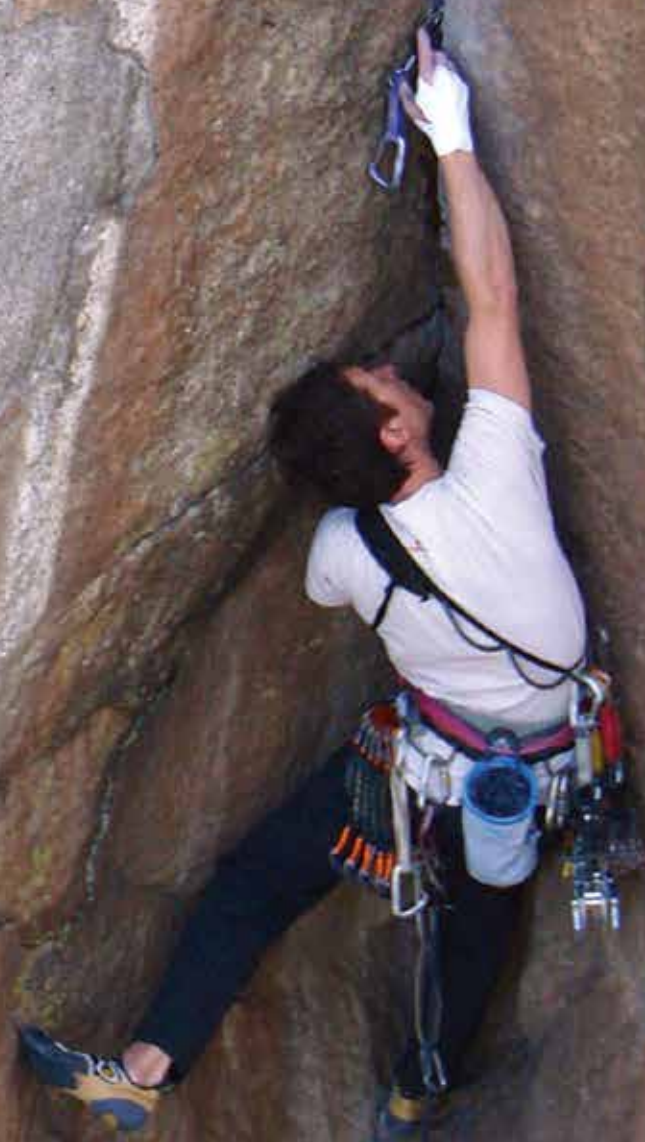
Researchers Explore Judith Basin Watershed

Faculty Push Students to New Heights

# Arête

*In its basic sense means excellence of any kind;  
"Reaching your highest potential."*

A thin, almost knife-like, ridge of rock typically formed when two glaciers erode parallel u-shaped valleys. The Garden Wall in Glacier National Park is an example of an arête.





In Montana we are intricately tied to the mountains; whether it is simply an appreciation of the rugged beauty, as an environmental backdrop, a source of snow melt, recreation, or inspiration. Anyone who has spent time in Montana can understand why we might compare graduation with arriving on top a mountain peak.

In so many ways, the climb—toward excellence, toward progress, toward change—is what defines us in university settings: as we struggle upwards, attempting to improve our thinking, our teaching, our strategies, our commitment to service, we are constantly reminded that this is not an easy jaunt to the top.

Arête is not necessarily a component of our daily vocabulary here in the College of Agriculture (COA) and the Montana Agricultural Experiment Station (MAES), but as we kicked around ideas for themes for this issue of *Linked to Agriculture*, we kept coming back to this singular notion of *arête*: in Greek,

a term that means “excellence,” and in English, a term to describe the upper limits of any given mountain range. Think of the Garden Wall, looming over Glacier National Park, as an outstanding example of an arête in the geological sense, as well as a compelling metaphor for where we think we’re heading.

Arête implies reaching your highest potential despite tangible obstacles, and we seem to continually raise the standard for initiative and spirit in everything we do. The COA and MAES continues to gain national prominence with our students and faculty competing for prestigious awards and major competitive funding, all the while aggressively growing our teaching and learning activities.

As we balance on that peak and look toward the next challenge, our students and faculty in the COA and MAES continually rise to new challenges and meet higher objectives—always with enthusiasm, creativity, and a strong support team which includes each of you.

In this issue we want to share a few of the high peaks our students and faculty attained this academic year.

Jeff Jacobsen  
Dean and Director  
College of Agriculture  
Montana Agricultural Experiment Station

**“It’s tough not to get excited and to be intrigued by the amazing research that goes on day-to-day here in the College of Agriculture. We have amazing talent and a wealth of expertise. Our students and faculty are always looking to the arête.”**

—NORA SMITH,  
DECEMBER 2012

On the Cover: Collin Preftakes, a senior in Land Resources and Environmental Sciences, rises to new heights in academics and in recreation.

# End Goal is Spectacular

The College of Agriculture Ambassadors recruit and retain quality students in the College while instilling a life-long appreciation for agriculture and natural resources. For student ambassador Hannah Estabrooks, a junior in environmental horticulture from Jefferson, N.H., there is no better metaphor for education than an incredible hike to the top of a mountain.

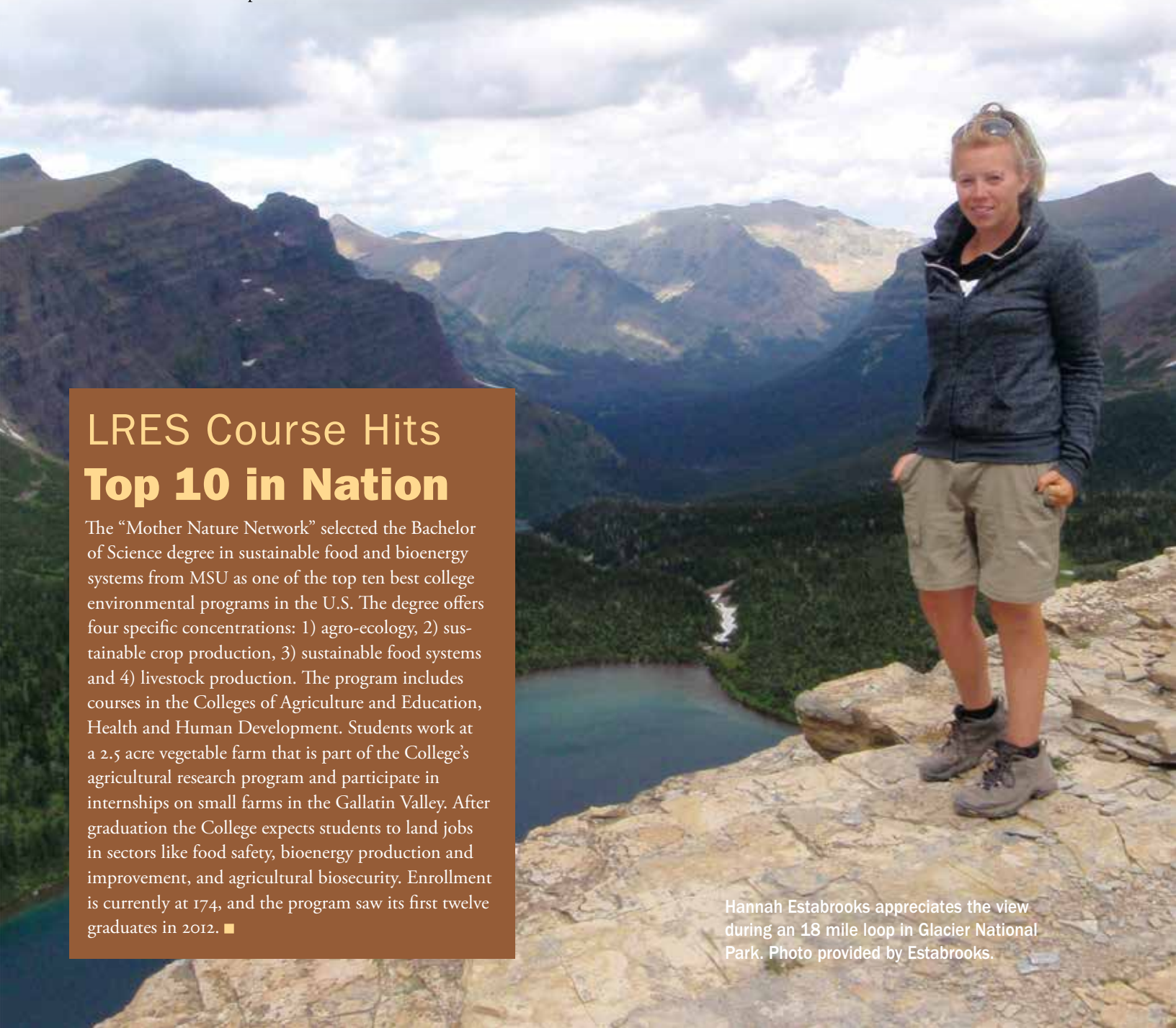
Estabrooks shared a photo of herself hiking in Glacier National Park last summer with friends. “I just love it up there,” she commented about the Park and the 18 mile loop they tackled. “The mountains—oh my goodness, every single turn we thought it couldn’t get any better and each turn it did. It was so amazing; we just kept going to see what was around the next corner.”

Estabrooks works as a second assistant superintendent for a local golf course and plans to use all of her horticulture expertise in golf course management. When asked about her educational experiences within the COA she stated, “Every step of the way is hard, but there is a reason you take it. The end goal is pretty spectacular.” ■

## LRES Course Hits Top 10 in Nation

The “Mother Nature Network” selected the Bachelor of Science degree in sustainable food and bioenergy systems from MSU as one of the top ten best college environmental programs in the U.S. The degree offers four specific concentrations: 1) agro-ecology, 2) sustainable crop production, 3) sustainable food systems and 4) livestock production. The program includes courses in the Colleges of Agriculture and Education, Health and Human Development. Students work at a 2.5 acre vegetable farm that is part of the College’s agricultural research program and participate in internships on small farms in the Gallatin Valley. After graduation the College expects students to land jobs in sectors like food safety, bioenergy production and improvement, and agricultural biosecurity. Enrollment is currently at 174, and the program saw its first twelve graduates in 2012. ■

Hannah Estabrooks appreciates the view during an 18 mile loop in Glacier National Park. Photo provided by Estabrooks.



# Animal & Range Sciences Graduate

also a

# Distinguished Military Graduate

Graduating in May with a degree in Equine Science Jess Patrick of Yelm, Wash., will also be commissioned as a second lieutenant in the U.S. Army as a field artillery officer. According to his professor and advisor, Janice Bowman, Patrick is a perfect example of a student striving to reach his or her highest potential. “Jess’s dedication to his degree program and his ROTC commitments truly impresses me,” stated Bowman. “He does a great job balancing requirements and has always been a pleasure to work with,” she added. “He tackles everything with a positive and upbeat attitude and doesn’t ever show signs of being ‘stressed out’ even while carrying a heavy load.”

That is a key reason he has also been identified as a distinguished military graduate placing him in the top 20 percent of Army ROTC graduates in the nation. Lt. Col. James West, professor of military science, credits Patrick’s upbringing with giving him an incredible foundation to build upon. “Jess was an extremely talented wrestler back in Washington State, and he faces everything he does with that same determination and forward push,” stated West. “He always strives for excellence and never looks for the accolades. For Jess, the sky is truly the limit. He can multi-task better than anyone I have met and will take that skill and apply it in his military career—working with soldiers, demanding the best out of them, and giving them his best.”

According to his professors, Patrick is the kind of student who consistently, quietly rolls up his sleeves and gets it done, and his humility runs deep. “I want to make a difference, and I think the military is where I can do it,” commented Patrick who will attend the Basic Officer Leadership Course at Fort Sill, Okla. in May. “I am looking forward to learning more and working with my platoon sergeant. I don’t want to be cocky. I just want to work my tail off,” concluded Patrick, an avid outdoor enthusiast who enjoys hunting, breaking horses and working out. ■



Jess Patrick proudly rides the colt he trained for the Best of the West Auction in 2012.  
Photo by Cait Lewis.

# Mouse Dracula takes Genetics to the Next Level

Ed Schmidt, ImID associate professor, received a National Institutes of Health Small Business Technology Transfer grant in collaboration with GeneSearch Inc. for the Dracula Pipette Mouse Embryo Project. GeneSearch, a Bozeman-based technology company founded by Paul Taylor, developed the “Dracula Pipette” for freezing llama embryos. The Dracula allowed the first successful production of llamas from frozen embryos and may work for embryos of other species such as horses. Advanced models of the Dracula may also improve pre-implantation genetic analyses.

Pre-implantation llama or horse embryos are roughly 10-times larger than human or mouse embryos—the relative size difference between a basketball and a ping-pong ball, so refining the Dracula technology to work with human or mouse embryos is a challenge. GeneSearch, with micro-scale

engineering expertise from Samuel Park of the Imperium Tool and Instrument Company in Butte, developed prototypes, named the “Mouse Dracula” to use with small embryos. This will establish the utility of the tool for procedures on “human-size” embryos, and therefore is an important step toward certifying the Dracula for livestock or human embryos.

Sharing his enthusiasm for science and research, Schmidt has spent hours supervising young scientists as they explore science based careers. This year, undergraduate student Michael McLoughlin, a senior in Biotechnology-Animal Systems, worked side-by-side with Pushya Krishna, a 7th grader from Chief Joseph Middle School in Schmidt’s laboratory helping him with a science project.

“Pushya and Michael did an outstanding job on this project and came to some

conclusions that are very important for the progression of my lab’s research,” said Schmidt. “Pushya exemplifies the value of the strong research programs in the COA and at MSU, and his achievements attest to the exceptional and unique educational opportunities that the College provides as a result of its research activity.” ■



Pushya Krishna evaluated mouse liver cancer specimens for his Science Fair Project, entitled “Do Antioxidants that Naturally Reside in a Cell Help in Preventing Liver Cancer?” in the laboratory of associate professor Ed Schmidt. Pushya’s project won the award of “Top Biomedical Project” in the State Science Fair Competition in Missoula, March 19.

## 2013 Awards for Excellence Banquet Honors Student Success

Striving to reach the highest standards of performance the College of Agriculture recognized the community service and scholastic aptitude of four seniors at the Awards for Excellence Banquet in February.

This year’s honorees were:

- Elisa Boyd, Landscape Design, originally from Boulder, Colo.;
- Chisholm Christensen, Agricultural Education, Hindsdale, Mont.
- Jamie Inglis, Animal Science, Central Point, Ore.
- Collin Preftakes, Environmental Science, Lyndeborough, N. H.



Each student selected a faculty member who has inspired and influenced them. The faculty members recognized this year were Jennifer Britton, Gary Brester, Rebecca Mattix, and Robert Peterson. Each year the MSU Alumni Foundation selects an honoree from each college to receive the Torlief Aasheim Community Involvement Award, named in honor of the 1937 alumnus, to “recognize the best of the best,” a senior with outstanding records of academic achievement and community involvement. The COA owes a hearty congratulations and thank you to Jamie Inglis for her dedication to the campus and community. Jamie’s designated mentor of excellence, Rebecca Mattix, serves as her academic advisor and sometimes instructor. “Jamie is the example I encourage students to use in pursuit of any college career path,” Mattix wrote. “She makes me proud to be a teacher and a mentor.”

The evening marked Mattix’ ninth Award for Excellence as a mentor. As Jamie summarized, “Dr. Mattix is a wonderful person with a heart of gold...I am forever grateful to have met such a wonderful woman who inspires me to be as motivated, strong, and compassionate as she is.” ■

## Dr. Ben Lei, MSU Charles and Nora Wiley Award for Meritorious Research

Ben Lei, associate professor in the Department of Immunology and Infectious Diseases (ImID), is an expert in the area of bacterial pathogenesis and known for making groundbreaking contributions that will have long-lasting medical relevance. He received two major grants from the National Institutes of Health in 2012 to further his research into how bacterial pathogens evade the host immune system and to develop therapeutics and vaccines to treat and prevent streptococcal bacteria-caused diseases, including strangles in horses. ■

# Working together for Water Quality

Researchers within the Land Resources and Environmental Sciences Department are collaborating with producers in the Judith River watershed of Central Montana to identify management practices that will improve water quality. In the watershed, rising groundwater nitrate concentrations often exceed drinking water standards, and may be influenced by agricultural practices on thin soils overlying shallow, vulnerable aquifers that supply water to local domestic wells. Last year, the team surveyed 240 active farming operations in the watershed, characterizing management practices, perceptions of effectiveness and practicality, and land use history. Researchers shared the results with a producer research advisory group comprised of six growers and a 15 member advisory council that includes five producers and ten local stakeholders. The principal investigator is Stephanie Ewing, LRES assistant professor. "This project is absolutely consistent with the arête theme," explained Ewing. "We are combining MSU's excellence in outreach and Extension with a research strategy that addresses the underlying processes and sources contributing to groundwater nitrate, in conversation with the communities that live and work in this unique region. I believe we can demonstrate a powerful new approach to understanding Montana landscapes and achieving sustainable management goals."



Adam Sigler examines a well at the Central Agricultural Research Center near Moccasin. Photo by Christine Miller.

Other LRES team members are Clain Jones, associate professor, and Adam Sigler, LRES Ph.D. student and MSU Extension water quality associate specialist, Christine Miller, a second year master's student, and Andrew John, a first year master's student. Updates and more information can be found on the project website, <http://waterquality.montana.edu/docs/judith.shtml>. ■



Representatives of the COA/MAES posed for a photo at the Capital during a Welcoming Montanans and Visitors Coffee in March. Pictured left to right: Sen. Max Baucus, Lance Juedeman, Rep. Steve Daines, Jeff Jacobsen, Glenn Duff, Darrin Boss, Perry Miller and Sen. Jon Tester. Several individuals were in town for federal research funds (Hatch advocacy), while others were in D.C. for a final component of their leadership development program.

## Talbert and Bruckner, Tech Transfer Award

Phil Bruckner and Luther Talbert, both in the Department of Plant Sciences and Plant Pathology, received MSU's Meritorious Technology/Science Award recognizing their scientific contributions that have been transferred to the private sector.

Bruckner and Talbert have contributed immeasurably through their research, plant breeding expertise, student development and new varieties of wheat. The winter wheat varieties Bruckner developed resulted in four licenses to two international seed companies generating sales of 300,000 bushels and plantings of more than 2.3 million acres in Montana and the region. Talbert developed higher yielding and pest resistant spring wheat varieties that are currently the leading spring wheat varieties planted in Montana, growing on approximately 18 million acres since 2000. ■

## Professor Attains Highest Honor from the American Society of Microbiology

The American Society of Microbiology elected Mark Young, professor in Plant Sciences and Plant Pathology, as a Fellow of the American Academy of Microbiology for his research efforts. ■

## Seeking Top Dollar for Wheat Marketing

WheatBasis.Montana.edu is an interactive tool that predicts harvest-time prices for 50 locations in Montana and Washington. Producers can input their marketing location, wheat class and protein level, and an economic model then predicts a cash price, helping farmers optimize marketing strategies. Economists at Montana State University (Anton Bekkerman and Gary W. Brester) and Kansas State University (Mykel Taylor) worked together developing the tool and website with a grant from the Federal-State Marketing Improvement Program, administered by the USDA Agricultural Marketing Service.

“Understanding grain price behavior and making accurate predictions for markets in the Northern Great Plains is challenging,” stated Bekkerman. “Because nearly all wheat is shipped to export terminals in the Pacific Northwest, protein considerations are critical, and harvests occur several weeks after wheat is harvested in the Midwest.” The web tool takes these factors into account and incorporates daily market information. WheatBasis.Montana.edu offers relevant, timely, and useful knowledge that can improve producers’ ability to be more competitive, efficient, and effective in marketing grain products, increasing opportunities to maximize revenues and realize highest net returns. ■


# Graduate Student Garnering New Knowledge for Weed Management

Tall Buttercup is a newly listed noxious weed in Montana posing problems for producers in western and southwestern Montana. Found primarily in wet hay meadows there is little information about tall buttercup currently available, but producers are concerned because it is toxic and appears to reduce forage production. Therefore, a College research team is hitting the problem head on. Jane Mangold, Land Resources and Environmental Sciences professor, teamed up with first year master’s degree student Hally Berg as advisor and principal investigator on the project. “We wanted to face this problem head on, trying to understand the plant’s biology and ecology, and how to manage it,” stated Mangold. “This project was totally stakeholder driven,” Mangold added. The Madison County Weed District and local producers approached the COA about helping them manage the buttercup problem. Mangold and Berg used field observations and collective knowledge about living with and managing the plant to develop a proposal, research design, and research questions. The project, funded by the Noxious Weed Trust Fund, is ongoing.



# MSU Calendar

- |                |   |                   |                         |
|----------------|---|-------------------|-------------------------|
| <b>May 4</b>   | Spring Commencement                       | <b>July 18</b>    | Eastern ARC, Sidney     |
| <b>June 19</b> | Sheep Symposium,<br>Museum of the Rockies | <b>August 21</b>  | Move-in Day             |
| <b>June 26</b> | Northern ARC Field Day, Havre             | <b>August 26</b>  | Fall Classes Begin      |
| <b>July 9</b>  | Central ARC Field Day,<br>Moccasin        | <b>Sept. 6</b>    | Scholarship Banquet     |
| <b>July 10</b> | Western Triangle ARC, Conrad              | <b>Oct. 25-26</b> | Celebrate Agriculture!! |
|                |   | <b>Dec. 14</b>    | Fall Commencement       |

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**Linked to Agriculture** is published by the MSU College of Agriculture, 202 Linfield Hall, Bozeman, MT 59717; tel: 406-994-3681; fax: 406-994-6579; email: agdean@montana.edu; http://ag.montana.edu. **Cover photo:** provided by Collin Preftakes; **Editor:** Tanya Casey-Reinhardt.

## Barry Jacobsen at the Helm

Barry Jacobsen is the interim department head for the seven Research Centers. The department currently has ten faculty members and 43 employees located throughout Montana. Barry Jacobsen is no stranger to the administrative team, since he served as the dean and director of the COA and MAES from 1992–94. Prior to joining MSU, Jacobsen served as a department head in the Department of Plant Pathology at Auburn University. In his new role, Barry will take some time away from his research agenda (focused on post-harvest and storage issues for potatoes and sugar beets) to coordinate efforts across the MAES research centers and oversee projects. ■

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