

# Linked to Agriculture

## Inside:

Montana Fires and their Impact

Invasive Weeds: A Disturbance  
in and of themselves

Bugs can be Disturbing

## Disturbance

*disturbance*

**noun** The interruption of a settled and peaceful place.

**origin** Middle English: from Old French *destourbance*, from *destourber*



It's hot. It's dry. And there doesn't seem to be a break on the way. It seems every year we are faced with either too much or too little water, and it has certainly been that way this year. In this issue of *Linked to Agriculture* we wanted to share with you some of the "disturbances" that impact our College and

how researchers strive to minimize the impact that natural disturbances such as fires, drought, or even too much water, can have on the agricultural industry and natural resources. We also wanted to share with you some examples of financial and other "disturbances" that sometimes impact our students and faculty and how alumni support often mitigates those issues. I hope you enjoy this edition as we explore how the College of Agriculture deals positively with challenges that affect the state and beyond and turns those disturbances into learning and research opportunities. We look forward to feedback and ideas from our readers. If there is something you would like to see included in our upcoming editions of the newsletter, please don't hesitate to share your thoughts with us at [agdean@montana.edu](mailto:agdean@montana.edu).

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

## Celebrate Agriculture!!

October 26 – 27

Montana State University's College of Agriculture is seeking nominations for outstanding agricultural leaders to honor during 2012 Celebrate Agriculture!! Oct. 26–27.

The name was changed to reflect the significant role agriculture has at MSU and throughout Montana. "Celebrate Agriculture!! is all about sharing ideas and generating relationships in a festive atmosphere," said Jeff Jacobsen, dean of the College of Agriculture and director of the Montana Agriculture Experiment Station. The venue offers the College of Agriculture the right opportunity to present the annual Outstanding Agricultural Leader(s) awards to those who have exhibited leadership in Montana public service, as an agricultural producer, industry advocate, agri-business leader or as a friend of agriculture.

Successful award applicants will be:

- well respected in their agricultural community,
- actively involved in the agriculture industry with accomplishments that impact many, and
- industry leaders; upcoming, active and innovative producers; or have lifetime achievements in agriculture.

The deadline for nominations is Sept. 15. Download nomination forms at: <http://ag.montana.edu/development/nomination.pdf>. Visit <http://ag.montana.edu> for an event schedule.

## Agriculture 2012: A Changing Landscape Conference

The Department of Agricultural Economics & Economics and MSU Extension are hosting *Agriculture 2012: A Changing Landscape* conference October 26 as part of MSU's *Celebrate Agriculture!!* event. The conference will focus on current issues facing Montana agriculture. For more information or to register, please visit: [www.ampc.montana.edu/fallconference.html](http://www.ampc.montana.edu/fallconference.html)

## MSU Friday

The MSU Friday visit program will be October 19, 2012, February 1, 2013 and March 22, 2013. The program is free and open to all prospective students and families. MSU Friday is an all-day, on-campus program offering an in-depth preview of college life. Prospective students and families can meet with faculty and students, explore academic facilities, tour campus and investigate possibilities for financial aid and scholarships. Find out more and register at [www.montana.edu/admissions/msufriidayreg.shtml](http://www.montana.edu/admissions/msufriidayreg.shtml)

# Weeds and Disturbances

## Invasive Weeds: A Disturbance in and of themselves

Invasive weeds are one of the greatest threats to rangeland health and can be viewed as both a disturbance and an outcome of disturbance. Even controlling weeds can be a disturbance as it opens space in the plant community for something else to grow. The ecological impacts of rangeland weeds are complex, but it is believed weeds alter the structure, organization and function of rangeland plant communities by threatening biodiversity and displacing native plants, hence impacting wildlife and livestock.

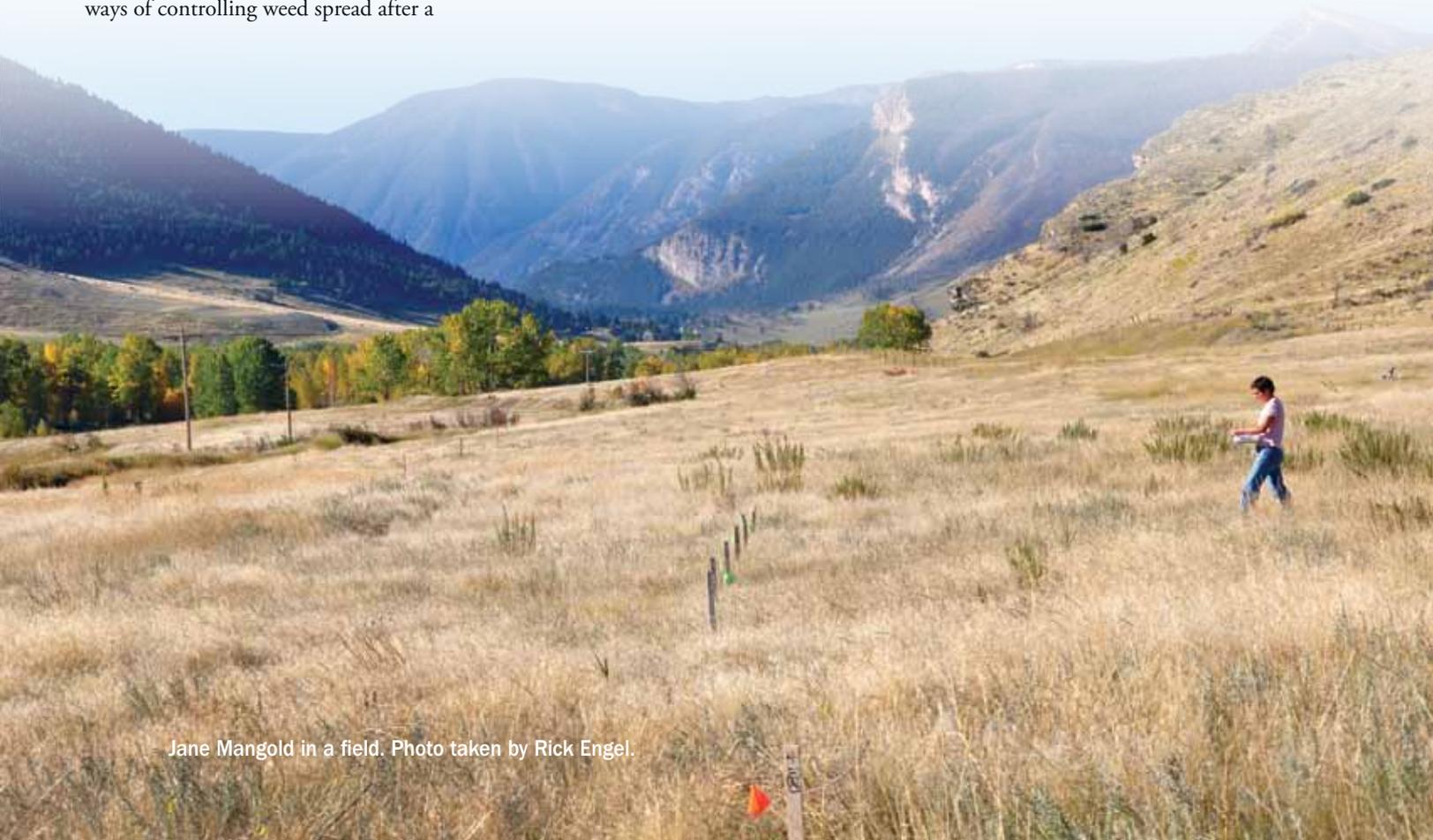
Disturbances like fire, overgrazing and drought often result in an increase in weeds. Following a disturbance, weed management should focus on promptly containing existing populations, restoring rangeland severely degraded by weeds, and preventing establishment of new invaders in noninfested rangeland. Jane Mangold, assistant professor with the Department of Land Resources and Environmental Sciences, suggests several ways of controlling weed spread after a

disturbance. “Chemical, mechanical, and biological control; prescribed fire and deliberate revegetation are all critical for ecologically- and economically-sound weed management on rangeland in Montana,” advised Mangold.

Following weed control or other disturbances, niches are opened in the plant community. If desirable species are not present to reoccupy the site, weeds are likely to reestablish. Planting desirable species can minimize the problem. However, revegetation is challenging and often results in weedy plants remaining dominant. Climatic conditions, competition between seedlings of seeded species and weeds, and thresholds for determining when revegetation is necessary are all challenges to successful revegetation. Mangold’s research focuses on developing integrated methods for managing rangeland weeds, with special emphasis on revegetation. Results from the research will help rangeland recovery following disturbances.

A recent comparative study between cheatgrass and the native bluebunch wheatgrass suggested bluebunch wheatgrass seedlings avoid suppression by cheatgrass more effectively when they are larger at the time of cheatgrass seedling emergence. Larger bluebunch wheatgrass seedlings can more effectively suppress cheatgrass, but soil nitrogen enrichment decreases the ability of bluebunch wheatgrass to do so. According to Mangold, management practices that encourage perennial grasses to emerge before cheatgrass could improve seedling establishment in revegetation projects.

Results of Mangold’s research also suggest competition between bluebunch wheatgrass and cheatgrass may be altered to favor cheatgrass when plant-available N is increased, a condition often created by disturbance. “Based on past revegetation projects don’t expect immediate success,” said Mangold. “It takes time for the plant communities to recover from disturbances.” ■



Jane Mangold in a field. Photo taken by Rick Engel.

A photograph of a woman, Erin Longergan, standing in a greenhouse. She is wearing a black long-sleeved shirt and glasses. She is surrounded by numerous trays of small pine seedlings in yellow pots. In the background, there are larger potted plants, including a large cactus. The greenhouse has a wooden frame and a translucent covering.

Erin Longergan, a graduate student in PSPP, planted whitebark seedlings at the MSU greenhouse as part of the study. Longergan is currently studying how fertilizer affects mycorrhizal colonization of pine roots in the greenhouse.

## Blister Rust and Fire Suppression Disturb the White Bark Pine

Whitebark pine (*Pinus albicaulis*) is a threatened species which grows at treeline in Montana and surrounding areas. The pine is important in watershed dynamics and the seeds are a valuable food source for grizzly bears. It is in decline due to whitebark pine blister rust, mountain pine beetles and fire suppression.

The USDA Forest Service and the National Parks are trying to plant new rust resistant nursery seedlings and reestablish whitebark pine forests. Assisting their efforts is Cathy Cripps, associate professor with

the Plant Sciences and Plant Pathology Department. Cripps is leading a research team examining fungi in extreme environments including whitebark pine forestlands and alpine tundra. In previous research, the team identified native ectomycorrhizal fungi which are important to growing whitebark pine. Cripps has been working to identify these fungi, maintain them in the lab and use them for inoculation of rust resistant nursery stock in the greenhouse. "Adding the 'good fungi' to nursery crops will help the Forest Service

re-establish the whitepine bark in parks in Alberta, Canada, Montana and Idaho," said Cripps who has done extensive research in both Yellowstone and Glacier National Parks.

In the wild, tree roots are naturally covered with fungi. In nurseries those fungi are controlled and the new plants struggle. While fungi are sometimes considered a disturbance, it is important to recognize that there are good and bad fungi just as there are good and bad disturbances, added Cripps. ■

# Bugs can be **Disturbing**

Walking into the quarantine lab in the MSU Plant Growth Center is a bit like walking onto the set of a science fiction movie. And then to be left alone in a glass-sided room with unknown creepy crawling critters climbing about is just plain disturbing. Annie DeMeij, research assistant for the Department of Land Resources and Environmental Sciences, is not bothered by them at all. In fact she raises them — nurtures the eggs, transfers larvae, cheers on the growing pupae and even brags about the young adults that emerge a few months later.

DeMeij is working with Jeffrey Littlefield, a research scientist in LRES, improving and developing new ways of using insects to control noxious weeds. Littlefield and DeMeij are rearing colonies of insects to attack harmful weeds in Montana. Current research projects are investigating new biological control agents for:

- Russian knapweed
- hoary cress
- invasive hawkweeds, and
- rush skeletonweed

Invasive plant species are a serious economic and ecological problem for range and forested lands. “Noxious weeds impact productivity and the invaders compromise the ecological integrity of Montana’s land,” stated Littlefield. These projects contribute to the selection of potentially new control

agents and increase knowledge about how to use them.

Scientists introduced three new insects into Montana for controlling Russian knapweed and orange hawkweed. One of these is a small fly that only lives a few days. “The gall midge (*Jaapiella ivannikovi*) lays its eggs on the knapweed’s tip which keeps the plant from flowering and seeding,” explained DeMeij as she pointed at the rounded green “gall” at the plant’s top. The small insect causes the plant to grow a gall — an abnormal outgrowth of plant tissue — creating a cocoon-like environment for the larvae and keeps the weed from seeding.

Littlefield also rears two stem galling wasps for controlling the weeds. One gall wasp attacks the developing stem of the knapweed plant; while the other wasp, which resembles a tiny flying-ant, stunts the stolons or runners of hawkweed and keeps it from spreading. In May the research team used approximately 180 females to rear 800 individuals in the quarantine lab for release at hawkweed infested sites next year.

Littlefield started the Russian knapweed project with less than 40 gall wasps from Uzbekistan and has developed a large field population — up until this year the only ones in the U.S. “Because they only produce one generation per year and are highly attacked by various parasites, it has



The gall midge on Russian knapweed.  
Photo taken by Tanya Reinhardt.

been difficult to release enough wasps to make a significant impact in a few years,” stated Littlefield. A measure of success is to compare the total wasps released to the galls found on Russian knapweed in test sites. Results on private ranchland near Toston, Mont., were positive. Researchers released approximately 20 gall wasps in 2009 and found an equal number of galls infesting the Russian knapweed. Since then the numbers have increased exponentially with thousands of galls present this year. “The gall wasp is holding its own at this test site,” stated Littlefield. “And it shows great potential as a control agent for Russian knapweed if this trend continues.”

Needless to say the work that started in the quarantine lab is creating a disturbance for the noxious weeds of Montana and the U.S. Maybe those creepy crawling creatures aren’t all that disturbing to people — just the noxious weeds. ■

**“The biggest challenge our society faces is to learn to live with change and disturbances”**

—CLAYTON MARLOW  
PROFESSOR OF ANIMAL & RANGE SCIENCES

## **Battling** Locoweed

Dr. Tracy Sterling, professor and department head of Land Resources and Environmental Sciences, is examining alkaloid biosynthesis by the toxic rangeland plant locoweed. Locoweed grows throughout the western U.S. poisoning cattle and wildlife. A chemical called an alkaloid makes the plant toxic and is certainly a disturbance to cattle that consume it. The alkaloid is produced by a fungus which lives in the plant and can survive to the next generation. Sterling has found that even though the fungus produces this expensive alkaloid, it does not appear to offer the plant any protection from herbivores such as cattle or insects and the plant’s ability to flourish on the range is unaffected. She is currently seeking to uncover the genes that control this fascinating relationship. ■

**Alkaloid:** A member of a large group of chemicals made by plants; normally contain at least one nitrogen atom in a heterocyclic ring.

Devon Ragen, a research associate with the Dept. of Animal & Range Sciences, helped battle the blaze at Red Bluff. Photo taken by David Baumbauer.



# MONTANA FIRES

## and their Impact on Agriculture

The Red Bluff Research Ranch found itself in a “hot spot” June 27 as the Bear Trap Fire burned 20 miles northeast of Ennis and charred 2,000 acres of rangeland on the ranch. While fighting the fire was an adrenaline rush for the student volunteers who held the southern boundary of the fire, for others it was a chance to explore firsthand the impact fire has on rangeland management.

Kellen Marlow, a senior in Range Management and a summer employee at the Bozeman Agricultural Research and Teaching (BART) Farm, helped control the southern line of the fire and deter it from hitting any structures at the ranch. As fire crews worked off in the distance, Kellen discussed what he knew about fire and its impact on rangeland. “Fire burns the dead material and the invasive species which allows the range to move back into a successional stage. As early grasses progress, the first species are replaced by heartier species—especially at Red Bluff,” he explained.

Kellen Marlow’s knowledge about the benefits of fire to rangelands was passed to him by noted professor of Montana State University’s College of Agriculture Clayton Marlow, who also happens to be Kellen’s father. “My dad teaches a class on fire restoration and how to use it in agriculture,” added Kellen.

Clayton Marlow, a professor in the Department of Animal & Range Sciences, teaches a course on fire ecology and management. Marlow explains to his students the importance of regular disturbances to the health of many western ecosystems. “The biggest challenge our society faces is to learn to live with change and disturbances,” said Clayton, citing fire as a prime example. “Fire resets the ecological clock and

### Using fire for good:

- Available nitrogen pulse to soil
- Move wildlife populations
- Protect grazers from predators hiding in the thick ground cover
- More water in the creek for grayling and cutthroat
- Protective fires—burn one area to protect another

### Negative impact:

- Must replace fence at Red Bluff Ranch
- Lost part of the winter pasture which means buying more hay

allows plant and animal species to spring back. It refreshes the plants and wildlife and makes them capable of withstanding other disturbances.” A healthy ecosystem leads to more calves, lambs and better wool in two to four years, but it is going to be tough for the stockman initially as they try to find food for the stock, summarized Marlow.

Bob Brekke, the BART Farm animal operations manager, discussed the positive and negative impacts of the fire. “We lost a lot of winter pasture, which means we have to buy more hay, but it also burned out weeds and a bunch of low lying brush which increases the ground moisture available for native grasses,” he stated. Brekke already sees an immediate economic impact as they buy hay.

Clayton argues our forest lands have been weakened because we have controlled too many disturbances such as flooding and fires. “Cottonwood growth was stopped when we started to control flooding. When the flooding was controlled, the willows and trout also struggled. We need to be cognizant that disturbances aren’t always a bad thing,” said Marlow.

A natural bi-product of fire is a pulse of nitrogen (N) into the soil, which impacts the competitive balance of invasive and native species. Spotted knapweed, for example, thrives where fires are actively suppressed. The fire suppression allows invaders into the system. Cheatgrass is an exception, because it actually likes hot destructive fires and it likes N rich soils.

At Red Bluff the super-heated soil added lots of available N to the soil. Some areas already have native grasses coming back. This fall students will test N levels and study hydrophobicity (how soil repels water, which can lead to erosion). Bunch grasses have already re-sprouted at Red Bluff, and scientists and professors are looking forward to studying the impact of the fire at the research ranch and extracting knowledge from the disturbance.

“Listening to Smokey the Bear wasn’t always the best thing to do,” said Marlow. “We didn’t let the fires burn; we stopped logging, and now the fires are really bad. Expect deer, elk and pronghorns to shift into fire area because it’s nitrogen rich and the grasses are more digestible and tender,” he explained. ■



Luther Talbert spoke at the Post Farm Field Days in June.  
Photo by Tanya Reinhardt.

## Optimism High

From Luther Talbert’s vantage point, Montana is having an ok year—at least average—with optimism across most of the state. Talbert, professor and plant breeding scientist in the Department of Plant Sciences & Plant Pathology, developed ‘Vida’ as a drought resistant variety of spring wheat. “We needed spring wheat that performed with limited water,” explained Talbert. Researchers developed ‘Vida’ with a genetic trait that allows the leaves to stay green for a few more days under hot dry conditions. The extra green time allows the plants to undergo photosynthesis longer and better fill the grain.

Talbert is part of a nationally funded grant conducting research on water use efficiency in wheat and barley crops. Other team members include Tom Blake and Jamie Sherman, both of the Plant Sciences & Plant Pathology Department. The research team is in their second year of a five-year study exploring how to improve wheat and barley in a changing climate. The \$2.3 million dollar grant is part of a larger \$25 million project. ■

## Silver Lining in a Disturbance

“Even droughts have silver linings,” said Vincent Smith, professor of economics in the Department of Agricultural Economics & Economics. The drought in the Midwest is expected to reduce the corn crop in Iowa, Illinois and Indiana between 20 and 35 percent—the consequence is a sharp increase in corn prices, which will result in an increase in wheat prices explained Smith.

Low quality wheat will be a more important food source for livestock, resulting in higher wheat prices. “Wheat producers in Montana with even an average crop are likely to have a financially successful year,” Smith added. Consumers, however will likely face higher prices for staples due to lower feed, food grain and oilseed production. ■

# ImID Focusing on Health Disturbances

Research in Immunology & Infectious Diseases (ImID) focuses on the development of new drugs, vaccines and diagnostic tools for fighting infectious diseases of livestock, humans and wildlife. Jovanka Voyich-Kane, assistant professor, is researching *Staphylococcus aureus*—a common bacterium found on human skin and in nasal passages. Although this organism can be a benign inhabitant, it can also cause skin infections, bacteremia, endocarditis, sepsis and toxic shock syndrome, according to Voyich-Kane. “Our lab focuses on how the bug causes disease in healthy humans.”

“*S. aureus* is one of the most common causes of skin-and soft-tissue infections in the United States,” said Voyich-Kane. “These infections are very contagious and painful, and drug resistant strains are difficult to effectively treat,” she added.

While the staph bacterium is dangerous for humans, it also is a problem in livestock.

Voyich-Kane’s research team is investigating incidence and characteristics of *S. aureus* in Montana’s dairy herds and studying the antimicrobial potential of a chemokine (a signaling protein) found in bovine milk. “We want to learn more about immunity to *S. aureus* and the prevalence of *S. aureus* in Montana’s dairy herds and also in horses,” said Voyich-Kane. Staph is one of the most frequent causes of mastitis in cattle, which impacts milk production.

The bacterium can also cause bad infections in horses. Voyich-Kane’s research team comprised of faculty and students is working with Dr. Shannon Moreaux, veterinarian and assistant professor in the Department of Animal & Range Sciences. They are looking at the percentage of horses carrying the bacterium and trying to determine if they might be a reservoir for *S. aureus*. Investigators are surveying several ranches in the Gallatin Valley and tracking the

presence of the bacterium. “We are focusing on the incidence and transmission potential of *S. aureus* in Montana’s equine populations, and also looking at the potential for cross contamination between cattle, horses and people,” added Voyich-Kane.

ImID is also supporting a project for junior faculty member Josh Obar. Obar is investigating the role of mast cells in the progression of Listeria infection. Listeria, a widespread human and animal disease, is a common cause of food borne illnesses. In ruminants, it can cause encephalitis, septicemia, late-term abortions and on rare occasions mastitis. According to current research data, mast cells may be an important early source of inflammatory cytokines during heat-killed Listeria infection. ■

**Mast Cells:** *a certain kind of white blood cell involved in immune and allergy responses.*

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## Market Volatility

Disturbances in agricultural commodity prices are common, and managing the volatility is important. Professors Gary Brester and Eric Belasco, Department of Agricultural Economics & Economics faculty, offer senior-level marketing and management courses to train students in commodity price risk management—diversification, forward contracting, hedging and commodity options.

The College and Montana businesses collaborated on the course design. Brent Poppe, a loan officer with Stockman Bank, believed students would learn more with real money. Stockman Bank, Billings Wells Fargo Bank and the Montana Wheat and Barley Committee provided funds so classes could obtain a position in the market. Charley Switzer, owner of Professional Commodity Management in Bozeman, assists the students, who then monitor and evaluate the portfolio.

Commodity options markets are a way to manage price risk—a type of price insurance, explained Brester. During the semester, professors offer student teams real world scenarios: a feedlot manager concerned with increases in feeder cattle prices or a wheat

producer concerned about price decline. The class votes as a group to purchase a put or call option.

Belasco noted the course helps students learn processes used by producers and agribusinesses to manage price risk. “It is an investment in the future, the business and future employees. They won’t mess up later—knowing and understanding the risk. As an employee they are ahead of the game.”

Mitch Grove, originally from Highwood, Mont., graduated from MSU in 2011 with a double major in economics and agricultural business, and works as a farm loan officer for the Montana Farm Service Agency. Grove recalled his class voting on a speculative position in the cattle market because they thought it had the most chance of success. They purchased a “put” option on live cattle. The Japanese tsunami caused cattle prices to decline, and they were able to capitalize on their option much like a cattle processor would in the same situation.

“(Dr. Brester) made us watch the world market. One event can throw the market and cause significant changes. Hedging (the

process of purchasing a put option) worked well for us,” said Grove. “We got little return after we paid the broker and made our moves, but the idea wasn’t to speculate to make money, but rather, to protect our presumed business from declines in fed cattle prices.”

Grove helps producers protect themselves from price declines using futures and options markets, and credits the classes with helping him better understand a global economy.

Jessica Lacey, a senior from Folsom, Calif., is majoring in Agricultural Business with a minor in economics, and took the marketing course from Belasco. Her team purchased a call option, but feeder cattle prices declined. “As a speculator we chose wrong—as a producer it would have been ok,” said Lacey.

“The spring class purchased a call for \$1,600 and basically ended with no value. Losing was probably a better learning experience for them,” said Belasco. “Having money helped keep their interest and demonstrated the dynamics of investor psychologies.” ■

# The Wheat Stem Sawfly:

A More Serious  
Disturbance  
During Dry Years



Photo provided by Bob Peterson.

Researchers at MSU are investigating high yielding/high quality crop varieties resistant to insects and diseases that will perform well in the Northwest region. The agricultural community and allied industries depend on new cultivars to remain competitive in the world marketplace. Primary breeding objectives include increasing yield potential, improving winter hardiness, enhancing wheat stem sawfly resistance and improving dual-purpose end-use quality grains. MSU's research teams will help Montana producers stay competitive and provide improved cultivars adapted to Montana's ever-changing climatic conditions and cropping systems.

In addition to worrying about too much or too little water, growers also continue to battle the wheat stem sawfly. Professor David Weaver with the Department of Land Resources & Environmental Sciences is developing new techniques and tools for wheat stem sawfly management. "Montana growers

report they are losing up to \$100 million worth of grain per year," stated Weaver. "The losses are reported at \$350 million per year in the northern Great Plains of the United States and Canada," he added.

The wheat stem sawfly problem is exacerbated by drought because it impairs two of the sawfly's natural enemies—diseases and parasitic wasps—which thrive in a moister environment. "Growers should do everything they can to preserve the parasitic wasp," explained Weaver. The wasp kills larvae in the stem of the wheat plant. Growers provide optimal shelter to the parasitic wasp by cutting their wheat as high as possible to allow the overwintering population to be as large as possible. Other research by LRES Professor Bob Peterson shows that under certain situations, these parasitic wasps can kill large numbers of immature sawflies, and the mortality that the wasps cause cannot be replaced by any other factor.

The winter and spring wheat breeders from the Department of Plant Sciences & Plant Pathology have collaborated on this project. Professors Luther Talbert and Phil Bruckner are working to develop strains of wheat that are more resistant to the wheat stem sawfly. The Northern and Western Triangle Agricultural Research Centers both have test sites for the project. Wheat producers throughout Montana are participating in experiments. Research results indicate the complex interactions in managing sawfly make a total systems approach necessary to reduce damage to small grains. MSU is examining the integration of natural enemies, pathogens, and plant and insect produced odors (semiochemical: a generic term for a chemical substance that carries a message) for management of sawfly and is developing new sources of host-plant resistance. ■



# The Disturbed Path:

## Students Who Stop Out

*Stop Out: to withdraw temporarily from college.*

Several MSU graduate students have tackled the topic in their thesis work, and while there's no singular explanation, we know MSU students stop out for myriad reasons: family, personal health and financial instability.

"Anecdotally, I'd argue MSU has always been a 'stop out' friendly institution," commented Nora Smith, assistant dean of the College of Agriculture. "When we were on the quarter system, a lot of us would take fewer credits during Winter Quarter. Dozens of otherwise fully-engaged MSU students stopped out during winter months to work the ski seasons at Bridger Bowl or Big Sky."

Since the Montana University System restructuring in the 1990s, Fall Semester at MSU often begins in the middle of the busiest agricultural season—harvest. Many COA students, who are otherwise working on a family farm or ranch, juggle multiple demands during the first few weeks of the term.

"There's a big difference between slowing down, stopping out and dropping out," Smith clarified. In many cases, taking a semester off can positively impact student motivation and degree completion.

MSU's Office of Student Success provides programming, "Return to Learn," targeting "stopped out" students in Montana, especially those who might be within a few semesters of finishing their degrees: [www.montana.edu/success/returntolearn](http://www.montana.edu/success/returntolearn).

## Student Back After Stop Out

"I was young and not focused on school. I needed more discipline," reminisced Frank Frontado, a freshman in Animal and Range Sciences. Originally from Southern California, Frontado is like many students who stop out for a number of reasons. Frontado enlisted in the Air Force (AF) as a parachute-rescue man responsible for rescuing and treating downed pilots. After completing his AF tour, he joined Medieval Times as a knight, where he relied on his equine experience to joust and participate in mock fights on horseback at castles throughout the U.S. and Canada. After several seasons riding for Medieval Times, Frontado went back to California as a ranch hand. It was a roundabout way to return to school, but this summer after working on a Montana horse ranch near Ennis and completing farrier school, Frontado is back—using his GI Bill, experiences and passion for horses to enhance his collegiate experience.

"Being a 30-year-old with life experiences under my belt is a totally different experience," stated Frontado. "I love the equine science program here at MSU. I am excited about finishing school and getting a good job in the horse industry," he added. ■

Photos: Frank Frontado rode as a Knight during his Stop Out (top left) and has now come back as a student in the Department of Animal & Range Sciences (bottom left).



## Retention Grant Assists Students in Turbulent Times

The College of Agriculture offers more scholarships per capita than any other College on campus. While most scholarships are based on academic success and community involvement, some are simply a boost for students struggling with unforeseen difficulties and needing immediate assistance. The Christy Retention Grant offers struggling students immediate financial assistance. Another scholarship available to students in the Ag Econ department is funded by a private donor through the MSU Alumni Foundation. "The donor

faced financial hardship in college and is passionate about helping current students facing adversity," said Jessica Murdock, student services coordinator. The Ag Econ Opportunity Scholarship was awarded to 13 students last year. Murdock looks forward to the annual scholarship banquet in September. "It is amazing to watch the students interact with the donors. You can see the impact their gifts have on the students and the pride they share in their college. It's so much more than money...it's about support," she added. ■



Photo by Kelly Gorham.

“I am a nontraditional student finally realizing my dream of obtaining a degree in the field of natural resources and rangeland management. I hope to use this degree to help strike a balance for Montana’s abundant natural resource uses. I grew up on a cattle ranch northwest of Helena, and know the struggle ranchers and others have in striking a balance while working with government agencies, and I hope to be a part of the solution... Thank you for providing me with this financial gift that makes it easier to continue my studies while providing for my family as I balance school, home and a full-time job.”

*Tad Brenden, has a full-time job, is a senior in Animal and Range Sciences and a recipient of the Christy Retention Grant, a scholarship that helps students with immediate financial assistance.*

“I am fully aware my accomplishments are not simply attributed to my hard work and perseverance. I grew and gained knowledge only because I found great help from those like you who gave me loyal support along the way...Thank you for encouraging me to reach my goals with financial aid, and helping me keep my feet from flying out from under me in this hectic last semester. The future is looking bright, and I want you to know how appreciative I am of your support and your contributions to my rather rosy outlook.”

*Alix Wittmayer graduated in May with a degree in agricultural business and was a past recipient of the Christy Retention Grant. A native of Terry, Mont., Wittmayer is working for the Natural Resource Conservation Service in Wibaux, Mont., as a soil conservationist.*

## Impact Student Success — Make a Donation

Fellowships, internships and research opportunities directly impact student success through active learning experiences and can often only be realized through scholarships due to increasing educational costs. Donations:

- provide access to first-generation students, veterans and their spouses, and create opportunities to distribute need and merit-based support.
- support student travel to conferences, competitions and compelling exchange programs.
- help the College enhance internationally-based curricular experiences.

To make a donation or for more information on how you can assist, please contact Darin Paine, COA development director at 406-994-7671.

## 2012/2013 Events

<b>Sept. 5</b>	Fall Convocation
<b>Sept. 7</b>	Horticulture Farm Tour
<b>Sept. 7</b>	Scholarship Banquet
<b>Sept. 17-22</b>	Homecoming
<b>Oct. 19</b>	MSU Friday
<b>Oct. 26-27</b>	Celebrate Agriculture!!
<b>Dec. 15</b>	Fall Commencement
<b>Jan. 8</b>	Spring Convocation
<b>Feb. 1</b>	Ag Scholarships Due
<b>Feb. 1</b>	MSU Friday
<b>Mar. 22</b>	MSU Friday
<b>May 4</b>	Spring Commencement

 Keep up with the College of Agriculture on Facebook. Search for “College of Agriculture” or “MSU College of Agriculture.”



## MSU Enrollment Hits All-Time High

MSU is facing an all-time enrollment high with enthusiasm and working hard to avoid disturbances that might accompany a record number of students. In a letter to staff and faculty, Martha Potvin, Provost and Vice President for Academic Affairs, highlighted preparations to accommodate the influx:

- Hired an additional 120 student tutors with the Smarty Cats Tutoring Program
- Renovated the Writing Center in Wilson Hall
- Added more than 36 sections in high-demand courses
- Modular classrooms added as swing spaces while other classrooms receive technology upgrades
- Freshmen living within 30 miles of campus can opt out of living on campus
- MSU broke ground on a 70-bed residence building located between the SOB Barn and North Hedges

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Return Service Requested

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