



# animal & range sciences newsletter

Winter 2017 • Volume 10, Issue 2

## Dr. James Berardinelli Marks 37 Years Teaching Animal Science

Some things are synonymous with Montana State University: the bobcat, blue and gold and Montana Hall. In the MSU College of Agriculture and for many Montana ranchers, **James Berardinelli** may be on that list, too. For the last 37 years, Berardinelli, professor of animal science in MSU's Department of Animal and Range Sciences, has taught students how to be familiar with the rear end of a cow. In more than three decades of teaching and researching animal reproductive science at MSU, about 2,500 students have passed through his classrooms and labs, some of them spanning generations from the same family.

Many of Berardinelli's students have taken skills they've learned from his classes and labs back to family ranches or to their professions. Over the years, Berardinelli's emphasis and instruction on new technologies in cattle breeding has helped transform many next-generation cattle producers, while impacting the genetics of Montana cattle herds through the use of artificial insemination.

*continued on page 3*



Another year has ended and we continued to have tremendous growth and success in our department. We added some new faces, including Livestock Operations Manager, Tom Groneberg and Assistant Livestock Operations Manager, Tyrell McClain. Together, with Arianne Perlinski, they will work to improve our livestock and forage operations. Tracy Ross has joined our team as the Equestrian Facility & Program Manager and Ben Wheaton is the new department Lab Manager. Not new to us, but still important to recognize, is Devon Ragen becoming the Wool Lab Manager. To the faculty, we welcome Tami Parrott as an Instructor in Equine Science. And, we currently have a search committee working to fill the Sheep Extension Specialist position.



Dr. Patrick Hatfield  
Department Head

And, while the search began to fill the positions in livestock operations, circumstances left us short-handed during the summer months for haying operations and other livestock-related tasks. As typical of this department, our faculty, staff and students rallied to keep operations moving. I want to thank Andi Shockley for taking care of our horses, Dr. Tim Del Curto for keeping operations at the BART farm on track and Dr. Tom Murphy for overseeing Ft. Ellis. I especially want to thank JT Saunders for taking the lead on haying operations this season.

The Ranch Management program for our department is moving along well, with potential donors asking for more information. MSU President Dr. Waded Cruzado met with some potential donors in New York.

It's been a great year. Our newsletter offers you some of the wonderful things that are happening in our department and we are looking ahead to another successful year.

A handwritten signature in black ink that reads "Pat Hatfield". The signature is fluid and cursive, written on a white background.

## In This Issue

Cover Story . . . . .	1	Awards, Honors and Grants . . . . .	19
From the Department Head . . . . .	2	Publications and Presentations . . . . .	22
In the News . . . . .	4	Upcoming Events . . . . .	24
ANRS Briefs . . . . .	13	Hello and Goodbye . . . . .	25
Graduates Fall 2017 . . . . .	18	Parting Shot . . . . .	26



“My teaching motto has always been that science excites me, and teaching science motivates me,” Berardinelli said. “I learned early that incorporating research into my classes, along with my personal experiences while doing the research, is perhaps one of the most powerful tools to ensure success in the classroom.”

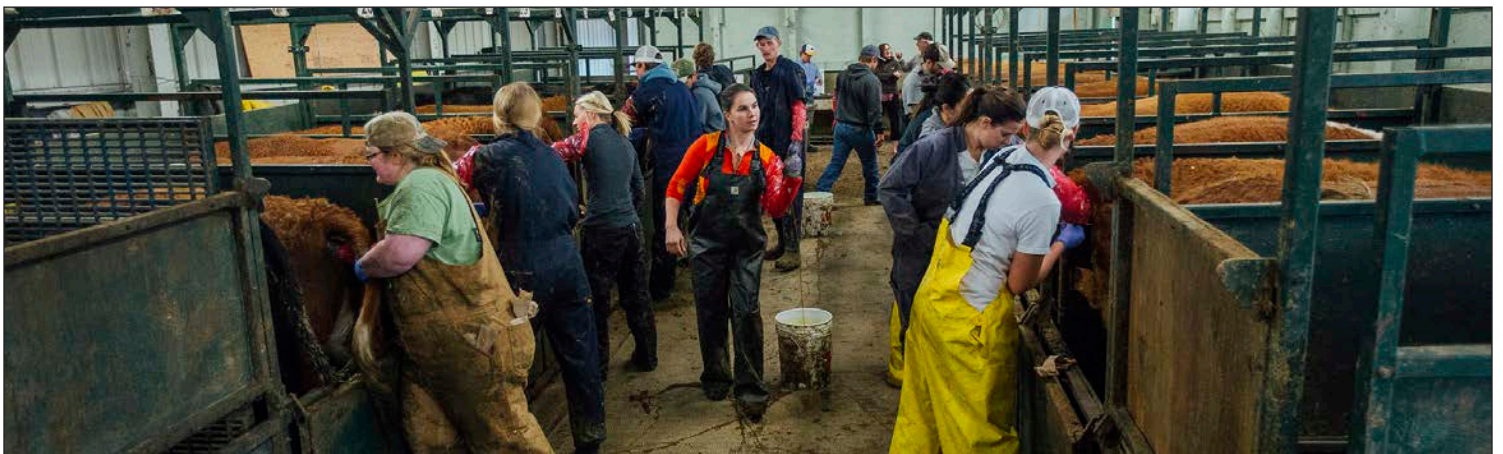
Berardinelli said that throughout his many years of teaching, he has learned to adapt his teaching to various learning styles of a diverse student population. “I have come to understand that concern, care and attention to the learning styles of students is my model for ensuring positive student outcomes and engendering lifelong learning skills,” he said. “I hope that I have had a small impact on the growth and development of each student that I have come into contact with over the years; they certainly have had an impact on my career.”

At MSU, Berardinelli teaches undergraduate and graduate classes in animal endocrinology, reproduction and assisted reproduction, and advanced reproductive physiology. His research focuses on the reproductive efficiency of large animals, the use of new protocols and cutting-edge technologies to facilitate breeding by artificial insemination and methods to help heifers and postpartum cows come into heat sooner. In one particular class, Animal Science 421: Assisted Reproduction Technologies, students learn firsthand how to artificially inseminate cows and heifers and how to pregnancy-test cows and heifers using cattle owned by the Montana Agricultural Experiment Station.

After four weeks studying the anatomy of the bovine reproductive tract and practicing proper handling and thawing of frozen semen straws in class, students spend the remainder of the semester practicing these hands-on skills on cows and heifers in the artificial insemination, or AI, facility west of campus on the MSU’s Bozeman Agricultural Teaching and Research Farm. In this facility, students become adept at determining bovine pregnancy status by rectal palpation, and artificially inseminate cattle with the use of a steel pipette, also known as an AI gun.

According to Berardinelli, by the end of the semester, most students are able to artificially inseminate cattle in 10 minutes, at most. “By the end of the semester, the goal is always that students are able to determine pregnancy and estimate the age of the fetus within a month, in less than 30 seconds,” he said. “The class is unique in that it offers a comprehensive training of bovine reproduction, both in and out of class, and its impact on ranches across Montana is tremendous.”

For the more than 28,000 farms and ranches in Montana, on-farm artificial insemination can reduce the length of the breeding season and increase the genetic quality of the herd. It also provides a more direct way to track reproductive lineage. Graduates of Berardinelli’s class often return to family farms and ranches with skills that save money and time when it comes to breeding practices, according to Brady Richardson, an MSU undergraduate from Dillon, majoring in animal science.



## Animal Science Alumni Receive Major Financial Awards

Two recent animal science graduates received \$126,000 in scholarships to fund their veterinary school and equine careers. The awards were announced at the 2017 American Association of Equine Practitioners (AAEP) Annual Convention in San Antonio, Texas. Anne Hutton of Wisdom, MT received one of four \$75,000 Coyote Rock Ranch Scholarships. Kelsey Stoner from Montana City, MT won three awards – the \$45,000 Margaret A. Haines Telephony Scholarship through the American Quarter Horse Foundation, \$5,000 AAEP Foundation/Merck Animal Health Scholarship, and \$1,000 AAEP Winner's Circle Scholarship.

Animal and Range Sciences faculty member Dr. Shannon Moreaux was in attendance at the awards ceremony. "I couldn't be more happy for, and proud of, these two young ladies. They are both outstanding students and will make significant contributions to the equine industry as veterinary health professionals." Dr. Moreaux added, "Anne and Kelsey's success can be attributed to many factors, not the least of which is their Montana heritage, but also their hard work, passion and preparation to this point in their academic careers. Both Kelsey and Anne pursued elective courses and participated in multiple internships and volunteer opportunities to gain knowledge and experience." Additionally, as indicated from each of their testimonies below, Anne and Kelsey expressed gratitude for their animal science education at MSU.



Anne Hutton received a \$75,000 Coyote Rock Ranch Scholarship from the American Association of Equine Practitioners.

*The opportunities I have received, including the Coyote Rock Ranch Scholarship and an internship at Pioneer Equine Hospital, would not have been possible without my education and experiences at Montana State University.*

*My degree in Animal Science through Montana State University gave me a firm foundation to follow my dream of becoming an equine veterinarian. Classes such as Anatomy and Physiology, Animal Nutrition, Diseases of Domestic Livestock, and Applied Reproductive Physiology provided me with a strong knowledge base for animal health and production. With my primary interest in horses, I was then able to use those foundation classes as a springboard for others in my specific area of interest such as: Equine Lameness, Equine Reproduction Management, and Equine Exercise Physiology.*

*Subsequently, I was able to obtain a well-rounded education in both animal science as well as in equine science. I feel that this combination of course work as well as other extracurricular activities offered through Montana State (including competition with the Bobcat Rodeo Team through the National Intercollegiate Rodeo Association and the Pre-Veterinary Club) enabled me to be a competitive candidate for entry into the Veterinary Program. I*



*also felt that I was well- prepared for the courses that I encountered throughout my education as a veterinary student.*

*These courses are offered at many schools throughout the country but what sets MSU apart are the professors and the support staff. It is the knowledge, compassion, and dedication of these people that determine the quality of your experience. I felt that the staff at MSU truly cared about my education and my future. They constantly went out their way not only to answer course- related questions but also to provide valuable insight and advice into life. Many professors at MSU are veterinarians and this was valuable for me in that they knew exactly how to individualize my curriculum to give me the best chance of getting into vet school and being able to succeed once I was accepted. I can't thank my professors enough for all they did for me in undergrad and all they continue to do for me.*

*-Anne Hutton*

*I graduated with a Bachelor's of Science degree in Animal Science in May 2014 and began veterinary school through the WIMU Veterinary Cooperative Program in the fall, completing my first year of veterinary school at MSU. I will graduate with a DVM this May. My undergraduate education at Montana State University and my experiences in the College of Agriculture are inimitable and have propelled me into a future career as an equine veterinarian. It was the distinguished professors at MSU who made my studies remarkable. They were committed to my education and dedicated time outside of the classroom to offer hands-on laboratories that further advanced my knowledge and skill-set.*

*With the rigorous curriculum offered in the Department of Animal and Range Sciences, I was prepared for the intensive studying that veterinary school required. The classes offered in numerous species, provided me with a strong foundation, that I could continue to build on throughout veterinary school, instead of focusing on the basics. Most notably, reproduction, diseases of livestock, veterinary entomology, anatomy and physiology of domestic animals, sheep management and equine management, animal genetics, and animal nutrition. Additionally, completing my undergraduate studies in three years required a large credit load that I believe prepared me for the demanding veterinary curriculum. I was also involved in numerous campus organizations at MSU including, the Pre-Veterinary Club, College of Agriculture Student Council, MSU "Advocats", MSU Chorale, and private vocal lessons. I was a Teacher's Assistant for the anatomy of domestic animals laboratory for two semesters and a tutor for the diseases of livestock class for one semester. I attribute my success in veterinary school to my experiences both in and out of the classroom at MSU, and to the outstanding professors that provided me with a strong foundation in animal science.*



Kelsey Stoner, a fourth-year student in the WIMU regional veterinary program, has received a \$45,000 Margaret A. Haines Telephony Scholarship from the American Quarter Horse Association.

*- Kelsey Stoner*

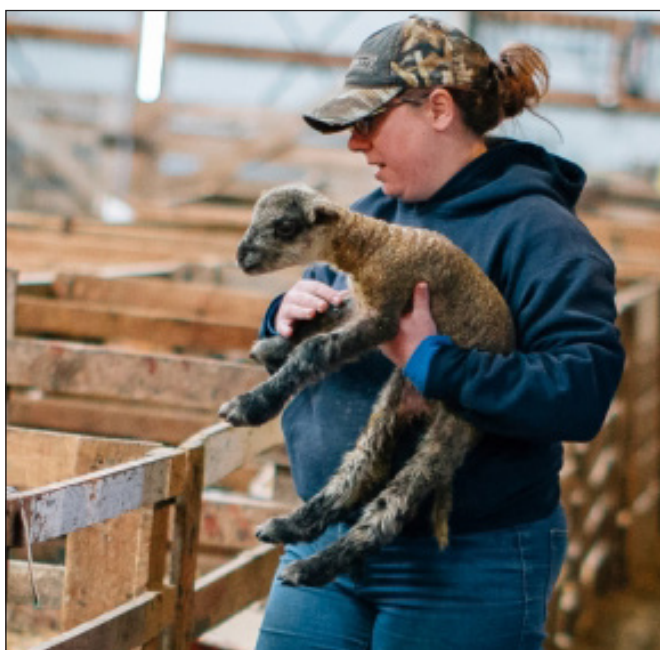
## MSU lambing season full of life lessons

The last week of April and the snow finally stopped at Montana State University's Red Bluff Ranch. Farm-truck mud rivets run deep and the only sound is the Madison River Valley's late-spring wind that still carries winter's bite. At every turn, the ranch's budding green hills are peppered white with new lambs hobbling on rickety legs.

"We can finally say the "Q" word this week," said Arianne Perlinski, attending veterinary technician and farm assistant with the Montana Agricultural Experiment Station. "It's finally quiet. Last week, it was all hands on deck –there wasn't even time to really check the clock. We had between 70 to 80 lambs born per day."

If there's a harbinger of spring at MSU, it's likely the sight of MSU's sheep flock showing signs of early labor, commencing the annual MSU lambing season. While students prepped for final examinations on campus, Perlinski and her team of 15 temporary employees, 11 of whom are students, were busy on the ranch assuring the safe and healthy delivery of 926 lambs from 675 ewes representing the Targhee, Rambouillet and Columbia breeds.

The ranch sprawls 10,800 acres, most of it rangeland, and is home to cattle and sheep year-round that are used in variety of research and teaching involving grazing, breeding and animal health. The ranch's lambing season, according to Perlinski, lasts about the entire month of April and often extends into early May.



"At peak time, it's a muddy, windy, chaotic symphony," Perlinski said. "Some days it's exhausting, but then you realize the weight of the responsibility for these animals and it becomes a very special job. There's not a day I don't drive home recounting the day with these animals."

At the center of the season, Perlinski said, is the opportunity for students to apply animal science coursework to a real-life ranching situation, where Mother Nature dictates the flock's vulnerability to weather, unpredicted labor complications, hungry predators and risk of infection – all of which can escalate in a moment. Perlinski said students participate in every stage of lambing, from health-checking for signs of early labor, to the actual delivery and postpartum care of ewes and lambs.

Katie Combs with a new lamb.

*continued on page 7*



Katie Combs, a senior from Utica, New York, majoring in animal science in the Department of Animal and Range Sciences in the College of Agriculture, said the opportunity to participate in lambing provided her a deeper understanding of livestock birth.

“I’d had experience calving with dairy cattle, but not sheep, so it was a whole different animal and learning process for me,” she said. “Learning and becoming confident about signs, challenges and getting the hang of it was invaluable experience. It’s something I’m sorry I waited to join in on until I was a senior; some of the material in class would have made a lot more sense.”

Just after birth, students are charged with marking the ewe with a number that matches her lamb. More than 50 percent of the lambs born are twin sets, Combs said, so the tagging is critical for record keeping and keeping pairs together.

“I feel like I have a better understanding of the animal’s behavior from interacting and observing them over the season,” Combs added. “There (are) just some things you wouldn’t pick up or appreciate as much from classroom instruction only.”

*continued on page 8*



Lambs wander into pens at Montana State University’s Red Bluff Research Ranch near Norris in during lambing season. Typically the entire month of April helps students in animal range science receive first-hand experience in a working ranch.



Perlinski says she tries to mirror the in-class animal reproductive curriculum as much as possible, but also teaches lambing students to focus on a low-stress labor and delivery approach, with as little human interference as possible.

Some of the more challenging situations students may encounter include difficult labors, where the lamb is in the breech position during delivery and students must intervene to deliver the lamb as safely as possible, Perlinski said.

Other challenges during the season include natural preterm miscarriages, malnourishment, the weather, birth deformities, uterine infections and vaginal prolapse in ewes. “Just like any other working ranch, there’s a range of

what can happen when it comes to animal health,” said Raven Phifer, a junior from Camden, Tennessee, majoring in equine science in the Department of Animal and Range Sciences.

“It’s always challenging when to know to let things happen naturally and when to step in and help, but I’ve learned most from making diagnostics on the land, in the elements, when things are happening. That’s when I’m able to put it all together.” Phifer said it’s particularly challenging to watch a ewe reject her lamb, which is common among sheep.

“First-time breeders often will neglect the lamb, and that’s where (we) try to intervene so that the baby can get colostrum during the first 24 hours, which is a critical time period,” she said. “Wiping some of the amniotic fluid on the mom’s nose so that she can smell her pheromones and naturally want to nurse her lamb is an example of helping maternal instincts kick in without much meddling.”

Perlinski said staff will bottle feed a lamb if a ewe rejects it, and the ranch will sell the lambs and ewes to 4-H participants, local ranchers and hobby farms. “We’re a working ranch and our flock is mostly used for education and research, but we do care for the animals like any other livestock operation,” she said. “We want them to go to good homes and be of value for grazing, processing or for a local 4-H’er.”

Tom Murphy, assistant professor of sheep production in the Department of Animal and Range Sciences, said the lambing season provides a unique opportunity for students to apply classroom curriculum and training to a working ranch situation.

“Land-grant universities, like MSU, have a responsibility to deliver applicable training and student involvement both in and out of the classroom,” he said. “When it comes to learning reproductive systems of livestock and animal health, there’s no better training than the real thing. We’re grateful to have the facilities and animals that we do, because it’s not only critical for research purposes, but it’s central to student learning, too.”



## MSU equine instructor featured on cover of two national magazines

A Montana State University adjunct instructor who has made a name for herself as a horsewoman and a businesswoman is featured on the covers of two national magazines popular with equine enthusiasts.

Reata Brannaman, who since 2013 has instructed the colt-starting class in the MSU College of Agriculture, is the cover story for the August issue of *America's Horse*, a publication by the American Quarter Horse Association, the world's largest equine breed registry and membership organization.

Brannaman is also on the cover of the September/October issue of *Cowgirl*, a magazine with print and media formats that combined reach 840,000 primarily women consumers who are interested in the western lifestyle, according to its website.



Brannaman said she was surprised to be on the cover of both magazines, but proud to draw attention to MSU's Equine Science Program in the Department of Animal and Range Sciences, and to the hard work that goes into its annual events, such as the Top of the West colt sale and colt-starting competition.

"It was also a really neat opportunity to get to talk about what I've been doing at MSU in trying to build the equine program the past four years and about my own business," said Brannaman, who graduated in 2017 with a marketing degree from MSU's Jake Jabs College of Business and Entrepreneurship and launched her western wear business, Reata Ranchwear, when she was 12.

Brannaman, 23, was a sophomore when she was hired to instruct MSU's colt-starting class, which had been without an instructor for some time. Younger than most, if not all, of her students that year, Brannaman already had years of horse-training experience under her belt, gained from being mentored by three of the world's most renowned horsemen: Ray Hunt, Tom Dorrance and her father, famed horse whisperer and clinician Buck Brannaman.

In the *America's Horse* story, "Her own way," written by Mary McCashin, Brannaman shares how she grew the colt-starting class from 10 students and colts to a program that now boasts 20 student trainers and as many colts donated by quarter horse breeders. The colts – AQHA fillies and geldings -- are sold each year to raise money for the equine program and funds go to support its students and for the care and upkeep of the horses.

She also talks about her growing-up years on the family's Sheridan, Wyoming ranch with her two sisters and her mother, former model Mary Brannaman, and what it means to have Buck Brannaman as her father.

"I'm sure it comes with a lot of preconceived notions from people, but to me, Dad was always just Dad," Brannaman said in McCashin's story.



Brannaman, who teaches in MSU's Department of Animal and Range Sciences, is shown with her horse, Sperry.

In the Cowgirl magazine story, "American Cowgirl," written by Chase Reynolds Ewald, Brannaman shares her journey as an MSU sophomore marketing student who spent three years juggling coursework and teaching duties, while also running her business and helping her father conduct clinics and events across the country. "I'm just really good at having a lot of irons in the fire," she said in Reynolds Ewald's story.

Now with student life behind her, Brannaman's fire has one less iron in it. Looking back, she said she wouldn't recommend anyone else take on as much as she did at such a young age, although she has no regrets. "I didn't have anyone to advise me against doing it," she said. "Dad was like, 'Go for it. You can do it.'"

This year, in addition to the colt-starting class and colt sale, Brannaman is teaching a course in young horse development and a one-credit, independent-study course in equine marketing. She developed the marketing course to recognize the hours of work her students put into developing a catalog for the annual colt sale.

"They learn to market a horse and talk to potential buyers and clients," she said. "It's a lot of what I learned in the business school, but with the focus on horses that they can use in the field."

She also credits her students' work ethic as a big reason for the program's success. "They put in 40 hours a week, and they're required to do two labs a week," she said. "How many electives would you do that for?"

What the students gain from putting in those long hours has more to do with what they produce than the thought of a high letter grade, Brannaman said. "They like that they get to show a return for the amount of effort they put out," she said. "These horses give the students something they can work toward and see results. They're so proud their horses get to go to people who will enjoy them for the rest of their lives."

Since she took the reins of the colt-starting class, some of Brannaman's students have graduated from MSU and are now working or studying in various animal- or equine-related fields, such as veterinary school or the MSU farrier program. "Some have gotten scholarships to go on the road and travel with my dad, which is a pretty awesome experience for them to get to go into the field," she said.

Several have even continued on in colt-starting and have done well selling the horses they have trained. "It's cool to see students who keep doing it and know that they're getting paid to do it," she said. "That's what I think college is about -- learning what you want to learn and making it a career. Like they say, if you do something you love, you don't work a day in your life. That's what this teaches them."

And as she considers the growth of her students and the colt-starting program, Brannaman also considers her own, and how her experiences over the past four years have changed her. "Teaching these students has broadened my abilities as a teacher and a rider," she said.



## Increased funding for pesticide education trainings across Montana

Federal and state funding cuts have compromised many pesticide education programs across the nation. Some universities have closed the doors on pesticide education, while others offer fewer pesticide applicator trainings. Historically the Montana State University (MSU) Pesticide Education Program (PEP) coordinates the certification and training of private (farm) applicators; which ensures applicators receive valuable education on the care and handling of pesticide products. In 2014 Crop Life Foundation recognized MSU PEP as 'funding deficient' in a competitive national grant process. Grant funds were used to form an ideal educational vision for land grant university pesticide education programs and form a strategy for obtaining additional sources of funding to achieve this vision.



### Private Applicator Surveys

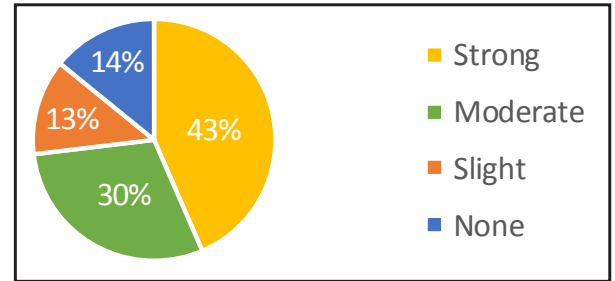
Two surveys sent to 4,500 Montana private applicators from 2014 - 2016 assessed the perspective of Montana applicators related to the: 1) importance of MSU PEP, 2) ideal role of MSU PEP, and 3) ideal funding options that minimize negative impacts. Ninety two percent of private applicators considered the PAT program to be valuable to very valuable in surveys of 656 private applicators in 2014. Twenty six percent of overall respondents indicated they would lose their private applicator license as a result of less training tools / props for trainers, less training for trainers to provide technical updates, and fewer fumigant education programs in funding wasn't found. Eighty two percent of private applicators surveyed indicated that a loss of their license would cause significant economic losses when facing a pest outbreak (a minimum of \$1,000 - \$5,000 per outbreak / individual).

Fifty five percent of private applicators indicated they would lose at least \$5,000 dollars from one pest outbreak, while 33% indicated they would lose over \$10,000 from one pest outbreak without their private applicator pesticide license. The need to seek additional funding for the MSU Extension PEP was well supported by pesticide applicators.

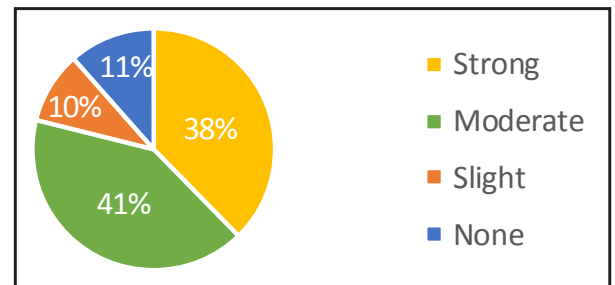
### Montana Pesticide Education Stakeholder Team

A Montana Pesticide Education stakeholder team was formed to assess the needs of Montana pesticide applicators and associated stakeholders. This included Dr. Cecil Tharp (MSU Extension Pesticide Education Program), Krista Lee Evans (Montana Agribusiness Association), Tom Butcher (Montana Grain Growers Association), Becky Kington (Montana Weed Control Association), Heather Rimel (Montana Seed Growers Association), Jay Bodner (Montana Stockgrowers Association), and Jess Bandel (Montana Farm Bureau Federation). This committee was crucial to assessing the ideal role of MSU PEP by reviewing applicator surveys and feedback from their own groups/associations. The strategy for seeking funding was based off of private applicator feedback:

Private applicators (829) were asked if they would support an increase in private applicator license fees from \$50 to \$60. Seventy three percent of private applicators moderately or strongly supported this strategy. Only 14% indicated no support for this strategy. Consequently, this is a preferred avenue of support to pursue as is proposed in the next section.



Private applicators (825) were asked if they would support an increase in pesticide product registration fees to provide sustainability to the MSU PEP. Seventy nine percent moderately or strongly supported this approach. Only 11% indicated they had no support for this strategy. Consequently, this is a preferred avenue of support to pursue, as is proposed in the next section.



Due to pesticide applicator support the Montana Pesticide Education Stakeholder Team decided to pursue an increase in private applicator license fees from \$50 to \$60 as well as raising pesticide registration fees. These options were proposed to the 2017 legislature in House Bill 126. House Bill 126 passed in the spring of 2017.

## Conclusion

The passage of House Bill 126 ensured adequate trainings for private applicators and the continued role of MSU PEP as the coordinators of the Montana Private Applicator Program. The increased funding will ensure applicators are trained to effectively manage pests while minimizing environmental or safety consequences from misuse.

An additional \$10 in private applicator license fees will be dedicated towards MSU Extension county pesticide programs where the applicator resides. This funding can be used by local trainers to deliver high quality pesticide training programs. In addition, a portion of this funding is set aside for tribal pesticide programs. Tribal pesticide applicators are identified as an underserved audience within Montana.

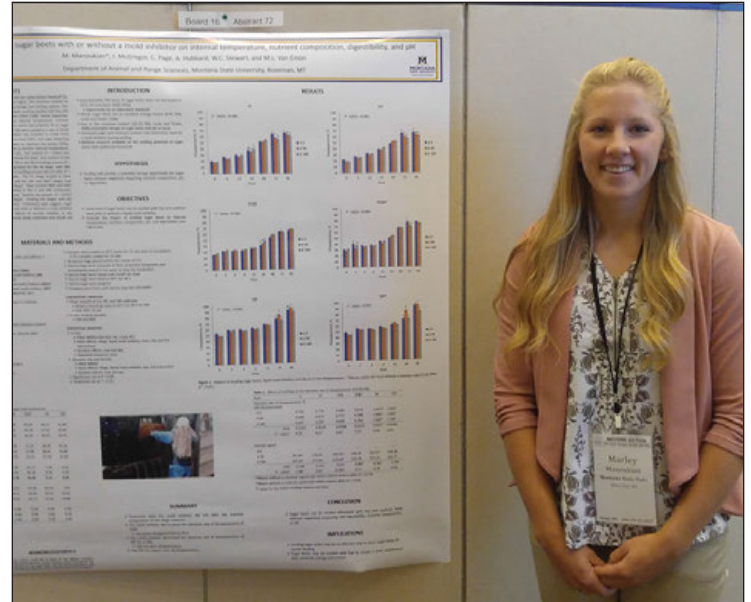
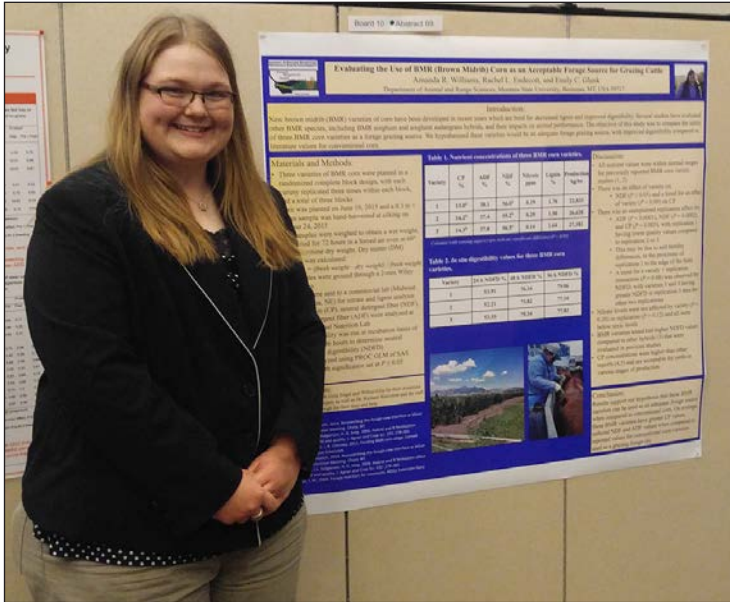
Private industry supported an additional \$8 to \$11 from pesticide registration fees to be collected from pesticide manufacturers wishing to register their pesticide products in Montana. This funding will be distributed to MSU PEP administration for: 1) training pesticide trainers to deliver local pesticide programs, 2) travel to support regional, state and local pesticide programs, 3) training tools for local trainers, and 4) increased regional initial and fumigant training opportunities.

This is good news for pesticide applicators in Montana. By maintaining a private applicator license with access to high quality pesticide programs applicators save money by managing pests properly while ensuring the proper use of pesticides. Private applicators also will find it convenient to attend local trainings as opposed to more travel to statewide pesticide programs.

## For Further Information

For more information on House Bill 126 navigate to <https://legiscan.com/MT/text/HB126/id/1590789>. Contact Dr. Cecil Tharp if you have any other questions about this article (406-994-5067; [ctharp@montana.edu](mailto:ctharp@montana.edu)).





**Amanda Williams and Marley Manoukian** presented their undergraduate research projects at the 2017 Western Section of the American Society of Animal Science (WSASAS) meeting held in Fargo, North Dakota, this summer.

**Dr. Carl Yeoman** was an invited speaker for the Department of Basic Medical Sciences Seminar series at the University of Arizona in Phoenix, AZ in June and presented a talk entitled “Biogenic amines: Biomarkers of bacterial vaginosis or precursors to vaginal dysbiosis”.

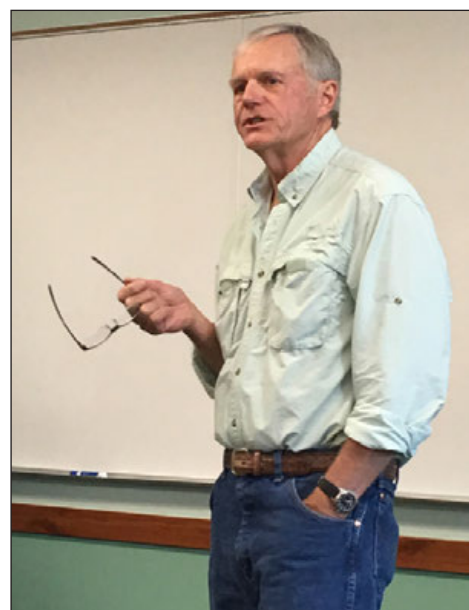
**Dr. Carl Yeoman** spent this past summer on the Fort Peck reservation teaching a group of eight American Indian youth about the importance of the microbes that live in and on each of us and the basic microbiological and newer molecular and bioinformatic methods used to study them. The students were enrolled in a six week course as part of the Fort Peck Community College’s T-Cup program and Dr. Yeoman’s involvement was funded through an NIH-NIGMS grant awarded as part of a local Center for Translational Research effort focusing on Native American and Alaska Native health disparities. Students covered topics ranging from the importance of the microbes that live in and on us to our health and nutrition, basic ecological measurements, bioinformatic processes and also carried out several hands-on projects, including assessing the viability of different types of bacteria in locally sourced dairy foodstuffs and assessing how consuming these products could alter their oral microbiota.



**Dr. Greg Johnson** retired after thirty-plus years with Montana State University. After earning his B.S. in Biology from Eastern Mennonite University and his M.S. in Entomology from the University of Wyoming, Greg received his Ph.D. in Entomology from the University of Wyoming. After working as a Research Associate in the Department of Entomology at the University of Nebraska, Greg joined MSU in 1986 as Assistant Professor and Pesticide Education Specialist, working in the Entomology Research Laboratory. Greg has been a part of countless research projects and publications for his work in the field of entomology.

Research in Greg's lab focused on the biology, ecology and management of arthropod pests that attack livestock and wildlife. Field and laboratory studies were been conducted on West Nile virus determining vector distribution in the state, identifying enzootic and epizootic zones of virus transmission and studying the impact of WNV on sage grouse and American white pelicans. Research was also conducted on biting midges (Culicoides) and bluetongue virus focusing on vector competency and midge distribution in the state. He conducted studies on insecticide management of different livestock pests that cause direct losses and affect livestock production.

Greg's retirement was celebrated by the department and he received a special gift from, Dr. Waded Cruzado, MSU President, to commemorate his years of service and dedication to Montana State University. Best wishes to Greg!



**Smith Wells** successfully defended her M.S. thesis titled, "Livestock Depredation by Grizzly Bears on Forest Service Grazing Allotments in the Greater Yellowstone Ecosystem" in July 2017. Smith is now employed as a GIS analyst with the Montana Department of Fish, Wildlife, and Parks in Helena.



**Melissa Rashelle Lambert** (Herrygers) completed her M.S. Degree requirements in Reproductive Physiology and Endocrinology in May 2017. Her thesis was "A metabolomics approach for the study of long-term progesterone in domestic sheep and physiological processes in domestic and bighorn sheep". This seminal work in the area of metabolic physiology in domestic and bighorn sheep and many more publication related to her thesis, can be accessed from the following addresses: <https://scholarworks.montana.edu/xmlui/handle/1/12785>; other publications [https://scholar.google.com/scholar?start=0&q=Herrygers+M-R&hl=en&as\\_sdt=0,27](https://scholar.google.com/scholar?start=0&q=Herrygers+M-R&hl=en&as_sdt=0,27)



The Montana State University Range Management Club sold wild fir trees from local rangelands for the club's annual fundraiser that benefits club travel expenses to national competitions. Club members harvested local fir trees from private, native rangelands in Gallatin County that ranged in height from 2 feet to 12 feet. Funds from the tree proceeds will be used to send the club to the annual International Society for Range Management Convention in Reno, Nevada this spring. Last year at the convention, club members won fifth place in the Undergraduate Range Management exam competition and eighth place in the Range Plant Identification Test. Senior Noah Davis, from Ventura, California, earned second place in the competition's individual combined scores for both the Undergraduate Range Management Exam and Plant identification contest.



The MSU Range Management Club includes 25 student members from several majors within the Department of Animal and Range Sciences, in the College of Agriculture and is for students interested in principles of range management and range ecosystems. Club functions include the sponsorship of student study sessions and travel to participate in the Undergraduate Range Management Exam, Range Plant Identification Exam, and the Extemporaneous Speaking Contest at the Society for Range Management Annual Conference. Additionally, the club supports guest speakers, field trips and social functions.



The rams were enjoying grazing the plots at Ft. Ellis in October. They focused a lot of their time in the wheat stubble plot. Photos are courtesy of Devon Ragen.





**JT Saunders**, Red Bluff Ranch Manager and **Jace Self**, Farm Assistant, delivered 5.25 pallets (11,000 lbs. of water or just under 9,000 bottles) of bottled water to the folks affected by the wildfires in Eastern Montana in July.

JT expressed his appreciation to the College of Agriculture and the Animal & Range Sciences Department, who donated money to cover the cost of the water. “Jace and I would like to thank all of you for your efforts to make this possible. We personally know or have worked for several of the ranches and farms in that area. So the whole situation hit home for us, and we appreciate you guys making all of this happen for us and the affected families and the fire crews.”

They delivered the water to the Fire Hall in Winnett, for distribution to the Lodgepole Complex fire crews, the Crying Fire crews, and the families in need. JT said, “They were very gracious towards us and the College of Ag. It was a very long evening/night of driving, but every mile was worth it to help them out.” The Fire Department in Winnett and the members of the Sand Spring volunteer department helped unload the water and extended their gratitude. Thank you, JT and Jace for helping get the water where it was needed!



The Montana Wool Lab’s Laserscan is up and running. The staff will begin testing the qualities of known samples for comparison. The Laserscan provides flexibility, as well as options, on how to clean the wool prior to coring, snipping and testing, which helps the Wool Lab find the most efficient way to process wool samples. The Laserscan provides the same analysis as the OFDA 2000, only more in depth. The goal of using the Laserscan is to improve the quality and yield of sheep, through collaboration of wool growers, the MSU Sheep Program and the Wool Lab.

The Department of Animal and Range Sciences, once again, partnered with ST Genetics, Billing, MT to offer a short course for artificial insemination (AI) in cattle. Mr. John Jackson Regional Manager, ST Genetics, partnered with **Dr. Jim Berardinelli**, his graduate teaching assistant, Jarrett Payne and 6 outstanding, undergraduate students to certify 15 students in technologies and techniques of AI in beef cattle over the course of intensive days in December, 2017. Students and producers used the Student Physiology Laboratory facility in the Animal Bioscience Building for classroom instruction and demonstration, and the AI Facility at the Bozeman Area Research and Teaching Farm, for “hands on



training and experience. These special interactions contribute to our teaching and outreach mission, and enhance the quality of our relationships with Montana companies and beef cattle producers to improve the overall use and efficiency of AI in our State.



## Meat Processing Students Develop New Meat Products

As part of the meat processing class each year, the students develop a new product. They are charged with investigating the market and competitors as well as looking at what is necessary to take the product to full production including different types of packaging and equipment. This year the students drew for what species they would be using. In the draw were beef, pork, lamb and a wild card. The wild card was allowed to choose any species they wanted to use as long as it could be obtained relatively easily.



**Ed Weidenbach** and **Michaela Blevins** developed a Kalbi style beef ribs. The flavor profile is a Korean Barbeque style, known as Kalbi, so this is where the name originates from. The main flavors in this product are soy sauce, lemon garlic with some sweetness. The product is fully cooked and ready to reheat on the barbeque or under the broiler. They utilized Flanken style beef ribs which is a unique approach to utilizing the short plate. Proposed market to young people on the go.



**Allie Novotony** and **Taylor Kramer** developed an “after breakfast” sausage utilizing pork, red wine and with the main spice flavor of sage. Their Red Wine and Sage sausage was developed to give options besides breakfast sausage in the fresh sausage category. The product can be utilized as patties, crumbles or meat balls giving it the versatility to be used for different types of meals.



**Sam Shearer** and **Shannon Saint** probably had the hardest draw as they had lamb. One of the greatest challenges to lamb consumption is people not knowing how to season or cook lamb. They developed a process for lamb ribs that took care of both the seasoning as well as most of the cooking. The lamb riblets are first marinated and then smoked and cooked prior to packaging and freezing. The consumer just needs to thaw the ribs sections in water and then heat them under the broiler with an agave lemon glaze.



The wild card group, **Kaitlyn Goroski** and **Amanda Williams** decided to utilize beef. Their approach was to develop a product that consumers could feel they were contributing to their meal. Their product was Home-style Beef in Gravy. The premise was to have the raw meat in a base that could be thickened with starch after the meat had been cooked. Allowing the consumer to feel they actually cooked their meal. This group also utilized a less used cut from the chuck.

## **SUMMER 2017**

### Graduate Students

Danielle Peterson – MS in Animal and Range Sciences

## **FALL 2017**

### Graduate Students

Ashton Hubbard – MS in Animal and Range Sciences

Ian McGregor – MS in Animal and Range Sciences

Chad Page – MS in Animal and Range Sciences

### Undergraduate Students

Kaitlyn Goroski – B.S. in Animal Science

Taylor Hansen – B.S. in Animal Science

Ryan Hoffman – B.S. in Animal Science

Colten Hughes – B.S. in Animal Science

Madison Kolar – B.S. in Animal Science

Amanda Kotar – B.S. in Animal Science

Taylor Kramer – B.S. in Animal Science

Lauren Larios – B.S. in Animal Science

Dori McNeill – B.S. in Animal Science

Katherine Miller – B.S. in Animal Science

Remington Monfross – B.S. in Animal Science

Angela Muggli – B.S. in Animal Science

Tara Povalish – B.S. in Animal Science

Kamron Ratzburg – B.S. in Animal Science

Caleb Reichhardt – B.S. in Animal Science

Carine Riley – B.S. in Animal Science

Rex Shevitski – B.S. in Animal Science

Karissa Skogg – B.S. in Animal Science

Victoria Wilson – B.S. in Animal Science

Bahareh Ziai – B.S. in Animal Science

Randie Adams – B.S. Natural Resources and Rangeland Ecology

Zachariah Fighter – B.S. Natural Resources and Rangeland Ecology

Laci Nielsen – B.S. Natural Resources and Rangeland Ecology

Ryan Parkinson – B.S. Natural Resources and Rangeland Ecology

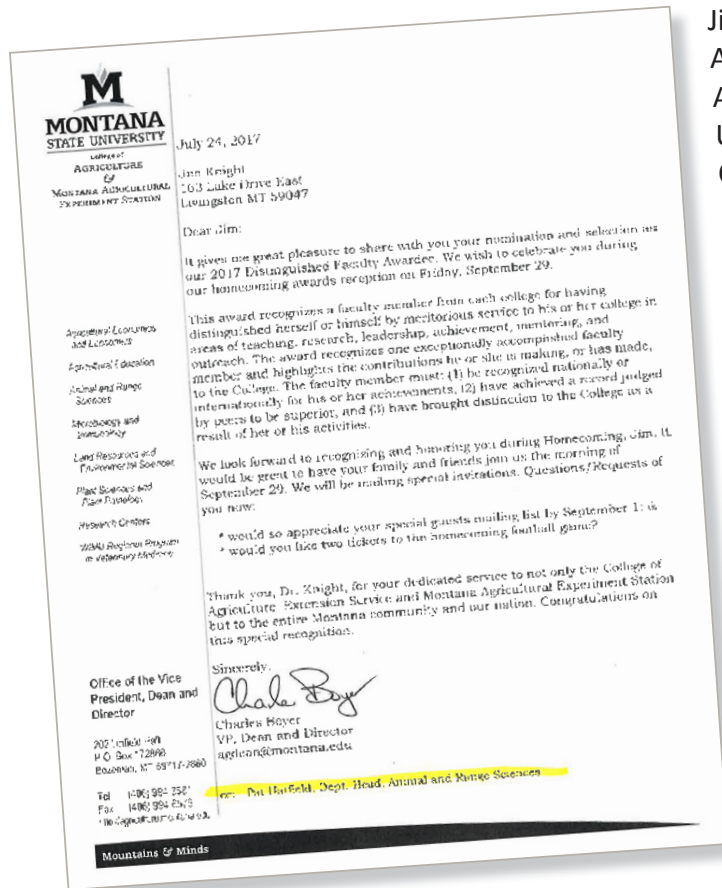
# **Congratulations to all the graduates!**





# Awards, Honors, and Grants

Dr. Jim Knight received the 2017 Distinguished Faculty Award from the College of Agriculture. He was recognized for his meritorious service and contribution he has made to the College of Agriculture. Here is a copy of the letter sent to Jim informing him of the award.



Jim also did a tremendous job organizing the history of the Animal & Range Sciences Department. The history of the Animal and Range Sciences Department at Montana State University actually began before the start of the Agricultural College of the State of Montana in 1893.

As Montana was settled, many farming and ranching practices which worked in the east were quickly found to be ineffective in the unique environmental conditions of the Rocky Mountain west and the Great Plains.

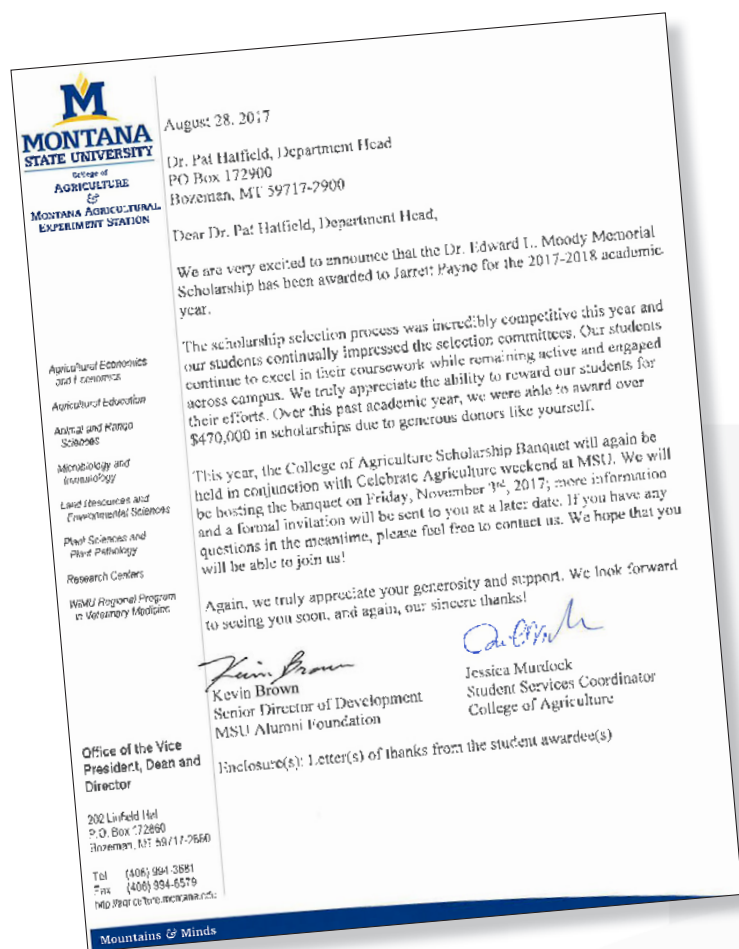
The need for research and knowledge regarding livestock production in Montana was essential to provide food for the increasing population. Take a look at this amazing timeline compiled by James E. Knight, Professor Emeritus. Here is a link to the site – <http://animalrange.montana.edu/documents/ARNR%20HISTORY%2011.14.17.pdf>.

**Carl J. Yeoman** and Elizabeth Rink (HHD) were awarded \$85,969 by NIH-NIGMS AIAN-CTR to continue work with the Ft. Peck Reservation to understand the influences of stress and behavior on biogenic amines and microbes in the context of reproductive health

**McNew, L.B.** Greater sage-grouse habitat research in the sagebrush focal area of northcentral Montana. Bureau of Land Management, Montana Dakotas State Office, \$229,717. September 2017 – December 2021.

**McNew, L.B., B. Sowell, and T. DelCurto.** Remote evaluations of wildlife and livestock habitats using UAVs. Bair Ranch Foundation, \$52,073. August 2017 – July 2019.

**Gabrielle Blanchette**, MS Graduate student, was awarded \$200 from the Montana State University Foundation Endowed Fund for MS Students in Entomology. Fund donors are Tom Helm and Alieda Ston. They created this endowed fund to support graduate student education and research in entomology at Montana State University. Through their company, Seed Source, Inc., they understand the importance of entomology research and discovery to the agricultural industry in Montana. They are passionate about ensuring the future of entomology education and research at MSU. Congratulations to Gabrielle.



**Jarrett Payne**, MS Graduate student, was awarded the Dr. Edward L. Moody Memorial Scholarship for the 2017-2018 academic year. Jarrett's research topic is "Targeted cattle grazing to improve greater sage grouse brood rearing habitat through protein supplementation." His advisor is Dr. Jeff Mosley, Rangeland Extension Specialist.

The Student Travel Grant funds, through The Graduate School, allows MSU Bozeman graduate students (in good standing) to apply for funding to support their travel to present (oral) their research findings at a professional conference or to perform research. Two Animal and Range Sciences students were awarded funding this year.

**Skylar Vold**, MS Graduate student, was awarded \$400 toward his travel to present his research, "Effects of Livestock Grazing Management on the Abundance of Grassland Birds in a Northern Mixed-Grass Prairie Ecosystem" at the National Wildlife Society Annual Meeting. Skylar's advisor is Dr. Lance McNew.

**Anish Sapkota**, MS Graduate student, was awarded \$250 toward his travel to present his research, "Optimizing Boron Maintenance Fertilization for Alfalfa" at the Agronomy, Crops, and Soil Science Annual Meeting in Tampa, Florida. Anish was up against a large group of competitive national and international students and his poster came in 2nd place! Anish's department advisor is Dr. Emily Glunk.

*"Hard work spotlights the character of people: some turn up their sleeves, some turn up their noses, and some don't turn up at all."*

– Sam Ewing



## The WINNING LAB for the 2017 ANSC 421 “Assisted Reproductive Technologies in Domestic Animals Pregnancy Testing Competition” – LAB 1



**2017 ANSC 421 Award Winners**

*Congrats*

**1st Place Award Winner:**  
Colten Hughes

**2nd Place Award Winner:**  
Brady Richardson

**3rd Place Award Winner:**  
Cody Boyce

**Honorable Mention:**  
Andrew Barkhuff  
&  
Evan Haughian

**Pregnancy Testing**

### Individual AWARD WINNERS for Pregnancy Testing, with scores of >97%

- 1st Place: Colten Hughes
- 2nd Place: Brady Richardson
- 3rd Place: Cody Boyce

### Individual AWARD WINNERS for Proficiency in Artificial Insemination

- Lab 1  
Brant Marsh  
Cody Boyce
- Lab 2  
Colten Hughes  
Jenny Roddewig

**2017 ANSC 421 Award Winners**

*Congrats*

**LAB 1**  
**Brant Marsh & Cody Boyce**  
Special Commendations to:  
Allie Novotny & Brady Richardson

**LAB 2**  
**Colten Hughes & Jenny Roddewig**  
Special Commendations to:  
Kaylee Kountz & Riley Foster

**Artificial Insemination**

## Publications:

Ishaq SL, **Yeoman CJ**, Whitney TR. 2017. Ground redberry juniper and urea in supplements fed to Rambouillet ewe lambs. Part 2: Ewe lamb rumen microbial communities. *Journal of Animal Sciences*. In press

Betiku OC, **Yeoman CJ**, Gaylord TG, Duff GC, Hamerly T, Bothner B, Block SS, Sealey WM. 2017. Differences in Amino Acid Catabolism by Gut Microbes with/without Prebiotics Inclusion in GDDY-based Diet Affect Feed Utilization in Rainbow Trout. *Aquaculture*. In press and online <https://doi.org/10.1016/j.aquaculture.2017.09.006>

Nelson TM, Borgogna JC, Michalek, RD, Roberts DW, Rath JM, Glover ED, Ravel J, Shardell MD, **Yeoman CJ**, Brotman RM. 2017. Cigarette smoking is associated with an altered vaginal tract metabolomic profile. *Scientific Reports*. In press.

Winder, V.L. **L.B. McNew**, J.C. Pitman, and B.K. Sandercock. 2017. Effects of habitat selection and rangeland management on survival of female greater prairie-chickens. *Journal of Wildlife Management*, DOI:10.1002/jwmg.21331.

Thompson, S.J., C.M. Handel, and **L.B. McNew**. 2017. Autonomous recording devices reveal complex patterns in avian detection probability and presence in the Subarctic. *Journal of Wildlife Management*, DOI:10.1002/jwmg.21285.

Vold, S., C.M. Handel, and **L.B. McNew**. 2017. Comparison of acoustic recorders and field observers for monitoring tundra bird communities. *Wildlife Society Bulletin* 41: 566–576.

Winder, V.L., **L.B. McNew**, J.C. Pitman, and B.K. Sandercock. 2017. Space use of greater prairie-chickens in response to fire and grazing interactions. *Rangeland Ecology and Management* 70:165–174.

**McNew, L.B.**, B. Cascaddan, A. Hicks-Lynch, M. Milligan, A. Netter, S. Otto, J. Payne, S. Vold, S. Wells, and S. Wyffels. 2017. Restoration plan for sharp-tailed grouse recovery in western Montana. Montana State University, Bozeman. DOI: 10.13140/RG.2.2.26189.95204.

**Jeff Mosley** coauthored a paper presented at the 52nd Annual Congress of the Grassland Society of Southern Africa in Hoedspruit, South Africa. The paper was entitled, “Targeted Livestock Grazing to Improve and Restore Rangelands”.

**Jeff Mosley**, Rachel Frost, Brent Roeder, and Rodney Kott published a journal article (*Rangeland Ecology & Management* 70(5):560-568) entitled, “Targeted Sheep Grazing to Suppress Sulfur Cinquefoil (*Potentilla recta*) on Northwestern Montana Rangeland”. An abbreviated version (“Can Targeted Sheep Grazing Suppress Sulfur Cinquefoil?”) was published in the 2017 MSU College of Agriculture and Extension Research Report (pages 24-26).

Lehnhoff, E.; Miller, Z.; Miller, P.; Johnson, S.; Scott, T.; **Hatfield, P.**; Menalled, F.D. Organic Agriculture and the Quest for the Holy Grail in Water-Limited Ecosystems: Managing Weeds and Reducing Tillage Intensity. *Agriculture* 2017, 7, 33.



## Presentations:

Milligan, M.\*, **L.B. McNew**, and L. Berkeley. 2017. Flushing hens from nests results in lower nest survival. Biannual Meeting of the Prairie-grouse Technical Council. Dickinson, ND.

Milligan, M.\*, **L.B. McNew**, and L. Berkeley. 2017. Effects of grazing management on nest survival of sharp-tailed grouse in Montana. 24th Annual Conference of The Wildlife Society, Albuquerque, New Mexico. (poster)

Vold, S.\*, **L.B. McNew**, and L. Berkeley. 2017. Effects of grazing management on the abundance and diversity of grassland birds in northern mixed-grass habitats. 24th Annual Conference of The Wildlife Society, Albuquerque, New Mexico.

Milligan, M.\*, **L.B. McNew**, and L. Berkeley. 2017. Factors affecting space use of sharp-tailed grouse in Montana. 24th Annual Conference of The Wildlife Society, Albuquerque, New Mexico. (poster).

Sandercock, B. **L.B. McNew**, and V. Winder. 2017. Rangeland management impacts on grassland obligate birds in tallgrass prairie ecosystems. Annual Meeting of the British Ecological Society, Brussels, Belgium.

## Book Chapters:

Borgogna JC, **Yeoman CJ**. 2017. The Application of Molecular Methods to Improving Our Understanding of the Vaginal Microbiomes Role in Health and Disease. In: Methods in Microbiology (book chapter). Ed. Colin Harwood. Elsevier. 44: 37 - 91 <https://doi.org/10.1016/bs.mim.2017.08.003>



It's a  Boy!

**Devon Ragen**, Wool Lab Manager, and her husband, Tyler welcomed their new son Jack at 2:47 a.m. on November 9, 2017. He weighed 7lbs. 15oz. and was 20.5" long. His big brother is Jace. Congratulations to all!

# Upcoming Events

---

January 15, 2018  
College of Ag Connects  
Bozeman, MT

The Montana State University College of Agriculture and Montana Agricultural Experiment Station invite members of the agricultural community and the public to attend its first college-wide public forum, “College of Ag Connects” on Monday, Jan. 15 from 10 a.m. to 4 p.m. The forum is slated to engage with the Montana agricultural community on current and local issues by highlighting relevant, ongoing college programs and projects in agricultural teaching, research and Extension. Faculty from each of the college’s five academic departments will present overviews of their teaching and research, followed by a question and answer session.

College of Ag Connects will be held in Room 125 in Linfield Hall. Lunch costs \$10 in MSU’s Miller Dining Hall, but the event is free and open to the public, though registration is encouraged.

**Registration forms can be found at <http://bit.ly/2BJp4q1>.**

Visitors are welcome to park in university parking lots designated SB and F for the day, as January 15th is a federal holiday and MSU classes will not be in session and offices will be closed.

College of Ag Connects faculty presentations from the Animal & Range Sciences Department are:

- **Jane Ann Boles**, associate professor in the Department of Animal and Range Sciences, “Value-added Beyond the Carcass: Meat Processing Product Development”
- **Lance McNew**, assistant professor in the Department of Animal and Range Sciences, “Working Lands & Wildlife: Understanding Wildlife-Habitat Relationships to Improve Agroecosystems”

For more information, contact Patrick Hatfield at [hatfield@montana.edu](mailto:hatfield@montana.edu) or call 406-994-4850.

---

February 9-11, 2018  
Wool Harvesting School  
Red Bluff Research Farm

The MSU Sheep Program is offering an opportunity for students to develop the skills necessary for the sheep shearing industry. Additionally, we will provide instruction to improve your understanding of harvesting the wool clip in a manner that provides the grower with the most value.

Contact Sharon Henderson at [sharon.henderson@montana.edu](mailto:sharon.henderson@montana.edu) or 406-994-3415 for more information.





# Hello

---

Although she's been here since June 19, 2017, we want to officially welcome **Becky Van Zee** as the department Accounting Associate IV.

**Tom Groneberg** is the new Livestock Operations Manager and started his position on November 27, 2017. Bob Brekke retired in July.

**Tyrell McClain** is the new Livestock Operations Assistant Manager. He started his position on December 27, 2017.

**Tracy Ross** is the Equine Facility & Program Manager. She began her duties on December 15, 2017.

**Tami Parrott** is an Instructor in Equine Science. She started her teaching duties this Fall.

**Ben Wheaton** accepted the position of Lab Manager and began work on December 18, 2017.

And, while **Devon Ragen** has never left the Animal & Range Sciences Department, except to have a baby or two, we want to say congratulations on her new position as the Wool Lab Manager.

In the meantime, **Liz Deurmeier** has been doing a great job as Interim Wool Lab Manager, where she will continue to help Devon until late September.

We welcome all these talented individuals to the department and know their contributions will have a tremendous impact on the future of Animal & Range Sciences.

# Goodbye

---

Well, hopefully it's not goodbye, just see you later!

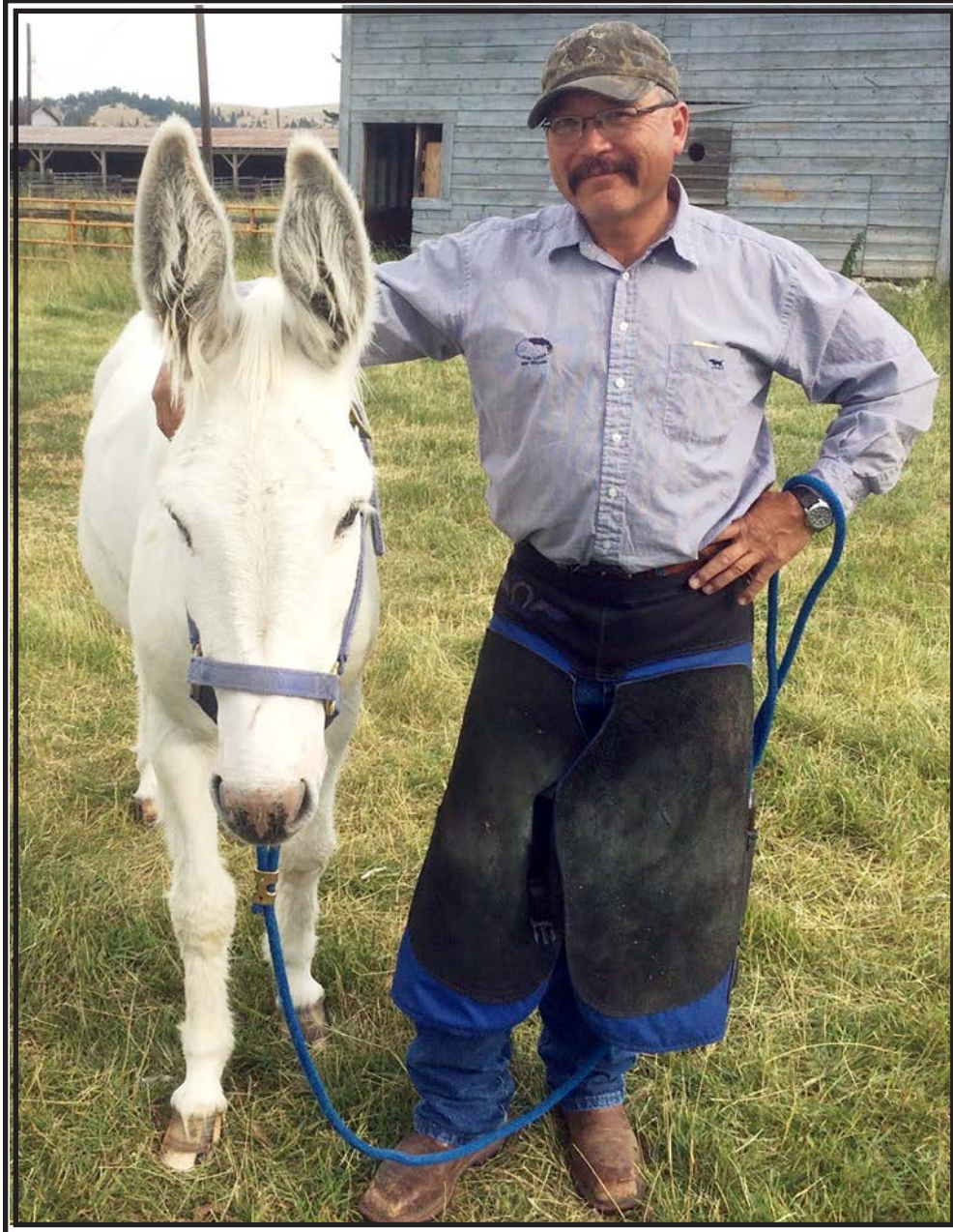
**Greg Johnson** retired after 30 years of service to MSU as the Veterinary Entomologist. You can read a little bit about Greg on page 12.

After serving as Beef Extension Specialist for over 12 years, **Rachel Endecott** has accepted the position as Director of Youth Development and Special Projects at the American Simmental Association. Good luck, Rachel!

Visit our website at [animalrange.montana.edu](http://animalrange.montana.edu)

Find us on Facebook at [facebook.com/MSU.Animal.Range.Sciences](https://facebook.com/MSU.Animal.Range.Sciences)

Email newsletter comments to [sharon.henderson@montana.edu](mailto:sharon.henderson@montana.edu)



**Bryce Kawasaki**, MSU Farrier School Director stands with Shenaningans, after a hoof trim. While Shenaningans does a great job protecting the Ft. Ellis flock, Bryce could have used a little protection of his own after he was in an accident in November at a Bismarck, ND ranch, where he took his students for part of their hands-on education. Bryce was trampled by horses that they were trying to corral. Luckily, he was not seriously injured. Thanks to the quick work of his farrier school students, they were able to get help. Bryce had surgery to repair his eye socket, but after some rest, he is on track to a full recovery.

The mission of the Animal and Range Sciences Department is to create, evaluate and communicate science-based knowledge to enhance the management of Montana's livestock and rangeland resources in ways that are economically, socially and ecologically sustainable.

