



# animal & range sciences newsletter

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## Celebrating 10 Years In the Animal Biosciences Building

July 2020 marked 10 years since our department moved into the Animal Biosciences Building. Having this space has allowed us to successfully continue our mission to create, evaluate and communicate science-based knowledge to enhance the management of Montana's livestock and rangeland resources. In August 2008, construction began on our 40,000 square-foot Animal Bioscience Building, which offers animal science and natural resources/rangeland ecology students state-of-the-art classrooms and laboratories for instruction and research. In 2004 the planning committee included Interim Department Head Bret Olson, two faculty members from the Department, Jan Bowman and Dennis Cash, and an undergraduate at the time, Anna Heryford. Bret Olson shared some of the details that he remembered from the time of the planning and construction of the ABB:

"The initial square footage was to be 42,000 square feet for the three stories, with estimated costs around \$16 million. Before we broke ground, we had only raised about \$12 million. MSU administration told the Dean of COA at the time (Dr. Jeff Jacobsen) to reduce square footage by 25% to align with funds raised. The common use areas on the first and second floor (west side) would have been sacrificed among other things. I believe it was the Dean's idea at the time to maintain square footage at 42,000 and leave the third floor research labs and support rooms unfinished. They would be finished when additional donations were received. The Great Recession began in late 2007 and lasted until 2009. This actually benefited our building at that time because contractors wanted to keep their employees busy and the building came under budget. During the 2009 Montana legislative session, the legislature awarded another \$3 million or so to ABB building construction, which enabled the research labs and support rooms to be completed along with the rest of the building. Taylor Brown, with the Northern Ag Network, was on ABB's fund raising committee. Taylor was an original member of the department's advisory committee and continues on the committee to this day. Taylor was also a state senator at that time. I do not know for a fact, but I imagine Taylor was instrumental in passing that \$3 million award (at the end of the Great Recession, no small feat). All said and done, almost 50% of the funding of the building was from private donations, large and small. There was a small amount of federal funds, the rest was state money. Thus, the building was essentially paid for when we moved in, which is unlike many buildings on campus (exceptions: Jake Jabs Business Building, Norm Asbjornson College of Engineering Building) which are bonded."

It is remarkable the way that the livestock industry came together to provide this facility for Montana State University. It truly displays their belief that the teaching and research done by our department is a necessity for the animal agriculture and natural resource industries. We would like to thank the donors who made having this building possible and for continuously supporting our students and enhancing the department's vision of the future. The last 10 years have been great, and we look forward to another 10 years of collaboration with producers, land managers, and the Montana Agricultural Experiment Station.

On the following page we have included some "Then" and "Now" pictures showing the changes to Mandeville Creek and the surrounding foliage from 2010 to 2020.

With the necessary safety precautions, students and faculty were allowed to return to a mix of online, blended, and in person classes this fall. We are fortunate to have been able to make the most of our interactions and learning opportunities while safely working with Covid-19 protocols. We are continuously proud of the work from our students, faculty, and staff as they adapt and succeed in these ever changing times.

We are happy to welcome Dr. Amanda Bradbery (equine science) and Dr. Christian Posbergh (sheep production) to our faculty positions. We are also excited to have filled the position of Farrier School Director with Diego Almeida. We are looking forward to the first sessions beginning February 1st. During a hiring freeze we were fortunate enough to be able to move forward with our search for an Extension Forage Specialist, this position is important to MSU and producers state wide, and we look forward to having the position filled soon. We also officially have Kellen Marlow in the Livestock Operations Manager position and Noah Davis as Red Bluff Foreman.



Dr. Patrick Hatfield  
Department Head

Several members of our faculty deserve congratulations for their accomplishments over this past semester. Dr. Clayton Marlow was selected to be the Western SARE Regional Coordinator. Extension Beef Cattle Specialist Dr. Megan Van Emon received the Western Section American Society of Animal Science Extension Award for her community engagement and outstanding work in beef extension. Hannah DelCurto-Wyffels was awarded the Teaching Innovation Award from the Office of the Provost.

Our Department successfully completed our 7 Year Review in October. Although we had to switch to a virtual format, we had great participation by faculty, staff, students, and stakeholders. The review team was Eric Belasco, Associate Professor in Ag Economics and Economics (MSU), Robert Collier, Professor and Department Head Animal and Veterinary Science (University of Idaho), Diana Debinski, Professor and Department Head of Ecology (MSU), and Jeff Heys, Professor and Associate Dean of Research Economic Development and Graduate Education, College of Engineering (MSU).

Overall, the review committee was encouraged by the improvements in the department over the 7-year review period. The department has excellent leadership, engaged faculty, a strong record of hiring high quality new faculty, well-prepared graduates, and extensive facilities. While there are areas that need to be improved, including peer-reviewed publications, the review committee concluded that the department appears capable of making those improvements.

We also celebrated 10 years in the Animal Bioscience Building this summer, we are so grateful to the many donors who made having this building possible and for continuously supporting our students and the department's future.

It has certainly been a year that we will all remember. Despite all of the challenges, our department has remained strong and put forth excellent work. We are looking forward to 2021, and wishing everyone a safe and healthy new year.

A handwritten signature in black ink, appearing to read "Pat Hatfield", written in a cursive style.

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Then...

Now!



## MSU Research Team Receives Grant to Study Invasive Grass Management

BOZEMAN — An interdisciplinary team of researchers from the Montana State University College of Agriculture received a grant to develop an integrated management framework for cheatgrass, an invasive species in Montana and a growing concern for agriculturalists in the Northern Rockies.

The team, made up of professors Lisa Rew, Cathy Zabinski and Jane Mangold of the Department of Land Resources and Environmental Sciences and Bok Sowell of the Department of Animal and Range Sciences, was awarded the three-year, \$350,000 grant by the Western Sustainable Agriculture, Research and Education program, which is overseen by the U.S. Department of Agriculture's National Institute of Food and Agriculture. They will collaborate with Kyle Cutting of the U.S. Fish and Wildlife Service, Jim Berkey of The Nature Conservancy nonprofit organization and local farmers and ranchers to study the impact of the invasive grass and how to best manage it in Montana.

"All the current information says that if you're going to stand a chance of getting rid of cheatgrass, you have to target it when it's just beginning to take hold," said Rew. "That's where we are in a lot of areas in Montana right now. But if we don't get it soon, it will be very hard if not impossible to get any land back to the way we want it to be."

Cheatgrass, said Rew, has been in Montana for a while, coming from states to its south and west. But farmers and ranchers state it is increasing rapidly, making it essential to address its spread as quickly as possible. Herbicide is one of the most frequently used management techniques, but ranchers also use short, intense stints of grazing in the fall or early spring when the grass is green and actively growing.

"Cheatgrass germinates in the fall, when none of our native grasses have germinated yet," said Rew. "In that regard, it has a bit of an advantage over the native species, because it's already up and growing in the spring when they're just waking up."

The grass becomes unpalatable to cattle once it goes to seed and can crowd out or reduce the population of more desirable plants, so the need to find alternative management techniques is pressing, said Rew.

The team will test on-farm herbicide application and novel strategies such as applying mustard seed meal, mulch and micronutrient supplements to deter cheatgrass growth and promote native plants, as well as evaluating the effectiveness of different seed mixes. Testing is set to begin this summer, both in the laboratory and on active producer land. As the team learns more about the different techniques they will develop a decision framework so that landowners can tailor their approaches.



*Fields like this hayfield near Bozeman are currently cheatgrass-free, and MSU researchers Lisa Rew, Cathy Zabinski, Jane Mangold and Bok Sowell are working to keep it that way. Using a grant from the USDA, the team is researching integrated management practices to prevent the spread of the invasive grass.*

Rew and her team will focus their research in the Centennial Valley near Dillon and partner with the Beaverhead County Weed District to develop strategies that will be applicable to producers across the state and beyond.

“This will help producers decide how best to manage their own land, allowing for the fact that some don’t want to use herbicides, some don’t have the capacity to seed and considerations like that,” said Rew. “This is very much a grassroots project. They wanted to figure out how to deal with this, and our job is to help facilitate that discovery.”

By Reagan Colyer, MSU News Service

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## MSU Beef Specialist Honored for Extension Work

BOZEMAN — A Montana State University Extension specialist has been recognized for her outstanding community engagement efforts and youth programming by the American Society of Animal Science.

Megan Van Emon, MSU Extension beef cattle specialist, is based in Miles City. Van Emon serves the beef producers of the state by traveling to all 56 Montana counties. She meets ranchers and community members and tailors her research projects as an associate professor in the MSU College of Agriculture’s Department of Animal and Range Sciences to meet their specific needs.

“If an Extension agent or a producer needs answers to any questions, I do the best I can in either answering them or finding the best person who can,” said Van Emon. “Most of my research focuses on looking into those questions I receive, which varies based on the different regions of the state.”

Van Emon arrived at Montana State in 2014 after receiving her doctorate from North Dakota State University and conducting postdoctoral research at Iowa State University. She focuses on questions of beef nutrition for producers in Montana. In the eastern part of the state, Van Emon said, that often takes the shape of examining the effects of water quality on cattle digestion, while in western Montana she often looks into small acreage production and maximizing production efficiency on smaller ranches.

Van Emon received the Animal Science Extension Award from the western section of the ASAS, which includes 12 western U.S. states as well as parts of western Canada and Mexico. The award was presented during the virtual section meeting last month.

“Just to be recognized as an outstanding member really meant a lot to me,” Van Emon said. “Being recognized by my peers both here at the university who nominated me and the wider community of the section is really an honor.”

Van Emon’s programming also includes statewide engagement with Montana youth through 4-H and FFA programs. She helps lead the Montana Steer of Merit competition, an opportunity for students throughout the state to raise cattle and learn about various elements of beef quality. Students collect data on their steers each year at their county fair, such as weight, fat percentage and grade. Van Emon, in partnership with the Montana Stockgrowers Association, evaluates and grades the final animal statistics, selecting the top five highest-quality steers in the state.

“We’re very lucky to partner with MSGA for that program,” said Van Emon. “It helps those 4-H and FFA students learn more about the impacts of what we feed our cattle and looking at the end product, how that’s promoted for the beef industry and



Dr. Megan Van Emon

how that impacts the beef quality of the final product.”

With the onset of the COVID-19 pandemic, like many, Van Emon has had to adjust her outreach programming and has turned to virtual means to do so. She maintains connections with Extension agents across the state through video conferencing, recorded presentations and social media. Her research continues with an ongoing project examining the impacts of high sulfate and high salt concentrations in cattle drinking water on digestion of forage crops, which are often a primary food source for beef cattle in the state.

“Megan’s work is critical to all of the elements of our land-grant mission at Montana State: education, research and outreach,” said Cody Stone, MSU Extension executive director. “She works incredibly hard to ensure that our producers and community members are able to get their questions answered using the most accurate and up-to-date information, even if that means conducting the research herself. We are so lucky to have her, and this honor is truly deserved.”

While much of her in-person work has been put on hold since the spring, Van Emon hopes to continue her statewide travels this winter, which she says are her favorite part of her work.

“What’s unique about Montana is that we have beef cattle all over the state, so the questions are changing all the time,” she said. “I like the mix of everything that I get to do, meeting producers and learning about their operations. I love getting out and meeting people, learning how I can best help them.”

By Reagan Colyer, MSU News Service

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## Grazing Cover Crops In Late Fall Or Winter: Dr. Jeff Mosley

Cover crops are non-cash crops planted to improve a field’s soil health, limit soil erosion, and suppress weeds and other pests. Cover crops also can provide livestock forage. More and more livestock owners in Montana are using cover crops as pasture in late fall or winter, preferably after a hard freeze when the temperature drops below 28F for more than two hours. Cover crops for livestock grazing in late fall or winter are best comprised of simple mixtures containing three to four species. Optimal mixtures include one cereal grain/grass species that comprises 50-70% of the mix, one legume as 20-40% of the mix, and one or two brassicas that comprise 10-30% of the mix. Seed cost is an important consideration when designing a cover crop mixture. Seed costs exceeding \$50 per acre typically are not financially sustainable. Cover crops for grazing in late fall or winter in Montana can be planted in either spring (mid-March to mid-May) or late spring/early summer (mid-May to mid-June). Cover crops planted in late spring/early summer are usually restricted to irrigated fields because most spring-summer rainfall in Montana occurs before July 1.

### **Cereal Grains and Grasses**

Preferred cereals for spring planting are awnless varieties of spring barley, spring wheat, and spring triticale. Preferred cereals and grasses for planting during late spring/early summer are Proso millet, sorghum-sudangrass, or forage corn. Proso millet is better for grazing than foxtail millet (also called Siberian millet) because the roots of Proso millet grow deeper, and in contrast with foxtail millet, Proso millet is not toxic to horses. Proso millet is better than pearl millet because it produces more forage under Montana conditions.

### **Legumes**

Forage field pea is the preferred legume for spring planting. Forage field peas may lose some top growth during freezes, but they can continue growing after temperatures fall as low as 10F. Forage soybean is the preferred legume for planting

*Continued on page 7*

in late spring/early summer. Late-season frost does not damage soybean plants as long as they are mature (i.e., 95% of pods have turned brown). Chickpea is another cold-tolerant annual legume, but chickpea seed is usually too expensive to use as a cover crop.

## Brassicas

Collard and canola are the preferred brassicas for late fall and winter grazing in our state. Both species can be planted either in spring or late spring/early summer. Collard will produce more leaf mass and a larger taproot if planted after the last frost in spring. Radish and turnips are sometimes used for early fall grazing, but they are much less cold-hardy than collard and canola. For example, radish and turnips are usually killed by air temperatures below 25F, while collard often survives down to 0F. Cold-hardy cultivars of canola can withstand temperatures as low as 10F.

## Cover Crop Yields and Stocking Rates

Cover crop production varies across Montana. Dryland fields of cover crops produce about 1,000 to 2,000 pounds per acre of dry matter forage in the 11-14 inch annual precipitation zone, versus 3,000 to 4,000 pounds per acre in the 15-18 inch precipitation zone. Irrigated sites typically produce 5,000 pounds or more per acre.

Appropriate stocking rates per acre vary from one to two cows per month (or the equivalent weight of weaned calves, sheep, goats, etc.) in the 11-14 inch annual precipitation zone, three to four cows per month in the 15-18 inch precipitation zone, and five or more cows per month in irrigated fields.

## High Stock Density Grazing

The most effective way to graze cover crops is to use High Stock Density Grazing (HSDG). HSDG confines livestock within smaller areas, at higher than normal densities, for brief time periods. Portable electric fence can be used to subdivide cover crop fields into smaller areas (sometimes called paddocks). Grazing periods of one to three days per paddock work best at stock densities of 30,000 pounds or more live-weight of livestock per acre. For example, stock density would be 30,000 pounds live-weight per acre in a 10-acre paddock stocked with 250 cows that average 1,200 pounds live-weight  $[(250 \text{ cows} \times 1,200 \text{ pounds per cow}) \div 10 \text{ acres} = 30,000 \text{ pounds live-weight per acre}]$ . If the 250 cows remained within the 10-acre paddock for three days, the stocking rate would be 2.5 cows per acre per month  $[(250 \text{ cows} \times 0.10 \text{ months}) \div 10 \text{ acres} = 2.5 \text{ cows per acre per month}]$ .

## Cautionary Grazing Practices

The preferred species and mixtures discussed above potentially can cause several livestock disorders, including bloat, nitrate poisoning, prussic acid poisoning, selenium poisoning, goiter, and grass tetany. However, risks are very low when grazing occurs after a hard freeze in late fall or winter. For extra caution: 1) wait to begin grazing until seven days after the field experiences its hard freeze; 2) make sure livestock are not hungry or thirsty when turned into the field; 3) move livestock into the field in the afternoon rather than morning, and 4) provide livestock iodized salt.



*2020 Fall Lives & Landscapes*  
by Dr. Jeff Mosley  
Extension Range Management Specialist

*Cover crops in Sweet Grass County, MT.*  
*2020 Fall Lives & Landscapes*

## Dr. Clayton Marlow Named Western SARE Regional Coordinator

After a comprehensive search, Western SARE and Montana State University announce that Dr. Clayton Marlow has been selected as our Regional Coordinator.

“The AC is pleased with the selection of Dr. Clayton Marlow for the position of Regional Coordinator for the Western SARE program. The AC has worked with Clayton during his tenure as Interim Regional Coordinator. The Executive Committee for the AC has worked with him on items related to the search for the new Associate PDP Coordinator. We have found him to be thoughtful, transparent, and forward-thinking about Western SARE. We are looking forward to working with him,” says AC Chair Julie Maitland.

Clayton is a veteran professor of MSU’s Animal and Range Sciences Department with extensive expertise and experience. His research focuses on the enumeration and description of the cumulative effect of grazing, wildfire suppression, and habitat preservation on the physical and biological processes that create and sustain lotic riparian ecosystems. In his classes, Clayton enjoys preparing students to advance the conservation of natural resources and those families and communities that rely on agriculture, fishing, hunting, logging, and eco-tourism.

Clayton was on the board serving as Vice-President, and then President, of the Society for Range Management. Community is important to him, for example volunteering as a Dishwasher/Waiter at the Community Cafe, Montana HRDC.

“I am excited to work with Western SARE’s diverse stakeholders to address unique local needs and conditions with local and regional expertise. Western SARE will continue bringing together traditional (land-grant) and non-traditional (farmers and nonprofit) researchers and educators in the West to effect a truly sustainable food and fiber system. That focus is what makes SARE stand out amongst other research programs,” says Clayton.

Moving forward, Clayton plans to continue Western SARE’s efficient grants administration program as well as a re-invigorated effort to mentor farmers, ranchers, NGOs, and educators to be successful applicants. He will focus on shortening the time between submission of projects’ results in final reports and our publication of “on the ground” guides and podcasts. With the AC and staff, he will promote informed research on topics that help producers become more resilient in the face of socio-economic upheavals (such as pandemics) and climate change.



Dr. Clayton Marlow



## Hunting in Grizzly Country: Dr. Jared Beaver

Grizzly bear populations across Montana are rapidly growing and expanding into historic ranges. This expansion increases the likelihood of human-bear conflict, especially during hunting season, because while there are many well-documented safety practices for recreating in grizzly country, being visible and making as much noise as possible isn't the best approach for a hunter. At least not a successful one.

As hunters, we put ourselves inherently more at risk of a dangerous bear encounter. We're more active in low light conditions, trying to remain hidden, move quietly, sound and smell as much like game as possible, and we are in the field when the bears are most active and calorie loading for the winter (hyperphagia).

So, what can hunters do to be more bear aware during the hunting season?

### **Avoid Hunting Solo**

First and foremost, the best thing one can do during hunting season is hunt with others. Research shows that traveling in groups can reduce the likelihood of a dangerous bear encounter. However, for many this isn't an option. If you must hunt alone in bear country, let someone know your plans and have a way to check in and send an emergency signal.

### **Be Alert and Spatially Aware When in Bear Country**

Spend more time looking for fresh bear sign (e.g., tracks, scat, overturned rocks, tree markings, and concentrations of preferred bear foods). If you notice signs of bear activity or presence of a carcass or scavenging birds, use extreme caution and try to avoid the area. When possible, avoid pushing straight through areas without a clear line of sight, and give thick and shady areas a second look.

### **Keep a Clean Campsite**

Properly store food in bear-proof containers, hard-sided vehicles, or hang food away from camp at least 10 feet high and 4 feet away from a vertical structure. Cook food and strain and toss water at least 100 yards from the downwind side of the tent. Do not bring anything into the tent that has a scent and do not sleep in clothes you cooked in. In bear country, open spots with long, clear lines of sight are best for setting up camp. If the camp is more accessible, a portable electric fence surrounding camp is also an option.

### **Make Some Sacrifices to Maximize Safety**

Many hunters know the last hour of daylight as that magical 'golden hour.' However, coming back to camp after dark or tracking an animal shot at last light is difficult enough without having to worry about bears. Butchering and packing an animal at night is a bad combination and just adds an element of danger. When hunting in bear country, forgoing a few minutes of daylight or waiting until morning to finish tracking an animal may not be ideal; on the other hand, a little extra caution allows for an enjoyable and safe hunt.

### **Communicate with Other Hunters**

Often in the field, we may come across fellow hunters or have friends who hunt in the general area. In these cases,



*A grizzly bear is pictured in brown grass and brush, 2020 Fall Lives & Landscapes*

sharing detailed information on when and where grizzly bears have been seen and/or fresh sign has been observed can be invaluable and may very well save someone's life.

## **Carry Bear Spray**

Regardless of the activity, when in bear country, carry bear spray and make sure it's within reach and that you're familiar with how to use it. Research has shown pepper spray to be a proven and valuable deterrent tool against bears. Use a weapon only as a last result. Attacks often happen quickly and in close range and wounded bears may intensify and prolong the attack. If you have to kill a grizzly in self-defense, or experience an attack, leave the scene and report the incident immediately to local authorities. A bear encounter can be reported to a regional Montana Fish, Wildlife & Parks bear specialist.

Unfortunately, regardless of safety precautions, encounters do occur. If you encounter a bear, stop and assess the situation. The bear's behavior - not the species - should first determine how you respond (i.e. is the bear aware of you or not? Is it threatening, curious, or fleeing?). Do not run or approach the bear. As a last resort, if physically attacked by a surprised/agitated grizzly, lie face down, covering your neck and head with your hands and arms and remain still until the bear is gone. If you have a backpack, leave it on to protect your back.

At the end of the day, if you let paranoia rule decisions, hunting in grizzly country is going to be a miserable experience. By staying alert, and exercising caution and a lot of common sense, hunting in grizzly country can be a rewarding and exhilarating experience.

*2020 Fall Lives & Landscapes  
Dr. Jared Beaver  
Extension Wildlife Specialist*

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## **Water Quality Study Examines Effects of High Salt, Sulfates on Cattle**

For generations cattle producers have dealt with livestock water quality issues. Side effects from these poor water supplies can vary, from as mild as cattle simply not drinking as much, to as severe as toxicity and even death.

Dr. Megan Van Emon, Montana State University Extension Beef Cattle Specialist, spearheaded an experiment aimed at examining exactly what happens physiologically when cattle consume poor quality water. The hope is, after examining the data, Van Emon and her research team will be able to offer recommendations to producers who deal with water source issues.

"This is one of those things where we are just trying to learn more about water. Water is an essential nutrient, but we don't think about it that much on an essential level," Van Emon noted.

Producers in eastern Montana and western North Dakota battle two major water quality issues, water that is high in salt and water that is high in sulfates. Normally, when dealing with water high in salt, cattle simply won't drink as much as they need, which can lead to issues with feed intake, digestive upset and dehydration.

"Sometimes it can be hard to see this issue on a pasture scale, but you'll just notice cattle aren't going to water as much as they should. To offset what they do drink, those cattle will be looking for forages that will offset any rumen upset that those high salt concentrations might be causing," she explained.

According to Van Emon, waters with high salt concentration are more of a concern with young cattle that have never before been exposed to that water source. Older cattle, especially those who have drank from the high salt waters repeatedly for years, are more used to them and therefore less affected.

In comparison, waters high in sulfates present a whole other set of production headaches. On the severe end, cattle can suffer from sulfate toxicity, which causes cattle to have neurological-like side effects, including blindness, staggering, and

even seizures. Recovery from this level of toxicity is difficult and can even cause death.

At lower levels, sulfates are still a huge issue in cattle as they tie up essential trace minerals in the rumen. Copper is the main mineral tied up by sulfates. Other essential minerals that could be tied up include selenium, zinc and manganese.

Being based at Fort Keogh Agriculture Research Station in Miles City, Mont., positioned in the heart of eastern Montana cow country, Van Emon often fields calls from producers dealing with water quality issues. She says producers often wonder if there is a way to overcome or at least mitigate the issues caused by poor water quality. Most area ranchers do not have access to other water sources, so they have to find a way to make do with that they've got.

The concerns of producers is what precipitated the water quality experiment Van Emon and her research team conducted during the summer and early fall of 2020. The overarching question with water quality issues in livestock has always been, what is happening internally? With that questions in mind, the MSU team set out to study how high salt and high sulfate waters affect ingestion and forage intake.

For the experiment, 16 cannulated cows at MSU's BART farm were divided equally between a high salt and high sulfate study. For the high salt, two cows each were drinking water with salt at 1000, 2000, and 3000 parts per million (ppm). For the high sulfate study, two cows each were drinking water with 700, 1400, and 2100 ppm of sulfates in the water. Both studies also had two cows drinking control water sources, as well, for comparison.

Van Emon knows sulfates are found at much higher levels across eastern Montana and western North Dakota, but since this was the first time the experiment was conducted and the research cows had never been exposed to sulfates before, the team erred on the side of caution with their levels.

The cattle in the experiment were also given a custom supplement blend and were fed a low quality hay to best mimic range-like conditions in the fall/winter.

The research cattle were given a period to adjust to their water source, and following that period, there were six days of collection where things like manure, left over hay, and water were all collected and sampled.

As previously mentioned, these cattle were all cannulated, which allowed Van Emon and her research time a great opportunity to study how poor water quality affects the inner workings of the rumen. Passage rate, digestion and the activities of microbes were all studied.

"This is a trial where we can get a lot of answers with not many animals," she said.

Van Emon is very excited to see what comes of the research and hopes this all leads to one day being able to make recommendations to producers about how to overcome water quality issues.

Until those recommendations can be made, she advises producers to test water salt/sulfate levels using a TDS meter or by employing the help of your local Extension agent. Ideally, water should be checked whenever cattle are entering a new pasture as levels can fluctuate with rain water and the time of year. She also recommends recording the levels and making management plans accordingly.

In conclusion, Van Emon's work again proves that MSU and their top quality researchers are working to find solutions to the issues faced by agriculturalists across the region. She hopes by early spring 2021 results from this research will be more conclusive and recommendations can begin to be made.

*By Morgan Rose,  
Prairie Star Livestock Guide  
2021*

## Covid 19 Lab Update

*Animal and Range Sciences Lab Manager Dani Ruocco has been hard at work in the Covid 19 Lab. Michael Dills, the General Supervisor of the MSU Covid Laboratory, prepared an update for our Winter Newsletter.*

As many of you know, we started testing clinical SARS-CoV-2 samples in early July this year. Thanks to your department and Tom Hughes from Cell Biology and Neuroscience, we were able to integrate robotic liquid handling into our workflow. The Eppendorf epMotion systems your department lent have been essential workhorses for us. In November, Eppendorf upgraded hardware and software on your 5075 model, pictured below, and it is running at peak performance. We have increased capacity from an initial 500 samples per day in August to over 2,000 each day from across the state. These are often priority samples from high risk facilities and outbreak centers. Watching hundreds of positive curves come up in real time while cases spiked in early October was a humbling experience that drove home the seriousness of this project. We have a high bar of accuracy and precision to reach with each new batch of samples. That would not be possible without support from across campus and a great team including Daniele, who has been with us from the start, keeping samples meticulously organized and running a crucial part of the onboarding process. Despite international supply chain shortages and other bumps in the road, we plan to continue providing in-state testing as long as there is a need. A big thanks to your department for providing equipment and consumables. I hope you all find some time to enjoy the holidays before Spring Semester.

Cheers,  
Michael Dills  
General Supervisor  
MSU Covid Laboratory



*Above: Animal and Range epMotion 5075 moving Covid samples to a 384-well PCR plate.*

*Top right: Lab Manager Daniele Ruocco wearing full PPE in Covid Lab*

*Bottom right: Looking in to the lab Restricted Area*



# ANRS Briefs



Dr. Christian Posbergh, Kellen Marlow, and supervisor Morgan at the 2020 Miles City Ram Sale



Lady MAES employees being girl bosses. Luka Mueller, Ashley Purcell, Janessa Kluth and Madison Marx building corrals at Ft. Elliis



Frequently through the semester the ABB parking lot was utilized for some hands on work for the Equine Lameness class. Diego Almeida also gave students some hands on lectures on managing lameness with farrier work.



## Department Review

This October the Animal and Range Sciences faculty and staff all combined their efforts for the 7 Year Department Review. Preparation took place months in advance, beginning with the Program Self Study and Review to define our strengths and weaknesses for the Review Committee. This was a Department wide team effort, as countless faculty and staff members contributed to putting the Self Study together. The review itself was scheduled over a two day span via Webex. The review team was made up of four members, Eric Belasco, Associate Professor Ag Economics and Economics (MSU), Robert Collier, Professor and Department Head Animal and Veterinary Science (University of Idaho), Diane Debinski, Professor and Department Head, Ecology (MSU), and Jeff Heys, Professor and Associate Dean of Research, Economic Development and Graduate Education, College of Engineering (MSU). On the first morning after the Review Team met with several different members of MSU Leadership, Department Head Pat Hatfield presented a Department Overview, summarizing the Program Self Study and Review. We then had some break out groups with the Research Committee, Graduate Teaching Committee, Extension Committee, Animal Science Undergraduate Teaching Committee, and Range Science Undergraduate Teaching Committee, all composed of various faculty members. Each group had a committee chair give a presentation highlighting the program, followed by a question and answer session with the committee and the review team. The Review Team started the second morning by meeting with several other Department Heads on campus. Non Tenure Track and Adjunct Faculty followed with a question and answer session, subsequently met by sessions of that same format with Livestock Operations, Classified, and Professional Staff. Lastly the Review Team had the opportunity to meet with Undergraduate and Graduate Students before their final meeting with MSU Leadership. This Department Review was an enormous effort and could not have happened without the hard work of all faculty and staff members. A special thank you to Susan Cooper for coordinating the Webex meetings, she did a fantastic job making sure the meetings ran smoothly. We will include the results of the Review in our next Newsletter.

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## MSU Farrier School will start new session in February 2021



The MSU Farrier School will begin the first session with new program director Diego Almeida (CJF EE, FE, TE, AWCF) on February 1st, 2021. This has been a highly anticipated re-opening and Diego has great ideas for the school. Diego is an AFA Certified Journeyman Farrier and holds all three endorsements offered by the association (Educator, Forging and Therapeutic Endorsements). He is also an Associate with the Worshipful Company of Farrier in England. Almeida is also an AFA Tester and Certification Instructor. He is also involved in farrier certifications across the United States and abroad. There will normally be three 12 week sessions every year, however the Summer 2021 session was cancelled due to facility updates. Spots have been filling up very quickly and we are excited for the first group of students to start. While students are in session, clients can bring horses to the school for discounted

shoeing services. If you have questions or are interested more in having your horses shod by farrier school students, please contact Diego at [diego.almeida@montana.edu](mailto:diego.almeida@montana.edu) or 708-297-7620.

For more information about the Farrier School, check out their website: <https://www.montana.edu/msufarrierschool>

## DSRM Update

Dan Scott Ranch Management Program welcomes three new students to the Class of 2023. Over the next two years these students will take courses in animal science, rangeland ecology and business; complete internships on working ranches; and sharpen their leadership and management skills. Cayden Rose, Georgia Wortman, and Julia Hudson will all be great additions to the program and we are looking forward to watching their individual journeys. There are four remaining seminars in the Natural Resource & Policy Seminar Series, all being offered via Webex. To access the meetings, or recordings of past meetings, visit <http://animalrange.montana.edu/danscott/danscott-seminars.html>. The Dan Scott Ranch Management Program extends their sincerest thanks to the partners that continue to support the program and its students.

### Dan Scott Ranch Management Program Partners

**Risa Scott**  
**Switchback Ranches**  
**8 Mile Ranch**  
**Northwest Farm Credit Services**  
**Trailsend Foundation**  
**Lonestar Land & Cattle**  
**Shields Valley Ranch**

**Ken & Mary Beth Walsh**  
**Ralston Gap Cattle Company**  
**Swan Land Company**  
**Centennial Livestock**  
**Spur Cross Ranch**  
**Wiedemann Ranch**  
**Madison Valley Garden Ranch**

**Solso Family Foundation**  
**Hamilton Ranches**  
**Fay Ranches**  
**Legacy Ranches**  
**Turner Ranches**

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## NRRE Range Ecology and Management Undergraduate Student Coauthor on Poisonous Plants Document

Natural Resources and Rangeland Ecology Undergraduate student Haylee Barkley was a co-author on a very useful document titled "Plants Poisonous to Livestock in Montana and Wyoming: Considerations for Reducing Production Losses". Haylee worked with a host of professionals and PhDs on this project, it is a huge accomplishment and we are so proud. She is an outstanding student and will soon be a professional in the Natural Resources field with the NRCS. Way to go Haylee!



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## Lara Macon Awarded College of Agriculture Outstanding Student in Research

Natural Resources and Rangeland Ecology Undergraduate student Lara Macon was named the College of Agriculture Outstanding Student in Research. Her independent research evaluating the importance of ecological site type and condition on the brood ecology of sharp-tailed grouse coupled with her volunteered research time on microscopy of thousands of individual invertebrates clearly demonstrates that Lara has a strong aptitude and dedication to research. Congratulations Lara, great work!

## Hannah DelCurto-Wyffels Receives Teaching Innovation Award



Hannah DelCurto-Wyffels received the huge honor of being awarded the Teaching Innovation Award from the Office of the Provost. The award is designed to honor faculty who have incorporated outstanding innovative teaching practices into their classes. Hannah is excellent at making sure her students get real hands on experience, whether it be in the Steer-A-Year Program, Livestock Management classes, or the Intro to Animal Science classes. Through her teaching efforts she has enhanced the learning opportunities for students in the field of animal agriculture, not only benefitting their classroom experience but their future careers as well. We are lucky to have Hannah DelCurto-Wyffels in our department and we would like to congratulate her on being recognized for this award. We are so proud of you!

## Remembering Bryce Kawasaki

We are mourning the loss of one of our Animal & Range Sciences family members. Bryce Kawasaki, MSU Farrier School Director (2012-2019) passed away in November. Bryce was a teacher, mentor and friend and will be missed by all who knew him. We extend our most sincere condolences to all of Bryce's family, friends and students.

Bryce Kawasaki graduated from the MSU Horseshoeing School in 1994. After this training he started working with several Certified Journeyman Farriers. Bryce has had his own farrier business for many years. He had great skill at forging handmade shoes, and well over half the shoes that Bryce put on were made by him in his shop or on the job. Bryce served as president of the Montana Professional Horseshoers Association for six years, and sat on the Board of Directors for the American Farriers Association for those same six years. Prior to becoming the MSU Farrier School Instructor, he helped Tom Wolfe at the School for ten years. Bryce was born and raised in Montana and always felt very privileged to have been able to work and live in this great state.





The fall semester has been a busy one for MSU Steer-A-Year (SAY). The students in the SAY class did a fantastic job coordinating the arrival of 34 steers to campus. The steers are all housed at the Bozeman Ag Research and Teaching Farm and are currently being worked up on their feedlot diet. We are excited to have students back on campus during spring semester and to continue working with these calves.

Most importantly, we would like to thank all who make this program possible. A big thank you goes to Elanco Animal Health (Cory Boswell) and Endovac (Maddee Moore) for supplying us with vaccines as well as CHS (David Miller and Cash Yount) for facilitating feed delivery and designing and donating our supplement pellet. As always, thank you to all our steer donors. Without your generous support the Steer-A-Year program would not be possible. Now more than ever, we appreciate the opportunities the SAY program provides for hands-on learning and student success.



## 2020-2021 Steer-a-Year Donors

Dawn and Erik Swensson  
J Bar Braunvieh  
Hay Camp Cattle Co  
Big Sky Ranch  
Boyd Angus Ranch  
Gateway Simmental LLC  
Bair Ranch Foundation  
Bradley Livestock  
EL Peterson Ranch  
Dearborn Ranch L.L.C.  
Skattum Dairy and Ranch  
Cooper Hereford Ranch  
Triangle Land & Livestock  
Hahn Ranch  
Veseth Cattle Co  
Cowan & Son  
Grant and Deanna Harrer



Mike McCauley  
Dynneson Ranch & Feedlot  
Trapper Creek Ranch (JM Peck)  
Smith 6-5 Livestock  
Jumping Horse Ranch  
Deseret Land and Livestock  
Harrington Ranch Co  
Mark and Barbara Harrington  
Glen and Paula Bummer  
Todd and Kara McCabe  
Forder Land and Cattle  
JD Vukonish  
Prickly Pear Simmental  
Bozeman Ag Research and Teaching Farm  
ARS – Fort Keogh  
Northern Ag Research Center

## Lainee Hill, Sorenson Veterinary Hospital

This summer I was and intern at Sorensen Veterinary Hospital in Belgrade, MT. My experience at Sorensen Vet spanned from May 11th, 2020 to August 1st, 2020. During the period of my internship I worked primarily as a Veterinary Assistant to Dr. Jenifer Haugland. In addition to Dr. Haugland I also worked with Dr. Nick Johnson, Dr. Bruce Sorensen, Dr. Rod Warren, Dr. Katy Malcott, and Dr. Kelsey Baver. Sorensen Veterinary Hospital is a large animal clinic; however, I was also able to also spend a few days at Skyline Veterinary Hospital, a nearby small animal clinic.

As a Veterinary Assistant, I had many responsibilities. Each day I worked with a single doctor, attending their appointments and helping them with paperwork and other tasks throughout the day. I was responsible for care of overnight patients. This involved administering medications and treatments in the morning, throughout the day, and in the evening. In addition to treatment, I cleaned stalls, fed, and watered. Another task I was responsible for was preparing for daily appointments. I prepared paperwork for the state, diagnostic laboratory, and records. I was responsible for packing any additional instruments or tools we would need to use that day as well as ensuring that we left and arrived in a timely manner. At appointments, I was responsible for helping the doctor in a variety of ways. I helped in the form of animal restraint, medication administration, record keeping, and other ways.

There have been several cases that have come into the clinic that have fostered me to work independently. An interesting horse laceration came into the clinic as an emergency appointment. I was tasked with restraining the patient, cleaning the necrotic tissue from the wound, and preparing the wound for the doctor to suture. In order to clean the wound, I first ran a cold garden hose over it for 10-15 minutes. I then gently scrubbed the tissue with a weak betadine solution. The wound was several days old, so I also had to debride the tissue of an maggots that had infected the wound. After it was clean, I gently shaved the outer rim of the laceration so that Dr. Johnson would have a clean working area.

My internship also exposed me to a lot of small ruminant medicine. I was able to assist in many ovine and caprine c-section surgeries. An interesting case that I was able to help with through the summer was a goat with chronic urinary blockages. This goat came in many times due to discomfort and inability to urinate. Each time he came into the clinic, we catheterized him and temporarily unblocked his urethra. I learned a lot during this case. Dr. Nick Johnson taught me the proper way to sedate and block the goat prior to catheterizing. We put lidocaine directly into the sheath and I held it closed in order to ensure that his sheath was numb. Even though the patient is sedated, they still can react to pain if they are not blocked properly. During these procedures I was the main source of patient restraint. This was especially challenging because of the delicacy of the procedure. There were times when the patient could not move, otherwise the procedure could fail or be harmful to the goat. The owners eventually decided to euthanize the goat and upon further inspection, we found that the bladder had ruptured and was nearly full of kidney stones. This was a big teaching experience for me because I learned that sometimes, no matter what you do to try to help an animal, the end result is not positive. As a veterinarian, it is important to recognize this for your own mental health.

My first learning object was to better understand sedation and euthanasia techniques in large animal medicine. I actively focused on asking a lot of questions throughout my internship to achieve my goals. I became better educated on both sedation and anesthesia techniques and medication. Ketamine, the main anesthetic drug that Sorensen Vet uses, is also a drug that is used in humans. Ketamine in humans causes severe hallucinations so most patients are sedated prior to administration. A similar result has been observed in horses. If ketamine is administered to a non-sedated horse, the patient will have an uncontrollable excitement period. During this reaction, horses have the potential to flip themselves over backwards and hit their head on the ground, resulting in severe injury or death. In order to prevent this, the patient



should be sedated. We used a lot of Dormosedan, Butorphanol, and xylazine. Butorphanol is in the same class of drugs as morphine and is a GI relaxant, pain controller, and mild sedative. Dormosedan is a slower acting sedative and xylazine is a faster acting sedative. Smaller procedures require less sedative than larger procedures. I was able to see these medications be used in equine castrations, hernia repairs, teeth floats and sheath cleanings. Additionally, these techniques were used in farm animal c-sections.

My second learning objective was to better understand equine kinematics. Dr. Haugland and Dr. Warren were instrumental in helping me obtain this goal. Each week, Dr. Haugland and I saw at least two equine lameness appointments. I learned how to identify where lameness was originating from. Approximately 95% of lameness in horses originates in the foot, even though it may appear higher. The head bob is a large indicator of which limb the lameness is coming from. You can also look at stride length, ability to turn each direction, transition from walk to trot to lope, and lead leg. Another way to pinpoint lameness is to look for pain responses from different pressure points in the hoof. Dr. Warren walked me through many radiographs of equine limbs. He taught me how to identify arthritis, ring bone, fractures and other osteo-defects. He also pointed out that you can hear lameness if you listen to a horse walk on concrete.



My final learning objective was to gain experience in customer service and proper paperwork procedures. I was tasked with obtaining histories from patients prior to the doctor coming into the appointment. This was a big opportunity for me to learn how to communicate with clients. Additionally, I was often the first person to greet the clients for their appointments. The state of Montana is slowly requiring that veterinarians submit all of their paperwork electronically. My job required me to fill out paper and electric forms. I filled out diagnostic laboratory forms, state DSA bleeding forms, health certificates, coggins, and many other state-dictated papers.

Overall, I had a very successful internship. I gained experience and valuable knowledge that will benefit me as I pursue a degree in veterinary medicine. I feel that having the opportunity to learn from others will be a key asset moving forward. This internship also helped me grow as a communicator with my coworkers and with clients. I also feel that I was a valuable asset to Sorensen Veterinary Hospital. As I learned, I was able to contribute more as a team member and work alongside the vets with more certainty and capability. I was asked to come in for emergency cases. I built relationships with veterinarians, other staff

members, and clients and assisted the vets in a competent manner.

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## Madison Marks, Montana Agriculture Experiment Station

My internship with Montana Agriculture Experiment Station (MAES) was a very educational, hands on, and experiential opportunity – spanning from May 11th to June 26th.

During this seven-week period, I was given the opportunity to work closely with Shay Larsen (Livestock Operations Manager), Luka Mueller (Livestock Foreman), Kellen Marlow (Sheep Foreman), and Alison Reck (Equine Foreman). Given their combined expertise in livestock handling, I was able to learn how to adequately and efficiently care for large (and small) quantities of various livestock species in three different locations – Red Bluff, Fort Ellis, and Bart Farm.

Work hours for this internship varied greatly, as time demands increased with activities such as artificial insemination (A.I.), embryo transfer (E.T.), haying, and rotational grazing. Hours varied because these activities are very time sensitive. During these busy seasons, it was not uncommon for me to average 60 hours a week. However, during most of the summer I averaged around 45-50 hours per week.



My first objective was to perform tasks that would increase my hands-on knowledge and application of areas related to animal agriculture including, but not limited to, cattle checks, cattle rotation, A.I. & breeding selection, mixing rations, feeding, lambing, maintenance and operation of machinery, fencing, and branding. As a result of this objective, I would become familiar with multiple species and breeds of animals (sheep, horses, cattle) and how to manage them properly.

Perhaps the most important aspect to this objective was learning how to properly manage various livestock species. Through this internship I have been able to treat cattle, sheep, and horses for different health issues and more thoroughly understand their behavior and habits. This has helped me gain a better understanding of their anatomy and diet and has also given me a keener eye for detecting health issues and abnormal behavior.

Overall, I met most of these goals in my first objective. The only goals I did not meet were ones that happened either before my internship started or after my internship was complete. These unmet objective goals were A.I. and breeding selection, branding, and lambing. Despite not getting internship experience with these goals, I was still able to get work experience with these goals as I continued working for MAES after my internship was complete and will continue working for MAES through the fall semester of 2020.

My second objective was to expand my skills related to data collection and analysis and make recommendations for animals on an operation. This included data on nutrition, assessment of animal health, analysis of intake & growth, and determining nutrient requirements of species in different areas along their growth curve.

One of the major benefits of interning for MAES was the ability to work with multiple species of animals in many different growth stages. Throughout the internship I was able to work with new calves and lambs, older calves, yearling steers and replacement rams, yearling heifers and ewes, two-year-old cows and ewes, three-year-old cows and ewes, old cows and ewes, and bulls and rams.

As a result of having these varying species and ages, I was given the opportunity to better understand the nutritional requirements of animals along different points of the growth curve and what producers can do to increase the production potential of their animals. I've learned that supplements and mineral play a huge role in animal growth and efficiency. When doing rumen evacuations on our cannulated cows I was able to analyze their nutrition and assess their intake and rate of passage.

One project that was my responsibility was rotational cell grazing with our yearling steers. This gave me flexibility to decide when to move the steers when the forage was approximately half utilized, which area of the pasture I should move them to next, how big to make the cells, and how many animals I should include in each cell. With this project, I was better able to understand yearling cattle nutrition requirements with mineral and pasture forage.

In addition, I was given the responsibility to lightly manage a high school employee and assign them daily tasks to complete. This was a very insightful experience, as I developed important communication skills, organizational skills, and managerial strategies. Overall, I believe I met the goals I set for my second objective very well and gained a lot of experience in animal nutrition.



My third objective was to increase in knowledge of activities and resources essential to the success of an operation such as finances, budget, operational costs, production goals, daily operation goals, crop yield, and animal turnover. This included working with the cooperator to gain experience in managerial tasks such as making a budget, recording expenses and income, marketing animals, and developing operational goals for future production.

My daily tasks at work helped me realize how important it is for livestock managers to provide their employees with tasks to complete each day. This way, it isn't so overwhelming to have a week's worth of work to manage. I felt very efficient and accomplished when given a short list of daily tasks to complete and have learned that this is an important delegation skill among managers.

I was also given the opportunity to discuss some operational costs, budget, and expenses with my supervisor. University finances, however, are very complicated most times and are not common to how private producers would manage their finances. This made it difficult to gain real-life experience in budgeting and expense/income records.

One of the most intriguing things about an operation is the amount of resources needed to sustain its livestock herd and the financial wellbeing. Hay yield is one of those resources. This year, I was able to be involved in haying. It has been educational to be a part of the hay production process and understand how much time, energy, and resources go into it. It has also given me a better understanding of how much hay is required to feed the number of animals we have. Despite producing over 200 bales, we are still needing to buy hay to get through the winter.



My fourth objective was to discuss current management practices and potential management improvement practices that will increase performance among animals on the operation. Examples of improvements could include utilization of different facilities and handling practices to decrease stress, improved rotational/intensive/extensive grazing programs, altered breeding programs and calving/lambing seasons, and selection suggestions for future animals.

These goals in my objective were very educational to complete, as they allowed me to discuss 1-on-1 the benefits and disadvantages of our current operation systems. One of the major operation system disadvantages that we discussed was our calving season. Because the nutrients on pasture are so poor during the common February-April time period, it made more sense for us to move our calving date back to May. This allows us to utilize pasture and higher nutrient values of forage rather than hay for cows producing milk.

Another disadvantage discussed was our handling facility layout at Fort Ellis. I was able to discuss the benefit of moving the fence line to diagonally taper into the bud box system, rather than push cows into the 90-degree fence corner that proved stressful and inefficient. As a result, we have already built a new fence to cater our goals.

Finally, I was able to converse with my supervisor about the benefits of a seedstock operation versus a commercial operation. It is very intriguing to discuss genetics, breeding programs and strategies, and marketing the registered cattle as opposed to commercial cattle.

In conclusion, I have benefited greatly from this internship as it has provided an educational experience that has increased my exposure to various livestock species and handling, developed my skills as an employee, and increased my hands-on expertise in multiple ranch system protocols. In addition, my employer benefited from my employment as well. I received numerous commendations from my supervisor on work ethic, efficiency, and productivity in the workplace. As a result, I believe my employment at MAES was both greatly appreciated and beneficial to the efforts of the program to increase productivity and accomplish work tasks.

As a result of this educational experience, I have noticed areas in which I need to increase in experience for future career proficiency. These areas are time management, managerial skills, livestock evaluation, animal handling, breeding program scheduling and assistance (A.I.), and marketing livestock. With increased experience in these areas, I believe I will have a better understanding of livestock management and how to properly manage an operation.

## Geffrey Snook Cosgrave, Double J Ranch

The Double J Ranch is a 6,000 acre ranch that sits at approximately 7,300 feet above sea level and is home to 250 Angus cows and 8 registered Waygu bulls producing F1 calves (Angus x Wagyu). The ranch also takes part in leasing ground for either steers or heifers to be grass fed to go into meat production. The Double J Ranch is owned by a gentleman named JJ Healy but is operated by two managers, Leah and Wyatt Zupan, who call the ranch their home and are raising a young son (Coyt) on the ranch as well. The two managers generally do all the work on the ranch themselves except for the addition of Joe, the foreman, who works weekdays, and then two interns (I am one of these interns) that they hire on during the summer months. I was partnered with another intern that I shared a home with on the ranch; this would be Cole Morrison, a fellow Montana State student and now, good friend.



For my internship I set off to learn everything I could about managing a ranch and livestock. At first, I had no idea what I was going into, but I was very fortunate to be able to learn on a ranch that still holds the dying tradition of “cowboying”. By cowboying I mean that most of the work or interaction with the cattle is done on horseback. Doctoring of the cattle (taking care of ill or injured cattle) is done in the pasture by heading and healing. Heading is when one person throws a rope around the head of the animal and healing is when another person throws the rope around the animals’ back legs catching either one or both of the legs. The ill or sick animal is now tied up with a rope and the horses are used to keep the animal stationary and on the ground. This is a technique of animal husbandry that I originally thought was long gone before being able to take part in this internship. There is a great advantage to be able to work a horse and throw a rope to care for the sick and ill in the pasture. It is a much easier way of moving the animals on horseback as opposed to needing a motorized vehicle. In doing so, I learned a lot about caring for cattle, cell grazing to best use the grass that is available, caring for horses, haying for winter feed, and all the other things that go into keeping a ranch functioning and in well working order.

On the Double J Ranch I learned a lot about what has to be done to manage a working cattle ranch. Being a working cattle ranch includes using the technique of cell grazing, to be explained in more detail later, with temporary electric fences to more efficiently use the grass produced from a certain cell. This was amazing to see because much of the 6,000-acre ranch was a barren sage forest, only in the creek bottom was the grass plentiful and was able to be used for hay. The use of the electric fence and a divided pasture allowed for what little hay that grew between the sage brush to be used to its full potential and not passed up by a less caring animal. The cattle were moved around to each different cell by the use of a horse and rider and because of this, horsemanship was a very important skill to have or to develop on the Double J ranch.

Horsemanship was also a very important aspect of tagging calves and doctoring the cattle in the pasture with the use of ropes. I was not very sharp on my horsemanship ability upon first arriving to the ranch, but I have improved with each day that passes here on the Double J and with arena lessons from the managers Leah and Wyatt. That is something I am very proud of. At first when I was on horseback, I felt that I was very little help in working and interacting with the cattle. By June, I was becoming more and more useful and towards the end of my internship, I was riding better than I ever thought was possible for myself. I was able to move quickly and without the fear I originally had.

On the Double J ranch, I was also fortunate enough to learn a lot about how to care for a ranch in terms of vaccinating and supplying medicine to livestock. Vaccinating and providing medicine to the calves was a very interesting process because the Double J is a NHTC



(Non-Hormone Treated Cattle), so the cattle on the ranch do not receive any hormone, animal bi-product, or antibiotics. If a calf is ill enough where antibiotics are the humane option for treating it, the animal must be tagged to keep it out of the program.

I also learned a lot about the proper way to give vaccines and medicine injections to both horses and cattle, as well as different techniques to do so. Previously, I was only familiar with giving cattle injections with the use of a cattle shoot. At the Double J Ranch, I was taught how to give cattle injections in the pasture with the use of a horse and rope. Vaccinating calves while giving them an ear tag and banding future steers was a lot more fun than having to provide medicine to an older animal though just from the more inherent danger.

On the Double J Ranch, I have learned more than I ever thought possible in a short three months. I was fortunate enough to learn firsthand how to manage a large ranch and livestock, as well as managing them with different, but effective techniques, I was not familiar with. Learning how to properly and efficiently practice cell grazing was a privilege and knowledge that I will use for a long time to come. The Double J also used registered Wagyu bulls to produce F1 offspring, earning a premium when selling the calves and better enhancing the genetics of the herd. The best experience that I will take with me and use was learning to be a good neighbor and member of the community. Working with the community to brand calves and to move cattle was the highlight of my summer and made all of the hard work worth it to me.

My summer on the Double J Ranch has been one of the best I have ever had and definitely not an experience I will ever forget. Never before have I had the opportunity to witness actually cowboys working their trade, let alone to be working alongside them. Never before did I think I could ride a horse the way I can now at the conclusion of my internship, or be able to work and doctor cattle from one. I have learned many useful mental tools and other ways to work and manage cattle. Along with learning an enormous amount about managing livestock and a ranch, I have learned a lot about being a productive member of a community. When I first arrived and was working with the community of Daniel at different ranch brandings, I felt awkward and as if I didn't belong in Wyoming. This amazing town soon welcomed me in with open arms. When leaving the ranch and heading into the public, I know everyone and have had an amazing time socializing and getting to know them all personally. I will miss the people of this town and definitely have intentions of returning to see everyone very soon.

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## Fall 2020

### Graduate Students - MS in Animal and Range Sciences

Kylie Gardhouse

### Prospective Undergraduate Students -B.S. in Animal Science

DaLayna Bravo  
Logan Dutoit  
Jarrett Emborg  
Abrielle Grandbois  
Emily Hoskins

Denver Krone  
Rachel Leuthauser  
Brianna McWilliams  
Dani Merchant  
Ty Morgan

Tyana Murphy  
Makayla Paul  
Logan Peterson  
Shania Prielipp  
Bryce Rehwinkel

### Prospective Undergraduate Students -B.S. in Natural Resources and Rangeland Ecology

Lara Macon

*Congratulations to all the graduates!*





## Publications:

**Jennifer Thompson:** Flesch, EP, Graves, TA, **Thomson, JM**, et al. Evaluating wildlife translocations using genomics: A bighorn sheep case study. *Ecol Evol.* 2020; 00: 1– 18. <https://doi.org/10.1002/ece3.6942>

**Carl Yeoman:** Ishaq SL, Seipel T, **Yeoman CJ**, Menalled F. 2020. Dryland cropping systems, weed communities, and disease status modulate the effect of climate conditions on wheat soil bacterial communities. *mSphere.* 5:e00340-20 DOI: 10.1128/mSphere.00340-20

**Christian Posbergh:** **Posbergh, C.J.** and Huson, H.J. (2020), All sheeps and sizes: a genetic investigation of mature body size across sheep breeds reveals a polygenic nature. *Anim Genet.* <https://doi.org/10.1111/age.13016>

## Grants:

**Carl Yeoman** was awarded \$500,000 by the USDA to investigate the capacity of calf gastrointestinal tract microbes to improve the animal's immunological response to enterotoxigenic *E. coli* and preserve barrier function following enterotoxin challenge.

**Carl Yeoman** was part of a group of researchers primarily based at the University of Maryland's School of Medicine that were awarded an R56 for \$171,000 by the National Institutes of Health to assess lifestyle factors and genitourinary symptoms and their relationship to vaginal microbes, metabolites, and immune mediators as women transition through menopause

**Carl Yeoman** was part of a team led by Dr. Mary Miles (Health and Human Development) that was awarded \$300,000 by the USDA to investigate the impact of dietary lentils on postprandial bile acids. Bile acid compositions and concentrations having been linked to metabolic diseases, including obesity, fatty liver disease, heart disease, and diabetes.

**Christian Posbergh:** Determining the relationship between growth EBVs, feed intake, and feed efficiency in range sheep. \$21,800 National Sheep Industry Improvement Center.

**Christian Posbergh:** Development of Predator Mitigation GPS Collars. \$14,000 National Sheep Industry Improvement Center. Brent Roeder is the PI, Christian is co-PI.

**Tim Delcurto** and the Western Rangeland Precision Livestock Management proposal. Senate report: The Committee recognizes the opportunity for precision livestock management strategies and tools to promote economically efficient and environmentally responsive livestock production systems for the Western rangeland. The Committee provides \$3,000,000 to develop precision nutrition strategies for rangeland-based livestock as well as technology-based rangeland and livestock management strategies to optimize the health and productivity of both Western rangeland-based livestock and the rangeland ecosystem. Further, the Committee recommends this funding to transfer new knowledge and technology strategies into data-informed tools and decision guidance for Western livestock and rangeland managers.

Hannah DelCurto-Wyffels received the honor of being awarded the Teaching Innovation Award from the Office of the Provost.

Dr. Clayton Marlow Named Western SARE Regional Coordinator.

Dr. Megan Van Emon received the Western Section American Society of Animal Science Extension Award for her community engagement and work in beef extension.

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You can connect with the Animal & Range Sciences department via a variety of social media sites based on your interests or needs. They are also great ways to keep up to date with our activities and current news. We encourage you to check out the options at <http://animalrange.montana.edu/socialmedia.html> and interact with us by posting a question or comment. We'd love to hear from you!

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.



# Hello

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We have added many new faces to our department!

**Allison Reck**, Equine Operations Manager. Allison has been with us for a little while, but needed a formal hello!

**Dr. Amanda Bradbery**, Equine Science faculty.

**Dr. Christian Posbergh**, Sheep Production faculty.

**Diego Almeida**, Farrier School Director.

**Lisa White**, innagural fiscal operations manager for Animal and Range Sciences and Plant Science.

**Kellen Marlow**, Livestock Operations Manager.

**Noah Davis**, Red Bluff Foreman.

# Goodbye

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We say goodbye to **Shay Larsen** (Livestock Operations Manager), **J.T. Saunders** (Red Bluff Foreman), and **Luka Mueller** (Town Livestock Foreman). All had other opportunites and we are grateful for their time with us.

Former accountant **Amanda Reuland** is now working in Fiscal Shared Services.

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 [laura.bratz1@montana.edu](mailto:laura.bratz1@montana.edu)

