

ANIMAL & RANGE SCIENCES NEWSLETTER

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Introduction from Dr. Glenn Duff, Department Head



As the new kid on the block, I would like to extend my personal welcome as Department Head to the Department of Animal and Range Sciences Newsletter. We have exciting times ahead and are excited about what is happening at Montana State University. It has been and will continue to be a steep learning curve, but I believe I am keeping my head above water.

The big move happened the end of July/first of August. With all new things, there have been some “hick ups” (e.g. furniture was a bit slow arriving and we had to borrow furniture from the Student Union, etc.) but the department keeps on rolling. We started teaching classes in the New Animal Biosciences building in August. Classroom facilities, as well as the 21st century information technology capabilities, make the Animal Bioscience building the envy of other departments of the university. I want to again thank all of our donors to make this building possible. The laboratory complex, on the third floor, is coming together nicely. Laboratory capabilities will help attract new faculty as well as graduate students to Montana State University. In addition, these facilities will allow the department to secure new funding opportunities that will allow us to keep producers on the cutting edge of technology in the country (see page 7).

I have started making my presence known in the state by traveling to meetings in Billings, Helena, and Miles City. I look forward to getting out and promoting our department’s efforts in all corners of the state. As I travel around, I no doubt will run across many of you who receive our newsletter.

My wife Donna is also enjoying our move to Montana. She has been busy getting us settled into our house but has had the opportunity to get out and meet people in the Bozeman area. She too, looks forward to meeting as many of you as possible. Soon after meeting Donna, you too will realize and understand her enthusiasm for all of our efforts. We had the American Angus Convention tour of our facilities in early September (see story inside) and Donna jumped in to help with preparation of the food as well as serving on the line.

I can’t express to all of you how much our faculty (including adjunct and emeritus), staff, graduate students and undergraduate students contribute towards our success. Without the efforts of each member, we would not be where we are today. Clientele of the university other than students (producers, allied industries, alumni, etc.) are also so important to what we do. Thank you for all of your efforts.

In closing, I would like to again express thanks for allowing me this unique opportunity. There is no place in the United States that has the potential for what we have her at MSU We will be working closely with all of you to ensure that your money and efforts are well spent.

Glenn C. Duff, Head

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Awards, Publications & Presentations

John Paterson was an invited speaker at the 2010 Liquid Feeds Symposium in San Antonio, TX in September. The talk was entitled: “Animal Welfare—Are we Listening.”

Mike Frisina, adjunct instructor with our department, has a recent publication titled: “Montana Wildlife Management Area and Livestock—Wildlife Interactions Bibliography.”

Pat Hatfield, Hayes Goosey and Erin Snyder are co-authors of “Dryland Soil Carbon and Nitrogen Influenced by Sheep Grazing in the Wheat—Fallow System.” This article appeared in the *Agronomy Journal*, Vol. 102, Issue 6 (pgs. 1553-1561) 2010.

Dennis Cash, Aimee Halfa and Lisa Surber are co-authors of “Registration of Willow Creek Forage Wheat.” This recent publication appeared in the *Journal of Plant Registrations*, Vol. 3, No. 2 (pgs. 185-190).

Jim Berardinelli was awarded the “Mershon Award” of the Montana Academy of Sciences this past spring in recognition for his scientific excellence, the advancement of science in Montana, and service to the Montana Academy of Sciences.

Rodney Kott was the recipient of a 30 year certificate and pin for his 30 years of service as an MSU Extension Sheep Specialist. The award was presented by Vice Provost and Director of Extension, Dr. Doug Steele, during Extension’s 2010 Annual Conference in Bozeman, MT.

Jane Ann Boles was an invited speaker at the New Zealand Institute of Food Science and Technology. Jane presented “Natural Curing of Meat Products.”

Mike Tess was the recipient of the Beef Improvement Federation’s (BIF) 2010 Continuing Service Award presented at their annual meeting in Columbia, MO.

Greg Johnson has several new publications:

“Surveillance for West Nile Virus in American White Pelicans, Montana, USA” *Emerg. Infect. Dis.* 16: 406-411.

“Control of *Culicoides sonorensis* (Diptera: Ceratopogonidae) Blood Feeding on Sheep with Long-lasting Repellent Pesticides.” *J. Mosq. Contr. Assoc.* 26: 302-305.

“Investigation of Epizootic of Bluetongue Virus Serotype 17 in Sheep in Wyoming.” *JAVMA.* 237: 955-959.

“Management of Lice on Livestock.” MSU Extension Service MT201002AG. <http://msuextension.org/publications/AgandNaturalResources/MT201002AG.pdf>.

“Ticks of Veterinary and Public Health Importance in Montana.” MSU Extension Service EB0198. http://www.msuextension.org/store/Products/Ticks-of-Veterinary-and-Public-Health-Importance-in-Montana_EB0198.aspx.



Graduate Student, Charles Sloane, in front of the Animal Bioscience building with native plants ready for landscaping. Charles started these plants at MSU’s greenhouse.

Research at Fort Ellis: Integrating Sheep into Dryland Farming Systems



Studying variation of salt/mineral intake by ewes.

Sheep based research at the MSU Fort Ellis Research and Extension Center has taken a new turn. In 2009, a multi-disciplinary team of researchers secured \$668,000 through a competitive USDA CAR grant to investigate the sustainability of integrated crop-livestock production systems. Principle investigators Jan Bowman, Hayes Goosey, and Patrick Hatfield (Animal and Range Sciences), Jane Mangold, Fabian Menalled, and Kevin O'Neill (Land Resources and Environmental Sciences), and Andy Lenssen and Upendra Sainju (USDA ARS – Sidney, MT) collaborated to bring sustainable crop and livestock production to a focal point at MSU.

Conventional farming systems are based on substantial inputs of fuel, synthetic fertilizers, and pesticides. Montana wheat producers use 4.5 million pounds of herbicide active ingredients annually on 3.2 million acres of summer fallow for weed control.

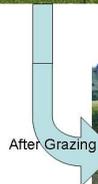
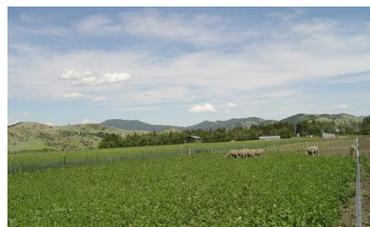
Tillage is currently the only alternative to chemical fallow, but tillage can reduce soil organic matter and increase CO₂ flux by 118% compared with no-till systems. Our main goal is to develop an integrated sheep/crop production system that uses sheep to manage crop residues and reduce weeds and insect pests, thereby reducing herbicide and pesticide use, increasing carbon sequestration and nutrient cycling, and mitigating greenhouse gas emissions.

Our specific goals are:

- Incorporate sheep grazing into zero-till farming systems to control weeds and pest insects, and maintain soil quality and crop productivity.
- Investigate grazing as an alternative weed management strategy during fallow periods and develop a better understanding of the effects of sheep grazing on annual and perennial weed communities compared to conventional chemical and mechanical fallow management systems.
- Improve the conservation of beneficial arthropods and assess their population dynamics in farming systems using conventional and grazed fallow methods.
- Determine the influence of sheep grazing compared with tillage and herbicide applications on greenhouse gas emissions, carbon sequestration, and nitrogen cycling
- Compare sheep grazing versus harvesting a pea/barley forage cover crop on soil and weed components as well as impacts on sheep feeding systems (confinement vs. swath grazing) and mineral consumption by sheep in confinement and swath grazing.



Dr. Pat Hatfield and Devon Powell measuring forage availability in a swath grazing study.



After Grazing



Before and after.....using sheep for weed control on summer fallow.

Research at Fort Ellis: Integrating Sheep into Dryland Farming Systems (continued)

Currently five graduate students are working on the project. The project compares 3 farming systems: 1) a three-year crop rotation of spring wheat, pea/barley forage, and summer fallow, 2) continuous spring wheat, and 3) alfalfa. In the three-year crop rotation and the continuous spring wheat we have a conventional tillage system, a zero-tillage system using herbicides, and a zero-tillage system using grazing sheep for weed control and residue management.

Graduate Students working on this project:

Devon Powell (Animal & Range Sciences) is comparing individual animal consumption of mineral supplement by ewes either swath grazing or fed a pea-barley forage in confinement. She will use titanium dioxide, to measure forage and mineral intake.

Erin Snyder (Animal & Range Sciences) will be investigating the impact of swath grazing on forage intake and wastage by ewes. Erin will compare the differences between swath grazing and feeding baled pea-barley hay on baled and swath wastage, forage intake, and nutritional change of forages (swath or baled) over time.

Joy Barsotti (Soil Science) is measuring soil carbon and nitrogen sequestration and greenhouse gas emissions from three cropping sequences (perennial alfalfa, continuous spring wheat, and spring wheat-pea/hay barley-fallow) in chemical and grazed treatments. She is also working on measuring soil labile and non-labile carbon and nitrogen fractions that determine influence of treatments on soil quality and productivity.

Melissa Graves (Weed Science) is assessing the overall impact of sheep grazing on weed population and community structure. Specifically, Melissa is comparing chemical and grazed fallow managements systems, continuous spring wheat, and alfalfa systems to determine the short- and long-term effect of alternative weed management practices on weed abundance and species composition.

Paramjit Karam Singh (“Gil”) (Entomology) is investigating the above-ground arthropod community in three cropping rotations; perennial alfalfa, continuous spring wheat, and a three-year rotation (spring wheat/pea-hay barley/fallow) where fallow plots are managed either by mechanical tillage, herbicides or grazing sheep. Gil is also trapping wireworms and estimating densities to relate them to external agronomic inputs.

Additional competitive funds have been secured with related projects. Hayes Goosey secured \$98,908 from the Five-State Ruminant Consortium to validate a previously developed grazing model and also to investigate grazing of annual and perennial cropping systems on regrowth and pest/beneficial insect and plant communities. Jan Bowman and Patrick Hatfield have grants from the Bair Foundation and the Five-State Ruminant Consortium to support the Erin Snyder and Devon Powell MS projects.



Devon Powell dosing a ewe with a marker to estimate intake of forage and mineral.



Joy Barsotti taking soil samples.



Erin Nix weighing ewes.

Meet our Graduate Students:

Dustin Anderson (Dillon, MT) Dustin is studying riparian restoration in abandoned hayfields. Major advisor: Dr. Clayton Marlow

Joy Barsotti (Sidney, MT) Joy is studying greenhouse gas emissions and soil quality in grazed cropland. Major advisors are Dr. Upendra Sainju and Dr. Cliff Montagne.

Michael Borgreen (Lewistown, MT) Mike is studying the causes of reproductive failure of bison on the National Bison Range. Major advisor: Dr. Jim Berardinelli

Neto Garcia (Brazil) Neto is studying habitat modeling of the National Bison Range. Major advisor: Dr. Clayton Marlow

Kristina Hale (Bozeman, MT) Kristina is studying the bionomics of stable flies in a prairie wetland in northeast Montana. Major advisor: Dr. Greg Johnson

Blake Hauptman (Hall, MT) Blake is studying digestibility of ethanol yeast as an alternative protein source for rainbow trout. Major advisor: Dr. John Paterson

Rick McCosh (San Diego, CA) Rick is studying biostimulatory effect of males on adrenal function and kisseptin expression in neural centers in sheep. Major advisor: Dr. Jim Berardinelli

Erin Nix (Bozeman, MT) Erin is studying the effect of swath grazing on forage intake and wastage by ewes. Major advisor: Dr. Pat Hatfield

Tess Norvell (Kiowa, CO) Tess is studying the effects of increasing the tetany risk ratio on blood serum Mg levels and nutrient digestion. Tess is also looking at the

effects of supplementation on decreasing the tetany risk ratio and DCAB ratio. Major advisor: Dr. John Paterson

Glenn Owing (Bozeman, MT) Working on response of Gray Rubber Rabbitbrush to wildfire return intervals. Major advisor: Dr. Clayton Marlow

Devon Powell (Mercer Island, WA) Working on investigating the variation in individual ewe mineral supplement intake when fed pea/barley hay in confinement or when swath grazing pea/barley forage. Major advisor: Dr. Jan Bowman

Elizabeth Read (West Point, UT) Liz is currently doing a study on copper bioavailability rainbow trout that she hopes to use as a model for further research on copper bioavailability in beef cattle. Major advisor: Dr. John Paterson

Bob Sager (Wilsall, MT) Bob is studying Cobalt supplementation affecting the immune system of weaned beef calves. Major advisor: Dr. John Paterson

Andy Schell (Bozeman, MT) Working on attitude of professional wildlife managers about use of prescribed fire. Major advisor: Dr. Clayton Marlow

Charles Sloane (Livingston, MT) Working on manipulation of environmental condition to control annual bromes. Major advisor: Dr. Clayton Marlow

Billy Whitehurst (Belgrade, MT) Billy is currently a graduate teaching assistant assisting with the teaching of ARNR 434. Major advisor: Dr. John Paterson

Upcoming Dates

November 4	Holiday—General Election Day
November 5-6	Ag Appreciation Weekend (http://ag.montana.edu/excellence/agappreciation.htm)
November 11	Veteran's Day Holiday
November 18-20	Ag Days (http://ag.montana.edu/students/agdays.htm)
November 25-26	Thanksgiving Holiday
December 24	Christmas Holiday
March 12-14, 2011	Beginner Shearing School
March 15-17, 2011	Advanced Shearing School

2010 National Angus Conference & Tour Visit the New Animal Bioscience Building at Montana State University



Angus producers turned out in record numbers for the 2010 National Angus Conference & Tour in Bozeman, Mont., Sept. 15-17. More than 630 registered producers from 33 states and 3 countries attended the conference. One of the stops on the tour was the Animal Bioscience Building at Montana State University (which houses the Animal & Range Sciences Department) for breakfast on the 17th.

Certified Angus Beef provided the meat and the Animal & Range Sciences Department; students, faculty and staff, pitched in to make and serve breakfast burritos. Tours of the building were given by graduate students and members of various student organizations.



Bill Davis, President of the American Angus Association and also a Montana rancher stated that the Animal Bioscience Building is the realization of hard work on the part of Montana ranchers, members of the industry and the Montana legislature.



Dr. Jane Boles, Dr. John Paterson and Mo Harbac from the Department of Animal & Range Sciences, were key in the organizing and success of this event.

Photos courtesy of Bill Brewster, Tri-State Livestock News and Denise Thompson, Animal & Range Sciences Dept. More great photos and information on the conference and tour can be found online at "Meet in Montana" www.nationalangusconference.com.



Dr. Doug Steele (center), Vice Provost and Director of Extension Service, MSU visiting with Angus producers.



Grad Student, Devon Powell, conducting tour.



Dr. John Paterson (right) visiting with Angus producers.



Glenn Duff, Dept. Head, Animal & Range Sciences, extending greetings.



Donna Duff helping Cattlewomen's Club members serve breakfast.

Scott Family Physiology Laboratory

The Dan and Jeanne Scott Family Foundation pledged \$500,000 toward the new Animal Bioscience Facility and home to the Animal & Range Sciences Department. The foundation includes Dan and his wife Jeanne Scott of Dayton, WY and their children Randy and Lynette Scott of Billings; Riki Davidson and Trink and Tom Morss of Parkman, WY; Ron and Audra Scott of Sheridan, WY; and Risa Scott of Orange, CA. Dan Scott is the retired general manager of the family ranch, known as the Padlock Ranch, which stretches across the Montana and Wyoming border.

On September 12, 2010 the Scott Family officially christened the “Scott Family Physiology Laboratory” in the new Animal Bioscience Building.

Research in the Scott Family Physiology Laboratory focuses on generating and understanding new concepts and mechanisms involved with physiological bases of functional genomics, proteomics, and metabolomics that influence breeding quality, growth, and reproduction, primarily in sheep and cattle.



Scott Family members in the Scott Family Physiology Lab.

Other News



Jim Berardinelli spent 4 days at the University of Missouri where he was invited by the Animal Science Reproductive Biology Cluster of the Department of Animal Science. Jim was asked to present seminars on his nationally recognized research “Biostimulatory Effect of Bulls on Heifers and Postpartum, Suckled Cows.” Jim also interacted with faculty and graduate students on how his laboratory might interact with them in the area of beef cattle reproduction and lectured in graduate and undergraduate courses.



Rachel Frost was co-organizer of the Targeted Grazing Workshop that was presented at the Society for Range Management (SRM) in Denver, CO February 11, 2010. This organized oral discussion focused on the practical application of targeted grazing as a vegetation management tool.



Shannon Moreaux lead the 2010 FAS Foreign Agricultural Attaché Tour through the new Animal Bioscience Building. The tour represented 22 countries and was organized by Marty Earnheart of the Montana Department of Agriculture.



Marc King will be taking the MSU Livestock Judging Team to compete at the American Royal Contest in Kansas City, MO October 26—November 1, 2010 and to the North American International Judging Contest in Louisville, KY, November 12-16, 2010.

Student News

The Montana Weed Control Association Scholarship was awarded to Charles Glenn (Wilsall, MT), Rangeland Ecology and Robbyn Reukauf (Terry, MT), Natural Resources and Rangeland Ecology.

The Huber Scholarship was awarded to Benjamin Lynn (Clyde Park, MT), Natural Resources and Rangeland Ecology.

The Lois Britt Memorial Pork Industry Scholarship and the Montana Pork Producers Scholarship was awarded to AnnaMarie Samson (Three Forks, MT), Animal Science.

Jonathan Carpenter (Olympia, WA), recent graduate in Animal Science was a Kentucky Equine Management Intern in the Spring of 2009 and is currently an intern at Margaux Farm in Kentucky and plans on staying in Kentucky to work in Thoroughbred breeding.



Dr. Bok Sowell outside new Animal Bioscience building teaching his ARNR 102—Montana Range Plants Lab.

Grad student, Devon Powell, helping Dr. Shannon Moreaux teach his ARNR 327—Equine Lameness class in lot next to Animal Bioscience building.



Dr. Clayton Marlow and his ARNR 489/490 undergraduate class in the Judith Mtns.

Help Support Animal and Range Sciences

A gift to the Department is a great way to support student and faculty endeavors. Donations can be earmarked for student scholarship funds, faculty research, the new Animal Bioscience Building, and more.

For more information about making a donation to the Department contact:

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With special thanks to the entire A&RS Administrative Team



The new Animal Bioscience Building