

**June 2016**

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# AGADEMICS

JUNE 2016



COLLEGE OF  
AGRICULTURE AND  
NATURAL RESOURCES

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# Pistol and Pete turn back the clock to 1891

By Ann Tanaka | June 2016



*Pistol and Pete - and Travis Smith - gave rides at a Cinco de Mayo celebration in Laramie.*

## College's draft horses pull sights, sounds of past into present

This mobile University of Wyoming billboard boasts two horsepower and will be viewed across the state this year and foreseeable future.

Haflinger horses [Pistol and Pete](#) will patiently pull the College of Agriculture and Natural Resources sheep wagon, refurbished with new canvas and sporting new logos and lettering, in parades and at other venues, promoting the 125th anniversary of the Wyoming Agricultural Experiment Station.

## Mobile Brown and Gold

The pair's color scheme may not be the OFFICIAL institutional color tones mandated by the University of Wyoming marketing team, but there's no doubting the two Haflingers represent the university with their brown and gold hair and manes.

The AES, housed in the college, directs operations at four research and extension centers in Wyoming: Laramie, near Lingle, Powell, and Sheridan. Pistol and Pete are expected to put in appearances at the centers' field days this summer and at other venues across the state, pulling the college's revamped sheep wagon and offering rides on a flatbed trailer.

Laramie center director Doug Zalesky believed the college should make more use of its sheep wagon - a

symbol of Wyoming's ranching heritage that had been sitting idle at the Laramie center - to promote the AES 125<sup>th</sup> anniversary and the college.

Zalesky received the go-ahead from AES director Bret Hess and Frank Galey, dean of the college, to revamp and use the wagon.

"Some things needed to happen," notes Zalesky, based at the Laramie Livestock Center near the Cliff and Martha Hansen Teaching Arena. "One, we needed to find a team to pull it, and two, we needed to update the logo and the wording to the College of Agriculture and Natural Resources."

Smith says the two outlined what they wanted in the team: a smaller-framed draft horse broken for the purposes for which they would be used.

"We came to the conclusion a nice set of Haflingers would be ideal," says Smith.

### **A Circle Back to Home**

The breed, that had originated in present-day Austria and northern Italy, has a gentle disposition, is easy to handle, and travels easily.

"We started looking for parade-broke Haflingers, and it went downhill from there," Smith says.

They checked Pennsylvania, Ohio, and the closest set was in Missouri.

Meanwhile, Smith had contacted Ty Blake at Wyoming Wagon Works in Laramie to ask a few questions about the wagon.

Says Smith, "At the end of the conversation he said, 'So, I suppose you are looking for a team of horses to pull it?' Without knowing what we were looking for, he said, 'I might have a deal for you. I've got a team of pretty well broke Haflinger geldings here, and I'm not using them. And I'll sell them with the harness - but I have to break it to you, it's a parade harness and not a work harness.'

Smith asked if Blake had been reading Smith's emails, "And he said no," Smith says, and laughs. "Doug and I went out a night or two later, and they were exactly what we were looking for. Right here in Laramie."

The pair had belonged to the late Dean Alexander, a local family, that had expressed to Blake they preferred if the team could stay near Laramie.

### **Why not a Tractors?**

The number-one question he received when word got out they were bringing in the team was "why feed with a team of horses when you have all the nice equipment out here?" says Smith. "I tell them I can still feed with nice equipment when I have to, but I **get** to feed with the team. It's not a curse. It's an enjoyable, kind of a relaxing part of my day."

The team and wagon connects modern day Wyoming to when the AES was started in 1891, only one year after the last soldiers left the decommissioned Fort Laramie, and one year after Wyoming was admitted to the union.

"It's a piece of our heritage to have a horse-drawn wagon represent the college and the University of Wyoming and maybe connect the modern day agricultural experiment station with the original ag experiment station," Smith says.



# Molecular biologist's lab has two papers named among top 100 most influential

By Ann Tanaka | June 2016



*Molecular biology Professor Mark Gomelsky with former postdoctoral associate Zehra Tuzun Guvener. The Gomelsky laboratory papers describe the role of the cyclic diguanylate monophosphate molecule signaling bacteria to switch from a mobile, single-cellular lifestyle to a surface-attached, multicellular lifestyle.*

Telling bacteria Stay! or Go! really is like giving commands to man's best friend to sit or fetch - a scientist just needs to know the keywords in micro-speak to unlock the language.

One such key is cyclic dimeric guanosine monophosphate, mercifully shortened to c-di-GMP, and in bacterial-speak is responsible for their deciding to stay put or swim away.

University of Wyoming molecular biologists were among the first to determine how this molecule is made and broken down.

Two papers by Professor Mark Gomelsky's lab were nominated by the editorial board members of *Journal of Bacteriology* to represent the 100 most influential papers published in this journal since 1916. *Journal of Bacteriology*, the flagship journal of the American Society for Microbiology, is celebrating its centennial.

The Gomelsky papers published in 2005 helped open a new field in bacterial signaling. Each paper has acquired approximately 400 citations, according to Google Scholar.

"We stumbled upon this new field quite unintentionally," says Gomelsky in English-speak, "but in some ways intentionally."

## Unknown Universe

Gomelsky wasn't aware of c-di-GMP and had no intention of studying it. The late Professor Moshe Benziman of Hebrew University, Israel, discovered c-di-GMP and described enzymes involved in its syntheses and hydrolysis (Gomelsky dedicated both papers in Benziman's honor).

Gomelsky's lab was studying light-activated proteins at the time (it still does), and one of their proteins, he says, was strange, containing "domain of unknown function 1" and "domain of unknown function 2."

Domains are large modules from which proteins are made. Gomelsky wanted to understand how their strange, light-activated protein worked.

"I was stunned," he recalls. "Unknown domains 1 and 2 were not just in "our" protein; they popped up everywhere in the bacterial genomes. It was difficult to believe people would not know about this apparently undiscovered universe."

He says he decided to address the issue head on, driven by scientific curiosity, by deciphering what these domains of unknown function actually do.

And did.

“Our studies were not overly sophisticated,” says Gomelsky. “We explained that c-di-GMP was made by the domain of unknown function 1 and that it is broken down by domain of unknown function 2. We also offered hard evidence that c-di-GMP is a widespread and probably important molecule.”

Once these papers were published, along with a few others at about the same time, a surge began.

“Suddenly there was the gold rush,” says Gomelsky. “At the beginning, there were just a few papers exclusively from the Benziman group, then a handful of influential papers appeared in 2004-05, and now the annual number of papers about c-di-GMP is in the hundreds.”

## **Brawny Biofilms**

Why is understanding whether bacteria attach to a surface and stay put or swim by without attaching important?

Gomelsky says when grown on surfaces - whether human organs, medical implants or water pipes underneath kitchen sinks - bacteria form biofilms. Biofilms are like bacterial cities in which cells are very diversified.

Gomelsky compares bacterial diversity to human diversity.

“Like in a city, people differ by occupation, incomes, origins, mentality. The same type of diversity happens in bacterial cities, biofilms,” he says. “Growth on surfaces within self-made protective matrices produces bacteria with different physiologies. Diversification provides strength to bacterial communities, just like it does to human communities. It’s difficult to eradicate a diverse population.”

Antibiotics dropped into a test tube culture, where bacteria are similar, will kill practically all the bacteria.

“If you do the same thing with biofilm, the antibiotic will kill the top layer but won’t necessarily even reach the inner areas due to physical and chemical constraints,” says Gomelsky. “Some of the cells in the bacterial city are dormant and not even susceptible to antibiotics.”

Treated chronic bacterial infections go away but usually come back because some of the bacteria survive the antibiotics onslaught. After multiplying in the absence of the antibiotic, they can cause another episode of acute infection, says Gomelsky.

## **Mindful Persuasion**

If scientists could tell the bacteria to go instead of allowing them to build a biofilm, or if they could tell bacteria in an existing biofilm to disperse, antibiotics would destroy bacteria more readily.

“Speaking bacterial language helps us designing “psychological warfare” agents against pathogens,” he says. “We want to trick bacteria into making bad decisions during infection.”

By combining antibiotics, which are regular warfare agents, with drugs that meddle with bacterial “minds,” Gomelsky says bacteria can be eradicated more efficiently. Studies on c-di-GMP opened the ways for designing new types of antibacterial drugs.

Former Ph.D. student Dmitri Ryjenkov, post-doctorate researchers Marina Tarutina and Oleg Moskvina, and technician Andy Schmidt worked with Gomelsky on this project. Ryjenkov is employed by a U.S.-Russian biotech company, Tarutina returned to Russia, Moskvina is a research scientist at the University of Wisconsin, and Schmidt went on to study medical technology.

# Changing Faces, Changing Places

By Ann Tanaka | June 2016

## Welcome:

**Balzan, Julie:** Platte County UW Extension, southeast area nutrition and food safety (6/1)

**Madden, Kevin:** James C. Hageman Sustainable Agriculture Research and Extension Center, farm manager (4/30)

**McFadden, Crystal:** Natrona County UW Extension, Cent\$ible Nutrition Program assistant (5/2)

**Mohler, Tycee:** Park County UW Extension, interim 4-H educator (5/18)

## Farewell:

**Hininger, Scott:** Sheridan County UW Extension, extension educator, sr. (5/31)

**Roop, Kelsey:** Park County UW Extension, 4-H educator (5/16)



# Calendar

By Ann Tanaka | June 2016

**June 14:** Forage Field Day 2016, Sheridan at the Sheridan Research and Extension Center, 8 a.m.-4 p.m.

# Proposals Submitted

By Ann Tanaka | June 2016

**Dhekney, Sadanand:** \$24,757 to Utah State University for “Assessment of Goji Berry (*Lycium barbarum*) as a High Elevation Specialty Crop for the West.”

**Ernest, Holly:** \$459,812 to California Department of Fish and Wildlife for “California Black Bear Molecular Mark-Recapture Genetic Analyses,” and \$49,050 to Wyoming Wild Sheep Foundation for “Wyoming Statewide Bighorn Sheep Population Genomics: Year 2.”

**Freeburn, James:** \$282,121 to Utah State University for “Professional Development Program Administration and Sustainable Agriculture Research and Education Fellows Program.”

**Hansen, Kristiana, Roger Coupal, Virginia Paige, Eric Peterson,** Jim Magagna, Melanie Purcell, Jen Lamb, Sara Brodnax, and Anne MacKinnon: \$558,363 to U.S. Department of Agriculture (USDA) Natural Resources Conservation Service for “Establishment of the Wyoming Conservation Exchange.”

**Hess, Bret, John Tanaka, James Heitholt, Vivek Sharma, Gustavo Sbatella, William Stump, and Andrew Kniss:** \$15,000 to Wyoming Bean Commission for “Dry Bean Research.”

**Islam, Anowar:** \$24,500 to Wyoming Department of Agriculture (WDA) for “Evaluation of Chickpeas in Wyoming Environments.”

**Islam, Anowar,** Joe Brummer, and Doohong Min: \$249,951 to USDA National Institute of Food and Agriculture (NIFA) for “The Silent Decline in Soil Potassium Levels and its Effect on Alfalfa Productivity in the Central and Western U.S.”

**Murphy, Melanie:** \$45,000 to Fish and Wildlife Service for “Impact of Vegetation Treatments (Fire and Grazing) on Wyoming Toads - Continuation,” and \$92,732 to USDA NIFA for “Confluent Capstones for Natural Resources.”

**Murphy, Melanie,** Wendy Estes-Zumpf, and Rick Henderson: \$20,580 to Wyoming Game & Fish for “Comparing Efficacy of eDNA vs. Visual Surveys for Amphibian Monitoring.”

**Norton, Jay, Jeremiah Vardiman, Urszula Norton, Carrie Eberle, and James Heitholt:** \$24,500 to WDA for “Sustainable Product Practices for Edible Dry Beans.”

**Schell, Scott, Alexandre Latchininsky,** and Keith Wardlaw: \$5,200 to WDA for “Travel Support Funding for the Mosquito Larval Control Workshop and West Nile Virus Prevention Training Being Conducted by the City of Laramie and UW-ES-Entomology.”

# Monies Awarded

By Ann Tanaka | June 2016

**Despain, Johnathan, Dawn Sanchez, and Justina Russell:** \$57,960 from National 4-H Council for “Wyoming OJJDP National 4-H Youth Mentoring Program Year 6, 2015-2016.”

**Fay, David:** \$415,224 from National Institutes of Health (NIH) for “Characterizing Novel Functions of Conserved NIMA Family Kinases.”

**Ford, Stephen:** \$296,703 from NIH for “16-17 Cortisol Regulation of Perinatal Adipose Tissue and Sheep Neonatal Leptin Peak.”

**Jarvis, Donald:** \$309,531 from NIH for “16-17 Elucidating the Cellular Mechanisms of Prion Propagation and Clearance for Devising New Targets for Intervention in Prion Disease.”

**Mealor, Brian, Beth Fowers, and Dan Takiela:** \$39,999 from U.S. Fish & Wildlife Service for “Evaluating Strategic Weed Management to Reduce Pesticide Use and Improve Effectiveness on F.E. Warren Air Force Base.”

**Nathanielsz, Peter, and Matthias Schwab:** \$147,188 from Jena University Hospital for “Impact of Prenatal Stress on Brain Ageing.”

**Scasta, John:** \$15,617 from U.S. Department of Agriculture (USDA) Agricultural Research Service for “Quantifying Ecological Dynamics and Herbivore Impacts in Thunder Basin.”

**Schumaker, Brant:** \$35,130 from USDA Animal and Plant Health Inspection Service for “Brucellosis Diagnostic Testing 2016.”

# Videos

By Ann Tanaka | June 2016

**White Top, an Invasive Weed**

**From the Ground Up | Gardening Tips**

# Women in STEM 2016

By Ann Tanaka | June 2016

Cell phones allowed. Seventh-, eighth- and ninth-graders from across Wyoming used cell phones for science May 17 during the Women in STEM (Science, Technology, Engineering, and Math) conference at UW. John Willford, an assistant lecturer in molecular biology, Holly Steinkraus, instructional laboratory coordinator, and Rachel Coleman, a recent chemical and molecular biology graduate, presented a workshop where students snapped photos of fungus, bacteria, leaves, flowers, and seeds through dissecting, light field, and dark field microscopes. The images were projected, and the best won prizes (freeze-dried ice cream and stuffed toy paramecia).









[slickr-flickr tag="2016WomeninSTEM" captions="on" descriptions="on" ]



# Coat Couture

By Ann Tanaka | June 2016

Department of Family and Consumer Sciences fiber arts students presented their art to wear designs during an exhibit opening May 6 at the American Heritage Center Loggia. The exhibit is open to the public through August 19.

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# Nutrition, food safety educator serves southeast Wyoming

By Ann Tanaka | June 2016



*Julie Balzan*

A nutrition and food safety educator joined the Platte County office of University of Wyoming Extension June 1.

Julie Balzan will be based in Platte County and also serve Albany, Carbon, Goshen, and Laramie counties.

Balzan has a bachelor's degree in home economics education and a master's degree in agricultural education, both from the University of Wyoming.

"She joins extension with expertise in utilizing research to develop and provide nutrition, food safety and preparation and wellness programming and implementation," says Kim Reaman, extension federal relations and staff development coordinator.

UW Extension is the outreach component of the College of Agriculture and Natural Resources.

# 4-H volunteer development expert joins state program office

By Ann Tanaka | June 2016



*Sarah Torbert*

4-H volunteer development specialist Sarah Torbert joined the Wyoming State 4-H Office May 16.

Torbert earned a bachelor's degree in agricultural education from the University of Wisconsin-River Falls and a master's degree in training and development from the University of Wisconsin-Stout.

Wyoming 4-H has more than 1,750 volunteers working with over 6,600 youth members.

Torbert has 14 year's experience working with 4-H volunteers through extension programs in Wisconsin and Missouri, notes Kim Reaman, University of Wyoming Extension federal relations and staff development coordinator.

Torbert also worked with volunteers in the Girl Scout program in Wisconsin, Reaman added.

4-H is the youth arm of University of Wyoming Extension, and its state offices are in the College of Agriculture and Natural Resources.

# State forage field day June 14 at Sheridan research center

By Ann Tanaka | June 2016



*Anowar Islam leads a forage discussion.*

Forage production and management and tools to help alfalfa and forage growers produce the best possible yield and quality are part of the Wyoming Forage Field Day Tuesday, June 14, at Sheridan.

The fifth-annual event is 8 a.m.-4 p.m. at the Sheridan Research and Extension Center (ShREC) at Sheridan College.

University of Wyoming Extension forage specialist Anowar Islam said the event is farmer-focused, “especially for those who want alfalfa and improved forages in their cropping/animal production systems and improve yield, quality, and profitability.”

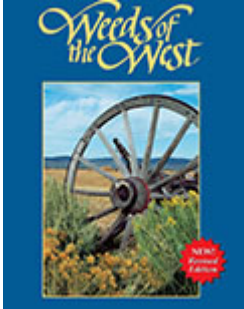
Full program details are at [bit.ly/forageday](http://bit.ly/forageday).

There are more than 13 presentations, ranging from 10 to 40 minutes. A panel of producers is in the afternoon and machinery and equipment demonstrations end the day.

Register by calling ShREC at 307-673-2856 or at [shrec@uwyo.edu](mailto:shrec@uwyo.edu), or contact Islam at 307-766-4151 or [mislam@uwyo.edu](mailto:mislam@uwyo.edu).

# Hundreds of weeds identified in free ‘Weeds of the West’ ePub

By Ann Tanaka | June 2016



Pigweed, dogbane, and horsetail are among plants featured in the free downloadable “Weeds of the West,” a guide to more than 350 species found around the home, farm and ranch.

The guide, available as a pdf or ePub at [bit.ly/weedswest](http://bit.ly/weedswest), aids in identifying species that compete with native plants, horticultural and agricultural crops or are toxic to livestock and people.

Entries include descriptions, habitats and characteristics for weeds growing in all western states, including Hawaii. More than 1,000 photographs show early growth stages and mature plants, plus important features for identification.

Abundance and ability to reproduce, compete and spread rapidly often characterize weeds. According to the editors, the “weed” label does not mean a plant is always undesirable or cannot be beneficial under certain circumstances.

They give as examples species undesirable on grasslands for livestock as being valuable wildlife forage or habitat elsewhere. Some species poisonous to livestock are valued as ornamentals, and some nearly universally unappreciated weeds may help reduce soil erosion on disturbed sites.

Published by the Western Society of Weed Science, Cooperative Extension of the United States, and the University of Wyoming, “Weeds of the West” is one of more than 500 guides and how-to videos available from University of Wyoming Extension (see [bit.ly/UWEpubs](http://bit.ly/UWEpubs)) covering livestock, wildlife and Wyoming open spaces, plus gardening, estate planning, energy planning and other topics.

For more on weeds, see “Wyoming Weed Watchlist,” “Cheatgrass Management Handbook,” and “Weed Control in Gardens and Lawn.”

# Farm manager joins UW Sustainable Agriculture Research and Extension Center

By Ann Tanaka | June 2016



*Kevin Madden*

Kevin Madden began April 30 as farm manager at the James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC) near Lingle.

Madden brings experience as an owner, operator, and manager of a family production farm and ranch in Potter, Nebraska, notes SAREC director John Tanaka.

Madden will manage irrigated and dryland crops, rangelands, and livestock at SAREC. He will also help coordinate off-site research and extension activities on the center.

Madden earned a diploma in center pivot sprinkler irrigation service/installation from Western Nebraska Technical College in Sidney and holds a Nebraska special electrician irrigation equipment license. He has also worked as a federal crop insurance adjuster.

For more information, contact Madden at 307-837-2000 or [kmadden1@uwyo.edu](mailto:kmadden1@uwyo.edu).