

March 2016

AGADEMICS

MARCH 2016



COLLEGE OF
AGRICULTURE AND
NATURAL RESOURCES

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Videos

By Ann Tanaka | March 2016

[Snow Mold | From the Ground Up](#)

[Backyard Chickens| From the Ground Up](#)

[Targeting Conservation Easement Purchases to Benefit Wildlife, Wyoming Open Spaces Initiative](#)

[Residential Development Effects on Firefighting Costs in the Wildland Urban Interface](#)

[Garden Snow Fencing | From the Ground Up](#)

[Storing Seeds | From the Ground Up](#)

Publications

By Ann Tanaka | March 2016

These publications are available as webpages (html), ePubs and PDFs.

[E3A Series: Ground Source Heat Pump](#)

[E3A Series: Solar Hot Water Applications for the Home, Farm, or Ranch](#)

[E3A Series: Solar Electricity for the Home, Farm or Ranch](#)

[E3A Series: User's Guide Assessment and Fact Sheets](#)

[E3A Series: Small Wind Energy Applications for the Home, Farm, or Ranch](#)

[E3A Series: Irrigation Efficiency](#)

[E3A Series: Energy Management for Home](#)

[Insects in Wyoming Alfalfa](#)

[Wyoming Pesticide Applicator Certification Core Manual](#)

Calendar

By Ann Tanaka | March 2016

March 8: Sizzling Skillet Suppers, 6-8:30 p.m., Newcastle High School

March 9: ServSafe Training, 8:30 a.m.-4:30 p.m., Sundance Courthouse Community Room

March 14: Keepers, 6-8:30 p.m., Sundance High School

March 19: 4-H Carnival, 1-6 p.m., Cheyenne, at the Laramie County Community College

March 19-20: Wyoming Bee College, Cheyenne, at the Laramie County Community College

March 23: ServSafe Training, 8:30 a.m.-4:30 p.m., Gillette, at Campbell County Public Health

March 24: Keepers, 6-8:30 p.m., Gillette, at Westwood High School

Department of Molecular Biology Seminars

By Ann Tanaka | March 2016

Fridays, 2:10-3 p.m., Animal Science/Molecular Biology building, room 103 -

March 4: "Host: Pathogen Interactions without a Host or a Pathogen," Vincent Starai, University of Georgia

March 11: "Assembling a Germ Cell Niche during *C. elegans* Embryogenesis," Jeremy Nance, New York University School of Medicine

March 25: "Therapeutic Potential for SHIP1 Inhibitors in Cancer and Obesity," William Kerr, SUNY Upstate Medical University

Changing Faces, Changing Places

By Ann Tanaka | March 2016

Welcome:

Allison, Karen: UW Extension, State 4-H Office, administrative assistant (3/1)

Eberle, Carrie: Plant Sciences, James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC), assistant professor (2/1)

Gillespie, Sunny: Crook County UW Extension, administrative assistant (2/15)

Hauptman, Blake: Crook County UW Extension, SMRR area educator (3/1)

Farewell:

Ibarra, Josie: Sweetwater County UW Extension, Nutrition & Food Safety educator (2/29)

Kettner, Callie: Carbon County UW Extension, Nutrition & Food Safety educator (2/12)

Proposals submitted

By Ann Tanaka | March 2016

Cardinal, Linda, and Enette Larson Meyer: \$5,000 to Medical Nutrition Practice Group for “Pattern of Human Cutaneous Vitamin D Synthesis in a Moderate Altitude, High Latitude Mountainous Region.”

Crane, Kelly: \$23,100 to Utah State University for “Western Sustainable Agriculture Research and Education (WSARE) Wyoming Development Program 2015-2016.”

Ernest, Holly: \$55,764 to Wyoming Wildlife Foundation for “Mule Deer Population and CWD Genomics,” \$28,754 for “Investigating Statewide Wyoming Pronghorn Population Genomics,” \$57,002 for “Wyoming Statewide Bighorn Sheep Population Genetics,” \$149,882 to Safari Club International Foundation for “Population Genomics and Disease Ecology of Pronghorn in Wyoming Landscapes,” and \$99,930 for “Statewide Population Genomics of Mountain Lions in Wyoming.”

Kniss, Andrew: \$8,500 to Winfield Solutions LLC for “Formulation and Adjuvant Research (Continuation).”

Mealor, Brian: \$33,000 to Wyoming Game and Fish for “Evaluating the Use of Threshold Concepts for Improving Habitat through Cheatgrass Management.”

Munoz-Gutierrez, Juan: \$5,000 to Wyoming Community Foundation for “Prevalence of Cervid Adenovirus in Wyoming.”

Norton, Jay, and Terry Booth: \$26,120 to Bureau of Land Management (BLM) for “Riparian Wetland Soil Quality as Affected by Grazing Exclusion.”

Norton, Jay, and Jessica Davis: \$24,500 to Wyoming Department of Agriculture for “Harnessing the Sun to Produce Fertilizer On-Farm.”

Norton, Jay, Karen Vaughan, George Jones, Robert Vaughan, John Likens, Sam Cox, and Terry Booth: \$25,000 to BLM for “Developing an Inventory and Monitoring Framework of Herbaceous Riparian Wetlands in the National Trails Management Corridor of the Upper Sweetwater River Basin, Wyoming.”

Norton, Urszula, Linda Van Diepen, and Jay Norton: \$150,000 to National Science Foundation (NSF) for “New Insights to Terrestrial Soil Organic Matter Stabilization Following Massive Scale Insect-Induced Forest Die-Offs.”

Rashford, Benjamin, Dannele Peck, Roger Coupal, John Ritten, Robert Godby, and Shannon Albeke: \$1,856,255 to NSF for “Integrating Sustainable Social, Ecological and Technological Innovation for Achieving Global Climate Stabilization through Negative CO2 Emission Policies.”

Zhu, Mengqiang: \$540,000 to U.S. Department of Energy (DOE) for “Impacts of Complexing Ligands and Natural Organic Matter on Technetium (VII) Reduction by Fe (II) Species.”

Zhu, Mengqiang, and Dongsheng Li: \$475,322 to U.S. DOE for “Nucleation, Growth, and Aggregation of Todorokite Nanoparticles from Both Geochemical and Materials Science Perspectives.”

Monies awarded

By Ann Tanaka | March 2016

Bastian, Chris, Leonard Smutko, Chian Jones Ritten, Amy Nagler, and Bridger Feuz: \$65,045 from U.S. Department of Agriculture (USDA) Agricultural Marketing Service for “Can We Help Producers Bargain for a Better Price.”

Bittner, Mark: \$3,500 from Wyoming Department of Education for “Enhancing Nutrition and Sustainability Concepts in Preschool through Gardening.”

Dhekney, Sadanand: \$28,732 from National Institutes of Health (NIH) for “DRRP Subaward - Studying Grapevine Cellular and Physiological Response to Abiotic Stress.”

Ehmke, Cole: \$24,500 from Wyoming Department of Agriculture for “A Guide to Specialty Crop Value Added Food Processing in Wyoming.”

Kniss, Andrew, Cynthia Weinig, and Brent Ewers: \$500,000 from USDA National Institute of Food and Agriculture for “Systems Analysis of Shade-Avoidance Responses as a Mechanism of Crop Yield Loss Due to Weeds.”

Levy, Daniel: \$239,655 from NIH for “Integration of Xenopus Extract and Microfluidics to Study Organelle Size Scaling - 2016-2017.”

Mealor, Brian: \$6,000 from Bayer Inc. for “Research and Extension in Invasive Weed Management.”

Nathanielsz, Peter: \$1,380,053 from NIH for “Mechanisms of Placental, Fetal Brain and Renal Outcomes of IUGR - 2016-2017.”

Wall, Daniel: \$268,850 from NIH for “Yr. 5 Protein Exchange and Self Recognition in Myxobacteria Biofilms.”

Organized organics

By Ann Tanaka | March 2016

More than 80 registered for the third annual High Plains Organic Farming Conference, held February 23-24 at Laramie County Community College in Cheyenne. Producers learned about the National Organic Program the first day, and second-day sessions focused on production, including producer presentations. [Subject and presenter](#) information is available.

[slickr-flickr tag="2016 High Plains Organic" captions="on"]

32 and counting

By Ann Tanaka | March 2016

The 32nd annual Fremont County Farm and Ranch Days in Riverton February 12-13 hosted more than 30 sessions plus private applicator pesticide classes in the Armory Building. Topics ranged from iPad technology on farms and ranches to fertilizer rates and agricultural marketing. View the [agenda](#) for all the topics and presenters.

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Worland's WESTI Ag Days presents 38 sessions

By Ann Tanaka | March 2016

The 2016 WESTI (Wyoming Extension's Strategically and Technologically Informative) Ag Days in Worland presented 38 sessions Friday and Saturday, February 19-20.

Sessions Friday focused on production agriculture, while Saturday session subjects were small-acreage and horticulture. The Washakie County Cowbells, as they have at past WESTI Ag Days, cooked lunches both days.

Experts from the University of Wyoming Extension and College of Agriculture and Natural Resources and from many private businesses and government agencies presented information. See the [agenda](#) for a complete listing of subjects and presenters.

UW Extension and the Washakie County Conservation District hosted the event.

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Lamarck, Darwin would probably high five each other despite theory chasm

By Ann Tanaka | March 2016



Steve Ford, professor and Rochelle Chair of reproductive biology and fetal programming at UW and director of the Center for the Study of Fetal Programming

Mentioning Jean Baptiste Lamarck and HIS theory of evolution during the celebration of Charles Darwin's birthday February 12 might have drawn snickers from the "survival of the fittest" faithful.

After all, didn't Lamarck suggest organisms altered their behaviors in response to environmental changes and that changed behavior in turn modified their organs and then those traits were passed along to their offspring?

Ridiculous, say Darwinists, who have the dour claim individuals are fixed and unchanging.

Not so fast, according to Steve Ford, professor and Rochelle Chair of reproductive biology and fetal programming at the University of Wyoming. He probably won't call for celebrating Lamarck's birthday (he was born August 1, 1774), but Ford's epigenetics work with University of Wyoming sheep validate at least some of Lamarck's concepts.

Lamarck vs. Darwin

Lamarck's 18th century theory says organisms get more complex as time passes and an organ is lost if not used. If that organ or an organ with a different function is needed later, that would develop. Darwin did agree with the organ description, notes Ford.

"The big difference between Darwin and Lamarck was Lamarck's theory was user or person friendly," he says. "It suggests an organism could control it's own fate."

Lamarck theorized an organism is driven by an inner need. And this is where snickers start among the Darwin crowd. A giraffe with a short neck would keep stretching to reach higher leaves, its neck becoming progressively longer, and that trait was passed on to offspring.

It wasn't as simplistic as that, says Ford.

"His hypothesis did suggest, however, that an organism directly controlled beneficial phenotypic changes in its offspring," he says. "The offspring would be improved based on the environment in which its parents were subjected."

Ford noted Lamarck's thesis was that the environment in which an animal was subjected could alter traits expressed by offspring. Not millennia ahead, but that the mother could somehow send the information to its offspring during development.

That's not on Darwin's timescale.

Center's Commitment

Ford, with Peter Nathanielsz, helped establish the Center for the [Study of Fetal Programming](#) at UW in 2002. The center has a double mission, a commitment to developing understandings leading to the production of healthy, high-quality livestock while at the same time applying this understanding to improve the health and longevity of human babies.

Nathanielsz is the core scientist and Distinguished Professor of Life Course Health at the Southwest National Primate Research Center in San Antonio, Texas, and a faculty member in the UW Department of Animal Science.

In 2013, National Institutes of Health awarded a five-year, \$1.5 million grant to Ford for research to find ways to stem obesity, now classified as a disease, in the U.S. and around the world.

“Some of the experiments we’ve run suggest you could change an individual’s phenotype in the next generation, and you can do that because the environment will change the way genes are expressed,” says Ford.

Genes can be turned on or off - or silenced - a variety of ways, like a series of switches. The phenotype is changed - not an organism’s DNA.

Epigenetics Piques Interest

Epigenetics, the study of the biochemical reactions that activate and deactivate parts of a genome at strategic times and in specific locations, was in its infancy when Ford joined UW in 2001.

Trained in classic genetics concepts, Ford was trying to convince himself one way or another whether an altered in utero environment could permanently change gene expression patterns in their fetus when he conducted the UW sheep experiment involving animals with the same genetic background but living in two extreme environments.

“I thought I’d see a little effect but not the effect I saw over that relatively short period of time,” he says. “That experiment really got me interested in epigenetics.”

A portion of the UW sheep flock was separated more than 30 years ago, some staying at UW and living in relative luxury, and the other sent off to the harsh conditions of the Baggs area in south-central Wyoming. The Baggs sheep not only survived, but their offspring thrived.

The mothers responded to the harsh conditions by modifying the fetuses so they could survive in those conditions. Even though its mother was being severely undernourished during pregnancy, its lamb when born was healthy and vigorous and developed normally throughout its lifespan.

Gene Expression at Work

Ford believes environmentally induced epigenetic changes in gene expression were at work in an attempt to optimize offspring survival.

He determined from this study that, in a few generations, the Baggs sheep had altered their placental structure and function, increasing nutrient transport from mother to fetus so the fetus developed normally in a mother who was severely nutritionally deficient.

“That is Lamarckian because it suggests to me the placenta is able to change its phenotype in response to a nutrient-deficient maternal environment,” he says.

Ford and his collaborators hypothesize a signal from the fetus and/or mother is responsible for altering

placental phenotype, and that this is transmitted across generations epigenetically.

Environmentally induced changes in offspring phenotype would allow a relatively rapid (on an evolutionary scale) adaptation of an organism to a new and potentially stressful environment.

“While the specific environmental cues which facilitate these phenotypic changes are at present unknown, we have confirmed that they are passed on from mother to offspring to increase its chances of survival,” notes Ford.

The specific mechanisms involved are under study.

Earn a “degree in bees” at Wyoming Bee College

By Ann Tanaka | March 2016



Registration is open for University of Wyoming Extension’s 2016 Wyoming Bee College Saturday and Sunday, March 19-20, at Laramie County Community College in Cheyenne. (See bit.ly/BeeCollege.)

The \$75 conference fee includes all conference meals, drinks, and snacks. There is no charge for Bee Buddy children under 14 accompanied by an adult.

“The 2016 Wyoming Bee College is open to everyone,” says Catherine Wissner, extension horticulture specialist for Laramie County. The program is for beekeeper “want-a-bees,” experienced beekeepers and anyone who wants to learn to help pollinators, she says.

Bee College presenters include beekeepers and business owners, researchers, professors, and chefs. “They bring lots of enthusiasm for helping our pollinators,” says Wissner.

Registration starts at 7:45, followed by a welcome from the American Honey Queen and a keynote address at 8:20 by Tony Landretti of Rice’s Honey in Greeley, Colorado, on the importance of buying honey from a known source.

The keynote speaker on Sunday is Jamie Strange, USDA Agricultural Research Service entomologist and contributing author of the Federal Pollinator Action Plan. Strange presents an update on national efforts to help all pollinators, including the monarch butterfly.

Bee College offers bee identification and a native plant program and helps citizens recognize the importance of pollinators native to the Rocky Mountain region.

Gardeners can learn about native plantings and rain gardens to help conserve water and land.

For small- and large-acreage land owners, developing plant diversity is important. Bee College offers techniques for habitat development and land conservation and maintenance, including why and what seed mixes or plants to use to help bird and insect species go from surviving to thriving.

For agriculture producers, Bee College addresses agriculture’s interaction with pollinators and native bees.

Beekeepers already know beekeeping is more than adding bees to hives. Bee College offers advanced beekeeping topics on bee health, honeybee nutrition and bee behavior. A marketing component is designed for those seeking to add value to their honey-related products.

Beekeeping 101 helps prepare new beekeepers for success.

Says 2013 Bee College graduate Kim Withers, CEO of Meridian Trust Federal Credit Union in Cheyenne, “This is one of the best courses I’ve ever taken. When I was first called a beekeeper after my first year of beekeeping, it was one of the greatest moments of my life.”

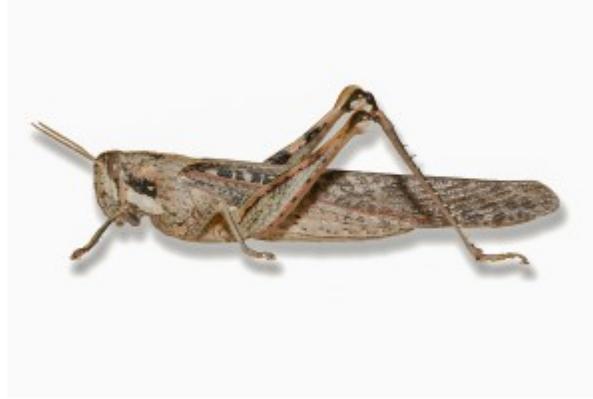
For those attending Bee College from out of town, the historic Plains Hotel offers a special \$85 per night

room rate. They can be contacted at (307) 638-3311.

For more information on 2016 Wyoming Bee College, contact Catherine Wissner, University of Wyoming Extension, at (307) 633-4383 or cwissner@uwyo.edu.

Extension entomologist says warmer climate may boost locust plagues, grasshopper numbers

By Ann Tanaka | March 2016



Schistocerca nitens

University of Wyoming Extension entomologist Alex Latchininsky says a wetter, warmer climate may contribute to future locust outbreaks like that harassing Argentinians and could also boost future grasshopper infestations in Wyoming and the west.

Officials says Argentina is facing its largest plague in more than half a century, with the New York Times this month reporting farmers last year sighted locust clouds more than 4 miles long and nearly 2 miles high.

The locust species causing havoc in Argentina is the South American locust, *Schistocerca cancellata*, noted Latchininsky. Because of the crops it feeds upon, economic importance is very high.

Latchininsky, as professor in the Department of Ecosystem Science and Management, was asked by the Weather Channel how climate change may affect future locust outbreaks and how insufficient control efforts contribute. Stories also appeared in [KRCU Radio](#) in Iowa and [Harvest Public Media](#) in Missouri.

Latchininsky is also an international consultant for the Food and Agriculture Organization of the United Nations, and advises agencies in the United States on grasshopper control and monitoring.

Climate change may influence the South American locust in two ways, he says.

More abundant rains in its breeding areas could trigger an outbreak, says Latchininsky.

“When it is dry, only one annual generation instead of three develops,” he says. “Higher temperatures may allow the locust to occupy more areas to the south and expand its range.”

He says some locust species (for example, the Moroccan locust *Dociostaurus maroccanus*) in Central Asia expanded its distribution ranges to the north because of warmer temperatures.

Grasshoppers in Wyoming could also get a climate-change boost, developing faster and producing more offspring, Latchininsky says. Some Western Hemisphere subtropical grasshoppers have expanded their ranges northward like the Moroccan locust.

The gray bird grasshopper *Schistocerca nitens*, whose northern-most boundary has been south Texas, was spotted several times in Wyoming near Cheyenne and Lusk.

“This shows the great migratory potential of these grasshoppers,” Latchininsky says. “Like locusts in the Old World, they can expand their ranges to the north when temperature rises.”

Locust swarms from South or Central America invading Wyoming is unlikely, he says, but last year showed an upsurge of the native grasshopper numbers in the state.

In a couple of years, that may lead to a widespread grasshopper outbreak in Wyoming similar to that in 2010 when over 6 million acres of rangelands were protected from these pests, which is equal to 10 percent of Wyoming, Latchininsky says.

As for South America, efficient monitoring systems should be established in the South American locust's traditional breeding areas in the north of Argentina for control, advises Latchininsky. Some of those areas are hard to access and are insufficiently monitored.

"It is extremely hard to control swarms when they develop because they move fast and, even if they are sprayed, the females may have already laid eggs, so the high densities will persist in the future," he says.

He advised breeding areas should have anti-locust treatments, against early-instar hoppers.

"Some or even many of those initially developing, high-density populations remained unnoticed in Argentina because of insufficient surveys, which resulted in developing a locust plague," he says.



UW Extension entomologist Alex Latchininsky, left, is an international consultant for the Food and Agriculture Organization of the United Nations and advises agencies in the United States on grasshopper control and monitoring.

University of Wyoming Horse Judging Team finishes as top 9 team

By Ann Tanaka | March 2016



The University of Wyoming Horse Judging team, coached by Jenny Ingwerson, finished top 9 team (out of 24) in performance at the American Quarter Horse Association Congress collegiate horse judging contest last October in Columbus, Ohio. Kaitlin Pittman took top 6 in senior college individuals in performance out of 94 entries.

Left to right are Julia Wickerath, Kaitlin Pittman, Anna Bertani, Hanna Caiola, and Katherine Sage.

Agricultural Experiment Station presents research awards

By Ann Tanaka | March 2016

The professor who is head wrangler at the Wyoming Worm Lab and an assistant professor gaining national attention for grapevine research received research awards from the Wyoming Agricultural Experiment Station.

The awards were presented in February on the UW campus during the WAES research and extension centers planning conference.

“What can I say?” notes Bret Hess, associate dean of research in the College of Agriculture and Natural Resources and WAES director. “This year’s award winners epitomize the quality, depth, and breadth of research being conducted by our college’s fantastic faculty and students. “

Professor David Fay received the Outstanding Research Award. His Wyoming Worm Lab uses the nematode *C. Elegans* to gain insight into how genes and the proteins they encode control fundamental molecular and cellular processes during animal development. He received his Ph.D. in molecular biology and biochemistry from Yale University in 1995, and in 2001 joined the Department of Molecular Biology in the College of Agriculture and Natural Resources.

Fay is director of the Wyoming INBRE Developmental Research Project Program at UW.

Sadanand Dhekney received the Early Career Research Award and is based at the Sheridan Research and Extension Center. His research focuses on grapevine genetic improvement. He received his Ph.D. in horticulture from the University of Florida in 2004 and in 2012 joined the Department of Plant Sciences at UW.

Dhekney was recipient of the 2013 Society for In Vitro Biology Young Scientist Award.

Professors KJ Reddy and David Legg in the Department of Ecosystem Science and Management were recognized as having the top faculty story in the college’s research magazine *Reflections*. *Reflections* is a WAES publication.

Their article titled “From wallpaper and green dresses and across the centuries to your well water” details how arsenic has affected humans, from being used as pigment in cloth to contaminating groundwater in the modern-day West.

Entomology master’s student Lawrence Haimowitz was recognized for having the top student story in *Reflections*. He wrote “Tiny wasps take big bite out of bark beetle populations.” His adviser is Professor Scott Shaw in the Department of Ecosystem Science and Management.

More photos available on [Flickr](#).



Molecular biology Professor David Fay was presented the Outstanding Research Award during the Agricultural Experiment Station's annual research awards banquet. Fay is director of the Wyoming INBRE Developmental Research Project Program.



Sadanand Dhekney received the Early Career Achievement Award. Dhekney is an assistant professor of horticulture in the Department of Plant Sciences and is based at the Sheridan Research and Extension Center.



Professors KJ Reddy and David Legg in the Department of Ecosystem Science and Management were honored for having the top faculty story in Reflections magazine. From left, AES director Bret Hess, Professor and department head Scott Miller, Frank Galey, Dorothy Yates, David Jones, vice president for academic affairs, Reddy, Legg.



Entomology master's student Lawrence Haimowitz received the award for top student story in Reflections magazine. From left, AES director Bret Hess, Professor Ann Hild, interim associate provost, Haimowitz, adviser Professor Scott Shaw, and Associate Professor Mark Stayton, interim associate dean.