

UW COLLEGE OF AGRICULTURE AG NEWS

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Dear Friends and Colleagues,

I hope this finds you well. The spring started with a good shot of moisture statewide. With luck, we all will have received much-needed moisture as this reaches you. The College of Agriculture has been working on a couple of projects in addition to our staples of teaching, research, and extension. Those projects include securing funds for our programs and building our Sustainable Agriculture Research and Extension Center (SAREC) near Lingle.

The two major sources of steady funding for this college are the state of Wyoming and the federal government through U.S. Department of Agriculture (USDA) research and extension funds. At the time of writing this, the state budget just passed and is very generous to the University of Wyoming. That budget provides increases in salary dollars for faculty and staff members that will be a tremendous aid in recruiting and retaining quality employees. Much-needed augmentation for our service functions at the Wyoming State Veterinary Laboratory, SAREC, and the Cooperative Extension Service is also proposed. The state's support is much appreciated and will allow us to better accomplish our mission to serve you.

Some might remember the federal administration's attempt last year to eliminate the USDA's base support for research to land-grant colleges. That effort was turned back by an overwhelming majority in Congress, including all three of Wyoming's delegates; however, the administration has again attempted to curtail USDA support for research this year. As I mentioned last year, the research support accounts for almost 10 percent of our entire budget. Loss of those funds could cost us faculty positions, staff positions, graduate student support, and possibly even a research and extension center. I have been involved in nationwide efforts to again, with all of your support, get that funding reinstated.

I had the opportunity to spend time with our SAREC advisory board. The center's building projects are largely on schedule, and we hope to move into our new offices near Lingle by late spring. Facilities we are building include an office building, dry laboratory/meeting area, workshop, livestock working facility, a feedlot that will accommodate both sheep and cattle, and an agriculture hazard storage area. In addition, Wyoming's legislators in Washington, D.C., have secured support for additional facilities at the center. Those facilities will be in the planning stages later this year.

In this issue, you will find articles about UW entomologists helping Hawaii deal with a grasshopper invasion, medical research using caterpillars, applying remote sensing and other spatial technologies to help producers, this college's continued research about prion diseases like chronic wasting disease of deer and elk, how one supporter is helping "Cowboy Joe's" handlers, and how ag college researchers are assisting in a biodiesel feasibility study.

Have a wonderful spring. Again, thank you for your support. Please stay in touch with your College of Agriculture!



Dean Frank Galey

Dean Frank Galey, College of Agriculture

"If we do what is necessary, all the odds are in our favor."

Henry Kissinger

UNIVERSITY
OF WYOMING

USDA seeks UW grasshopper expertise

By **Steven L. Miller, Senior Editor**

Office of Communications and Technology

A small, craggy Hawaiian island being denuded by grasshoppers and causing endemic plants, animals, and insects to face possible extinction prompted the U.S. Department of Agriculture to ask UW College of Agriculture grasshopper experts for help.

Alex Latchininsky, assistant professor, and Jeff Lockwood, professor, in the Department of Renewable Resources, traveled to Hawaii in April last year to meet with 10 other consultants examining events on Nihoa Island.

“We were brainstorming for two days to try to figure out if the situation was a threat and, if a threat, what should be done,” says Latchininsky.

Nihoa Island, about 250 miles from the main Hawaiian Islands, is part of a chain extending northwest. The island, which stretches about 1,500 yards east and west and varies from 300 yards to 1,000 yards wide, has an area of only 156 acres. The craggy mass of rock hosting a menagerie of rare species is under the Hawaiian Islands National Wildlife Refuge supervision. Erosion of the dormant volcanic peak has created steep slopes, and there are only two to three fresh water sources – described as seeps.

The problem is a grasshopper species that is found on the main islands, although it is not native there either. The

insects apparently hopped wind currents and flew the 250 miles to Nihoa.

Provisionally, the insect is identified as *Schistocerca nitens*, or “Gray bird grasshopper,” which is a distant “cousin” of the infamous Desert locust *Schistocerca gregaria* of the Old World. In 1988, huge swarms of the Desert locust crossed the Atlantic Ocean from West Africa to the Caribbean islands, showing a great migratory capacity of the insects from this genus.

“In 2004, grasshoppers ravaged the vegetation on Nihoa Island,” says Latchininsky. “There were an estimated 6 million grasshoppers eating vegetation at a rate of about 1,200 pounds per day, shearing off all the green.”

The island has abundant life. Seventy-two terrestrial arthropods, including giant crickets, and two endemic songbirds, the Nihoa finch and Nihoa millerbird, are found only on Nihoa, according to the Northwestern Hawaiian Islands Multi-Agency Education Project (<http://www.hawaiianatolls.org/about/nihoa.php>). Native endangered plants include a loulu or fan palm and ‘ohai shrub. Many of the island species can not be found anywhere else on Earth.

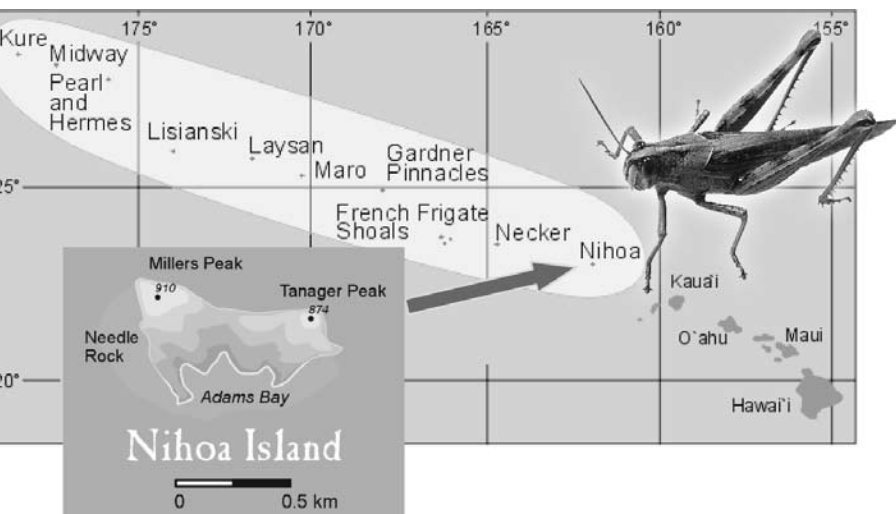
The U.S. Fish and Wildlife Service restricts visitation to protect the island’s ecosystem. Only four people at a time are allowed and their belongings must be sterilized, says Latchininsky.

“It’s hard to even land on the island because of its huge swell,” he says. “One ship waited two days before sending an inflatable boat to the island.”

The consultants had to build a working knowledge of an unknown ecosystem. Lockwood says that is done by hours of listening to descriptions, looking at photographs, studying



The Nihoa millerbird is one of two songbirds endemic to the island.



to stop Hawaiian island onslaught

imagery and maps, and asking a lot of questions.

“In a sense, the ecology of Nihoa is very simple, which helps at one level. But the lack of a complex ecological network is why it may not be particularly robust to acute disturbances or invasions – and so the ecological simplicity generates considerable complexity in terms of management. Without great care, we can do a great deal of damage ourselves in misguided efforts intended to protect the island,” says Lockwood.

The island’s wildlife characteristics shaped possible responses. Aerial spraying could kill the birds and insects endemic to the island. The release of pathogens for biological control could be worse than the grasshoppers if they infected the native species on the island.

The most viable solution, Latchininsky says, appears to be bait stations. Grasshoppers would eat poisoned bait, die, and then the traps could be removed.

Before any procedure was put in place, Mother Nature apparently intervened on behalf of the scientists and the grasshopper numbers have now decreased, according to 2005 surveys.



Schistocerca nitens ravaged vegetation on Nihoa Island



Nihoa Island has an area of only 156 acres.

A change in weather patterns could have played a part in swatting the grasshoppers, says Lockwood, along with the insect having depleted a significant portion of the food supply.

Researchers will continue to monitor grasshopper activity on the island, says Latchininsky. Lockwood adds that total eradication probably won’t happen.

“Even in the case of Nihoa, it seems that complete extirpation is unrealistic. In the vast majority of cases, we have to absorb the economic and environmental costs of managing an exotic organism,” he says. “This is why the USDA is so fervent in its few, strategically chosen efforts to eradicate new pests such as the Mediterranean fruit fly – the long-term costs of living with the damage is staggering. As entomologists, we have few tools with the tactical precision to make a surgical strike on a particular pest species that is mixed in with native or desirable elements of the fauna. With a few pests (e.g., the Mediterranean fruit fly), we have developed species-specific monitoring methods that allow broad-spectrum control programs to spatially target areas of infestation. But, as you can see, even this is a rather crude approach to eliminating a single pest species within an ecosystem.”

Free remote sensing data gives producers

By **Steven L. Miller, Senior Editor**

Office of Communications and Technology

Few if any producers in Wyoming have a beefy enough bank account to build, launch, and operate a satellite to detect in advance potential insect and weed infestations, water supply problems, or rangeland conditions.

They don't have to.

Ramesh Sivanpillai is looking for every opportunity under the wide Wyoming skies to let others know he's got a free service and will show how to use that service. Sivanpillai, remote sensing scientist with the Wyoming Geographic Information Center (WyGISC) located in the College of Agriculture, wants producers to know how remote sensing can help their bottom line.

Remote sensing used to occupy a lonely landscape. The U.S. Geological Survey (USGS) began collecting and archiving satellite data in the early 1970s – mostly for use by the government.

"That was the problem," says Sivanpillai. "It was mostly used by the government and universities and not widely used by people."

There were reasons. Data then was expensive and was in a format most couldn't use, and one needed training to work with the images.

Eventually, a group from Ohio went to the USGS asking for a process to get data to the user in a few days rather than weeks or months. Use jumped. OhioView formed in 1997-98 and, two years later, a consortium of users created AmericaView. The service is developed and managed at the state level. WyomingView was created in 2002.

Sivanpillai has a four-pronged mission – build a consortium of users, build data archives that can be downloaded free, educate students and the workforce about the service, and use the technology in applied research.

"There are people who are sitting on the fence," says Sivanpillai. "They are not sure remote sensing will work for them – that it may be too expensive. My job is to break down the barriers."

Sivanpillai eventually found he wasn't a lone voice crying in the remote sensing wilderness – the Upper Midwest Aerospace Consortium (UMAC) was also utilizing satellite imagery. UMAC, based at the University of North Dakota and funded by NASA, uses satellite imagery and other spatial technologies to develop products and services for agriculture, natural resource management, and K-12 education.

"Their goal is the use of satellite data for the end user – farmers and ranchers," Sivanpillai notes. He began coordinating UMAC activity in Wyoming.

All objects emit electromagnetic radiation (EMR), of which light to the visible eye is a part; however, objects explode with information when satellites gaze at objects with sensors able to detect high energy and low energy EMR.

Plants are green because they absorb blue and red and reflect green, a color caused by chlorophyll. Any stress to a plant causes a change in photosynthesis, which causes a change in the shade of green, says Sivanpillai.

The changes can be noted far in advance to the human eye, he notes. "There are a lot of things happening our eyes can't see."

The system is sweet for Wyoming sugar beet producers. Remote sensing can detect a change in color of the beet leaves, which could be caused by a host of factors that could lead to lower sugar content. Fertilizer can be applied selec-



Ramesh Sivanpillai helps Madison Ellison, a senior biology student, use remotely sensed data from aircraft to estimate wheat yield on fields at the Sustainable Agriculture Research and Extension Center near Lingle.

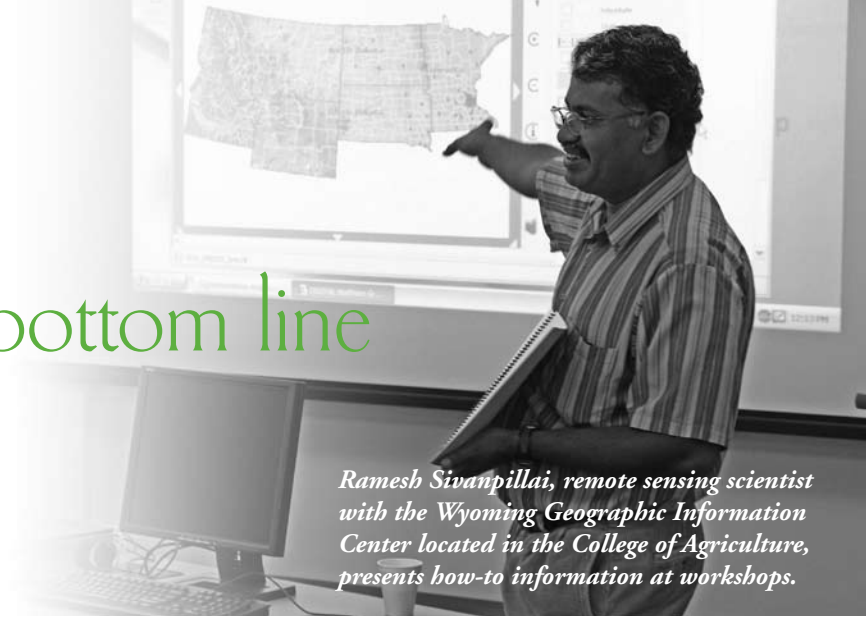
another tool to help bottom line

tively rather than over an entire crop – potentially saving producers input costs.

Farmers in North Dakota have used the technology for examining sugar beet growth. In February 2005, two North Dakota farmers who used this technology conducted three workshops jointly hosted by WyomingView, UMAC, the University of Wyoming Cooperative Extension Service (UW CES), and the Wyoming NASA Space Grant Consortium.

One Montana rancher grappling with invasive weeds used remote sensing to determine infestation locations and spot treated the areas rather than using blanket applications and saved money. Another rancher used the images to determine the amount of grass to divide his grazing allotments.

Dave Claypool, master technician with Department of Plant Sciences, is working with Sivanpillai to finesse remote sensing data for the Sustainable Agriculture Research and Extension Center (SAREC) near Lingle. Madison Ellison of Laramie, a senior majoring in biology, who was enrolled in



Ramesh Sivanpillai, remote sensing scientist with the Wyoming Geographic Information Center located in the College of Agriculture, presents how-to information at workshops.

the remote sensing course, worked with Sivanpillai and Claypool on estimating wheat yield using remotely sensed data acquired from aircraft (Airborne Environmental Research Observational Camera [AEROCam]).

The three presented “AEROCam Data for Analyzing Wheat/Weed growth in Wyoming” at UMAC’s annual meeting February in Grand Forks, North Dakota.

“SAREC allowed me to use wheat yield and weed biomass data that corresponded to an area that had aerial photos taken,” says Ellison. “The purpose of the project was to determine if there was a relationship between the amounts of wheat yield and weed biomass on the ground to the amount of vegetation in the imagery. Down the road, this might enable farmers to predict their wheat yield by looking at aerial and satellite imagery of their farms.”

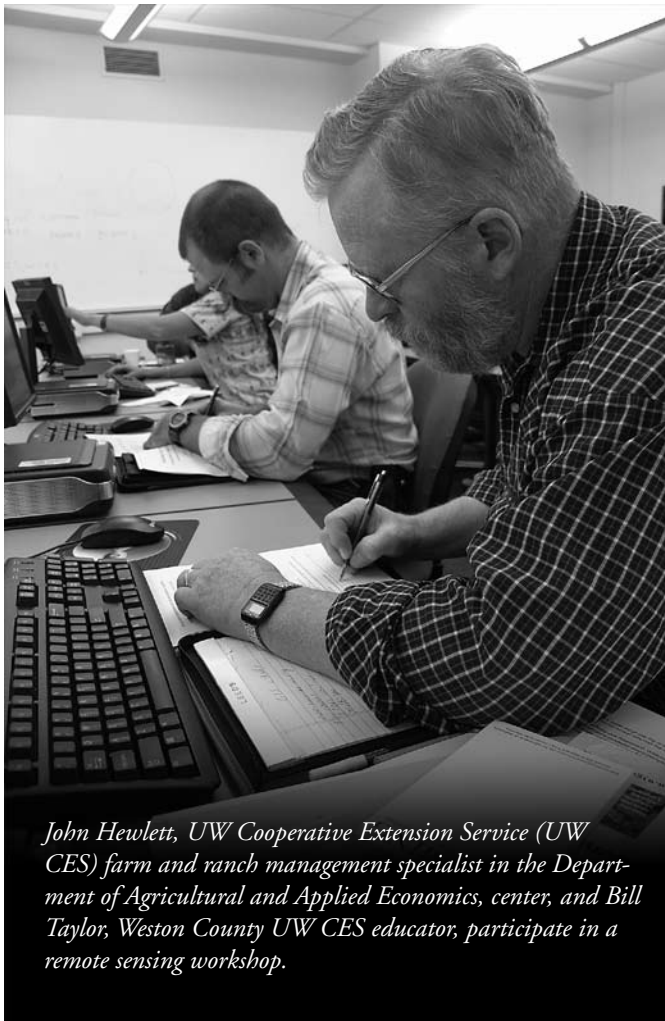
WyGISC satellite images allow researchers (and producers) to see overall trends and is accurate, says Ellison.

“Instead of several people collecting data over a certain region, one satellite image could cover the entire region, and accuracy is not diminished by different methods people use to collect data,” Ellison notes.

In addition to agriculture, these images could be used for monitoring cheatgrass encroachment, assess the impact of grazing on rangelands, map new roads and water ponds associated with drilling coal-bed methane wells, and monitoring landscapes before and after fires.

The UW CES has two computers available to producers for work with remote sensing data. One is in the Washakie County CES office and another is at the Natrona County CES office. For more information, contact Sivanpillai at (307) 766-2721.

On the Web: <http://www.wygisc.uwyo.edu/>, <http://www.wygisc.uwyo.edu/wyview/>, <http://www.americaview.org>, <http://americaview.usgs.gov/>, <http://www.umac.org/>



John Hewlett, UW Cooperative Extension Service (UW CES) farm and ranch management specialist in the Department of Agricultural and Applied Economics, center, and Bill Taylor, Weston County UW CES educator, participate in a remote sensing workshop.

UW's little Siberia contagious for learning,

By Robert Waggener, Editor

Office of Communications and Technology

Research scientist Jean Jewell walks across barren, tundra-like land between the Wyoming State Veterinary Laboratory and a small lab she calls her home away from home.

It's only 50 yards from the WSVL to the building informally called the "chronic wasting disease laboratory," but it might as well be a mile on this day as it's cold and snowy, and strong westerly winds pack a nasty bite.

"This little space is often referred to as Siberia," says the Department of Veterinary Sciences researcher before heading into the small, plain-looking building where she and her col-

leagues conduct research on chronic wasting disease (CWD).

Jewell was hired by the late Beth Williams in early 2002 to assist with several projects related to CWD.

Williams, a professor and wildlife pathologist in the veterinary sciences department at the time of her death in December 2004, is credited for having first

identified the disease. She died in a motor-vehicle crash with her husband, wildlife veterinarian Tom Thorne.

Jewell says she learned much from Williams during the short time she worked with her, and now she is trying to pass that knowledge to the next generation of scientists.

Among them is University of Wyoming graduate Sascha Rogers, a McNair Scholar from Gretna, Nebraska, who was mentored by Jewell and also Williams.

"They taught me about the ethics of research, proper measuring, and how to respect your specimens and the animals you are working with," says Rogers, who graduated in December with a bachelor's degree in zoology and physiology. She has been accepted into graduate school at the University of Alberta in Edmonton, Canada, and has been invited by her faculty adviser to partici-

pate in a 2008 population genetics study of Weddell seals in Antarctica.

At UW, Rogers investigated genetic variability in the prion protein gene in Rocky Mountain bighorn sheep to estimate possible resistance or susceptibility to scrapie.

"Because of Jean, I feel like I'm far ahead going into graduate school," Rogers says. "Jean is a thoughtful, reliable, fun-loving person. As a researcher, she is ambitious, meticulous, and passionate. She is hard working, but she loves what she does. She enjoys getting results in the lab, and she enjoys teaching students about basic lab practice."

As Rogers looks at prion protein gene sequences and organizes sequence files on her laptop computer, Jewell prepares a tissue sample from the brain of a mule deer that died of CWD.

CWD is a chronic, fatal disease of mule deer, white-tailed deer, Rocky Mountain elk, and moose. It belongs to the group of diseases called transmissible spongiform encephalopathies (TSEs), which are thought to be caused by abnormal proteins or "prions."

Among the other animal TSEs are scrapie in domestic sheep and bovine spongiform encephalopathy, also known as BSE or "mad cow" disease, in cattle.

Jewell emphasizes she made the decision to continue CWD research after Williams died because she knew it might help wildlife managers, hunters, scientists, and others.

"I have been trying to continue the projects Beth started with chronic wasting disease, and there were quite a few of them. A number of those involved outside collaborators," she says.

Jewell and a research partner, Jeremy Brown, a senior laboratory assistant in the Department of Molecu-



A tissue sample from the brain of a big-game animal is prepared for testing.



teaching others about wildlife diseases

lar Biology, are completing a study on the presence of CWD-associated prions in the muscle of deer and elk. The project was initiated by Williams.

Findings by the College of Agriculture researchers and collaborators from the Wyoming Game and Fish Department and the Colorado Division of Wildlife could be important to wildlife managers, hunters, and scientists because the muscle – which comprises meat – of big-game animals susceptible to CWD is consumed by humans.

Jewell presented preliminary research results during the annual meetings of the American Association of Veterinary Diagnosticians and the U.S. Animal Health Association last November in Hershey, Pennsylvania. She expects to publish the full results soon.

“That is a very satisfying feeling, a source of professional and intellectual satisfaction. Things like this don’t come easy, at least for me,” Jewell says. “You have to prepare the study plan, carry out the research, deal with snags that invariably come up, write the paper, and then have it pass the peer-review process. It’s an ongoing adventure.”

Previously, Jewell says, CWD had been detected in the lymph nodes and nervous systems – including the brain and spinal cord – of white-tailed deer, mule deer, and elk. Last fall, a hunter-harvested moose in northern Colorado tested positive for CWD – the first time a wild moose had been diagnosed with the disease.

In a separate project, Jewell and Karen Fox, a third-year veterinary student at Colorado State University, along with Michael Miller, a wildlife veterinarian with the Colorado Division of Wildlife in Fort Collins, have submitted for publication results of a major study Miller and Williams started 10 years ago. It is on the pathogenesis of CWD in mule deer and will describe how the accumulation of prions progresses from one tissue to another as the disease develops.

This comes on the heels of a project examining the role genetics plays in the occurrence of CWD in wild mule deer. It was completed by Jewell, Williams, Miller, veterinarian Lisa Wolfe of the Colorado Division of Wildlife, and Mary Conner, a research assistant professor at Utah State University’s College of Natural Resources.



With an eye on detail, Department of Veterinary Sciences research scientist Jean Jewell processes DNA samples extracted from deer in the small “chronic wasting disease laboratory” adjacent to the Wyoming State Veterinary Laboratory.

They found that certain mule deer were 30 times more likely to have CWD than other deer having a slightly different form of the protein that creates the disease.

Their paper, “Low frequency of PrP genotype 225SF among free-ranging mule deer (*Odocoileus hemionus*) with chronic wasting disease,” was published in the *Journal of General Virology Direct* in August 2005. It can be read in full at <http://vir.sgmjournals.org/misc/direct.shtml>. Click on the “August issue” link under 2005.

“I felt it was important to get some of the research that Beth had been working on published. It has been a struggle at times, but it has been satisfying to see some of her work come to fruition. I feel this was important to Beth and also important to me because she was very important to me. She was a highly intelligent researcher and a wonderful person.”

When it comes to knowledge being passed from one scientist to another, perhaps there is something contagious in that small stretch of tundra-like land known as Wyoming’s little Siberia.

“I gained a deep respect for Beth and had the opportunity to collaborate with a lot of very talented wildlife people. I hope to share what I have learned with others,” Jewell says.

Ag college researchers assisting in

**By Robert Waggener,
Editor**

Office of Communications
and Technology

Researchers in the Department of Agricultural and Applied Economics are participating in a feasibility study of growing oilseed crops for biodiesel in Fremont County and the Big Horn Basin.

The research will also examine the merits of adding value to the crops by pressing oil from the seeds to sell and marketing the byproduct – meal – locally as a livestock feed. Another option is building a biodiesel plant in the area to process that oil or partnering with a plant elsewhere and marketing the byproducts of the plants for livestock feed.

“There is a lot of interest in biodiesel right now in Wyoming, but there are also a lot of unknowns,” emphasizes David “Tex” Taylor, a professor in the department and a community development specialist with the University of Wyoming Cooperative Extension Service.

“Two key aspects of biodiesel are the cost of raising the oil-producing plants and the market for the residual meal, which is typically about 60 percent of the weight of the seed. That plays a huge role in the final cost of biodiesel,” Taylor says.

Also involved from the department are Roger Coupal, associate professor and interim department head; Tom Foulke, CES research scientist; and Cole Ehmke, CES rural entrepreneurship specialist.

Jim Krall, professor in the Department of Plant Sciences and agronomist at UW’s Sustainable Agriculture Research and Extension Center (SAREC) near Lingle, and Jack Cecil, a research scientist at SAREC, will provide production data and expertise in oilseed crops.



Five Fremont County agricultural producers purchased this vacant grain elevator and want to put it to good use, whether storing oilseed crops for biodiesel production and livestock feed or other value-added crops.

The feasibility study is being conducted on behalf of Wyoming Ag Marketing, a limited liability corporation owned by five Riverton-area agriculture producers who purchased a high quality but non-operating grain elevator in the county in 2002, Foulke says.

“The producers in Fremont County are interested in value-added agriculture options for the grain elevator. Oilseeds appear to present one option,” he notes.

Colorado-based Ed Dugan Trucking previously owned the three-bin, 500,000-bushel elevator complex, which was rented by Coors Brewing Company to store malt barley. The five ag producers became interested in purchasing the elevator when they heard it was going to be torn down.

“Coors ceased contracting malt barley in Fremont County, and the elevator sat vacant for several years before it received and stored Budweiser malt barley,” says producer Richard Klein, who formed Wyoming Ag Marketing with Dennis Horton, Jim Crouch, John Haggerty, and Alan Roland in an effort to buy the elevator and put it to good use.

“We wanted this valuable asset left in Fremont County,” Klein says.

biodiesel feasibility study

When Wyoming Ag Marketing bought the elevator from Ed Dugan, the group was unable to obtain a malt barley contract for the county's growers.

"That was, and continues to be, a great disappointment to our group. In the interim, we have handled confection sunflower seeds and hard red spring wheat," Klein says.

Crouch notes, "We're sure hoping we can make something work. The biggest problem we're seeing right now is the cost of production compared to the price of seed, but we feel if we can put together a vertically integrated system we can make this project a success."

The integrated system could involve growing oilseed crops, pressing the oil out of the seeds, either producing biodiesel in the area or partnering with a facility elsewhere, and developing a market for meal, a byproduct of the pressing process that can be used for livestock feed.

"You are producing a lot of it," Taylor says of the meal.

Ehmke adds, "The approximately 60 percent of the seed remaining after crushing and oil extraction – the meal – can be sold as a low-value feed ingredient in animal-nutrition markets."

Agriculture producer Klein says, "According to my computations, the profitability of the whole biodiesel enterprise rests on the value of the meal. If we had 500,000 bushels of canola seed in the elevator, that is roughly enough seed to make 1 million gallons of biodiesel and a bunch of glycerin." Glycerin is used in soap, cosmetics, creams, foods, and chemistry.

Klein continues, "If yields of canola are what they are purported to be – approximately 2,800 pounds per acre for spring-planted canola – it would take 12,000 acres of cropland to fill the elevator. That, in itself, is probably an unrealistic goal in Fremont County."

Klein, who has crunched many numbers to see if an integrated system involving oilseed crops will work in Fremont



Research Scientist Tom Foulke

County and the Big Horn Basin, says he remains cautiously optimistic and skeptical at the same time.

"I have many concerns, but I would really like to see the elevator go back to work and I'd like to fill my tractors and trucks with B-20," says Klein, referring to a blend comprised of 20 percent biodiesel and 80 percent conventional diesel.

"We have two diesel fuel distributors in Fremont County who would like to purchase biodiesel."

Professor Krall says he understands Klein's concerns.

"There are still many questions needing answers, and one or two years of crop data isn't going to provide those answers," Krall says. "I don't want people to think these crops will be the wonder crops to solve their financial problems, because they probably won't be. We just need more data to help the producers make decisions whether these crops could fit into their operations."



Professor David "Tex" Taylor



This elevator in Fremont County was used to store malting barley for Coors Brewing Company. Its new owners want to put it back to work and are awaiting completion of a feasibility study involving the College of Agriculture.

Rocky Mountain Farmer's Union coordinating biodiesel feasibility study

Rocky Mountain Farmer's Union (RMFU) Cooperative Development Center is coordinating the biodiesel feasibility study in Fremont County and the Big Horn Basin.

RMFU has hired a consultant, International Center for Appropriate and Sustainable Technology based in Golden, Colorado, to compile a final report and business plan.

College of Agriculture researchers are contributing economic analysis to the financial feasibility and marketing studies (see story on page 8).

"Rural communities are expressing a great deal of interest in alternative cropping systems to add income to their farming operations and complement their alfalfa rotations," says Bob Mailander, director of the RMFU Cooperative Development Center in Denver.

"Commodity prices have been low for alternative crops so folks have been looking for higher-value crops," he says. "What will ultimately drive this project is if we can turn a commodity like sunflowers, camelina, brown mustard, or canola into value-added products such as bio-fuels or high protein animal feed."

The project stems from a 2005 study that considered using a vacant grain elevator in Fremont County for storing and processing crops grown in the county and surrounding areas including spring wheat, pinto beans, and sunflowers. UW researchers were involved in that study as well.

"All the crops considered were commodities offering low margins. Out of that realization, we redirected the study to examine a new opportunity to grow oil-seed crops," Mailander says. "It's taking a commodity and turning it into a value-added product."

He adds, "We'll try to develop a general template from this study that will focus on the big picture of biodiesel production and, in turn, that template could be used by other communities."

The U.S. Department of Agriculture's Rural Development approved a \$24,500 grant for the feasibility study.

Also providing funds and in-kind contributions are UW (\$10,000), Wyoming Business Council (\$5,000), Fremont County Board of Commissioners (\$2,000), and Fremont County Economic Development Corporation (\$1,000).



Bob Mailander, director of the Rocky Mountain Farmer's Union Cooperative Development Center based in Denver, discusses biodiesel at a conference.



Jordanka Zlatanova

Jordanka Zlatanova, professor and head of the Department of Molecular Biology, gave the keynote address at the Chromosomes at the Nano-Era international meeting in Tokyo March 9-10.

The conference brought together physicists, biologists, mathematicians, computer scientists, bioinformaticists, and researchers from related fields

Head of molecular biology gives keynote address

trying to unravel chromatin structure in chromosomes.

Zlatanova presented "Chromatin Dynamics Studied by Single-Molecule Approaches."

"This is a lot of prestige for the University of Wyoming," she says. "I was the only speaker from the States at the conference."

Chromatin is the portion of the cell nucleus that contains all of the DNA of the nucleus in animal or plant cells. When a cell divides, chromatin compacts in distinct chromosomes that duplicate, and then separate, with an equal part of each set of chromosomes traveling to each new

cell. Six years ago, the Japanese government provided money for a consortium to use state-of-the-art technology to study chromosomal dynamics at the molecular level.

Zlatanova's department utilizes instruments that allow researchers to look at the fluorescence of individual molecules.

"This was unheard of five years ago," says Zlatanova. "We look at each individual molecule as part of the complex and how they interact with each other."

"The structure of chromosomes is something we must understand," she says. Zlatanova predicts whoever re-

solves the structure will receive a Nobel Prize.

Department of Molecular Biology post-doctoral student Miroslav Tomschik accompanied Zlatanova to the meeting.

Zlatanova also presented a seminar about UW research to the Osaka University, Department of Biotechnology, Graduate School of Engineering.

UW will begin collaboration with Kiichi Fukui, professor in Osaka University's Laboratory of Dynamic Cell Biology in the Department of Biology, with an exchange of graduate and post-doctoral students. A graduate student from Osaka will begin at UW in June.

Faculty, staff members receive honors at recognition program

Rachel Watson and **Bruce Cameron** received outstanding teacher and adviser awards, and other college personnel also received honors at the Sixth Annual Staff and Faculty Recognition Program in December.

Watson, a molecular biology temporary assistant lecturer, received the 2005 Lawrence Meeboer Outstanding Teacher Award, and Cameron, associate professor in the Department of Family and Consumer Sciences, received the 2005 Outstanding Adviser Award. Each received a \$500 cash award.

Jared Aumiller, research associate in molecular biology, received the Dean's Outstanding Staff Professional Award, and **Debbie McFaul**, a senior accounting associate in molecular biology, received the Dean's Outstanding General Staff Award. Both also received a \$500 cash award.

The nomination for Aumiller states he solves problems as they arise, and he is not only depended upon to unravel issues associated with his research projects but also his willingness to help every other member of the lab.

The nomination for McFaul states there is no of-



Bruce Cameron

fice procedure that has not been changed or upgraded during her tenure, and she has developed a scheduling system that ensures no deadline is missed or project ignored. The nomination states her cheerfulness is a major contributor to her effectiveness in dealing with and motivating faculty and staff members.

Other nominees were **Tracy Bennett**, senior accounting associate in family and consumer sciences, for the general staff award, and **Shane Thompson**, meat laboratory manager in animal science, for the professional staff award.

A subcommittee of the student Agriculture Council provided nominations for the outstanding teacher and adviser awards.

Nominees for outstanding teacher were

Professor **Dale Menkhaus** and associate professors **Ed Bradley** and **Alan Schroeder** of agricultural and applied economics, Assistant Professor **Rik Smith** of plant sciences, Professor **Larry Munn** of renewable resources, and Cameron of family and consumer sciences.

Nominees for outstanding adviser were Bradley, Professor **Dale Isaak** of microbiology, Professor **Lee Belden** of veterinary sciences, and Associate Professor **Mark Stayton** of molecular biology.

Other college and university recognitions included:

College of Agriculture Outstanding Educator awards: Professor **Michael Liebman**, family and consumer sciences, and Professor **David "Tex" Taylor** of agricultural and applied economics.

North American Colleges and Teachers of Agriculture (NACTA) Outstanding Faculty Teaching Award: Associate Professor **Sonya Meyer** of family and consumer sciences.

NACTA Outstanding Graduate Assistant Award: **Jeanne Rothaupt**, family and consumer sciences.

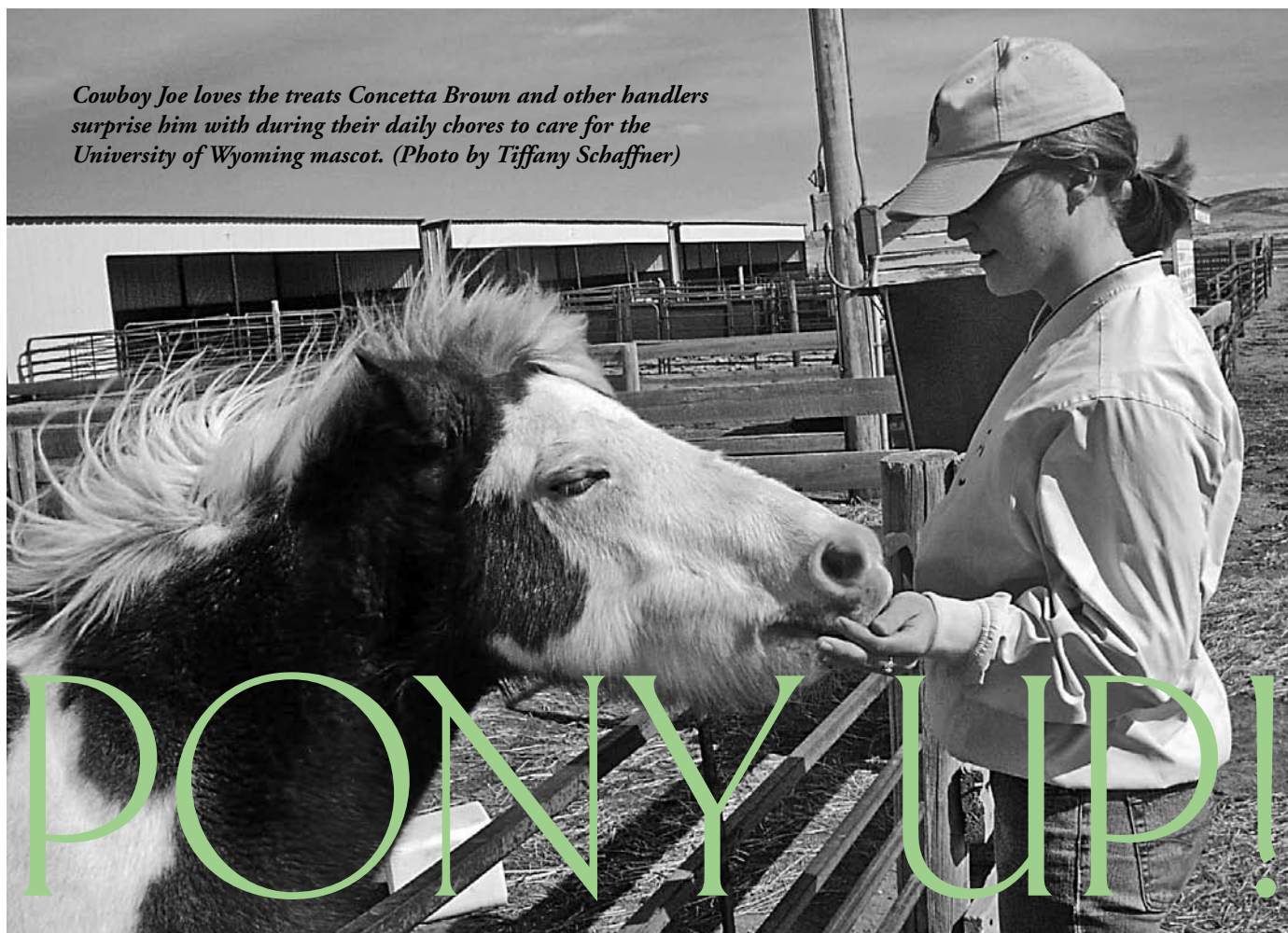
Office of Academic and Student Programs 2005 Toot Your Horn honorees: Associate Professor **Don McLeod** and Research Scientist **Tom Foulke** of agricultural and applied economics; Associate Professor **Warrie Means** and Professor **Steve Horn** of animal science; Meyer and Professor **Randy Weigel**, family and consumer sciences; and Professor **Peter Thorsness** of molecular biology.

Mortar Board "Top Profs" are Associate Lecturer **Dave Wilson** of plant sciences, Associate Professor **Paul Ludden** of animal science, Means, Menkhaus, Assistant Professor **Kari Morgan** of family and consumer sciences, and Assistant Professor **Gerry Andrews** of veterinary sciences.



Rachel Watson

Cowboy Joe loves the treats Concetta Brown and other handlers surprise him with during their daily chores to care for the University of Wyoming mascot. (Photo by Tiffany Schaffner)



College of Agriculture alum avid supporter

By Tiffany Schaffner, Intern
Agricultural Communications

How can a brown and white pony standing less than 4-foot tall be loved by so many University of Wyoming fans? For one man, it is the memory of riding the first Shetland pony ever donated to UW as its mascot, Cowboy Joe, he holds so near and dear to his heart.

“One morning while the pony was feeding, I got on its back and he bucked me off right straight into the air!” recalls Tom Davidson of his childhood years growing up on the College of Agriculture farm in West Laramie.

Davidson is an avid supporter of the Cowboy Joe pony program including the Wyoming Block and Bridle Club members who care for the pony and handle him during football games and other events.

Davidson, of Mukwonago, Wisconsin, graduated from UW in 1961 with a degree in agricultural education and science. He and his wife, Ann, annually donate monetarily to the university, but his dedication doesn't stop there. Davidson also gathers donations every year for the Cowboy Joe Club to keep the pony program kicking.

“After attending the university on a scholarship and living at the farm, I feel compelled to come back and return some of that,” Davidson says.

Davidson spent many hours feeding livestock and helping his father, Jim, at the UW farm, where Jim served for 36 years as the shepherd. At the time, the farm was at the present site of the Wyoming Territorial Prison State Historic Site.

“We learned a lot from our father as he was recognized as one of the best shepherds in the country,” remembers Davidson.

These fond memories helped draw Davidson back to Laramie and the university.

"Tom Davidson is an amazing man with tons of energy who helps support the college in every avenue possible," states Pepper Jo Six, College of Agriculture recruitment coordinator.

Davidson's contributions are making available scholarships for the Cowboy Joe handlers each year.

"Getting donations for the new Cowboy Joe mascot program has not been difficult; not only is there a lot of pride involved, but knowing there are scholarships given to the handlers is great incentive for donors," Davidson says.

This school year, five students received \$500 scholarships by being actively involved in the Cowboy Joe program.

"We would like to thank Tom for helping us further our education and making us feel appreciated," says Concetta Brown, one of the pony handlers.

Brown, a junior from Cheyenne and a rangeland ecology and watershed management major in the College of Agriculture and a wildlife management minor, has been a pony handler for slightly more than a year.



Professor Doug Hixon

and care for the pony as well as handle him during football games and special events, but the applicants need not be enrolled in an agriculture major.

"The Department of Animal Science and the Block and Bridle Club are proud to be a part of the Cowboy Joe tradition and provide the housing for the mascot, the opportunity for the handlers to gain experience with managing horses, and the opportunity to promote agriculture and Wyoming's ranching heritage," says Professor Doug Hixon, head of the animal science department.

Any UW student who is a member of the Block and Bridle Club can apply to become a handler and receive a scholarship. Handlers must maintain a 2.75 grade point average.

"You don't have to have any previous experience with horses, so we encourage anyone who is interested to submit an application," Brown says.

The Cowboy Joe handlers have worked closely with Davidson to steer the pony program in the right direction. "We really appreciate all the work Tom has done for us in helping us get the pony in the public's eye and all," Brown says.

Living in Wisconsin doesn't stop this dedicated alum from being involved in UW. About five times a year, Davidson and Ann visit Laramie and participate in various board meetings and athletic anniversaries.

(Continued on Page 14)

of Cowboy Joe handler program



"I started because it is fun. I thought it would be neat to be involved with the tradition, and the little devil is really cute," Brown says.

This school year's pony handlers and scholarship recipients include Brown; Claire Buckingham, a junior from Kaycee majoring in biology; Glenda McKim, a senior from Fallbrook, California, majoring in animal and veterinary sciences, production option; Kari Kontour of Casper, a senior majoring in English; and Laura Peltó of Cheyenne, who graduated last fall with an agricultural business degree.

A new face was added to the team for the upcoming school year – Katie Price of Wheatland, a junior majoring in agriculture business, will replace Kontour.

The Block and Bridle Club in the College of Agriculture monitors the Cowboy Joe handlers, who help feed, water,



Avid supporters of the Cowboy Joe pony program and the College of Agriculture's Wyoming Block and Bridle Club scholarship program are Tom Davidson, right, and his wife, Ann, center, of Mukwonago, Wisconsin.

Getting donations for the new Cowboy Joe mascot program has not been difficult; not only is there a lot of pride involved, but knowing there are scholarships given to the handlers is great incentive for donors.”

Tom Davidson

(Continued from Page 13)

Davidson attended UW on a track scholarship and also played freshman basketball. He now serves on the UW Foundation Board and the College of Agriculture, College of Business, and UWyo magazine advisory boards. Ann, also a UW graduate, serves on the UW Art Museum Board.

“We think it is important to come back and be a part of the university that gave so much to us,” says Tom Davidson. “The university gave me a wonderful base for my career, and the success I had in my working career can be related directly back to my degree from the College of Agriculture.”

After graduating, Davidson pursued a career in vocational agriculture education. He taught in Wyoming for five years before accepting a position with *The National Future Farmer* magazine in Washington, D.C., as its advertising manager.

Davidson then moved to Chicago where he worked for Swift & Company in its public relations department. During the next 32 years, he was employed by major national



Among the recent Cowboy Joe handlers are, from left, Concetta Brown, Glenda McKim, and Claire Buckingham, who are still with the program, and former handler Laura Peltó.

farm and consumer magazines in the Chicago area. These included *Progressive Farmer*, *Southern Living*, *Successful Farming*, *Better Homes and Gardens*, and *Good Housekeeping*.

The couple are now retired. When asked why they haven't moved back to Wyoming, he responds, “We are only 100 miles away from our five grandchildren.”

Davidson hopes to continue supporting the Cowboy Joe program for many years through his dedication and donations. He hopes, too, that alumni near and far will remember the friends they made at UW who are still a part of their lives, the education that enabled them to build successful careers, and the 4-foot-tall pony named Cowboy Joe who runs across the end zones each time the Pokes score.

“I'm very proud of this new pony program and the opportunity to help the handlers,” Davidson says.

For more information about the Cowboy Joe Club or to make a donation to the handler program, please contact the club at (307) 766-6242 or cowboyjoe@uwyo.edu.

Information about the Cowboy Joe handler program, including an application to become a part of the program, is available on the Department of Animal Science's Web site at <http://uwadmnweb.uwyo.edu/Anisci/CowboyJoeHandlers.asp>



Rangeland ecology and watershed management major Concetta Brown of Cheyenne brushes Cowboy Joe as part of the daily care the pony receives. (Photo by Tiffany Schaffner)

Tiffany Schaffner is a UW senior majoring in agricultural communications. She is from Yampa, Colorado.



Molecular biologist harnesses caterpillars to produce 'humanized' proteins

By Steven L. Miller, Senior Editor
Office of Communications and Technology

Sometimes, 1+1 CAN equal 3.

Or, at least with Department of Molecular Biology Professor Don Jarvis and his colleagues, things can add up that bend reality: insect + mammalian = mammalian.

The eventual solution to the above equation is caterpillars blended in a vat to produce caterpillar goo for the extraction of a specific, medically beneficial protein.

With a dash of genetic engineering and sprinkling of old-fashioned biology, Jarvis and colleagues have used baculoviruses – viruses that infect insects – and their insect hosts to produce recombinant glycoproteins. Further, they have genetically modified certain protein production pathways in insect cells with mammalian genes. The result is a protein palatable to humans.

The recombinant baculovirus is used to infect the genetically modified insect cells, causing mass production of a desired protein. “The insect cells become bioreactors,” says Jarvis, who began as an associate professor at UW in 1998 and became a professor in 2000.

Jarvis was trained in virology and was hooked early during undergraduate work by the world of viruses. “During my training, I learned how to use viruses as tools to study cells. Along the way, I became interested in the mechanism of glycoprotein biosynthesis,” he says.

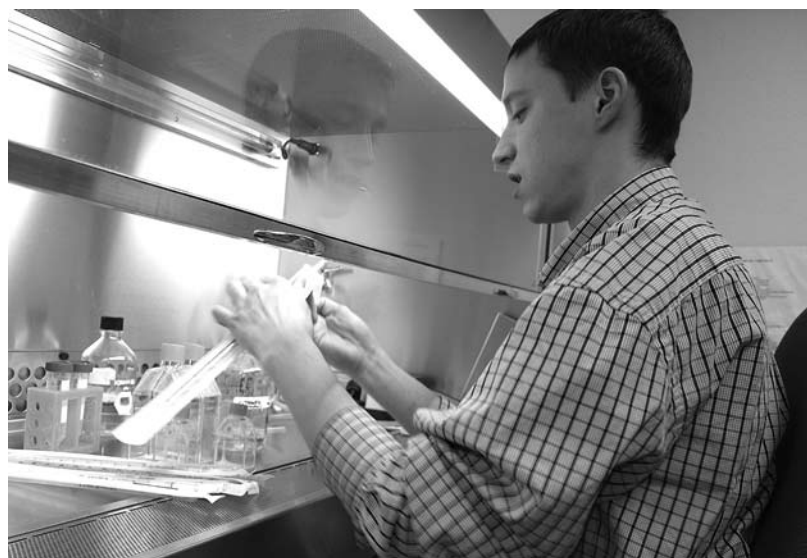
That led to interest in fiddling around with baculoviruses. “We take a baculovirus as it exists in nature and genetically modify it to encode something we can use,” he says. Insect cells are infected with the resulting recombinant baculovirus and produce a desired protein with beneficial applications in animal and/or human health.

Additional genetic modifications of the insect cells or insects that serve as hosts for recombinant baculoviruses are necessary to equip glycoproteins with the correct “humanized” sugars and to eliminate a fly-in-the-ointment, in the form of certain sugars that can bug humans with allergic reactions. Jarvis points out it is the sugar moieties, or parts, of certain glycoproteins that are largely responsible for human allergic responses to bee and wasp stings.

There are other reasons why scientists call upon the insect world for protein manufacturing. Large amounts can be created by insect cells, and they can be grown economically.

The process has taken years to develop. Jarvis pauses while describing the technical process and steps in the development and says, “The bottom line is that insect cells are not

(Continued on Page 16)



Jeremiah Hensley, a 2005 Department of Molecular Biology graduate, is a research technician who assists Jarvis with projects.

(Continued from Page 15)

equal to human cells,” and then laughs. “It took a lot of time and basic research to establish that simple fact. But it was important because it justified and guided our genetic engineering efforts to humanize insect protein glycosylation pathways and improve insect-based protein production systems.”

The protein products can be used in real-world applications, such as testing for hypothyroidism in dogs. The use of a recombinant product is designed to circumvent potential exposure of companion animals to contaminating prions associated with bovine spongiform encephalopathy (BSE) also known as “mad cow disease.”

“The best way to test for hypothyroidism had been to challenge companion animals with thyroid stimulating hormone (TSH) purified from bovine pituitary glands. Due to the potential danger of transmitting BSE to these animals, it would be unethical to inject a dog with TSH isolated from bovine pituitaries,” he says. A new test could use TSH produced by the insect production system, and a patent application has been filed for this new process.

Peeking into an incubator that looks like an old-fashioned horizontal soda cooler in one of Jarvis’s labs, yellowish fluid containing insect cells swirls in various-sized flasks. Jarvis’s lab group grows insect cells 24/7 for research and development designed to create new systems for protein production.

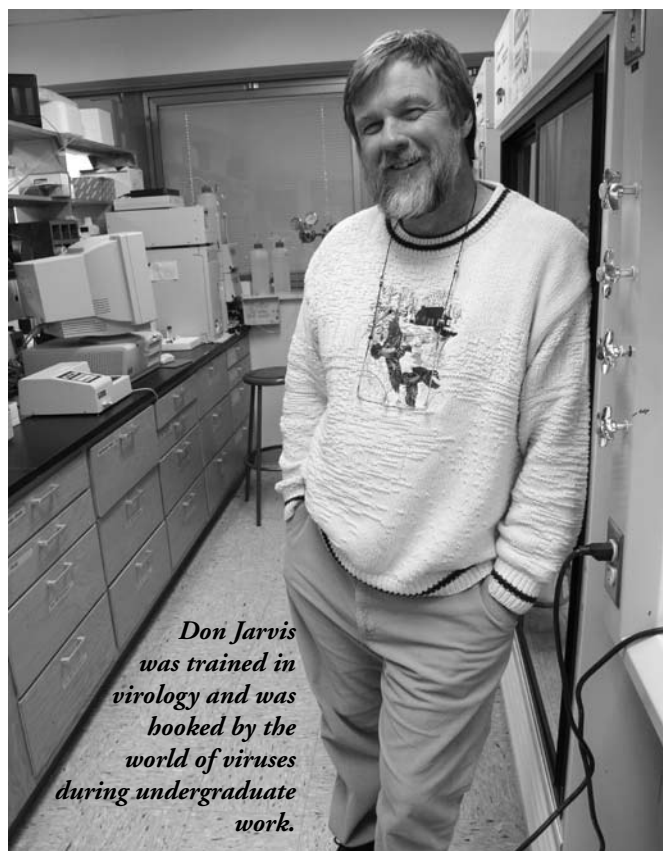
Jarvis and the University of Wyoming also have patents pending on a protein production system process involving caterpillars. Together with colleagues at Chesapeake PERL, a protein manufacturing company in Maryland, and the University of Notre Dame, Jarvis is developing a process for the production of humanized recombinant glycoproteins in baculovirus-infected caterpillars.

Together, this group received a \$2.5 million, three-year National Institute of Standards and Technology’s Advanced Technology Program grant to genetically transform caterpillars to produce humanized glycoproteins.

The caterpillars with genetically modified protein glycosylation pathways are called Transpillars™.

“Chesapeake PERL cultivates a million caterpillars a week,” Jarvis says. The caterpillars are raised individually in what look like ice cube trays. The Transpillars™ are fed a recombinant baculovirus encoding a glycoprotein of interest, become infected, and begin producing the required glycoprotein product.

The critters are ready for processing at about three to five days after being infected. At this point, they contain large amounts of the recombinant glycoprotein product. But, if



*Don Jarvis
was trained in
virology and was
hooked by the
world of viruses
during undergraduate
work.*

they are infected for too long, the baculovirus turns the caterpillars into useless mush.

“The infected caterpillars are put in a vat and homogenized, and then the protein is purified by conventional biochemical methods,” says Jarvis.

It sounds like a strange source of protein, but one has to distinguish the process from the product. Product quality and cost are the most important issues, and the baculovirus-caterpillar system is much cheaper than most, he says.

“Also, PERL has caterpillars ready to go at the drop of a hat, so if there is a demand for something really fast, it could be produced very quickly in this system,” he notes.

Jarvis says the insect protein production system can be a tool to help fulfill world demand. “We don’t have the manufacturing capacity for everything that needs to be made by the biotechnology industry,” he says. “Demand for recombinant proteins has already exceeded worldwide production capacity, and this problem is going to get much worse as new protein drugs come out of the pipeline.”

On the Web: <http://www.uwyo.edu/MolecBio/Jarvis.htm>
http://www.erc.umd.edu/TAP/Chesapeake_PERL/home.html



Researcher sleuths Wyoming vectors for vesicular stomatitis

By **Steven L. Miller, Senior Editor**

Office of Communications and Technology

A microbiologist casting about to find a disease vector used a fish to catch a biting midge.

Barbara Drolet utilized her doctoral research that tracked the path of a virus through a fish as a basis to determine if the biting midge – of “no-see-um” fame – could be a vector for vesicular stomatitis (VS). Drolet is with the U.S. Department of Agriculture’s (USDA) Agriculture Research Service, Arthropod-Borne Animal Diseases Research Laboratory (ABADRL) in the College of Agriculture.

VS is an economically important viral disease that infects cattle, horses, and swine and whose outward signs in cattle are similar to foot and mouth disease. The western United States suffered VS outbreaks in horses and cattle in both 2004 and 2005.

Drolet, who has been sleuthing the disease for five years, presented findings during a Department of Animal Science seminar last September. “The first case of vesicular stomatitis in the United States in 2005 was confirmed April 27,” Drolet told her audience. “On August 10, the first case of VS was found in a Wyoming horse and eventually in cattle. That was the first Wyoming case since 1995.”

VS suffered a slow death in the Rocky Mountain region last year. The disease began with two locations in New Mexico by April 30. Progressive USDA Animal and Plant Health Inspection Service (APHIS) maps with red dots show the disease blossoming in Arizona and Texas. Utah was dotted by June 19, Colorado by July 17, and Wyoming and Montana by August 14.

According to APHIS, the last quarantined Wyoming location was released December 28. Colorado took longer.

Although it is unusual to see this disease three consecutive years, no one knows what awaits producers in 2006, says Drolet. “Part of the problem is that we don’t understand all the variables that have to come together just right for an

outbreak to occur,” she says. “Temperature, weather patterns, insect populations, wind, and animal patterns are all players. If we could accurately predict these sporadic outbreaks, we’d do something about them.”

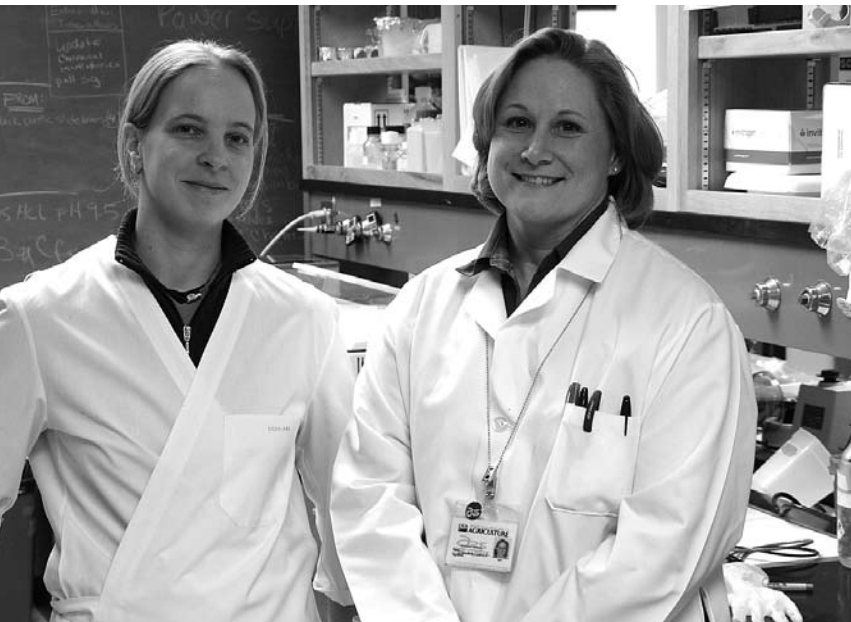
Outbreaks occurred in 1982-83, 1985-86, 1995, 1997-98, and 2004-05 – sporadically and never across three successive years, though no one knows why. But Drolet says it is commonly accepted, although not condoned, producers and horse owners underreport the disease. This could affect the “recognized” outbreak pattern.

Transportation could be one reason why the disease appears to skip across large geographic areas. Animals perform-

(Continued on Page 18)



Barb Drolet, microbiologist with the U.S. Department of Agriculture’s Agriculture Research Service, Arthropod-Borne Animal Diseases Research Laboratory (ABADRL) located in the College of Agriculture, says she was smitten by microbiology early and finds arbovirology fascinating.



Kathrin Langner, a post-doctoral research associate from Hannover, Germany, assists Drolet in the Arthropod-Borne Animal Diseases Research Laboratory.

(Continued from Page 17)

ing at such shows as rodeos, fairs, and other venues are transported into and out of areas – sometimes before a quarantine is put in place. The initial 2005 VS case in Wyoming was caught in Torrington. The animal had been in Colorado and Nebraska before restrictions had been put in place in those areas.

Despite being of high importance in the United States and the international community, no one knows all the insect players, notes Drolet. Is it sand flies? Black flies? Mosquitoes? Midges? Grasshoppers? All of the above?

After looking at more than 1,500 insect sections, each five-microns thick (that's less than one 10 thousandth of an inch), she determined that all the criteria for being a biologically competent vector for VS are met with *Culicoides sonorensis* midges.

Midges are pool feeders, which mean they get their blood meal from livestock by macerating the flesh with specialized cutting mouth parts and sucking up blood that pools into the wound.

Competent insect vectors must be able to become infected with the virus from the blood meal, amplify the virus and pass it on from the salivary glands, all without suffering ill effects from the virus.

The search fit Drolet's passion. "I find arbovirology fascinating," she says. "You have the animal, insect, and virus.

You must look at the interaction of three different organisms, and you have to figure out how it all works to result in disease. It's challenging and interesting. Arboviruses like VS infect insects and do no harm, enter the mammalian system and wreak havoc, and go back to insects and behave themselves. It's amazing."

No basic biology had been published on the virus for this possible insect vector when she started the project. She relied on experience gained during her Ph.D. research, where she painstakingly tracked a virus infection progression through a fish.

There was a problem. "I had never taken an entomology class in my life," she says. "I didn't know anything about insects other than they were generally annoying. That first year required a lot of learning about what I was looking at and making sense of what I was seeing. It actually was good internal control for me. I didn't know what to expect as far as infection pathways in the insect were concerned. Then the more I learned about insect physiology, the more the pathways I was seeing started to make sense."

She fed insects an infected meal and tracked the virus. It infected the mid-gut and then spread through the insect to the salivary glands and the ovaries. The virus presence in the salivary glands, the eggs, and in the excrement suggests it may be transmitted in the midge's bite, to the insect's offspring, and to other midges from excretions.

"If the virus is transmitted in all three ways, it's likely the insect is a significant player in VS transmission and outbreaks," says Drolet.

All her work has been conducted in the lab. The next step would be animal testing, but the facility's large animal facility is currently decommissioned. The ABADRL is considering leasing space in a facility in Athens, Georgia – the closest available place with the needed space and containment level, says Drolet.

Drolet says ranchers can help control VS spread by controlling midge habitat. Midges lay their eggs in standing water areas with high organic waste content, such as spillover areas around tanks and troughs, or in pockets of water remaining from flooding or irrigating in hoof prints and other ground depressions where cattle or horses are grazing and add to the organic content of the water. Decreasing these types of areas by controlling water spillover or by filling collection sites with dirt or sand can help.

PROGRAM NOTES



Stacia Berry

Animal Science

Stacia Berry, a junior in the business and communications co-options of the animal and veterinary science (ANVS) major, received a \$1,500 scholarship sponsored by the Chicago Mercantile Exchange and administered through the National Cattlemen's Foundation.

Berry was one of 20 students nationwide receiving one of the scholarships this semester.

"Excelling in national competition is nothing new for Stacia since she is also a former Wyoming and national FFA officer as well being a former Wyoming and national beef ambassador," says Professor **Doug Hixon**, head of the Department of Animal Science. "This very bright and articulate student grew up as an active participant in her family's registered Hereford operation near Cheyenne."

Berry is the daughter of **Jay and Janice Berry**.

Lynn Franzkowiak and **Kendal Bauman** received the senior honor book awards from the department at the 2006 Gamma Sigma Delta awards ceremony March 4.

Franzkowiak, from Schaller, Iowa, is a senior in the meat science and food technology option of ANVS.

"Lynn has a 'near perfect' grade-point average and will graduate in December after only 3 1/2 years," Hixon says.

Franzkowiak has been a member of either the Dean's or President's Honor Roll every semester since enrolling at UW. She has been active in the Block and Bridle and Food Science clubs and participated on the Meat Judging Team in 2005.

Bauman, of Carpenter, is a senior in the business option of ANVS.

"Kendal has not only excelled with a high GPA since transferring to UW from Northeastern Junior College in Sterling, Colorado, but she has been active in a variety of campus activities," Hixon says.

Bauman was secretary of the Block and Bridle Club and historian of Sigma Alpha Epsilon and has been a regular on either the President's or Dean's Honor Roll since enrolling at UW.



Don McLeod

Agricultural and Applied Economics

Faculty members in the Department of Agricultural and Applied Economics are collaborating with other University of Wyoming researchers to analyze the consequences of coal-bed methane discharge water in Wyoming.

The team, which received a grant from the U.S. Department of Energy, is also analyzing the water's best uses.

Involved are Associate Professor **Don McLeod**, Professor **David "Tex" Taylor**, and Associate Professor and Interim Department Head **Roger Coupal** of agricultural and applied economics, and Assistant Professor **Scott Miller** of renewable resources.

They are collaborating with researchers from UW's William D. Ruckelshaus

Institute of Environment and Natural Resources.

Separately, Coupal and McLeod have joined forces with researchers in the Ruckelshaus Institute and the Wyoming Geographic Information Science Center in the College of Agriculture to analyze how area water projects in Wyoming affect "exurban" (ranchette) sprawl.

"We hope to answer the question 'How can local land-use planning and regional water planning efforts work together better?'" says McLeod.

The project is being funded by the Wyoming Water Development Commission.

A new faculty position (wildlife/livestock systems economist) has been created in the department, and it should be filled by August.

The assistant professor will teach and will also be involved in research projects with other departments in the College of Agriculture. The research will focus on the positive and negative interactions between wildlife and livestock, and it could be used by land managers, policy makers, ranchers, wildlife agencies, and scientists, McLeod says.

McLeod was invited to participate on a panel discussion March 17 in

PROGRAM NOTES

Cambridge, Massachusetts, sponsored by the Lincoln Institute of Land Policy. He discussed valuation and tax considerations for agricultural conservation easements. Three agriculture business undergraduate students will represent the department, College of Agriculture, and UW in the annual academic bowl of the Student Section of the American Agricultural Economics Association, reports their coach, Assistant Professor **Mariah Tanner Ehmke**.

The national competition is July 23-26 and will test students in a number of areas in agricultural economics in a *Jeopardy*-style game. UW team members include senior **Amanda Phillips** of Yampa, Colorado, and sophomores **Jon Fessler** of Cheyenne and **Kim Josselyn** of Aurora, Colorado.

Family and Consumer Sciences

Wyoming's highest nonfatal occupational injury and illness incidence rate in a major industry group occurred in agriculture, forestry, fishing, and hunting. The incidence rate in 2003 was 17.1 per 100 employed in Wyoming compared to 6.2 in the United States, says **Randy Weigel**, Department of Family and Consumer Sciences professor



Randy Weigel

and Cooperative Extension Service (CES) specialist.

Animal production accounted for the majority of this incident rate. In addition, there were 34 agricultural machine injuries classified as a trauma-level injury from January 2000 to September 2005.

More than 77,000 Wyoming residents identified themselves as having a disability (17.1 percent of the population). With 24,153 people living on Wyoming farms, an extrapolation of the data would estimate 4,130 Wyoming farm and ranch members are affected by a disability.

Wyoming is a state with no history of support services specifically designed for production agriculture families with disabilities, says Weigel. There are many agencies that provide support or rehabilitation services, but none of these programs by themselves can offer the comprehensive

services needed by the agricultural worker or family member with a disability. The high occupational injury rate among agriculture, the lack of disability expertise, and the lack of services necessary to accommodate disabilities deprive many hardworking individuals from continuing productive lives in agriculture.

CES specialists in the family and consumer sciences department will partner with Gottsche Rehabilitation, Wyoming Institute for Disabilities, Wyoming Independent Living Rehabilitation, and the Center for Rural Health Research and Education on the **Wyoming AgrAbility Project**.

The AgrAbility Project was created to assist people with disabilities employed in agriculture, notes Weigel. The project links the CES at a land-grant university with a private, nonprofit disability service organization to provide practical education and assistance that promotes independence in agricultural production and rural living. The AgrAbility Project assists people involved in production agriculture who work both on small and large operations.

This is a four-year grant renewable annually based on programming success. Total grant award is \$704,637.



David Fay

Molecular Biology

The Molecular and Cellular Life Sciences (MCLS) program is the most recent addition to a growing number of progressive cross-departmental interdisciplinary Ph.D. programs on campus.

MCLS was approved by the University of Wyoming's Board of Trustees last November, and the first students (approximately 12) will enroll in the program beginning this fall.

More than 40 faculty members from 12 departments are participating, which gives students significantly greater options than they've had in the past with respect to research training and coursework, says **David Fay**, MCLS director and assistant professor in the Department of Molecular Biology.

"We've already seen an impressive jump in the number of Ph.D. applications received by MCLS this year compared to those we

had only a year ago to the molecular biology departmental program,” he notes.

In their first two semesters, students will choose four laboratories to carry out research rotation projects, thereby allowing them to sample the diverse range of research settings the program offers.

Faculty members participating from the College of Agriculture include:

Animal science – **Min Du, Stephen Ford,** and **Lawrence Goodridge.**

Plant sciences – **Gary Franc** and **Robin Groose.**

Molecular biology – Fay, **Mark Gomelsky, Don Jarvis, Jerry Johnson, Pam Langer, Randy Lewis, David Liberles, Kurt Miller, Nancy Petersen, Mark Stayton, Peter Thorsness,** and **Jordanka Zlatanova.**

Veterinary sciences – **Gerry Andrews** and **Ana Bratanich.**

Other participating departments are botany, electrical and computer engineering, chemistry, chemical and petroleum engineering, geology and geophysics, kinesiology and health, pharmacy, and zoology and physiology.

Also involved is the U.S. Department of Agriculture, Agricultural Research Service's Arthropod-Borne Animal Diseases Research Laboratory on the UW campus.

There is a MCLS page on the UW Web site at <http://www.uwyo.edu/MCLS/>.



Jim Krall

Plant Sciences

Dale Woods has accepted an offer to join the Department of Plant Sciences as associate professor of plant pathology.

Woods will be in Laramie but will have statewide University of Wyoming Cooperative Extension Service (UW CES) responsibilities. He will also be in charge of the Plant Diagnostics Laboratory. Woods will teach plant pathology this fall and will initiate research projects on the management of diseases of forage and biodiesel crops and on the biological control of invasive weeds.

Woods worked most recently as the primary plant pathologist in the California Department of Food and Agriculture for the entire state. He is a collaborator, co-investigator, or lead scientist on four competitive grants totaling \$5,191,351. Woods will be joined by his wife, Leslie, who accepted a veterinary pathologist and professor position in the Department of Veterinary Sciences.

Two faculty members recently had their propos-

als for sabbatical leave approved. Associate Professor **Robin Groose** will visit scientists in Italy and France while Professor **Jim Krall** will study in Australia with a possible visit to France.

Dave Wilson, who teaches the beginning Agroecology 1000 course and several other classes in the agroecology program, has been nominated for a teaching award in the National Awards Program for Excellence in College and University Teaching in the Food and Agriculture Sciences.

Ryan Rapp, who has been serving as a temporary forage specialist with the CES, has accepted a position as an assistant educator in Converse County with responsibility for forage crops in Converse, Natrona, and Niobrara counties.

Alan Gray, who was injured while conducting research at the UW Powell Research and Extension Center, is continuing to recover. He is participating in departmental meetings via phone and is anxiously awaiting the doctors' approval to return to work.

Renewable Resources

Shikha Sharma joined the Department of Renewable Resources as a permanent research scientist and is associate director and manager of the **University of Wyoming Stable Isotope Facility** in the college.

She has a Ph.D. in geological sciences and is a



Shikha Sharma

stable isotope geochemist. Her research activities focus on the use of stable isotopes as natural tracers to understand modern environmental processes affecting biogeochemical cycles of major elements such as carbon, oxygen, and hydrogen.

She is also interested in applying and developing isotope proxies for paleoenvironment reconstruction. Her last project at Iowa State University employed isotopes to understand palaeohydrologic controls on the water balance of Lake Superior. She says her research on lake deposits of northern India provided the first record of palaeoclimatic variation from that part of the sub-continent.

Her current research interests involve use of isotopes to understand plant carbon and water relations in Yellowstone National Park and trace infiltration from coal-bed methane drilling-produced water to shallow groundwater aquifers using stable isotopes of oxygen, hydrogen, and carbon.

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The **Stable Isotope Facility** is equipped with four mass spectrometers configured for the analysis of hydrogen, carbon, nitrogen, and oxygen isotopes. Isotopes integrate, indicate, record, and trace fundamental environmental and biological processes.

Some of the applications of stable isotopes are:

- Health, nutrition, and animal sciences: dietary stress, diet composition, and metabolic rates
- Archaeology and paleoecology: ecosystem composition/productivity, ecosystem change, paleodiet, and paleoclimate reconstruction
- Water resource management: hydrological cycling, recharge areas, water partitioning, and source studies
- Ecology and agriculture: nitrogen and carbon cycling, water-use efficiency, vegetation dynamics, food webs, and soil nutrient studies
- Environmental pollution: source identification and tracing
- Forensics: product adulteration, and point of origin authentication



Leslie Woods

Veterinary Sciences

Leslie Woods will join the Department of Veterinary Sciences in July as a veterinary pathologist and professor, bringing the department back to full strength with three pathologists.

Woods earned a doctor of veterinary medicine degree from the University of California-Davis in 1982 and a Ph.D. in veterinary pathology from UC Davis in 1996.

She is a clinical diagnostic pathologist with the California Animal Health and Food Safety Laboratory System.

“Dr. Woods has a strong interest in wildlife diseases and various forms of intoxication, particularly plant poisonings,” says **Donal O’Toole**, head of the veterinary sciences department and director of the Wyoming State Veterinary Laboratory (WSVL).

Her research interests are a viral disease of pigeons, West Nile virus, and an adenoviral disease of mule deer

she discovered and characterized in 1993.

“Since the disease was first recognized, she worked with a series of collaborators to establish how the virus causes mortality, how it might be differentiated from other high-impact pathogens of wildlife, and whether it occurs in species other than deer,” O’Toole says.

“Dr. Woods has taught, presented, and published widely on a broad range of diseases, particularly in wildlife, food animals, and birds. Her interests in wildlife are a particularly good fit for the department since we continue to deal with several major disease threats including West Nile virus and brucellosis,” he adds.

Several laboratory animal rooms in the WSVL are being converted into an infectious disease laboratory for Woods to perform research on wildlife diseases. The new laboratory will be named in honor of the late **Beth Williams**, professor and wildlife veterinarian, whose position Woods is filling.

“The laboratory is the result of a generous donation by members of Dr. Williams’s family,” O’Toole says.

Woods will be joined by her husband, **Dale Woods**, who accepted an associate professor of plant pathology position in the plant sciences department.



Pepper Jo Six

Academic and Student Programs

“Going far beyond the call of duty, doing more than others expect – this is what excellence is all about. And it comes from striving, maintaining the highest standards, looking after the smallest detail, and going the extra mile. Excellence means caring – it means making a special effort to do more.”

This is an excerpt from the book *The Best of Success*, but it also defines the College of Agriculture, says **Pepper Jo Six**, recruitment coordinator in the Office of Academic and Student Programs.

“Following a campus visit by a prospective student, I often receive correspondence from the student and/or parents after they return home. I am always proud of the positive comments we collectively receive as a college,” Six says.

She notes the following example reflects the type of positive feedback received.

It is from **Lisa McFadden** of Pennsylvania, whose son, Curtis, toured the college.

"If my husband and I wouldn't have felt so comfortable with you and all of the faculty and staff members we met during our visit, we would not have allowed Curtis to go so far from home for school. You are incredible people to dedicate yourselves to UW students the way you do."

The college is approaching a record enrollment with 876 students.

"I truly believe the increase is due to the personal attention we give our students," Six says.

When Academic and Student Programs Associate Dean and Director **Jim Wangberg** started here, he brought a new motto to the college, "Students – The Reason We're Here!"

"With pride, I have to say all of our faculty and staff have embraced the meaning of that statement and apply it daily in their jobs," Six says.

Agricultural Experiment Station

The College of Agriculture was awarded 186 external grants during the past fiscal year. This amounts to almost 16 percent of all external grant dollars brought in by the University of Wyoming.

Winter is the time to meet with external advisory committees for their input on what is being done right or what can be improved



Abdel Mesbah

upon at the research and extension (R&E) centers. This year's meetings were excellent and well-attended, says **Stephen Miller**, associate dean and director of the UW Agricultural Experiment Station.

Justin Moss hosted the Sheridan R&E Center advisory meeting January 3; **Abdel Mesbah** hosted the Powell R&E Center meeting February 1; and **Jim Freeburn** hosted the Sustainable Agriculture Research and Extension Center (SAREC) meeting March 9. The SAREC meeting had to be rescheduled because of a blizzard.

Progress continues on new facilities at SAREC with the office, shop, and animal handling facilities scheduled for completion in early May. The beef and sheep feedlot facility should be completed in early August. **Jim Krall**, Department of Plant Sciences professor and agronomist at SAREC, plans to host the Western Society of Crop Science meetings at SAREC in June, so the construction schedule needs to be kept.

Alan Gray continues to make remarkable progress from his serious accident last summer and hopefully will be back to work shortly. The story of his recovery is so remarkable it is being filmed for the *Discovery Health Channel*. A film crew has been to the Powell R&E Center once and will make a return trip in late spring. The documentary segment is set to air this summer.

Cooperative Extension Service

The University of Wyoming Cooperative Extension Service (UW CES) has a number of new personnel, and others have been promoted to other positions.

Carolyn Benepe was promoted from Cent\$ible Nutrition Program coordinator to nutrition and food safety extension educator in Sheridan County December 21. She covers Johnson and Sheridan counties.

Calvin Strom joined the Carbon County staff January 17 as the area sustainable management of rangeland resources educator for Carbon and Albany counties.

Molly Keil joined the Albany County CES staff February 21. A graduate of Colorado State University with a bachelor's degree in agricultural extension education, Keil was raised on a farm in northern Colorado and was actively involved in 4-H programs raising livestock.



Lindsey Moniz

Lindsey Moniz joined the state 4-H office as events coordinator February 27. This new position is responsible for coordinating all state contests and state and national conferences. Moniz was a long-time 4-H member in Campbell County.

Kellianne Tobul joined the Teton County CES staff March 6 providing leadership for the 4-H/youth program. Tobul has a bachelor's degree in education with emphasis in outdoor recreation from Bowling Green State University in Ohio.

Rachel Novakovich joined the Johnson County CES staff March 6 providing leadership for the 4-H/youth program. Novakovich completed a CES 4-H internship with Uinta County last summer and was the 4-H after-school coordinator with the Uinta County CES.

Patricia Tatman joined the Sheridan County CES office March 13 providing leadership for the 4-H/Youth program. She was a member of Collegiate 4-H for four years and had two summer internships in the Wyoming State 4-H Office.

PROGRAM NOTES

AG NEWS

Vol. 15, No. 2



Anne Leonard

Ag Development and College Relations

The 2007-08 budget recently enacted by the Wyoming Legislature includes many items that affect the College of Agriculture.

The continuation of the endowment matching program has the potential to benefit all research, teaching, and outreach activities. The legislature allocated \$25 million to extend the matching gift program for academic program endowments at the University of Wyoming.

Since its inception in 2001, this program, which matches on a dollar-for-dollar basis gifts of \$50,000 or more, has leveraged gifts to the college in many areas. Generous donors, together with the state matching dollars, have funded three new graduate assistantships and a number of undergraduate scholarships, provided applied research funds for the Wind River and Big Horn Basin areas, enhanced international agriculture programs, funded equipment purchases for teaching laboratories, supported research and teaching activities in wildlife/livestock diseases, and funded outreach publications for constituents of the college.

Based on past experience, **Anne Leonard**, director of ag development and college relations, expects the pool of \$25 million to be totally committed within two years.

To qualify for state matching funds:

- The gift must be from a single donor, which is

defined as an individual, nuclear family, corporation, foundation, or industry association.

- Only gifts or pledges totaling \$50,000 or more to permanent endowments are eligible for matching dollars. Gifts to endowments made since the beginning of the state match program (March 1, 2001) can be included in the total. Payments on pledges must be completed by December 31, 2014.
- Gifts or commitments received from March 1, 2001, through December 31, 2009, are eligible to be matched as long as funds are available. Gifts will be matched on a first-come, first-served basis.

For additional information on giving opportunities within the College of Agriculture or the state matching gift program, contact Leonard at (307) 766-3372 or by e-mail at aleonard@uwyo.edu.

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