College reorganization focuses on long-term value, commitment

The College of Agriculture, Biotechnology and Natural Resources has undergone some major changes after having nearly $4 million cut from its budget at the beginning of 2010. However, the college is still committed to quality education and offers a diverse array of programs for students.

“Our objective is to create a vision for the future that allows CABNR to address short-term issues while keeping focused on the long-term goal of becoming a valued resource to our constituents,” said interim Dean Ron Pardini. “A new CABNR is inevitable, with a sharper focus. We are raising the degree of commitment to Nevada’s needs.”

CABNR’s five departments were reorganized into three: Natural Resources and Environmental Sciences; Biochemistry and Molecular Biology; and Food, Agriculture and Nutrition. The graduate programs associated with these departments are still intact. Five tenured track professors from the Animal Biotechnology department and two from the Resource Economics department were retained.

The four degree programs and their associated minors eliminated due to the cuts were: Animal Science, Animal Biotechnology, Agricultural and Applied Economics, and Environmental Resource Economics. The Pre-Veterinary program continues to thrive.

There are nine continuing undergraduate B.S. degree programs, including: Biochemistry and Molecular Biology; Ecohydrology; Environmental Science; Forest and Rangeland Management; Wildlife Ecology and Conservation; Nutritional Science; Dietetics; Veterinary Medicine; and the combined BS/MS degree program in Biotechnology.

More than 200 students were affected by these changes. Every student who was in an eliminated department as of spring 2010 was given the opportunity to graduate in their chosen major. They were made aware of the changes and were encouraged to see an advisor to select the correct schedule in order to complete their degree.

Continued on page 4

CABNR programs remain strong, relevant

I am pleased to share with you this inaugural issue of our quarterly newsletter, which is planned to feature news and accomplishments of the faculty from the College of Agriculture, Biotechnology and Natural Resources (CABNR).

The most pressing issue this past year was the state’s budget crisis, which resulted in unprecedented budget cuts for UNR and significant changes for CABNR. We are decreasing our size by streamlining our administration and downsizing CABNR from five to three departments. In addition, we are evaluating the future role of the Nevada Agricultural Experiment Station (NAES) field laboratories in serving the mission of our land grant university.

Future planning will be underpinned by our heritage as the founding college of this land grant university and will emphasize our strong belief and commitment to the tripartite mission of the land grant system. We will feature strong and relevant education programs that produce a well educated workforce, a nationally competitive and locally relevant research.

Continued on page 2

Highlights

CABNR’s five departments reorganized to three:

- Natural Resources and Environmental Sciences;
- Biochemistry and Molecular Biology;
- Food, Agriculture and Nutrition (new).

Departments eliminated:

- Animal Biotechnology
- Resource Economics

Chris Pritsos has been appointed to serve on the Statewide Epidemiological Workgroup. Page 3

Marjorie Matocq’s two-year-old program teaches Nevada high school freshmen about genetics. Page 2

Biochemist John Cushman is pioneering research to understand how plants survive in arid, inhospitable regions. Page 3
Dr. Marjorie Matocq has taken her lesson plan on tour. The Natural Resources and Environmental Science (NRES) associate professor from the College of Agriculture, Biotechnology and Natural Resources (CABNR) runs Molecules on the Road – a weeklong program for Nevada high school students and teachers funded by the National Science Foundation and Nevada’s INBRE program through the National Institutes of Health.

Last year, Matocq reached 1,500 youth and trained 12 teachers. Her two-year-old program gives Reno-area high school freshmen a crash course in genetics.

“The students start by making an observation,” Matocq said. “The observation they make is whether they are able to taste a bitter chemical.”

Some students have the genetic predisposition to taste bitterness when they touch their tongues to a test strip containing phenylthiocarbamide, while others taste nothing. A single gene determines the predisposition to do so, Matocq said.

“There are two variants in the human population,” Matocq said. “So students observe their ability to taste the bitterness or not, they make a prediction of what their genotype is, and throughout the week they test their prediction by isolating this gene from their own DNA to see which variants they have.”

Matocq said the primary goal of Molecules on the Road is to awaken the minds of young scientists.

“Science and technology is where the future of humanity lies in terms of continuing to sustain ourselves, and so we need to be recruiting the most diverse and bright group of young people we can to this discipline,” Matocq said. “They are the ones who will solve our food crises and our water crises. They’re the ones we need to recruit.”

Matocq said students extract and test their own DNA using cheek swabs. Through these processes, youth learn about their genetic makeup and how their genes shape their everyday lives.

“Students gain hands-on experience with modern genetic tools, and they learn something about the relationship between their genes and the outward traits that make them who they are,” Matocq said.

The program isn’t just for students. High school science teachers get a refresher course on modern biotechnology and genetics research that can inspire them to create new curricula.

“Once they see the program, teachers come up with a million new ideas,” Matocq said.

This is kind of a gateway set of exercises. We try to give teachers some tools to design different programs for themselves.”

Matocq hopes Molecules on the Road will help youth see the fun side of biotechnology.

“At the simplest level, what I want kids to get is ‘science is cool, and I can do it,’” Matocq said.
CABNR research seeks to expand, revolutionize Nevada agriculture

In a state that receives only 9 inches of annual rainfall, Biochemist John Cushman is pioneering research to understand how plants survive in arid, inhospitable regions. Through this understanding, Cushman seeks to expand the productivity of existing crops as well as expand agriculture into regions that would otherwise be difficult or impossible to cultivate.

“Much of the total land mass of the world lies in arid or semi-arid regions,” Cushman said. “One of the things we’re really interested in is increasing yield stability in agriculture and expanding acreage in arid regions.”

One step in the research process is analyzing plants that already exist in harsh climates. According to the College of Agriculture, Biotechnology and Natural Resources, 35 percent of the world’s surface is classified as arid or semi-arid. In response, native plants have adapted to environmental factors such as salt, heat, drought and cold through specific biological functions in order to retain nutrients and moisture. According to Cushman, pinpointing these functions and engineering new crops with the desired traits would increase plant resilience to stress and boost productivity.

“Plants are already subjected to a variety of environmental insults, impacting the overall yield stability,” Cushman said. “Every time a plant incurs stress, the productivity of the crop decreases. If you can create resilience in a crop you can reduce the loss of agricultural product.”

One such crop being tested is camelina, a hardy plant that can be used for livestock feed or processed to be used as a biofuel. Cushman said camelina is a prime candidate for Nevada’s environment, with a short growth period, minimal water requirements and low nutritional demands. Cushman’s research with camelina currently involves creating more resilient strains of the crop, allowing camelina to be grown throughout more regions in Nevada.

John Cushman

Cushman also stressed how the global need for alternative energy sources could have an economic impact on Nevada if crops such as Camelina were adopted into the agricultural sector.

“We’re faced with a crisis,” said Cushman. “We are estimated to reach peak oil production in 2012 to 2015 and will have to pursue fuel alternatives. Crops like camelina not only have implications for Nevada, but the global economy as well.”

To date, the U.S. Department of Energy estimates that renewable energy sources account for little more than 8 percent of energy consumption in the country. However, faced with growing uncertainties towards energy sustainability, biofuels like those researched by Cushman may revolutionize the energy market while expanding agriculture into areas once thought impossible.

Pritsos to serve on statewide abuse prevention workgroup

Chris Pritsos, chair of the Department of Nutrition at the University of Nevada, Reno and researcher in the area of tobacco abuse and its effects, has been appointed to serve on the Statewide Epidemiological Workgroup.

“I was pleased to be considered to serve on the workgroup,” Pritsos said. “This is important work that has a large impact on other agencies and individuals.”

The workgroup, a subsidiary branch of Nevada’s Substance Abuse and Treatment Agency, combats the causes and effects of substance abuse in Nevada by collecting and analyzing information from various state agencies use to develop programs.

“Ultimately, we’re trying to understand how widespread a problem is and what its impact may be on the community.”

Pritsos has extensive experience in tobacco abuse research, specializing in the effects of environmental tobacco smoke on workers. He has tested air filtration systems designed to mitigate the harmful effects of tobacco smoke.

Pritsos has also served as president of the Nevada Tobacco Prevention Coalition. He helped pass the Clean Indoor Air Act of 2007, the Nevada law that prohibits smoking in public places.

Pritsos feels his research with tobacco abuse prevention will help the workgroup.

“Each person brings unique skills to the table,” Pritsos said. “My role as a scientist enables me to evaluate research from a different perspective.”

Pritsos said economic and social factors have led the rise of tobacco usage in Nevada. “Unfortunately, Nevada is at the bottom when it comes to health issues such as substance abuse,” Pritsos said. “These are areas that need to be addressed. I’m looking forward to doing that.”
Several CABNR professors and researchers contributed their expertise at a Pinyon-Juniper Restoration and Utilization Summit Dec. 8-9 in North Las Vegas.

CABNR faculty members Tom Harris, Tamzen Stringham and Maggie Cowee all serve on the steering committee for the Nevada Pinyon-Juniper Partnership, which is investigating ways to control the dramatic spread of pinyon-juniper forests into Nevada’s ranges and sagebrush habitat.

The p-j forests are taking over thousands of acres every year, destroying brush habitat that is valuable to wildlife, including the sage grouse, and causing severe erosion problems and fire danger. The goal of the project is to remove or thin out encroaching forests and utilize the wood as biomass for alternative energy, biofuels or other wood products.

Nearly 175 people attended the summit and helped create a proposal for a Demonstration Project for Pinyon-Juniper Treatment in eastern Nevada.

Stringham discussed her work on the Smith Creek Ranch, where she and other researchers are measuring the impact p-j tree removal has on the understory vegetation and hydrology of an area previously overtaken by the trees. Stringham’s work on the Smith Creek Ranch will lead to a better understanding of pinon-juniper treatment methods that best re-establish understory vegetation and groundwater recharge.

In a different session, CABNR Prof. Rang Narayanan moderated a session titled, “Leveraging Community and Economic Benefits in Nevada.”

CABNR unveils new majors

CABNR is creating two new majors it hopes to start September 2011.

The new Agricultural Science major will allow students to study traditional agriculture while also taking classes on the business side of agriculture, including accounting, marketing and economics.

The Rangeland Ecology and Management major will combine two former majors – animal rangeland production and forest and rangeland management majors.

Both of those majors qualified students for jobs with federal or state land management agencies in the West, as well as a wide variety of jobs with agriculture, consulting and environmental firms, said Prof. Sherm Swanson, a state specialist in range and riparian environments for both CABNR and University of Nevada Cooperative Extension.

Both majors must still be approved by the Board of Regents.

Tom Harris, the director of the University Center for Economic Development, contributed a white paper that explored the potential economic impacts of a proposed pinyon-juniper electric power plant in Lincoln or White Pine counties. CABNR Associate Professor Barry Perryman was co-author with Robert Wilson and William Morrill of another paper that explored the severe fire dangers posed by the encroachment of pinyon-juniper and cheatgrass.

Continued from page 1

to ensure they would be able to graduate in a timely fashion. In spite of these changes within the college, CABNR had more undergraduates in 2010-2011 than any years past, and the number of national merit scholar students has increased this year. Also, CABNR was able to hire Assistant Professor Marie-Louise Ricketts Ph.D., to the Department of Nutrition as a replacement for the retired Dr. David Wilson. Although CABNR has reorganized and changed many elements of the college, it is still committed to providing students with a high quality education. The college has risen to the challenge of making changes and continues to be a valuable resource for Nevada.