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Growing

A HEALTHY FUTURE

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Welcome to IANR's inaugural issue of **Growing a Healthy Future**. This interactive pdf contains lots of additional information so please click on **red type** or buttons  whenever you see them.



Institute of Agriculture and Natural Resources Administration



Greg Nathan

Archie Clutter,
Agricultural Research
Division dean

Steve Waller, College of Agricultural
Sciences and Natural Resources dean

Ronnie D. Green,
University of
Nebraska vice
president and
IANR Harlan
vice chancellor

Ron Yoder,
associate vice
chancellor

Elbert Dickey,
UNL Extension dean

Alan Moeller,
assistant vice
chancellor

Marjorie Kostelnik,
College of Education and
Human Sciences dean

Extension Leaders Retiring

Between them, they've given 75 years of service to Nebraska. And when Elbert Dickey, dean and director of [University of Nebraska-Lincoln Extension](#), and Elizabeth Birnstihl, associate dean, associate director, and state 4-H administrator, retire at the end of June, they have much to recollect, with pride.

They've been a team in leading extension for about 18 years now, envisioning possibilities, handling probabilities and the realities of constant change, working to position UNL Extension to meet Nebraska's current and future needs.



Beth Birnstihl

Elbert Dickey

They've long said when one retired, the other would, too. This year, that comes true.

Elbert joined the [Institute of Agriculture and Natural Resources](#) in 1978 as a member of the Department of Biological Systems Engineering. He was an assistant extension dean from 1991-98, and associate dean from 1998-99. After serving as interim extension director for nearly two years, he was named dean and director in 2001.

Beth joined extension in 1971. She has been an educator, district supervisor and associate director of the Southeast Research and Extension Center, and extension staff development leader. She was assistant dean from 1994-1997, and associate dean and associate director from 1997 through the present.

They've led extension's success, and had much of their own. For instance: Elbert served part-time in a two-year leadership role in USDA's Cooperative State Research, Education and Extension Service (CSREES) in 2005-2007, and was inducted into CSREES's Hall of Fame in 2008.

When the Nebraska State Fair moved from Lincoln to Grand Island, Beth served as an ex officio fair board member, taking the lead in enhancing and adding the "WOW Factor" to everything there involving 4-H.

She's a Holling Family Award for Teaching Excellence recipient, and has been inducted into the Nebraska Hall of Agricultural Achievement.

And more. For both, so much more.

Yet when you ask them their biggest success over the years, they'll tell you it has been hiring excellent faculty who are award winners, grant recipients, team builders, people who provide excellent, quality programs and impact people's lives.

Ask what they enjoy most, they'll say it's seeing people exceed their personal expectations when given the opportunity to do so.

Ask what they're looking forward to, they'll smile – a more relaxed schedule.

Ask them the biggest surprise of their careers, they'll reply, "how fast the years have gone."

We thank Beth and Elbert for all they've done in those swift years. And we look forward to seeing the further – well, extension – of their time, talents and enthusiasm in the next chapters of their lives.

Growing a Healthy Future

Spring 2012

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Chancellor, University of Nebraska–Lincoln
Harvey Perlman

**NU Vice President and Harlan Vice Chancellor,
Institute of Agriculture and Natural Resources**
Ronnie Green

Editorial
Cheryl Alberts
Sandi Alswager Karstens
Jill Brown
Daniel R. Moser
Judy Nelson

Designer
Gary Goodding

Photography
Craig Chandler
Michael Forsberg
Greg Nathan
Brent Plugge
Johnny's Selected Seeds
Spagnotti family

Cover: George Oyler, photo by Craig Chandler.



Troy Walz
UNL Office of
Research and
Economic
Development
USDA

We hope you enjoy this first issue of *Growing A Healthy Future*, the new twice-yearly magazine of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln. We welcome your feedback – please contact us at growing@unl.edu or Growing Editor, Educational Media, 104 ACB, University of Nebraska–Lincoln, Lincoln, NE 68583-0918.

FOOD • FUEL • WATER • LANDSCAPES • PEOPLE

It is the policy of the University of Nebraska–Lincoln not to discriminate based upon age, race, ethnicity, color, national origin, gender, sex, pregnancy, disability, sexual orientation, genetic information, veteran's status, marital status, religion or political affiliation.

Partnering with Brazil

Twenty-five of Brazil's best and brightest students were welcomed to UNL spring semester 2012, as part of Brazil's Science Without Borders Program (iie.org/en/Programs/Brazil-Science-Without-Borders).

The Brazilian government's new program provides student scholarships for one year of study in science, technology, engineering and math (STEM) at U.S. colleges and universities. Several students are studying in the College of Agricultural Sciences and Natural Resources.



The Science Without Borders group at UNL is the largest single delegation anywhere in the U.S.

The student program is one of several partnerships the University of Nebraska plans with the large South American country.

Vision. Planning. Growth.

Ray Ward of Kearney-based Ward Laboratories long wanted a vision statement for his firm. It wasn't until he participated in Gallup's Entrepreneur Acceleration System that he finally worked with staff to come up with one: "Guiding producers today to feed the world tomorrow." EAS, which measures and develops entrepreneurial ability of people running small- to medium-sized enterprises, is a partnership of Gallup, IANR, the Nebraska Department of Economic Development and the Greater Omaha Chamber of Commerce. Ward's a believer. Not only did his firm come up with a vision, they also devised a growth plan and goals for five, 10 and 20 years out.

Vet med ahead

UNL students already are among the best in the new **veterinary medicine education partnership** with Iowa State University: In the 2011 graduating class, they ranked Nos. 1, 2, 4 and 6 out of 143. At this writing, a UNL student was ranked No. 1 in the class that will graduate this spring. David Hardin, associate dean of the UNL-ISU program, noted at least nine of the 2011 class, the first graduating class, found jobs in Nebraska. Students attend classes at UNL for the first two years, then move to ISU to complete their veterinary degrees.



Militarily speaking

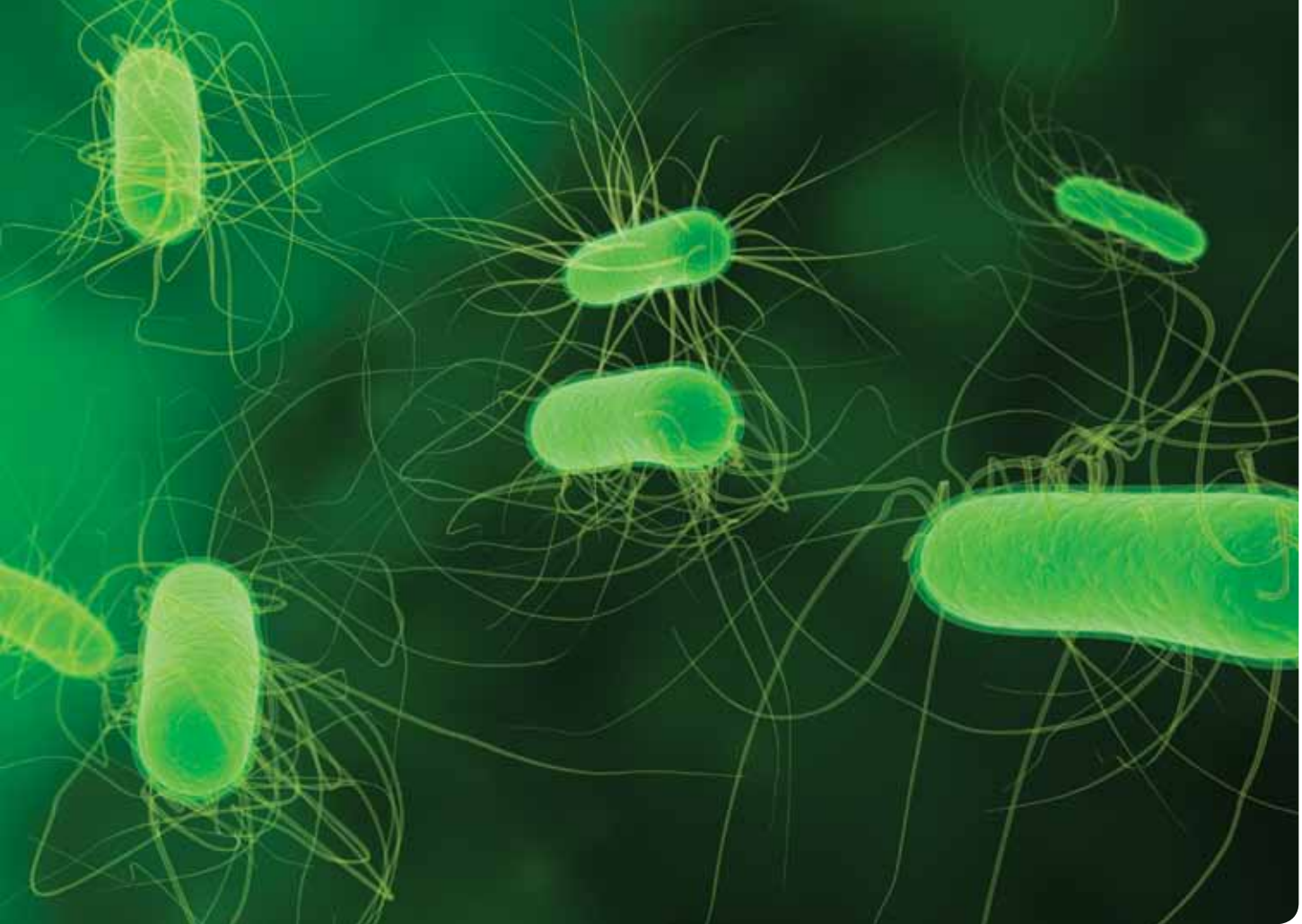
Young children of military families face special challenges from pre-school through adolescence, especially if they live off base where services and support for their unique situation are lacking. UNL Extension is taking the lead on a \$7 million, multi-state Child Care and Youth Training and Technical Assistance Project, funded by the Department of Defense. Ultimately the program will train about 28,000 professionals in 13 states to ensure these kids are ready to succeed throughout their early school years. Training of extension educators now is under way. Nebraska's role is to develop content and provide programming for this project.

Aiding Medical Research

A new partnership between the Nebraska College of Technical Agriculture at Curtis and the University of Nebraska Medical Center's School of Allied Health will be the first in the nation to offer a veterinary technology degree with a comparative medicine option.

The two-year degree will allow graduates to obtain jobs in medical research institutions across the nation, said Weldon Sleight, NCTA dean.

The program will be taught mainly by NCTA faculty at UNMC in Omaha, as well as by telecommunications. Students can enroll in the program starting in August 2013.



On Deck with STEC

As bacteria go, *E. coli* O157:H7 is a star villain, responsible for multiple outbreaks and illnesses and occasional deaths. It has been the subject of millions of dollars of research, at the University of Nebraska–Lincoln and elsewhere. Significant progress has been made, with intervention strategies from the ranch to the feedlot, the processing plant to the grill.

But O157 is far from the only so-called Shiga toxin-producing *E. coli* — STEC for short. There are about 500 of them, 100 of which can cause illness in humans. A new \$25 million grant from **USDA's National Institute of Food and Agriculture** (NIFA) takes aim at some of the most dangerous that can be found in cattle.

UNL is leading the research, teaching and extension effort. Kansas State University is another key player. In all, 11 universities and other institutions are involved.

UNL veterinary scientist Rod Moxley and food scientist Harshavardhan Thippareddi, part of a team that will focus on better detecting the so-called STEC-8, long have been involved in the fight against O157. Those efforts at UNL, largely within the Institute of Agriculture and Natural Resources, and nationwide have produced interventions at various production stages that help cut the incidence of O157, and the industry has incorporated those methods into their processes.

Scientists across the nation are targeting eight of the most dangerous *E. coli*, aiming to reduce their prevalence throughout the beef production chain.

E. coli

E. coli tests must detect the bacteria in a variety of locations — from cattle hides and feces to processed meat.



“We will look at these existing interventions and determine their efficacy against other Shiga toxin-producing E. coli and also to develop other interventions as needed,” Thippareddi said.

E. coli testing methods need to be improved, he added, as the organism spreads inconsistently in animals.

“We don’t need to reinvent the wheel,” Moxley said. “We’re already working with some things that work, and we need to see if it’s applicable to these other STECs.”

One key goal of the research is to develop a portable testing method that could be taken into packing plants, said Moxley, who at one time was the only scientist at UNL researching O157:H7. Tests must be able to detect the

eight STECs in both cattle feces and in beef samples, even areas such as cattle hides and carcass surfaces; in water, soil and feed; and in processed meat.

“We’ll be looking all the way across the spectrum,” Moxley added.

Moxley noted that other partners in the project will play important roles in improving detection methods. Scientists based at the Los Alamos National Laboratory in New Mexico, for example, will focus on DNA-based and other detection methods. And KSU has a state-of-the-art biosecurity research facility sophisticated enough to handle the bacteria.

Development of new vaccines for cattle is a potential outcome as well, Moxley said.

Students from all over the country will be eligible for internships that could place them with any one of the 48 scientists involved in this project. They could end up working in labs, in the field or at processing plants. New courses and training models may result.

Another aspect of the work will include development of publications, workshops and seminars to share findings with the industry.

“We’re addressing an issue that is of such great importance to the beef industry and the economy of Nebraska,” Thippareddi said. “That’s very exciting.”

Rod Moxley, 402-472-8460, rmoxley1@unl.edu

— Daniel R. Moser

 [View STEC announcement](#)

500

There are 500 Shiga toxin-producing E. coli. About 100 are dangerous to humans. This NIFA-funded \$25 million project focuses on eight.

100

Fast Facts

E. coli

E. coli doesn’t harm the cattle in which they live. While there are several ways humans can be infected, the most common way is by eating infected meat or foods that come into contact with infected meat.



Kevin Wright

Matt Hille, now a third year Professional Program of Veterinary Medicine student from Hickman, mixes testing agents for Shiga toxin-producing E. coli strains as part of his 2011 Summer Scholars research project in the laboratory of Rod Moxley, left.

A real 'foodie'

food.unl.edu

Since she sent out her first e-newsletter in 1996, Alice Henneman has been a social media leader.

"I saw the Web as a way of amplifying what I was already doing to a larger audience," said Henneman, University of Nebraska–Lincoln Extension educator based in Lincoln.

The website she created, using mostly existing programming, focused on food and nutrition. It became a national success.

Henneman since has embraced many Web tools – Facebook, YouTube, LinkedIn, Twitter, Pinterest and more. She thinks it's key that extension be on the cutting edge of these opportunities.

Among the websites having grown from Henneman's early efforts is food.unl.edu.

"It has been amazing how it helps spread our reach and how much people appreciate it. They



know they can use our information, they know it's nonbiased," Henneman said.

— Daniel R. Moser



**Growing a healthy future...
with your help.**

IANR is committed to growing the future of Nebraska's people, businesses and communities. With your help we can expand our statewide 4-H programs, increase scholarships, and fund important research.

To learn more, or to give, contact Ann Bruntz at abuntz@nufoundation.org or 402-458-1176.

Or go to nufoundation.org/ianr

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NEBRASKA**
UNIVERSITY of NEBRASKA FOUNDATION

International interns

Food Processing Center student interns Daniel Alexis Latacunga Chicaiza and Victor Manuel Escobar Gonzalez have been assigned to produce a food-safety plan for the Dairy Plant this semester. But they're also getting a little taste of everything, working in all aspects of food processing as part of an internship through Zamorano University in Honduras. Chicaiza, of Ecuador, and Gonzalez, of Guatemala, also are enjoying getting to interact with Americans as well as students from many other nations. Both are scheduled to graduate in December and probably will pursue their master's, perhaps at UNL. They noted that UNL's center is one of the choice intern spots for students from their university.

Algae could be grown as part of an integrated system that would include crop, livestock and ethanol production.



ALGAE

Taking it for a test drive

There's no danger algae ponds will replace corn, wheat or soybean fields in Nebraska's landscape, but University of Nebraska–Lincoln scientists believe algae could be a key player in an integrated system that incorporates crops, livestock and ethanol production while producing biofuels and other products.

A number of research angles involving many disciplines is under way. Some scientists are studying different strains of algae to determine which contain the most lipids, or fats, or which strains might best be genetically modified to boost oil content. Others are trying to determine how best to measure those lipids, first in labs, then in ponds; still others, how to most efficiently harvest the oils.

Yet another research thrust is taking a significant step forward with a new public-private partnership in South Sioux City. Funded by \$500,000 from the Nebraska Environmental Trust, this project will use hot water produced by the Beef Products Inc. plant to help grow algae on a one-eighth acre site.

It will be the UNL project's first venture growing algae outdoors. Until now, it has been grown in aquariums, bags and tubes in a Beadle Center lab.

"It's going to give us an opportunity to expand into the private sector and work with municipalities and really test-drive it at a scaled-up, semi-commercial level," said Paul Black, chair of UNL's biochemistry department



and part of the research team.

George Oyler, a research associate professor in biochemistry and project coordinator, said algae has many uses. In addition to its oil being developed into biofuels, it could be used as feed for fish raised in aquaculture, and for cattle and other ruminants; and incorporated into new treatments for human disease.

Taking advantage of algae's versatility will be key.

"To grow algae, particularly in the Midwest, we need to have it as a part of an integrated system that extracts value from every stage of the process," Oyler said. "Applications of algae have to be highly intensive to be economically viable."

In Nebraska, algae ponds near feedlots and ethanol plants may be a common sight in the future.

Algae grows faster with increased carbon dioxide. It might be possible to

route carbon dioxide produced during corn-ethanol production to nearby algae raceways. Manure produced by cattle, fed wet distillers grains produced during ethanol production, could in turn be used to fertilize algae.

The key goal: "Build these loops so you have a minimal amount of water expended while getting good outputs" and eliminating waste going into the environment, Black said.

UNL's algae research, which has received some \$10 million in grants since 2009, is working with other universities and private industry spanning the country from San Diego to Baltimore. Outreach to high school students is under way, via some programs in Omaha and Lincoln, and independent-learning courses elsewhere led by UNL partners.

George Oyler, 402-472-2948, goyler2@unl.edu

— Daniel R. Moser

Forecast: breezy, with a chance of power



UNL Extension provided the brain power behind 4-H's 2011 National Youth Science Day, winning a competition to devise the project for tens of thousands of youth worldwide.

Wired for Wind, created by extension educator John Hay, gave kids an in-depth look at wind power as a renewable energy source.

The program's goal is to enable youngsters to become scientists for a day, connecting important lessons in science, engineering and technology to civic engagement.

KidWind came up with a scaled-back, affordable wind-power kit.

Last fall, on National Youth Science Day, participating fifth-graders used the kit to build two types of wind turbines – horizontal axis and vertical axis. They determined which is the more efficient design, explored the effectiveness of various blade pitches and, finally, determined how and where to site a wind farm in their individual states.

Brad Barker, Nebraska 4-H science and technology specialist, said this was a real coup for Nebraska 4-H. "To be selected to lead the experiment is a great honor."

John Hay, 402-472-0404, jhay2@unl.edu

— Daniel R. Moser

Fast Facts

Oil content

The oil content of algae can comprise 30 to 50 percent of its weight, compared to 20 percent of a soybean.

50%

Yield

Algae could yield up to 6,000 gallons of oil per acre annually, compared to 43 gallons for soybeans, 86 for sunflowers and 171 for canola.

No competition

Algae do not compete with food crops; do not require premium farmland; are not as nutrient-intensive as other biofuel crops; and can grow on waste, salty and brackish water.

Switching to switchgrass

Biomass could reduce foreign-oil dependence and the greenhouse gases emitted by petroleum or other fossil fuels. But first it has to be economical to deliver it to power plants.

It isn't yet, say University of Nebraska-Lincoln experts.

Biomass – which can comprise crop residues or energy crops like switchgrass – can be burned directly as fuel or converted to a liquid fuel such as ethanol, using cellulose biorefinery technologies still in development. In either case, it must be collected and delivered to a use point, which can be expensive because of the low density of energy available in biomass and the dispersed availability, said Richard Perrin, agricultural economics professor.

Perrin and two graduate students studied the potential cost of delivering commercial quantities of biomass to three towns, Adams, Norfolk and Wood River, each of which has a corn ethanol plant that could use biomass as fuel, or could be modified to produce cellulosic ethanol.

Estimates showed it would cost \$75 per dry metric ton of switchgrass or \$62 per dry metric ton of stover in on-farm costs to supply plants.

"At the present time, coal and natural gas provide much cheaper combustion energy than these biomass prices. The price that can be paid by cellulosic ethanol plants is as yet unknown," Perrin said.

Richard Perrin, 402-472-9818, rperrin1@unl.edu

Get the full story on switchgrass.

— Daniel R. Moser

How much food can the world produce without destroying its environment?

“This may sound like a simple question, but if we do it with good underpinning science, it is a very tough question.”

*Ken Cassman, IANR agronomist
who holds the university's inaugural
Robert B. Daugherty Professorship*



UNL Office of Research and Economic Development

IANR's Water Research Goes around the Globe

Ken Cassman is trying to help answer the question: how much food can the world produce without destroying its environment?

“This may sound like a simple question, but if we do it with good underpinning science, it is a very tough question,” said Cassman, University of Nebraska–Lincoln agronomist who holds the university’s inaugural Robert B. Daugherty Professorship.

The Institute of Agriculture and Natural Resources scientist is using a “bottoms up” approach with a group of global agricultural experts to understand what all the world’s major crop-producing regions can produce within existing constraints of climate, land and water.

When finished, this information will be publicly available as a Yield Atlas so it can be used by scientists and policy makers throughout the world.

The Bill and Melinda Gates Foundation provided substantial funding to initiate the Atlas development, with a focus on selected countries in Sub-Saharan Africa and South Asia.

Seed funding to develop the concept also came from the Robert B. Daugherty Water for Food Institute.

Assuming access to a sustainable source of irrigation water as in Nebraska, the Atlas will help identify regions of the world where investment in irrigation would be most beneficial.

Cassman also is working to ensure that research outputs that provide solutions to current yield constraints reach areas with the greatest potential for yield improvement, especially South Asia, Sub-Saharan Africa and South America.

Cassman is the first chair of the new Independent Science and Partnership Council, which advises the Consultative Group on International Agricultural Research (CGIAR) on the scientific merit and feasibility of global agricultural research projects.

 More on Cassman water research.

Website info at
waterforfood.nebraska.edu

CGIAR is a network of 15 international research centers working to improve agricultural productivity, conserve natural resources and stimulate agricultural growth in developing nations. The seven-member council helps CGIAR funders identify agricultural development projects with the highest scientific quality and the greatest potential to increase farmer incomes in poor, rural areas.

“To increase investment in agricultural research, we have to know our research priorities are correct and the science is being done well,” said Cassman.

During his three-year term, which started in January 2011, Cassman is helping CGIAR establish a portfolio of proven research projects that leverage research specialties of the CGIAR centers and its partners in developing and developed countries. In his own research conducted at UNL with Patricio Grassini, an assistant UNL research professor of agronomy and horticulture, Cassman recently found irrigated corn in Nebraska is highly efficient in using energy, water and fertilizer; and that increased yields more than offset the energy cost of these inputs.

This research has important ramifications for agriculture’s efforts to meet increasing global needs for food, fuel, water, feed and fiber on existing farmland.

The findings are based on several years of field data collected from a large number of actual farmer fields in Nebraska’s Tri-Basin Natural Resources District. This “rigorous on-farm assessment” is a first, Grassini explained. Previous research used secondary data gathered and extrapolated by the USDA through producer surveys.

Ken Cassman, 402-472-5554,
kcassman1@unl.edu

— Sandi Alswager Karstens

Having Water in Common

A new international education partnership combines the strong engineering and water background of the UNESCO-IHE Institute for Water Education and the strong crop and large-scale production system expertise at the University of Nebraska–Lincoln.

The agreement between UNESCO-IHE, based in Delft, Netherlands, and UNL was signed during the 2011 global Water for Food Conference in Lincoln, after discussions began during the 2009 conference.

UNESCO-IHE agreed Nebraska’s expertise in water and production agriculture, coupled with IHE’s experience in water management focused on developing nations, provide the foundation for a strong partnership.

Dedicated faculty at both UNESCO-IHE and UNL have worked long and hard to bring the partnership to fruition, said UNL hydrologist Ed Harvey, speaking on behalf of the UNL team and the first faculty exchange member. “We have made a new friend in the Netherlands,” he added.

The full UNESCO-IHE partnership encompasses opportunities such as a new degree program, access to new courses for both UNESCO-IHE and UNL students, and exchanges for both students and faculty.

— Sandi Alswager Karstens

West Central Team’s Water-Savings Work Works for the Future

Getting the most of every drop of rain is important for a multidisciplinary team at the university’s West Central Research and Extension Center at North Platte. The team is working together to more fully understand all aspects of dryland and limited crop irrigation for profitability and maximum yield.

A big focus of their work is understanding the big picture – how management system decisions made today will affect things tomorrow.

The team works to tie together all aspects of crop production as it relates to irrigation and water management – from residue removal to variable rate irrigation, nutrition management and optimizing irrigation applications for efficient water use.

Greg Kruger, UNL Extension cropping systems specialist, and Tim Shaver, nutrient management specialist, co-advise a UNL graduate student along with Chandler Mazour, manager at the Monsanto Water Utilization Learning Center at Gothenburg. The student project looks at water use across corn hybrids and soybean varieties in order to compare water consumption to yields.

Bob Klein, western Nebraska crops specialist, educates about water-saving skip row planting. Simon van Donk, irrigation water resources specialist, studies the impact of residue removal on water consumption.

— Sandi Alswager Karstens

Growing Nebraska Entrepreneurship

From breeding and growing African violets, cut flowers and herbs to starting a cattle enterprise, restoring machinery or starting a bed and breakfast, the 59 students in the **Engler Agribusiness Entrepreneurship Program** have creative business ideas.

Tom Field, Engler Agribusiness Entrepreneurship chair, said the majority of the students are engaged in enterprise and growth-seeking opportunities. Students also have placed in national, regional and university business competitions.

The Engler program began in 2010 with a \$20 million gift from

the Paul F. and Virginia J. Engler Foundation to the University of Nebraska to establish a permanently endowed fund to support agribusiness entrepreneurship in the Institute of Agriculture and Natural Resources. Paul Engler created Cactus Feeders, the largest privately owned fed-cattle operation in the world.

The gift provides student scholarships and program support for student courses, a lectureship series, entrepreneurship training camps, internship placement assistance, student travel and more.



Tom Field

2010 Engler program started
\$20 million donated by the Paul F. and Virginia J. Engler Foundation
59 number of students in the Engler Agribusiness Entrepreneurship Program

Connecting Innovations Connecting People

Increasing demand for food and renewable energy provides growth opportunities for rural communities in Nebraska and across the Great Plains. Identifying and building on such opportunities is the goal of the May 8-10 University of Nebraska Rural Futures Conference in Lincoln.

“Connecting Innovations” is the conference theme. It will feature internationally known speakers and draw on the expertise of the university, its constituents and partners in developing NU’s proposed Institute for the Rural Future.

“Rural and urban communities in Nebraska are interdependent,” said Ronnie Green, NU Vice President and Harlan Vice Chancellor, Institute of Agriculture and Natural Resources. “When we increase the population of our nonmetropolitan areas, increase access to technology and resources, and enhance economic opportunities, it strengthens all of Nebraska.

“There are both opportunities and challenges facing rural areas across Nebraska, our country, and the world. How we work strategically, innovatively and collaboratively in needed research and education to

provide those things that improve quality of life and draw young people to rural communities, will help define the success, resilience and sustainability of rural regions.”

Frans Johansson, CEO of the Medici Group, a global innovation firm, will keynote the conference. An advocate of looking to other cultures and disciplines for innovation, he’ll speak on “Seeking Innovations Through New Combinations.”

Other speakers include NU President J.B. Milliken, Nebraska photographer Joel Sartore and Green.

Panels feature state, national and international experts. Topics range from combining ideas from diverse disciplines in higher education and research to community stakeholders modeling positive change, and moving from silos to synergies in the academic culture.

For more, visit ruralfutures.nebraska.edu.

 View Rural Futures keynote video and more



Back Home Again

It's no secret.

Weldon Sleight, dean of the Nebraska College of Technical Agriculture (NCTA) at Curtis, is on a mission: encourage rural youth to come back home.

Business Builders is one of Sleight's newest ventures to help achieve that mission.

"We don't have anyone putting their arms around our kids and saying, 'yes, go to college, and when you come home, we'll have a job waiting here for you,'" Sleight said. "Without rural communities, we are not Nebraska."

Business Builders pairs high school students with community mentors.

When students go to college, they return to the businesses and professions with which they were paired for internships. After college, graduates have a business or profession to go home to.

The process begins with feedback from teachers, lawyers, farmers, ranchers and other community business people about their future plans; and from high school students about their career interests. A student is paired with a mentor who is likely to retire, change or expand his or her business.

The program is being piloted in Grant and Oshkosh, and Sleight said plans are under way to make it available across the nation.



Marketing the community

Understanding the role of photographic images, and how people see them as representing communities online and in marketing materials, is the focus of a University of Nebraska-Lincoln study.

The four-year study started in 2008 and looked at six communities, two each in Nebraska, South Dakota and North Dakota.

Findings suggest images don't always communicate the intended message, and the same image can portray different messages to different people.

By tailoring images and messages, communities can enhance their ability to market their location to new residents. Suggestions on how to do so are being developed as one of the tangible products of this project.

Stories by
Sandi Alswager Karstens

Youthful Entrepreneurship

Strong rural communities rely on strong businesses, and two University of Nebraska-Lincoln Extension programs are helping spark business ideas and connections for middle- and high-school youth to do just that.

One example is extension's Community Connections in Thayer County. One day each month during the last two school years, Phyllis Schoenholz, extension educator based in Hebron, coordinated discussions with students and business men and women, garnering interest and support for local entrepreneurial opportunities.

Another example is 4-H's Entrepreneurship Investigation, or ESI, a curriculum also used at summer camps.

Noah Spagnotti, 14, of Cedar Rapids, raises endangered Jacob sheep on his family farm. Spagnotti

knew he wanted to do something with sheep wool. Through ESI, he came up with his idea: wool dryer balls that soften clothes and replace dryer sheets. The colorful balls reduce dryer time and save energy.

Spagnotti has a viable business, as well as knowledge of money management, pricing and marketing, all thanks to ESI.

For more information, see extension.unl.edu/communityconnections and esi.unl.edu.



Spagnotti family



For the Birds



A Nebraska Panhandle crop is a key ingredient in birdseed. Proso millet growers usually harvest between 100,000 and 150,000 acres annually. Nebraska typically has one-third to one-fourth of the nation's

proso millet acreage, annually producing from 1.2 million to almost 4.5 million bushels, with a value of \$4 million to \$21 million. The small grain millet also has potential as a biofuel, beer and wine.

 More on proso millet



Troy Walz

Blaze to Graze

Prescribed burns are an economical, effective tool to manage grasslands and control encroaching cedar trees in Nebraska. Since 1996 UNL Extension has collaborated with more than a dozen entities to hold more than 50 prescribed burn schools, enabling landowners to burn more than 53,430 acres and increase pasture productivity.

 More on blaze to graze



Herd Health

IANR scientists are honing in on solutions for low reproduction of the Oglala Sioux tribal bison on the Pine Ridge Reservation and others. Studies show low body condition of bison cows to be associated with reduced fertility. Scientists recommend that herd managers identify individual animals, maintain production records, cull unproductive animals, control parasites, limit herd size, and provide supplemental forage and minerals. A couple more years of research will assess progress and include other herds.

Soil Safe

Washed into streams, lakes and rivers, soil can become a major pollutant. Sediment and Erosion Control Seminars in Omaha, sponsored by UNL Extension and others, teach building industry professionals about stormwater management issues and regulations to reduce soil runoff from construction sites. Nearly 900 engineers, architects and contractors have attended the seminar since 2009. A 2010 survey showed 71 percent of surveyed participants say they were more confident in being able to meet sediment and erosion control requirements.



Brent Pluggie

Have Lab Will

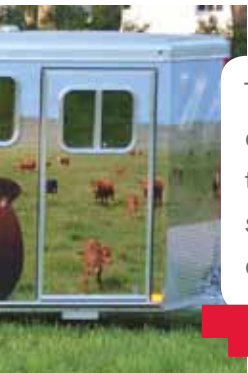
As science goes on the road with UNL Extension Mobile Beef Labs, Nebraskans learn more about the value of animal agriculture. Two, 19-foot aluminum trailers house a beef cow along with microscope, TV, computer and other lab components that teach lab visitors about science, specifically biology. From the lab students learn

Firecracker Seeds

4-H'ers are taking a crack at the firecracker sunflower this summer. The dwarf, pollenless plant is the 2012 4-H Special Garden Project. About 1,500 packets of seeds were distributed to 4-H'ers in some 60 Nebraska counties. The plant is ideal as it can be grown in a pot or in the ground; not so with last year's garden project, the vining striped Armenian cucumber. Watch your county and state fairs this summer and fall to see the results.



Johnny's Selected Seeds



Two mobile labs are available to go to your school or organization.

Travel

scientific principles, as well as about the complex ruminant animal and what makes the ruminant unique in the environment and ecosystem.

To schedule lab to visit a school or organization, contact Brent Plugge, UNL Extension educator based in Kearney, at 308-236-1235, bplugge1@unl.edu.



Johanns Yeutter Block Glickman

Former Secretaries of Agriculture Will Focus on Food for the Future

Four former secretaries of agriculture – two with Nebraska ties – are invited to headline the first of four Heuermann Lectures for the 2012-2013 season.

Nebraska's U.S. Senator Mike Johanns was U.S. Secretary of Agriculture from 2005-2008. Nebraska native Clayton Yeutter served from 1989-1991.

John Block, Secretary of Agriculture from 1981-1986, and Dan Glickman, who served from 1995 to 2001, are Yeutter's and Johanns' invited guests for the event, which will be broadcast nationally on RFD-TV.

Jeff Raikes, chief executive officer of the Bill and Melinda Gates Foundation, and Ronnie Green, University of Nebraska Vice President and Harlan Vice Chancellor, Institute of Agriculture and Natural Resources, will moderate the panel of former secretaries.

"The Land-Grant Mission of 2012-Transforming Agriculture for the 2050 World," is the panel's topic.

This Heuermann Lecture, scheduled at 7:30 p.m. Friday, Sept. 28 at the Lied Center, 12th and R in Lincoln, is part of a weeklong event celebrating the 150th anniversary of the Morrill Act that created land-grant colleges. This year also marks USDA's 150th anniversary.

The Heuermann Lectures in IANR focus on meeting the world's growing food and renewable energy needs while sustaining natural resources and rural communities.

They are made possible by a gift from B. Keith and Norma Heuermann of Phillips, longtime university supporters with a strong commitment to Nebraska's production agriculture, natural resources, rural areas and people.

The last Heuermann Lecture for the 2011-2012 season is May 8 at 2:30 p.m. in Hardin Hall, 33rd and Holdrege, when native Nebraskan Jay Keasling addresses "The Bold Future of Alternative Energy." Keasling is a professor at the University of California, Berkeley, and Chief Executive Officer and Vice President for Fuels Synthesis at the Joint BioEnergy Institute.



Other speakers in the Heuermann Lectures inaugural season were: M.S. Swaminathan, first World Food Prize laureate; P. Stephen Baenziger, IANR small grains breeder and first to hold the Nebraska Wheat Growers Presidential Chair; Bob Kerrey, former Nebraska governor and U.S. senator; Stewart Brand, author of "Whole Earth Discipline: An Ecopragmatist Manifesto;" and Roberto Lenton, founding director of the Robert B. Daugherty Water for Food Institute. See heuermannlectures.unl.edu.



— Judy Nelson



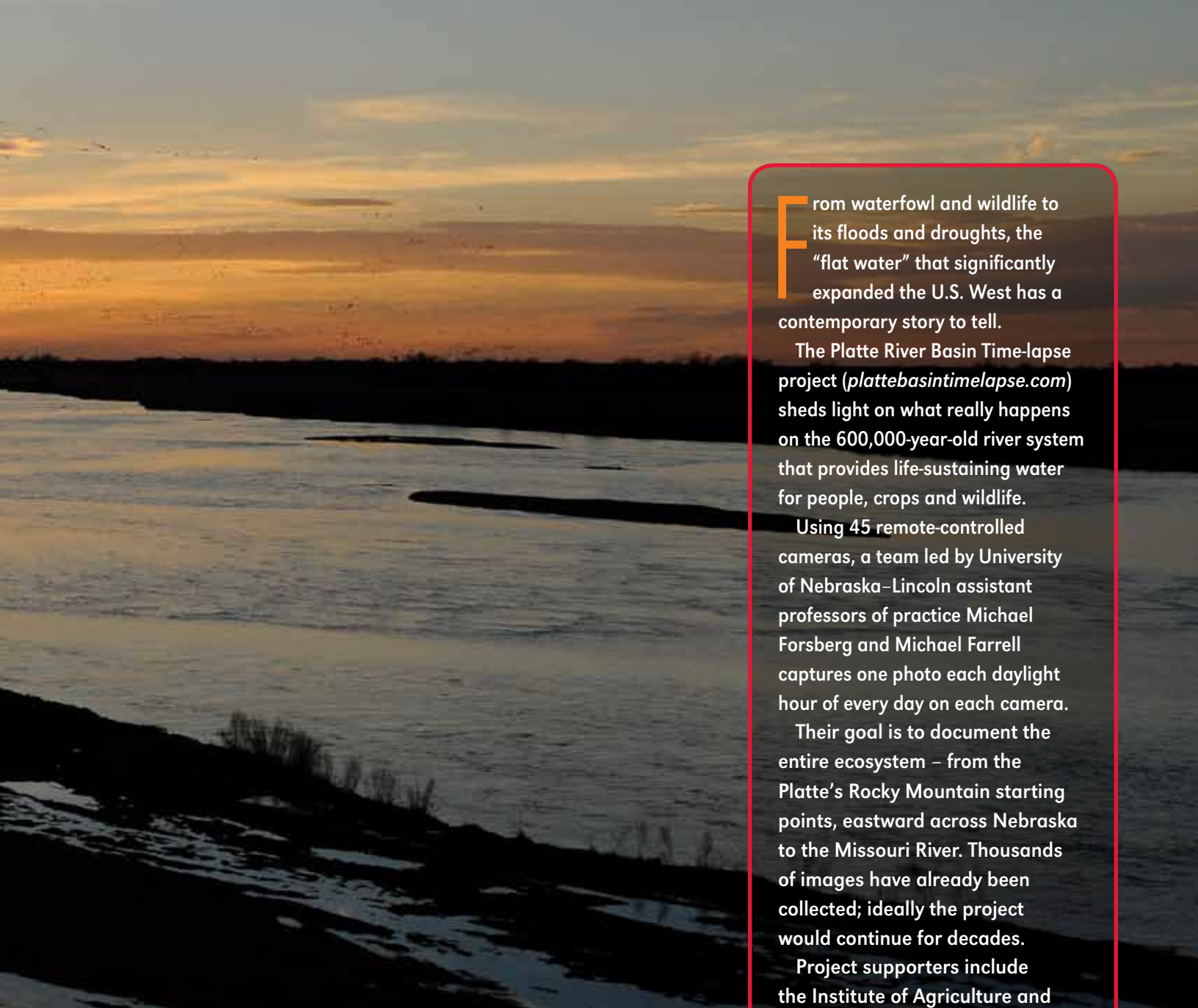
FLAT W

"We want to be able to show people how the complex



-  [View project webcams](#)
-  [View video on the Forsberg project](#)





From waterfowl and wildlife to its floods and droughts, the “flat water” that significantly expanded the U.S. West has a contemporary story to tell.

The Platte River Basin Time-lapse project (plattebasintimelapse.com) sheds light on what really happens on the 600,000-year-old river system that provides life-sustaining water for people, crops and wildlife.

Using 45 remote-controlled cameras, a team led by University of Nebraska–Lincoln assistant professors of practice Michael Forsberg and Michael Farrell captures one photo each daylight hour of every day on each camera.

Their goal is to document the entire ecosystem – from the Platte’s Rocky Mountain starting points, eastward across Nebraska to the Missouri River. Thousands of images have already been collected; ideally the project would continue for decades.

Project supporters include the Institute of Agriculture and Natural Resources; the Platte River Recovery Implementation Program; and the Cooper Foundation. Jeff Dale, TRLcam.com, provided technical assistance in setting up the cameras.

— Sandi Alswager Karstens

PLATTER

story of the Platte River unfolds over days, months and even years.”

Photographer Michael Forsberg



Energy, creativity, enthusiasm

— many, many students, faculty and staff in the Institute of Agriculture and Natural Resources have these attributes, and they're certainly seen in the five people here. We asked four questions. See what they have to say. And keep your eyes on these individuals — they're going places!

What brought you to UNL?

What are two of your goals for the future?

What is your favorite campus/IANR activity?

What IANR "must see" would you recommend?



Elizabeth Keuter, animal science freshman from Gilbert, Ariz.

Why UNL – While having grandparents living in Lincoln was probably a major factor, I would have to say the Department of Animal Science and the awesome atmosphere of East Campus really cemented my decision to come to UNL.

Two goals – My first goal is to get accepted into vet school. My second goal is to be able to work with beef and dairy cattle reproduction and research animal reproduction and genetics.

Favorite activity – Too many to choose from! I do play piccolo in the Marching Band and baritone in the Big Red Express Pep Band.

Must see – I would recommend seeing any and all of East Campus. It really is just so beautiful and the opportunities there are surely one of a kind.

Judson Hoffschneider, agribusiness freshman from Arlington.

Why UNL – I am following three generations of family members. Plus, the history in the College of Agricultural Sciences and Natural Resources, the Agribusiness Banking and Finance Program, and Nebraska Beef Industry Scholars program. The latter two were pivotal to my coming to UNL.

Two goals –
1. Educating the public about how their food is produced and where it comes from.
2. Campus engagement and making the most of my college experiences inside and outside of class, such as with Christian organizations, agribusiness/agricultural economics organizations and the National Agri-Marketing Association.

Favorite activity – Attending the free Homecoming concert with new friends.

Must see – The "must taste" Dairy Store.



Regis Moreau, assistant professor, Department of Nutrition and Health Sciences. Bachelor's in biology and biochemistry, University of Western Brittany, France; Master's in biology and agronomy, University of Rennes 1, France; Ph.D. in zoology, The Ohio State University.

Why UNL – To research and educate, and advance the field of nutrient-gene interaction in a collaborative and

dynamic environment, using leading molecular techniques to better understand how bioactive food compounds can improve human health, and to positively impact student education inside and outside the classroom.

Two goals – First, develop a nationally recognized research program in human nutrition. Second, pass on to the next generation an evidence-based appreciation for what we eat.

Favorite activity – Setting up my lab, meeting new colleagues.

Must see – Dairy store and lemon-custard ice cream.

Kayla Colgrove,

UNL Extension educator based in Beatrice. Bachelor's in nutritional science and dietetics, UNL; Master's in Nutrition and Health Sciences, specialization in nutrition and exercise, UNL.

Why UNL – I came to UNL on a Track and Field scholarship to throw the javelin. I actually hope to compete in a couple outdoor meets to see if I can qualify for the Olympic Trials in Eugene, Ore., this June – I want to give it one more round before being totally done with it. Through my experience at UNL, I knew I wanted to stay and work for a great university.

Two goals – First, to provide education to reduce health conditions related to poor diet, physical inactivity and overweight/obesity. Second, provide education to help reduce foodborne illnesses related to improper food handling.

Favorite activity – Eating Dairy Store ice cream.

Must see – Food Processing Center.



Sohan Birla, research assistant professor, Department of Biological Systems Engineering. Bachelor's in agricultural engineering, J N Agriculture University, Jabalpur, India; Master's in dairy and food engineering, Indian Institute of Technology, Kharagpur, India; Ph.D. in food engineering, Washington State University, Pullman.

Why UNL – Unique undergraduate and graduate program where I can start research and teaching in applying electromagnetic energy in biological processes.

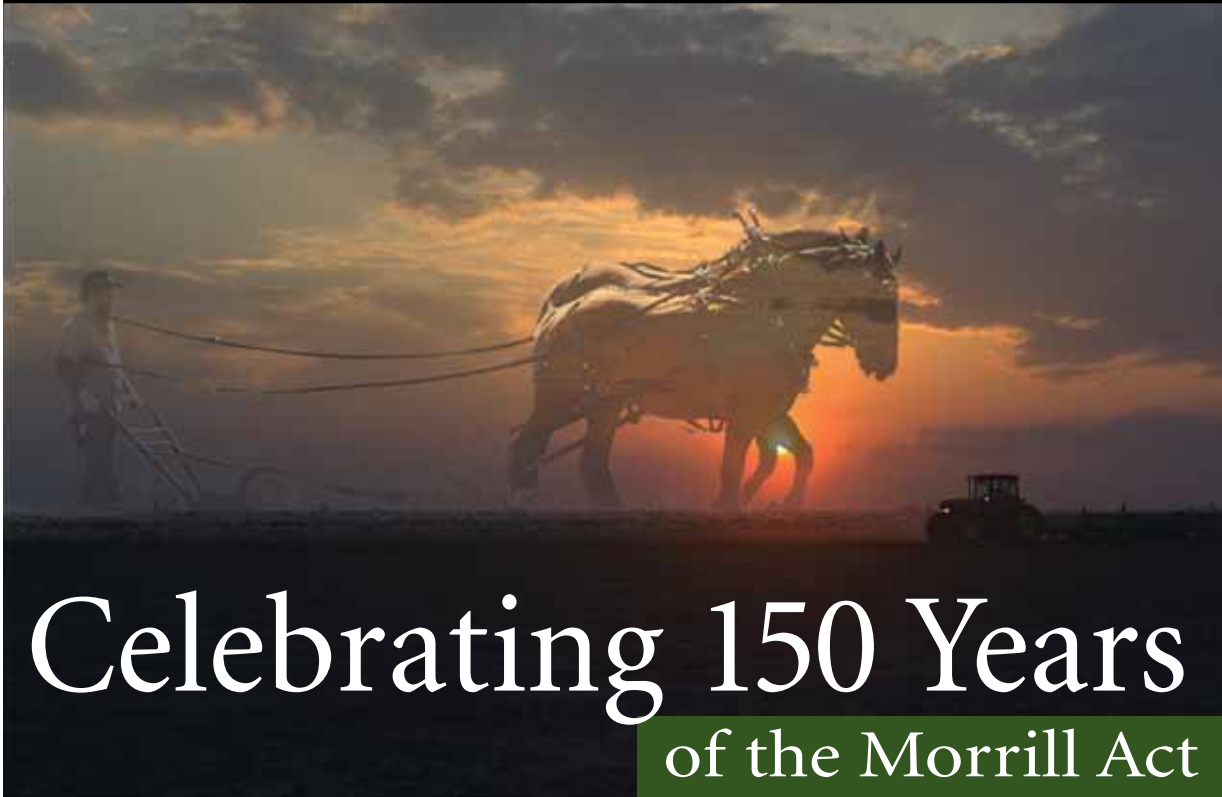
Two goals – Develop a self-sustained center of excellence for new process and products, and a virtual product and process lab. Start a teaching and extension microwave peripheral science program.

Favorite activity – East Campus Chili Cookoff (my family was twice the People's Choice award winner), and BSE birthday coffees.

Must see – Dairy Store Scarlet & Cream ice cream, Maxwell Arboretum, Lester F. Larsen Tractor Test and Power Museum.

Dairy Store

Tractor Test Museum



Celebrating 150 Years of the Morrill Act

This year the University of Nebraska–Lincoln, along with other land-grant universities and the states they serve, celebrate the 150th anniversary of the **Morrill Act**.

The Morrill Act brought into being land-grant universities, making education more affordable to all people, educating them in agriculture, home economics, mechanical arts and other professions practical at the time. Before the Morrill Act, higher education was primarily a privilege of the rich.

Thanks to the land-grant legislation, each state has tremendous success stories to

tell, graduating successful leaders and citizens, extending knowledge to those who put it to immediate use in their lives, and conducting agricultural research that helps feed the world.

The university is celebrating the Morrill Act anniversary with a full week of activities Sept. 23-28.

A celebration highlight is a scheduled forum of former U.S. Secretaries of Agriculture Sept. 28, led by Nebraska’s own Clayton Yeutter and Mike Johanns. The 7:30 p.m. forum will be the first Heuermann

Lecture for 2012-13 (see story, page 15).

Daily themes and events at UNL during the land-grant celebration conclude with the Nebraska-Wisconsin game Sept. 29.

Other themes and events

Sunday, Sept. 23	50 th Anniversary Celebration of ARDC (Agricultural Research and Development Center at Mead)
Monday, Sept. 24	Entrepreneurship and Youth Day, Nebraska East Union
Tuesday, Sept. 25	Life Sciences Day, Nebraska East Union
Tuesday, Sept. 25	Landscape Systems Day, Hardin Hall
Wednesday, Sept. 26	International Day, Hardin Hall
Thursday, Sept. 27	Rural Futures Institute Day, Center for Great Plains Studies
Friday, Sept. 28	Land-Grant Legacy Day, Lied Center for Performing Arts



Neal Ely

Neal Ely is where he wants to be, doing what he wants to do. And, he says, he's having a great time. Ely had already been in business for himself for six years when he earned his agribusiness degree from the University of Nebraska–Lincoln in December 2007. Three days after graduation, he became a loan officer at Astra Bank of Sutton, where he works as he also continues managing the family-owned and operated Ely Farms, LLC at Grafton.

“I feel blessed – this is the perfect set-up,” Ely said. “I have a pretty big passion for farming and small towns.”

Ely Farms took off in 2001 with a pickled asparagus recipe from his mother and a wood-working shop-turned-commercial kitchen. He



“I wouldn't trade my University of Nebraska experience for anything.”
Neal Ely, entrepreneur and Sutton loan officer

said the **Food Processing Center**, a part of the Institute of Agriculture and Natural Resources at UNL, often provided immediate assistance in product development, production, marketing and quality control as he needed it.

The perfect set-up



In 2001 Ely Farms sold 500 jars of pickled asparagus; it now annually sells about 13,000 jars of pickled asparagus and pickled bell peppers in grocery, gift, liquor and gourmet stores in Nebraska and six other states.

Ely said there is much opportunity – and demand – for quality specialty products. With the help of the online Grow Nebraska marketplace, Web, Facebook, blogs and Twitter, he said “we are able to market the product in ways that even five years ago weren't possible.

“We are a small business – the neat thing is we've been able to make it work.”

The community benefits as well. Ely hires seasonal and part-time help, and orders bulk produce through the local grocer to round out his own vegetable farming.

Ely is grateful for and well-satisfied with his college education.

“I still contact my professors when I need help. CASNR (College of Agricultural Sciences and Natural Resources) is small enough to form those long-lasting relationships. I wouldn't trade my University of Nebraska experience for anything.”

– Cheryl Alberts



Your ideas appreciated

We welcome your help in identifying story and photo ideas that show the many ways IANR benefits Nebraska and the world.

We are looking for stories of work done by alumni, students, faculty, staff and administrators that benefits people's lives, communities, the environment and economy. Is there a person, program, project or class you think particularly interesting? And if you'd like to send your own business notes for a class notes section for possible inclusion either in the magazine or online, please do. Please fill out the form at ianrhome.unl.edu/storyidea or send ideas to jbrown14@unl.edu and dmoser3@unl.edu. (We ask for your email and phone number in case of any questions.)

Thank you for your help.



More about Neal

Robots

Gear Up Science

66 camps

24 states

75 clubs

It started with a \$2.5 million grant from the National Science Foundation to University of Nebraska-Lincoln Extension 4-H and has grown into a national program that excites thousands of kids about science, technology, engineering and math (STEM).

Geospatial and Robotics Technologies for the 21st century, or GEAR-Tech-21 (gearthech21.org), is based on the Nebraska Robotics and GPS/GIS in 4-H Workforce Skills for the 21st Century. Through building and programming a robot, navigation and mapmaking activities, fifth through ninth graders learn robotics, GPS and GIS technologies, said Brad Barker, 4-H science and technology specialist.

Sixty club programs have been started by 4-H, Scouts and school groups across the country. The program also will sponsor another 66 summer camp sessions in 24 states in 2012.

GEAR-Tech-21 supports FIRST LEGO League teams nationwide and hosts the Nebraska tournaments. This year 72 FIRST LEGO League teams participated in three qualifying tournaments in Kearney, Omaha and Lincoln, which fed into the championship tournament in Ashland. With two to 10 youth each, 48 teams advanced to compete in the championship tournament.

– Sandi Alswager Karstens

See more about the exciting Robotics program at gearthech21.org.

Application Aptitude

The Institute of Agriculture and Natural Resources is taking a lead in the use of and development of mobile apps (ianrhome.unl.edu/web/ianr/mobileapps).

These Web applications accessed over the Internet

put information at users' fingertips any time, anywhere on mobile devices such as smartphones or tablet computers, from the field to the store or to use easily at home while saving energy and time.

Nearly a dozen apps have been developed or are in the development process. IANR apps are based on research about topics such as aphids, food safety and career development for youth.



GrowIt-KnowIt, Aphid Speed Scout, Snack Planet, Market Journal, mBYF (*Backyard Farmer*), 4-Day Throw Away, Career Explorer by Nebraska 4-H, and Nebraska Extension 4-H at the State Fair are a few of the apps available now.

Apps that will be available in the future include western bean cutworm speed scouting, porcine and bovine myology, parenting, nitrogen rate calculations and site-specific irrigation scheduling.

— Sandi Alswager Karstens

Feather Weight

Picture this: car bumpers made from thermoplastics made from chicken feathers.

Chicken feathers?

Yiqi Yang, textiles scientist at the University of Nebraska–Lincoln, and his team have discovered a way to make thermoplastics from the 3 billion pounds of waste chicken feathers produced each year in the U.S.

“We believe we were the first” to demonstrate that chicken feather-based thermoplastics can be stable in water and still maintain strength, Yang said.

The Institute of Agriculture and Natural Resources scientist said chicken feathers are made mainly of keratin, a tough protein also found in hair and horns. His invention led to an interview with

BBC News after he explained how keratin can strengthen plastics at the 2011 annual meeting of the American Chemical Society.

Thermoplastics are used to make products ranging from toothbrush bristles to car bumpers. Typically they are oil-based.

Yang’s research adds value to agricultural products while promoting sustainability. He also discovered a process to convert cellulose in cornhusks into natural textile fibers, which can be made into yarn and woven into fabric. That process is patented, he said, but not yet commercially developed.

— Cheryl Alberts



IANR's impact

reaches across the state and around the world. Here is just a sample of IANR's impact by the numbers.

External monies

Total amount of **external funding** **\$51.5** million to date in fiscal 2012 (as of March 7):

\$90+ **Campaign gifts** million: total amount of **gifts to IANR** as part of the **University of Nebraska Foundation's Campaign for Nebraska: Unlimited Possibilities.**

Interns see inner workings

UNL students have the opportunities as interns to get a **first-hand look** at the inner workings of UNL Extension offices. From helping plan educational programs on crops to working the county fair, in the last decade, UNL Extension throughout Nebraska has had **57 interns.**

57
interns

143,000 strong

Number of Nebraska youth involved with 4-H: **143,000.** That's **1-in-3** age-eligible youth involved primarily through **clubs, school enrichment** and **camps.** 4-H supports development of **life skills, healthy living** and **career development** for youth.



14,831 people have gone through the online option of the **food-handler permit program**, coordinated through the UNL Food Processing Center and Lincoln-Lancaster County Health Department. More knowledgeable food handlers mean **greater sanitation** and **fewer incidences of foodborne illness.**

Highest enrollment in college's history.

1,938 students in CASNR this fall.



2,178

Gallons of vanilla ice cream produced by **UNL Dairy Store** in 2011. Yes, it's the No. 1 flavor.

Prescription savings

Working as trained **Senior Health Insurance Information Program (SHIIP) volunteers,** UNL Extension educators from 2006-2012 enrolled nearly **5,000** rural Nebraskans in **Medicare prescription drug plans.** Estimated total savings as a result of extension's efforts for the six years is **\$4 million;** for 2012 alone it is estimated at

\$628,505.

\$6.8 million

in estimated savings to producers from UNL Extension's 2011 Crop Diagnostic Clinics.

66 The percent of Nebraska wheat crop planted with IANR-developed varieties.

Institute of Agriculture & Natural Resources
P.O. Box 830918
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(800) 742-8800 Ext. 2541