

Fall 2016



Growing

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FOOD • FUEL • WATER • LANDSCAPES • PEOPLE

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES | UNIVERSITY OF NEBRASKA-LINCOLN





Ron Yoder

As harvest winds down, we have much to be thankful for in 2016. Higher crop and livestock prices would make it even better, but if the past is any indication of the future we know those will return, and let's hope that is not too far off. I want to share with you a few of the things for which we in the Institute of Agriculture and Natural

Resources are thankful. Certainly the loyal support of you, our stakeholders and alumni, is at the top of the list.

As your university, we exist to serve Nebraska, and a quick review of the contents of this issue of *Growing* shows some of the breadth of how we do that. As our name implies, we serve agriculture and natural resources. Finding ways to make the lives of all Nebraskans better and ensuring the quality of the environment in which we live are also important parts of what we do. The connection between IANR and Nebraskans is strengthened by our outstanding Extension programs.

Having passed the century mark in 2014, Nebraska Extension is breaking new ground as it continues delivering programs in all 93 counties in our state, and exemplifies how IANR addresses important issues in crop and livestock production, in youth education, in food for healthy people, in community vitality and in ensuring the quality of the environment in which we live. In one-on-one consultations, through experiential learning, or by providing decision-making tools, the people of Nebraska Extension serve the people of Nebraska.

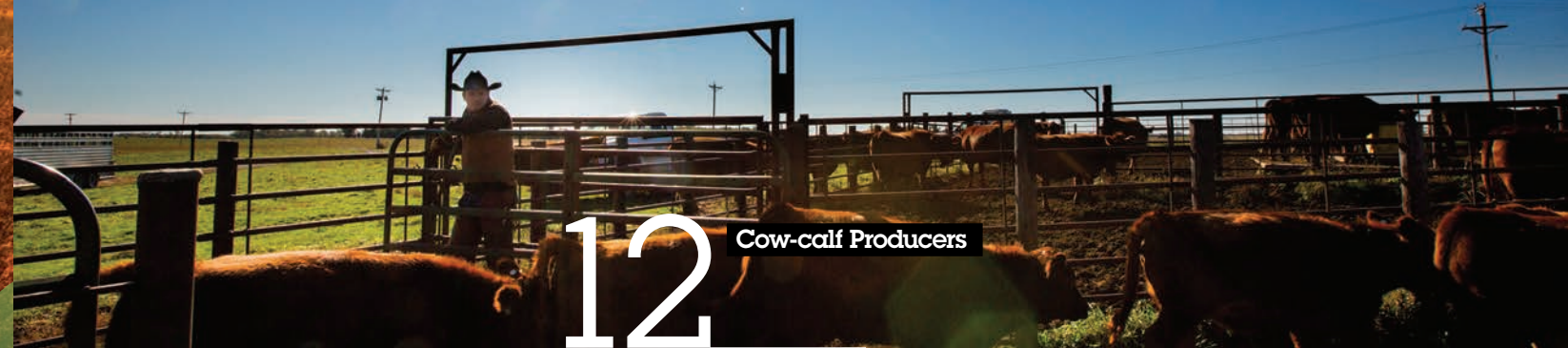
We are also serving Nebraskans through our research and teaching efforts. Enrollment in the College of Agricultural Sciences and Natural Resources (CASNR) has increased for the 12th consecutive year to a new high of 2,340 undergraduates and 692 graduate students.

With an additional 57 professional students in our Professional Program in Veterinary Medicine and Doctor of Plant Health programs, the total CASNR enrollment is 3,089. By next fall, some of those students will have the option of living in the newly completed residence hall next to the C.Y. Thompson Library.

Sponsored research funding in the Agricultural Research Division also set a record high in the past year, as our faculty members successfully competed for funding to support our growing research enterprise. Contributions from our generous donors are also helping support our cutting-edge research. In October, a \$40-million Food for Health initiative was announced with a \$5 million lead gift from the Raikes and Gates Foundations. This transdisciplinary initiative will integrate agriculture, medicine and nutrition across the university to improve the quality of life by preventing or ameliorating diseases such as heart disease, diabetes, cancer, and others.

We are thankful that we have loyal friends like you, and that we have the privilege of serving Nebraska.

Ron Yoder, Ph.D., P.E.
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GROWING A HEALTHY FUTURE

Fall 2016

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There is no charge for this magazine. Each issue describes IANR programs that benefit Nebraska and beyond. If you happen to receive more than one copy, please share with a friend.

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Cover photo: **University of Nebraska-Lincoln graduate Scott Spohn combines soybeans near Friend, Nebraska.**

Extension brings science to Nebraskans

HELPING PEOPLE SOLVE REAL-WORLD PROBLEMS



For more than 100 years, Nebraska Extension has made a huge impact on the state's environment, water quality, food safety, economy and quality of life.

"As Extension enters our second century, we are committed to ramping up our work to bring the science of

the University of Nebraska to the residents of our state. And, we will do so in ways that Nebraskans value," said Chuck Hibberd, dean and director of Nebraska Extension.

Many people know about the services Extension provides to the agricultural community, but Extension also provides expertise and know-how in many other areas, including nutrition, child development, community vitality and a wide array of applied technologies. By providing objective, relevant and research-based information and expertise, Extension educators, specialists and other professionals improve the lives of Nebraska's youth, its families, its communities and its economy as well as its farms and ranches.

In addition to one-on-one help, Nebraska Extension provides experiential learning, decision tools and consultation for clients.

Educational delivery methods include:

- workshops, conferences, field days, other events
- online learning modules
- blogs
- podcasts
- videos
- newsletters
- web articles
- downloadable educational materials, including NebGuides
- social media, such as Facebook, Pinterest and Twitter

HOW EXTENSION WORKS

Extension is believed to be the largest adult and youth out-of-school, nonformal educational organization in the world. It is a unique partnership of federal, state and local governments. Extension links the United States Department of Agriculture, the land-grant universities and colleges, and county governments. By leveraging the resources of each, Extension helps people solve real-world problems.



Nebraska Extension serves all 93 Nebraska counties with 170 locally based Extension professionals. Known for their teaching excellence, Extension personnel are responsive to local needs, issues and problems. Through a client-driven issues discovery process, Extension recently identified new opportunities, problems and challenges important to the people it serves.

To better meet these needs, Nebraska Extension has formed Issue Teams, which create demand-driven, interdisciplinary, innovative programs and services within seven program areas:

Beef Systems

The Beef Systems Team provides research-based information and resources to beef producers to help them provide an economical, safe, quality product to consumers while protecting and preserving Nebraska's vast natural resources.

Community Environment

Extension is committed to helping Nebraskans know more about creating resource- and energy-efficient rural and urban landscapes, protecting and managing water resources, properly managing insect and wildlife pests, and more.

Community Vitality

The Community Vitality Initiative is focused on launching rural and urban communities into the future by focusing on entrepreneurship, recruiting new residents, disaster recovery, broadband access, engaging youth and young adults, and building businesses.

Cropping and Water Systems

Population growth puts a greater stress on expanding yields for food and resource stewardship. To help meet this challenge, Nebraska Extension shares unbiased, research-based information that supports diversified agriculture and also conserves water.

Food, Nutrition and Health

Extension is committed to improving the physical and nutritional health of Nebraska's children and families. Access to safe and affordable food is another priority as well as safe food production practices throughout the food supply chain.

4-H Youth Development

4-H empowers youth ages 5-18 to reach their full potential by working and learning in partnership with caring adults (over 12,000 adult volunteers in Nebraska). 4-H is education for life that uses a learn-by-doing approach. Modern 4-H engages youth in robotics, wearable technologies, civic participation, leadership and healthy living.

The Learning Child



Caring adults in young children's lives play a major role in setting the stage for lifelong learning, discovery and success. Nebraska Extension is committed to providing research-based strategies to help support the holistic development of young children.

By: Linda Ulrich

Fast Facts

- Through the Nebraska Broadband Initiative, 82 percent of households surveyed have a better understanding of how to take advantage of broadband technology.
- The Entrepreneurial Community Activation Process engaged more than 2,500 people through community conversations and online discovery tools designed to build entrepreneurial communities.
- In 2014, Extension educators presented workshops related to cropping and water systems in over 94 locations across the state attended by an estimated 4,056 participants from 93 Nebraska counties, nine U.S. states and four foreign countries. Due to information provided at these meetings, more than 1,000 farmers across Nebraska reduced their water usage more than 2 inches per acre.
- In 2014, 53,000 Nebraskans were involved in an Extension program for creating healthier eating patterns, increasing physical activity, improving health management, or reducing foodborne illness.
- In Nebraska, one in three age-eligible youth across all 93 counties are enrolled in 4-H, for a total enrollment reaching approximately 140,000.
- As a result of The Learning Child programming and resources, approximately 24,000 children in Nebraska benefit from early childhood professionals and parents who have the skills and knowledge to support the children in their care.

W

hen 4-H began, it was known as a corn-growers club, primarily for boys.

Fast-forward over 100 years and you will find boys and girls of all ages

participating in 4-H projects from animal sciences to rocketry. 4-H is now the largest youth development organization in the nation.

Although the programs offered may have transformed over the years, positive youth development has always been the foundation of 4-H. For Nebraska 4-H, positive youth development is focused on science, technology, engineering and math (STEM); career and college readiness; community development; entrepreneurship; food supply confidence; healthy living; and leadership development. These focus areas were determined based off of a statewide needs assessment conducted in Nebraska in 2015.



“The focus of Nebraska 4-H shifts, based off of what is important to Nebraskans, but it will always relate back to positive youth development,” said Nebraska Extension Associate Dean Kathleen Lodi.

Just as the needs of Nebraskans change, the needs and interests of youth change as well. The rise of technology has taken over today’s youth, which encouraged Nebraska 4-H to alter its delivery methods. Online gaming, apps and videos are now part of Nebraska 4-H’s toolbox of methods to get youth excited about learning. Additionally, more technological programs have been added to the 4-H lineup with a focus on STEM activities.

While 4-H has placed an emphasis on STEM activities to build excitement for engineering and technology for many years, traditionally this has meant focusing on agricultural science topics such as veterinary science, biotechnology, raising and training animals, and forestry. In response to the growing impact of technology on everyday life, 4-H has added activities in robotics, rocketry, computer science and electrical engineering.

Exposing these career fields to youth early on will encourage them furthering their exploration in college. Not only does Nebraska 4-H programming in career and college readiness expose youth to higher education options, it also helps youth identify relationships between careers and 4-H projects.

Preparing for college begins at a young age. Youth as young as 5th graders are exposed to college readiness programming through Nebraska 4-H. They are developing social skills, stress management, self-discipline, self-motivation, responsibility and other qualities that will lead to greater persistence in college and employability.

The programming implemented by Nebraska 4-H would not be possible without volunteers. Approximately 12,000 volunteers across the state share their time and resources with 4-H. By adapting to Nebraska’s needs and embracing the passions of youth, Nebraska 4-H and its volunteers are preparing young people to become successful adults and take on the challenges of the 21st century, according to Lodi.

“Nebraska 4-H is thriving and it’s keeping up with the needs of the young people in the state.”

By: **Hailey Steinkuhler**



4-H: KEEPING UP WITH THE NEEDS OF

Young Nebraskans

Get involved with **NEBRASKA 4-H**

In Nebraska, 4-H reaches one in three age-eligible youth across all 93 counties for a total enrollment reaching approximately 140,000 youth. Nebraska 4-H programs are delivered through five primary modes.

“There are a number of ways to be involved in 4-H, all of which are excellent,” said Nebraska Extension Associate Dean Kathleen Lodl.

Camps: 4-H overnight and day camps offer recreational, educational and career exploration opportunities. Nebraska 4-H Summer Camps are offered at the Eastern Nebraska 4-H Center near Gretna and the Nebraska State 4-H Camp near Halsey. Big Red Summer Academic Camps are residential, career exploration camps held at the University of Nebraska-Lincoln.

Special Programs: Special programs, such as robotics, wearable technology and shooting sports, are available to youth across Nebraska and do not require youth to be a 4-H member. Nebraska hosts the 4-H Shooting Sports National Championships each year in Grand Island.

Clubs: 4-H clubs are organized groups that meet regularly to focus on a series of educational experiences. 4-H club members participate in service learning projects, give presentations, serve as club officers and complete educational projects.

School Enrichment: School enrichment programs are coordinated in collaboration with public and private schools. The programs offer nonformal, hands-on educational experiences in classrooms in support of school curriculum.

Afterschool: Afterschool 4-H programs are offered outside of school hours, to youth in kindergarten to 12th grade. Afterschool programs provide a safe environment for expanded learning opportunities.



By: Scott Schrage

‘Wearable tech’ curriculum aims to fuel interest in STEM

Sensor-embedded shirts. Bluetooth-enabled shoes. Camera-equipped glasses.



The age of “wearable technology” has arrived, and with it a potential avenue for engaging elementary students in the STEM fields of science, technology, engineering and mathematics.

With nearly \$1 million of support from the National Science Foundation, an interdisciplinary team from UNL and University of Nebraska at Omaha (UNO) is crafting a curriculum that will allow students to learn the science behind the fashion-forward technology.

Spanning both classrooms and afterschool programs, the three-year project will offer inquiry-based activities to roughly 900 students in grades 4-6 who attend public school in Nebraska.

The curriculum will give students access to kits featuring conductive thread, LED lights, sensors and other components commonly found in high-tech garments. Students will also work with microcontrollers, which include minuscule circuit boards that can be programmed to direct the various devices attached to them.

The research team envisions such activities helping students learn basic principles of engineering design—including electricity and circuitry—that they can then apply to create LED-encrusted bracelets and other apparel.

“It’s hands-on, minds-on (activity), and all of the technology is exposed,” said Brad Barker, UNL associate professor and 4-H science and technology specialist. “They’re manipulating an object in the real world. We’re hoping to teach these students to think like engineers, and wearable technology is the vehicle that we’re using to do it.”

“The next science standards specifically focus on engineering, but engineering traditionally is not taught in schools, especially at these grades. We saw an opportunity to fill that gap with this new curriculum.”

The research team will subsequently examine whether the curriculum enhances students’ engineering-related knowledge, skills and attitudes—particularly their interest in the field’s many potential careers.

“This is an age when students are very impressionable,” Barker said. “By fourth or fifth grade, many are self-selecting out of science and engineering. We think an intervention at this age group could be especially important for keeping them interested.”

Barker’s team also aims to determine whether wearable technology encourages more STEM participation among females and other traditionally underrepresented groups. A pilot study found that girls constituted roughly 60 percent of participants.

The multidisciplinary nature of the technology is reflected in the composition of Barker’s team, which includes Gwen Nugent, research professor at UNL’s Nebraska Center for Research on Children, Youth, Families and Schools; Carl Nelson, UNL professor of mechanical and materials engineering; Jennifer Keshwani, UNL assistant professor and science literacy specialist; Neal Grandgenett, UNO community chair of STEM education; Kim Larson, coordinator of professional development for the 21st Century Community Learning Centers program; and Michelle Krehbiel, UNL associate professor of youth development.



“The next science standards specifically focus on engineering, but engineering traditionally is not taught in schools, especially at these grades. We saw an opportunity to fill that gap with this new curriculum.”

-Brad Barker

Showing examples of wearable tech designed by 4-H students are (from left) Michelle Krehbiel, Carl Nelson, Jennifer Keshwani and Brad Barker.





TAKING A SYSTEMS APPROACH TO RANCH MANAGEMENT

Today's ranching industry is more complex than ever before. High input costs and low commodity prices are just a few of the issues Nebraska ranchers face. For assistance in efficiently managing and marketing their operations, ranchers can look to the Nebraska Ranch Practicum.

The Nebraska Ranch Practicum is a three-season, hands-on educational program designed to provide ranchers with ranching skills and education based off of cutting-edge research in range livestock production and marketing at the University of Nebraska-Lincoln Gudmundsen Sandhills Laboratory. The laboratory is a nationally recognized research and educational facility located in the heart of the Nebraska Sandhills in Grant, Hooker and Cherry counties.

During the eight-session practicum, a systems approach to ranch management is emphasized. Monitoring skills of livestock, land resources and economic components are covered at the individual and systems level. For instance, participants learn how changing the calving date by one month could affect forage resources, utilization and economics.

"The Nebraska Ranch Practicum encourages participants to think about the outcomes of changing just one component of their



Homer Buell

Participants learn to critically evaluate numerous management and marketing alternatives, dealing with grazing strategies, market risk, calving and weaning dates, winter livestock nutrition and cull cow management.

Quality educational materials and the use of technology play a key role in the curriculum. Take-home assignments cover the use of computer decision aids, including feed cost comparisons and feeder calf and yearling break-even analysis. This is paired with hands-on, in-field evaluation and training to ensure the practicum covers all facets of ranching. In addition to the Nebraska

reproduction, cost of production analysis and family working relationships.

"Ranchers able to integrate these four areas into decision-making will find they can use a systems approach to improve the long-term profitability of the ranch operation," said Aaron Berger, an extension educator at the Panhandle Research and Extension Center and High Plains Ranch Practicum instructor.

The Nebraska Ranch Practicum and High Plains Ranch Practicum both limit enrollment to 35 participants per session to foster better discussions within

"The Nebraska Ranch Practicum is by far the most valuable of any Extension educational program I have been involved with."

-Homer Buell, Nebraska rancher and past president of the Nebraska Cattlemen

operation," said Brent Plugge, an Extension educator at the West Central Research and Extension Center. "Our instructors are interdisciplinary researchers, so are able to teach systems thinking and systems monitoring. This approach has really driven the research at the Gudmundsen Sandhills Laboratory."

The three-season approach allows the practicum to cover a full livestock production cycle.

Ranch Practicum, Nebraska Extension has partnered with University of Wyoming Extension to offer another ranch management school. The High Plains Ranch Practicum is an eight-day, four-session hands-on educational program focused on providing ranchers tools to understand and integrate four areas of ranch management: range and forage resources, integrating nutrition and

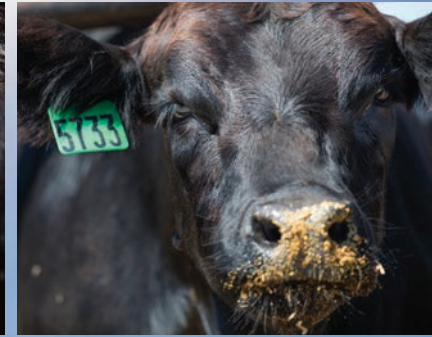
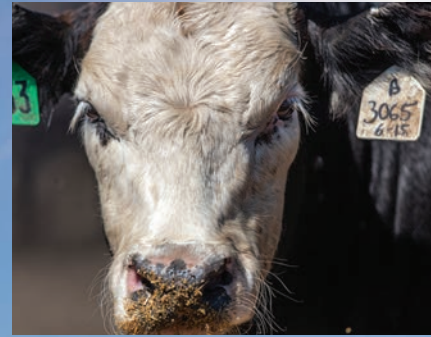
the group. The exchange of ideas between participants and instructors has often been noted as one of the most valuable components of the programs.

Leveraging cutting-edge research and participant experiences, Nebraska Extension is taking a systems approach to ranch management and helping the state's ranchers navigate today's complex ranching industry.

By: Haley Steinkuhler



COW-CALF PRODUCERS LOOK TO LONGSTANDING EXTENSION PROGRAM FOR PRACTICAL KNOWLEDGE



Since 1969, cow-calf producers have looked to the Range Beef Cow Symposium for best practices to implement on their cattle operations. Roughly 600 attendees attend the two-and-a-half-day program to hear from industry experts, network and discover new products at the vendor show.

The Range Beef Cow Symposium is a collaboration between the extension divisions and animal science departments of Colorado

State University, South Dakota State University, University of Nebraska-Lincoln and the University of Wyoming. The first symposium was held in Chadron, Nebraska, in 1969. It is held every other year and rotates location among the cooperating states.

"The number of years this program has been around really speaks to the strength of the partnership between those involved," said Karla Jenkins, cow-calf specialist at the Panhandle Research and Extension Center.

Producers in western Nebraska, eastern Colorado, eastern Wyoming and western South Dakota face many similar issues when it comes to managing their operations

without a great deal of additional resources due to climate. The symposium centers on those issues and gives producers practical ways to improve efficiencies.

The 2015 symposium was held in Loveland, Colorado. Presentations during the day covered a broad range of topics, including reproductive technologies, running more cows on less grass, market outlook and how to get young people into the cattle business. Also at the 2015 symposium, UNL Chancellor Ronnie Green, then Harlan Vice Chancellor of the Institute of Agriculture and Natural Resources, delivered a presentation titled "Why does consumer perception trump science?"

"Producers are extremely busy people, so the Range Beef Cow Symposium has an ideal agenda for them to gain a large amount of knowledge on a variety of topics, in a short amount of time," said Jenkins.

Following the presentations each evening, "Bull Pen Sessions" are held, which allow attendees to have in-depth discussions with the speakers. Speakers are divided into themes or topic areas to facilitate small group discussions. The Bull Pen Sessions are one of the most valuable parts of the Range Beef Cow Symposium, according to Jenkins.

"The exchange of ideas and information in the Bull Pen

Sessions is invaluable," she said. "Oftentimes two different schools of thought will be shared and debated in the same room, which allows the producer to gain understanding of both perspectives on a certain topic."

The vendor show is another popular component of the symposium. Commercial displays and newly released products are on display throughout the event. New vaccines, ear tags, water tanks and chute equipment are just a few of the products on hand that producers can learn more about and purchase for their operations.

A survey conducted in 2011 asked producers how the symposium

had impacted their operations over time. Over 70 percent of respondents said that they had made changes in their operations based off the knowledge they had learned at the symposium. That 70 percent represented 435,000 cattle and 800,000 acres of land across nine states. They estimated \$1.1 million of economic benefit from their attendance.

The next symposium will be held in Wyoming in 2017. Nebraska will host the Range Beef Cow Symposium in 2019. Following each symposium, proceedings are uploaded at beef.unl.edu.

By: Haley Steinkuhler

DEALING WITH THE EMERALD ASH BORER

The Nebraska Department of Agriculture confirmed that the emerald ash borer was discovered during a site inspection in Omaha's Pulaski Park on June 6, 2016. Nebraska became the 27th state to confirm the presence of the pest, joining the neighboring states of Iowa, Missouri, Kansas and Colorado.

The current treatment consideration zone extends from Fort Calhoun to Plattsmouth and from Gretna to east of Council Bluffs. The window of time for homeowners to treat their own trees this year has passed. Certified arborists may have products that can be applied up until autumn.

"For the homeowner products, if a tree is treated after mid-June, the chemical will not distribute throughout the tree as much as it would have in spring so it would be best to wait until next year," said Jonathan Larson, Nebraska Extension entomology educator.

By: Linda Ulrich

Bugs and insects can be beneficial and beautiful but sometimes they are destructive and deadly. Case in point: The emerald ash borer, an exotic, attractive beetle that can kill ash trees.

"Ashes are beautiful trees and a tree many homeowners would like to save," said Jonathan Larson, Nebraska Extension entomology educator.

Larson, together with John Fech and other Extension educators, is providing unbiased, research-based information about the emerald ash borer and treatments for affected trees through statewide seminars, internet-based conferences and social media.

There are lots of questions about treatment and a lot of sources of information, not all of them credible.

"People are very sad about the possibility of losing their ash trees, and there is a lot of conflicting information about whether there is any hope for these trees," Larson said. "We will lose millions of ash trees, no doubt about it, but homeowners can take steps to protect their trees. They just need to determine how much time, effort and money they want to invest.

"It's been heartbreaking to talk with ash tree owners but also very refreshing to see that we've helped people," he said.

Although many people are focused on the emerald ash borer, Larson can identify any insect or arachnid in the home or landscape.

"Nebraska Extension can provide control tips that are environmentally and economically sustainable," he said.

By: Linda Ulrich

Jonathan Larson is helping ash tree owners prepare for and deal with the emerald ash borer.

Extension can help what's bugging you — even bed bugs



On your evening walk, you see a fabric-covered headboard next to a trash can. It would be perfect for your guest bedroom.

"Don't even think about it," said Jody Green, Nebraska Extension urban entomologist and Extension educator whose job includes educational programming, fielding calls and identifying structural- and health-related insect specimens from people in the community.

While the headboard may look great, it might be harboring bed bugs. These pests don't get as much press as they used to, but they are still around and still fond of hitchhiking into homes where they can live in beds, couches and other furniture, sometimes undetected for months.

When people travel, they also may inadvertently bring these most unwelcome guests home with them in their luggage. "You can get them in a five-star hotel or a one-star motel," Green said.

There's a stigma about bed bugs and a lot of misinformation and myths. People don't want to admit they have them in their home or apartment, and bed bugs can cause psychological, social and emotional damage, she said. Bed bugs don't go south for

the winter so Green works with clientele to determine the safest and most economical treatment for their given situation.

Green began working for Nebraska Extension in the Lancaster County office in March and has answered

able to take back control of their health and their home."

Green is better able to help people when they can tell her where the pests are, how many there are, how long they've been seeing them plus provide a sample, either a photo or dead/



Jody Green, Extension urban entomologist, holds a vial of bed bugs brought to her for identification by people in the community.

494 questions from clientele through Sept. 1. Although the inquiries she gets are somewhat seasonal, the two pests people have called, emailed or sent samples of the most are bed bugs and ants. Termites, head lice and wasps (of all types) also are of concern.

"About half the phone calls I receive are about bed bugs and a lot of the callers are crying," she said. "I want people to be

live specimen. "Believe it or not, the majority of insects in the world are beneficial and play an important role in the ecosystem in some way," she said.

"Unfortunately, I can't inspect everyone's home so I try to focus on education and prevention," Green said. "I really like helping people."

By: Linda Ulrich



YOUTH ENTREPRENEURS FOLLOW A BLUEPRINT FOR SUCCESS

By: Haley Steinkuhler

Research has shown that many youth who grew up in rural communities would welcome the opportunity to return home as long as they knew they could do so successfully. The prevailing mindset for over the last half century has been that communities educate their youth so that they are able to go out into the world and get a job. That mindset has resulted in many youth from rural places relocating to where they can build their careers, often not back to the community that invested in their education. Nebraska Extension is working to shift that trend through the Community Vitality Initiative.

The Community Vitality Initiative is focused on making rural communities more appealing to young adults and families, engaging youth and young adults in civic and leadership opportunities, and increasing employment by growing Nebraska's businesses. A key part of the initiative involves implementing

entrepreneurship education that focuses on youth creating business opportunities in their home communities. The Blueprint program is one example of entrepreneurship curriculum that high school students are beginning to use in the classroom.

Blueprint is a digital experiential high school entrepreneurship platform. The program, implemented entirely online, teaches high school students what it takes to become an entrepreneur. The curriculum explores a working knowledge of entrepreneurship, financials and feasibility, marketing principles, global markets and how to develop a business plan.

Both students and teachers have responded positively to the new curriculum. Nebraska Extension's Nancy Eberle, who focuses on youth and young adult entrepreneurship, says many teachers are initially hesitant to use a curriculum that is entirely online. However, feedback indicates that in addition to increased student engagement, the shift from book to online lesson plans has also helped students hone in on their reading and grammar skills.

"Youth love the interactive activities and videos showcased through Blueprint," Eberle said.

Blueprint is just one component of a continuum of youth entrepreneurship education resources developed by Nebraska Extension.



Blueprint, a digital experiential high school entrepreneurship platform, is teaching students what it takes to become an entrepreneur.

Youth as young as 10 can experience Entrepreneurship Investigation, an interactive and comprehensive curriculum tool to help youth find their business niche. Through exciting activities, case studies and current technology, participants are transformed into budding entrepreneurs.



"The U.S. needs growth in entrepreneurial business," said Eberle. "To see that growth, it's time to think outside of the box and that's what this curriculum encourages kids to do."

After completing the Entrepreneurship Investigation and Blueprint curricula, youth should be ready for the next step in pursuing their entrepreneurial dream. The Engler Agribusiness Entrepreneurship Program at the University of Nebraska-Lincoln is a program designed to invigorate personal excellence focused on the creation of businesses. The program offers an academic minor while serving as an intersection in which students from a diverse array of majors and business interests can come together in pursuit of the American dream.



According to Eberle, the younger a child can explore his or her entrepreneurial spirit, the better. While the Engler program can help young adults turn their entrepreneurial dream into reality, engaging youth early on is key to fostering their entrepreneurial drive. There is a significant amount of risk in entrepreneurship, and youth tend to be more willing to take risks than adults.

"Kids think they can do anything, and that's the kind of thinking we need!"

Eberle said it was important to keep the price point low so all schools could gain access to the program. One yearlong license for the Blueprint curriculum is \$15.



MARKETING HOMETOWN AMERICA ENERGIZING RURAL COMMUNITIES

By: Haley Steinkuhler

NEBRASKA

RURAL POLL

Looking north into McCook, Nebraska, as traffic travels back and forth from a rural location to a Nebraska hometown.

The Nebraska Rural Poll is the largest annual poll of rural Nebraskans' perceptions on quality of life and policy issues. The survey takes the pulse of rural Nebraskans and shares it with local and state leaders so they have a better understanding of issues, challenges and concerns of Nebraska's rural citizens.

The 21st annual Nebraska Rural Poll was mailed to 7,000 randomly selected households located in nonmetropolitan Nebraska counties in March of 2016. The questionnaire asked rural Nebraskans about housing, internet services and education as well as core questions on well-being and community.

Results from the 2016 Nebraska Rural Poll indicate:

- Fifty-two percent of rural Nebraskans said they are better off this year than five years ago.
- Seven in 10 rural Nebraskans access the internet using a cellphone, and eight in 10 subscribe to a high-speed internet service at home.
- At least three-quarters of rural Nebraskans rate a safe environment for students, high graduation rate, high-quality teachers, teaching problem solving or critical thinking skills to students and preparing students for college as high priorities for their local schools.

The Department of Agricultural Economics at the University of Nebraska-Lincoln, in partnership with the University of Nebraska's Rural Futures Institute, conducts the poll, with funding from Nebraska Extension and the Agricultural Research Division.

More information on the Nebraska Rural Poll can be found at ruralpoll.unl.edu.

Many think that rural America is fading. One grows up in a rural community and then flees to a larger city to pursue education, employment or a different way of life. To figure out what was really behind this trend, a team of faculty from Nebraska Extension studied 11 counties in Nebraska's Panhandle. They discovered that not all rural communities are in decline. In fact, some communities are attracting new residents and are more vibrant than ever before. In response to this research, Nebraska Extension launched the Marketing Hometown America program.

Marketing Hometown America is an educational program focused on recruiting and retaining new residents. It engages communities through small groups, called study circles, to get more people involved

and more voices heard. Designed as a tool to create dialogue that moves toward action, it can be the spark to help a rural community look at itself and the recruitment and retention of new residents in a new way.

Funded by a University of Nebraska Rural Futures Institute grant, seven communities in Nebraska, South Dakota and North Dakota piloted the Marketing Hometown America program in 2013-2014. In Nebraska, the communities of Neligh and Kimball participated in the pilot. In Neligh, more than 70 residents joined study circles in which they discussed the town's strengths and opportunities.

Marketing plays a key role in attracting new residents to a community. What would someone think of Neligh if they discovered the town online? During the study circles, Neligh residents built a marketing plan based off of the overlooked assets the community already has that could attract potential new residents. The plan was built to appeal to someone who had never stepped foot in the community. They rebranded the town's website with an updated logo, slogan and a series of videos that showcase what the community in northeast Nebraska has to offer.

In 2016, the program expanded to six Nebraska communities, including McCook where Extension Educator Ben Dutton is helping lead the effort.

"McCook is an ideal candidate for the Marketing Hometown America project because a spirit of collaboration already exists," said Dutton. "Support is there from the chamber of commerce, the McCook Economic Development Corporation and the school system."

Having support and leadership from those groups is critical to the success of Marketing Hometown America. Those groups spearhead the effort and create interest and involvement from community members. At the community kickoff in May, community members were divided into nine different study circles. Over the course of the next four weeks, the study circles discussed assets that they felt McCook had to offer and ways to make the community more marketable.

"Citizens of McCook are very proud to say where they are from, and they want to share what their town has to offer, which is evident in their innovative ideas," Dutton said.

The study circles came up with ideas for citywide beautification, community development, new events and town promotion. The ideas range from new city maps to an indoor skate park. During



a town hall meeting, citizens voted on which ideas would be most prosperous for the community. McCook is currently working on the following projects:

- Improving McCook's online presence with a comprehensive website, which includes a community calendar and employment board.
- Establishing a plan for vacant homes and creating additional options for housing by creating a system that allows residents to flip abandoned homes and homestead that land.
- Purchasing a trailer that would be armed with games and other fun activities that neighborhoods could rent to foster gathering and networking.
- Building a tribute to George Norris, the U.S. Senator who brought electricity to rural America.

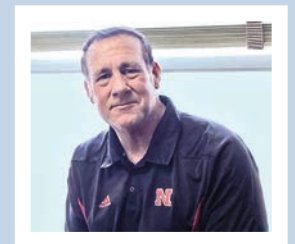
Marketing Hometown America has brought a sustainable plan for long-term success and growth to McCook. Dutton has no doubt that the citizens of McCook will successfully execute these projects.

"McCook has made great progress already, and once they successfully accomplish the first four projects, they will bring another idea from their study circles to the forefront."

Red Cloud and McCook completed the program this summer and are working on their projects. The communities of

Seward, York and Wausa are in the beginning stages of the program. The Marketing Hometown America team is searching for additional small towns to bring their action plan to, in hopes of reviving rural life one community at a time.

Community members gather at the Marketing Hometown America kickoff event in McCook.



"Bringing a proven and efficient project with credible resources from the University of Nebraska-Lincoln to McCook has been great for the community. McCook's foot is on the accelerator and we're moving forward thanks to Marketing Hometown America."

-Kirk Dixon, Director of the McCook Economic Development Corporation

Made in
Nebraska



Simulation game helps improve commodity marketing skills

Cory Walters (left) and Tina Kotsaku, along with Nic Colgrove, developed the Marketing in a New Era game.



Commodity marketing can be a challenge for producers.

Marketing in a New Era (MINE) is a Nebraska Extension commodity simulation game designed to help beginning and intermediate grain and oilseed marketers develop and improve their commodity marketing skills.

"The idea for MINE originated from conversations with the Nebraska Soybean Board, which wanted a marketing game incorporating both the modern marketing environment facing producers and

technology," said Cory Walters, University of Nebraska-Lincoln grain, oilseed and biofuels economist.

MINE is a free simulation that can be played either online or in person using computers provided at Nebraska Extension grain marketing seminars. The game development was led by Walters and Nic Colgrove, a software development specialist in the UNL Institute of Agriculture and Natural Resources, along with Tina Kotsaku, a master's degree student in the Department of Agricultural Economics. The seminars are led by Extension

educators Jessica Groskopf at the Panhandle Research and Extension Center in Scottsbluff and Robert Tigner at the Red Willow County Extension office in McCook.

"We're trying to develop a complete grain marketing environment, not just grain sales," Walters said. "The bones of the game are developed but we will be adding different modules based on what farmers and others playing the game would like to see." One of the modules Walters would like to develop is related to the farm bill.

MINE is unique because traditional marketing simulation games have been played by generally focusing on only parts of the producers marketing world over several weeks, which is necessary since they follow current commodity futures markets. As a result, the ability to learn how markets interact (i.e., futures and basis) and ask questions about different marketing scenarios is limited, Walters said. MINE circumvents this by allowing for interaction in cash, futures and basis markets using historical commodity prices in a flexible trading environment through a number of selling points. Additionally, MINE incorporates crop insurance into the marketing environment to make the game more realistic.

"This program allows producers to experience a number of pricing scenarios in a few hours while getting feedback from marketing benchmarks and peers," he said.

Because MINE selects from historical futures price patterns, a player does not know what kind of pricing environment, such as drought or a large crop, he or she will be experiencing. Users must be on the lookout for clues from the markets about what could be at stake for the marketing year they are entering.

Not only does MINE improve marketing, it also provides linkages between marketing and farm conditions. The marketing setup is flexible to allow a group to identify farm conditions such as farm size, yield expectations and expense expectations.

"This has often led to lengthy discussions between participants about how to identify expected yields and how to determine reasonable expenses," Walters said.

When asked "What was the most important thing you learned," one participant said: "How carrying charges affect me. Hard to pinpoint one 'most important thing' when the whole workshop was so educational and informative. I just learned so much. Best workshop I have ever attended, and that includes even other occupational ones."

The Nebraska Soybean Board provided major financial support with additional funding from the United States Department of Agriculture's National Institute of Food and Agriculture.

By: Linda Ulrich



Extension grows new knowledge for crop producers

As Jim McGill travels rural roads in his pickup, he uses information from Nebraska Extension in farmers' fields.

A certified crop advisor for Midwest Farmers Cooperative in Waverly, Neb., McGill works with 60-70 farmers each year. He has been attending Extension Crop Management Diagnostic Clinics and other crop-related Extension programs for more than 15 years. McGill is required to earn continuing education credits to maintain his professional certification, but he would still attend Extension programs even if he didn't need the credits. Extension always provides research-based information of value to crop producers, he said.

McGill attends programs coordinated by Keith Glewen, Extension educator in Saunders County. The one- or two-day programs feature experts discussing a variety of topics such as soil health, nutrient management, remote sensing and precision agriculture. They are held across the state and are tailored to the specific growing conditions in each area.

"If you have good content, people will come to the seminars," McGill said. "Keith works hard to put on a good program with good content. A lot of my growers appreciate this information."

Participants are asked to fill out evaluations at the end of the program, and suggestions that they make often shape topics for the next program. Sometimes attendees don't want to take the time to write their assessment of the program, but Glewen has a special trick for getting completed evaluations. He hands out ice cream bars at the end of the program and attendees don't get one unless they hand in an evaluation.

McGill likes ice cream so he always makes sure he fills out the evaluation, but it's the information he learns that whets his appetite to attend Extension programs.

"Farming is changing so rapidly. I attend these programs to stay current and help producers," McGill said.

Precision Ag

makes farming more sustainable, profitable

Farmers have numerous sources of technology and data available to use in their operations, but many producers struggle with what kind and how much technology they need.

Understanding which technologies and datasets are important and how to best use them is the focus of Joe Luck's work as Nebraska Extension precision agriculture engineer.

"To me, precision ag has become a catchall term, but basically it refers to hardware and software systems that improve knowledge and decision support to make farming more manageable, sustainable and profitable," said Luck, who also is an assistant professor of biological systems engineering.



Precision agriculture hardware includes field application equipment and sensor platforms that control products and record as-applied data. Software can then be used to collect and analyze the information with the goal to improve a crop production system.

Luck's extension work encompasses site-specific management strategies; precision agriculture technology use; and farm management software training.

In one project, for example, Luck and other members of the multidisciplinary UNL Precision Ag Research and Extension team are working with producers and local and regional industry partners to examine how one new technology—the multi-hybrid planter—might benefit producers in the future.

This planter can plant at least two seed varieties in one trip through a field or manage various seed treatments from separate bulk tanks on the planter. Five corn and three soybean fields were planted this year on both dryland and irrigated land. While more than one year of data is needed, the project team believes that preliminary data from this first year will help build future studies. Results from the field sites will be distributed through Nebraska Extension.

Luck also is developing instruments and tools that producers can use to collect information in their operations for improving crop input and water use efficiencies.

In Nebraska, technology adoption ranges from those who don't use technology at all to producers who use it extensively, he said.

And, he added, "The technological needs of a producer farming 1,000 acres are very different from a producer farming 10,000 acres."

Luck estimates that over 50 percent of farmers engage in some form of agricultural

technology. But, he cautions, while technology can be a useful management tool, farmers still need to make decisions.

As part of his extension work, Luck conducts workshops and meetings to share information about precision ag with producers to improve their operations. "I really enjoy talking with people and helping them solve problems," he said.

Part of Luck's research deals with "big data," which is often defined as an accumulation of data that is too large and complex for processing by traditional database management tools. University-based research will be an important part of the larger discussion regarding big data applications in agriculture, he said. UNL is a founding member of the Agricultural Data Coalition (ADC), which is aimed at helping farmers better control, manage and maximize the value of the data they collect daily in their fields.

"There have been extensive activities focused on agriculture data management platforms

within the past couple of years, and we're excited to be part of such advances in which the farmers' needs are at the core of the platform development process with input from a variety of industry partners," Luck said.

Ultimately, Luck hopes all of his work will have an impact beyond Nebraska and will help corn and soybean producers feed the hungry worldwide.

His research is funded by public and private organizations,



Joe Luck (left) and Rachel Stevens check seed placement of a multi-hybrid planter being tested as part of a collaborative research project being conducted by UNL researchers, industry and growers.

"I think the development approach taken by the ADC will serve as an industry model for adding value to small and large farm operations with respect to agricultural data privacy, access and utilization."

including local commodity boards, industry groups and the United States Department of Agriculture.

By: Linda Ulrich



THE LEARNING CHILD

builds a foundation for children's success in school

It has often been said that parenting doesn't come with a how-to manual, but by developing some skills, parents can help build the foundation for their children's learning, discovery and success in school long before kindergarten.

In the past, early childhood learning was focused on preschoolers, but researchers now also emphasize the importance of developing the skills of parents, child care professionals and other caring adults so they can help very young children learn too.

Nebraska is one of the leading states in early childhood development, and Nebraska Extension plays an important role with "The Learning Child," a program that provides an array of unbiased, research-based classes, training and resources to enhance the healthy growth, development and success of children from birth to age 8. Each year, more than 2,900 parents and 1,700 early childhood development professionals participate in The Learning Child programs.

"From university professors and their research we know that learning should start at birth," said Lisa Poppe, Nebraska Extension educator and member of The Learning Child team.

One focus of the program is children's social and emotional development. "It's important that children learn colors and letters of the alphabet, but the social and emotional well-being of children is an important part of getting ready for

school, too," Poppe said. That includes helping children to be able to regulate their emotions, to be able to stay focused and other skills necessary for success in school.

In addition to on-site classes and meetings, online programming—including webinars and video—is rapidly increasing in popularity.

“I will model using my vocabulary to express my emotions and encourage my children to express their emotions.”

— Parent who participated in The Learning Child programming

Child care professionals, for example, often are busy people with their own children and don't always have the time or energy to attend in-person training. Online classes enable them to earn required in-service hours any hour of day or night through the Early Childhood Education Series.

Similarly, Co-Parenting for Successful Kids—a class that helps separating and divorcing parents and others develop respectful and responsible co-parenting—offers both on-site and online classes. The number of online participants has increased from zero in 2011 to more than 80 percent of the 1,800 parents taking the court-mandated class in 2015, said Gail Brand, also an Extension educator and part of The Learning Child team. In addition, Oklahoma State University Extension and Purdue University Extension contract with Nebraska Extension to offer the online class for Oklahoma and Indiana parents.

What makes Nebraska Extension online classes unique is that instead of just answering multiple choice

questions, participants engage in interactive activities and "homework." Extension educators communicate with participants online or in person with opportunities for them to learn from each other.

After the initial training ends, members of The Learning Child team follow up with questions such as "Did you put the activity into practice?" "Is it working?"

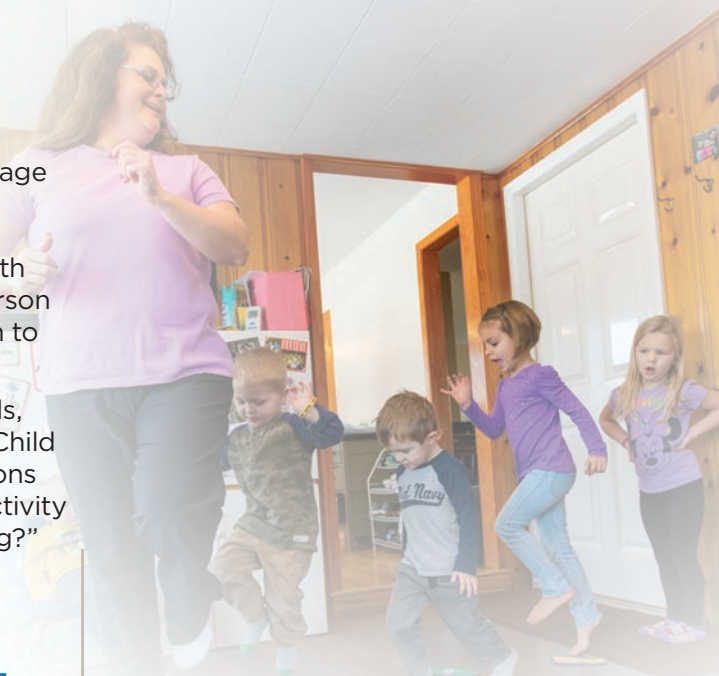
"We want to build relationships with our clientele," Poppe said.

Surveys are conducted after the class or training ends. Co-Parenting for Successful Kids is one of only a few parenting classes nationally that compile pre/post and six-month evaluations, Brand said.

"We're also concentrating more on social media because that's how many young parents access information," Brand said. In 2015, The Learning Child had a 71 percent increase in social media followers with more than 84,000 overall impressions of tweets, posts and pins.

The Learning Child Development team includes University of Nebraska-Lincoln faculty, Extension educators, specialists and professionals. "We use everyone's strengths," Poppe said. "It's what we love and what we're good at."

The Learning Child extends beyond Nebraska. Team members have engaged in international initiatives in Brazil, China, Italy, Kenya and Scotland. The goal of these reciprocal exchanges with other professionals is to improve early



childhood education for young children in Nebraska, the United States and abroad.

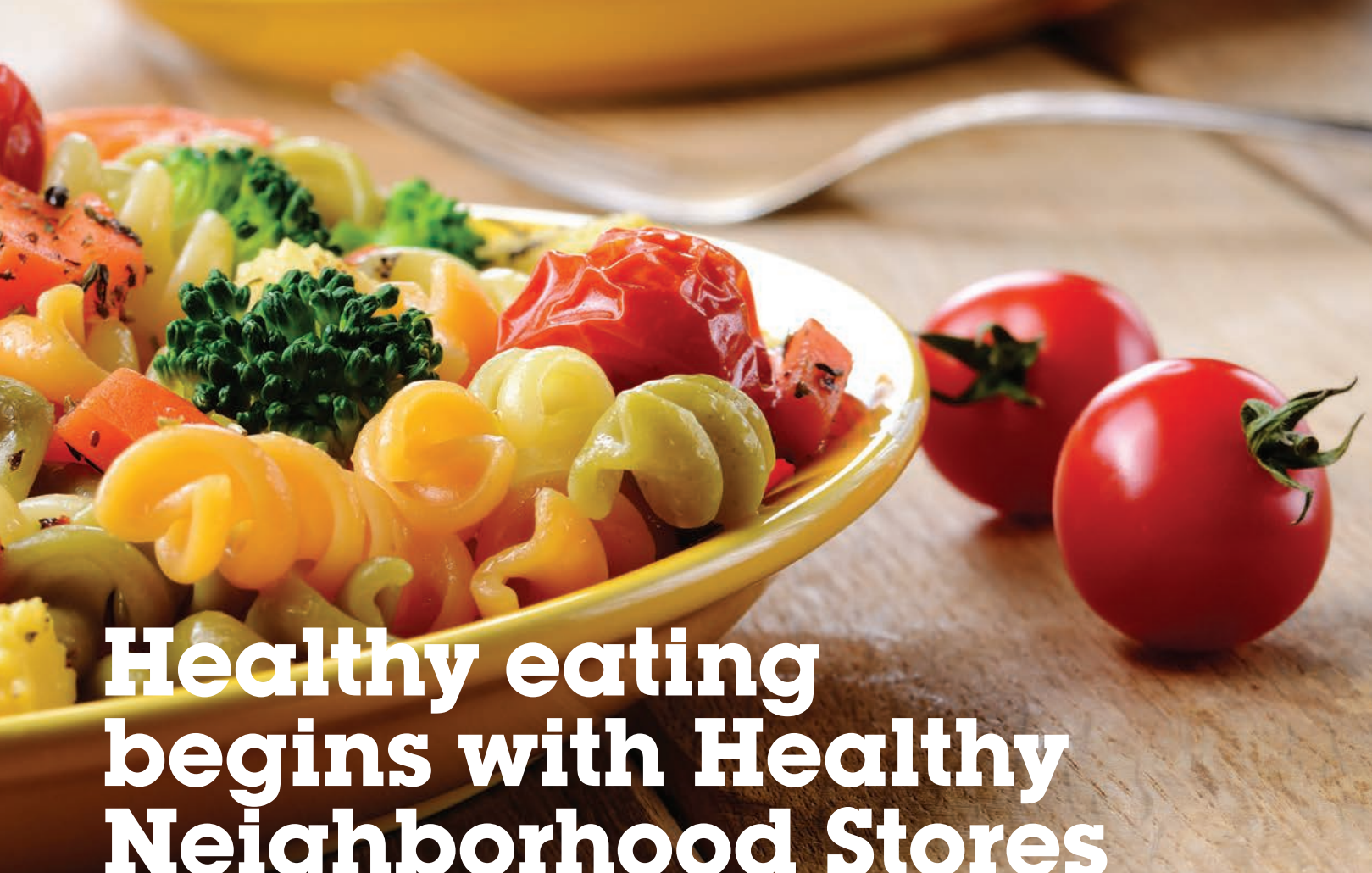
"Parents everywhere just want what's best for their kids," Brand said. "The Learning Child helps provide the necessary training for parents and other caring adults so they can provide the best learning for their children."

By: Linda Ulrich

Increasing the quality of educational services for military families

The goal of the Childcare and Youth Training and Technical Assistance Project is to increase access to quality educational services for young children in communities with a high concentration of off-installation military families.

The program began in 2010 as a response to the lack of high-quality childcare for military families living off-installation. Each year, the program benefits more than 420,000 military and civilian children in Nebraska and 21 other states.



Healthy eating begins with Healthy Neighborhood Stores

The most affordable food option oftentimes is not the healthiest. That circumstance, paired with limited access to transportation and lack of grocery markets, makes it difficult to eat healthy. Nebraska Extension has teamed up with the Douglas County Health Department to improve access to affordable and healthy food options in Omaha's neighborhood grocery stores.

Through this program, Extension and its partners work with select neighborhood grocery stores to promote and provide guidance on introducing healthy and fresh foods



into the diet. Over the past seven years, support has come from the Nebraska Grocers Association, Empace Group, Empowerment Network, Gretchen Swanson Center for Nutrition and the Center for Reducing Health Disparities.

“Healthy Neighborhood Stores is about showing all members of the community how easy and affordable healthy living is,” said Extension Educator Carrie Schneider-Miller.

Identifying potential store partners begins with extensive research of neighborhood obesity rates and store assessments focused on the amount of healthy food options available. Stores are recruited that have potential to improve and increase their healthy food options. The team then works with store owners and managers to offer healthier foods that are of good quality, at an affordable price.

Stores are provided with updated and customized exterior signage to catch the eye of new customers. Inside the store, price, placement and promotional strategies are used to create awareness of the healthy food options. For example, stores receive resources and training on implementing basic



Nebraska Extension assistants show shoppers easy ways to cook with fruits, vegetables, whole grains, low-fat protein and dairy foods as part of the Healthy Neighborhood Stores program.

strategies such as placing the healthier options at eye level and using customized price tags.

One of the most popular new offerings at participating stores is the healthy food demonstrations put on by nutrition assistants from Nebraska Extension. Assistants show shoppers easy ways to cook with fruits, vegetables, whole grains, low-fat protein and dairy foods. The demonstrations use simple recipes with basic ingredients. Demonstrations such as preparing a whole grain pasta salad or a fruit smoothie have become very popular in the neighborhood stores.

“The demonstrations have become one of the most in-demand components of the program,” said Schneider-Miller. “Along with teaching people simple food preparation techniques they can use at home, the demonstrations also encourage parents and kids to try foods they may have never tried before.”

According to Schneider-Miller, shoppers in the stores often say they have never tried a certain food item because that’s how they were raised. They never drank milk, or ate green vegetables as a child, because their parents didn’t. The demonstrations are an effort to influence the older generation to try new things and make it a habit for younger family members.

Increased awareness has resulted in increased sales, according to Schneider-Miller. One store participating in the program has seen a 50 percent increase in sales of fresh produce as a result of increased promotion during summer months.

“This program is helping put fresh, affordable and healthy food choices into the hands of people, especially children, in our own neighborhoods,” said Schneider-Miller.

Funding for Healthy Neighborhood Stores has come from CHI Health, ConAgra, the Centers for Disease Control and Prevention, and the United States Department of Agriculture.

By: Haley Steinkuhler



“The Healthy Neighborhood Stores project has become one of my favorite projects. It’s the greatest mix of community and public health innovation that I’ve ever known.”

-Mary Balluff, Douglas County Department of Health



Lincoln Public School students participate in hands-on activities focused on nutrition education as part of the Growing Healthy Kids for Healthy Communities program.

EXTENSION: ENRICHING HEALTH CURRICULUM IN THE CLASSROOM

Fast food consumption and lack of physical activity are two causes of the swelling obesity rates in the nation's youth. As a result, children are more likely to develop type 2 diabetes, high blood pressure, bone and joint problems, asthma and other health ailments. Nebraska Extension is doing its part to reverse childhood obesity rates through providing health curriculum resources in the classroom.

For over 16 years, Nebraska Extension has provided school enrichment kits to Lincoln Public School (LPS) District schools that have more than 50 percent of students receiving free and reduced price meals. The 19 additional LPS schools that don't qualify for that program are now receiving school enrichment kits through the Growing Healthy Kids for Healthy Communities program. The goal of the program is to increase nutrition and health knowledge in students ages 5 to 8.

"We hope that youth are picking up healthy habits at home, but if they are not, it's important to introduce those habits during the school day," said Lancaster County Extension Educator Alyssa Havlovic. "Through the Growing Healthy Kids for Healthy Communities program, every K-2 classroom within the LPS system is receiving nutrition education."

Growing Healthy Kids for Healthy Communities was made possible through a five-year grant from the Agriculture and Food Research Initiative administered by the United States Department of Agriculture's National Institute of Food and

Agriculture. The program provides a kit to each classroom that has all of the materials a teacher would need to conduct health curriculum lessons. The educational kits are specifically developed for each grade, with age-appropriate activities and curriculum.

Hands-on lessons and physical activity are key components of the curriculum. Basic hands-on activities involve proper hand washing and how to prepare a healthy snack. Students also learn about the digestive system and why our bodies need foods from all five food groups.

"Lifelong healthy eating habits start when youth at a very young age learn how important it is to eat fruits and veggies," said Havlovic.

Over 17,000 LPS students in kindergarten through the second grade have been reached through the program in the past four years. A significant increase in nutrition knowledge for all grades and improved nutrition-related behaviors were reported by parents and teachers.

At the conclusion of the grant, Nebraska Extension in Lancaster County will continue the initiative. Nebraska Extension is working with school administrators, parents and community leaders to expand the Growing Healthy Kids for Healthy Communities program to reach third through fifth graders. Extension is also exploring expansion into additional schools in Lancaster County, as well as Douglas and Sarpy County school districts.

By: Haley Steinkuhler



Gary Wells spent his career working with trees and shrubs as a landscape architect with the USDA Natural Resources Conservation Service. When he retired, he wanted to find a way to continue his public service.

He became a master gardener because, he said, it is a good fit with his professional background and his desire to be a volunteer.

Chair of the Lancaster County Master Gardener Education Committee, Wells particularly enjoys providing education for both children and adults, interacting with people and organizing Master Gardener staffing for educational events. Wells also is one of many volunteers who help people with their most vexing gardening and landscape questions when they call the Lancaster County extension office.

Part of Nebraska Extension since 1976, the Nebraska Master Gardener program is a horticulture-related volunteer training program based in many counties throughout the state. Master gardeners, who are trained by Extension staff, work through their local extension office to provide horticulture information to their community. Participants are required to complete 40 hours of training and 40 hours of volunteer

service during their initial year in the program. They retain their certification in subsequent years through annual training and volunteering.

"People may think they aren't knowledgeable enough to be a master gardener but that's not true," Wells said. In addition to training, master gardeners are provided reference materials, and beginning volunteers have mentors.

"Gardeners with all levels of experience are welcome in the Master Gardener program, both lifelong gardeners and beginners," said Sara Browning, horticulture Extension educator in Lancaster County. "One goal of training is to make sure all master gardeners have the same basic foundation of knowledge."

As a master gardener, Wells has enjoyed learning more about perennials and annuals, and incorporating more of them into his home landscape, a bit challenging since he has a lot of shade trees.

"I don't particularly like turf grass so I make my mowing area as small as possible," Wells said, smiling.

Being a master gardener is a learn-learn for Wells. He's helping people learn information that will help them be better gardeners while learning new information that helps him too.

For more information about becoming a master gardener, visit <http://mastergardener.unl.edu/>.

By: Linda Ulrich



Big Red Summer Camps



Jessica Schmidt of Gothenburg always had a love of animals and science. When the junior studying veterinary science at UNL attended a Big Red Summer Academic Camp during her freshman year of high school, her passions turned into a career path.

Big Red Summer Academic Camps are residential, career exploration camps held at the University of Nebraska-Lincoln. Youth participants explore campus, meet people from across the country and identify their interests.

"Attending a Big Red Summer Camp broadened my horizons to the field of veterinary science. Spending time in the lab during camp I learned that I could do more than just work in a clinic; I could go into toxicology, pathology or an animal specialty."



ALUMNUS STILL LIKES DIGGING IN THE DIRT

In the winter of 1983, Ray Ward started Ward Laboratories, an agriculture soil testing facility, in a three-bay garage in an industrial park in Kearney.

It was a tough beginning. "There was a terrible blizzard. It was 25 degrees below zero, and we were chipping ice off of reagents to be able to run samples on some days," Ward recalled. "We had a small kerosene heater and we were wearing coveralls to try to stay warm."

Ward persisted, and the laboratory gradually grew from one full-time and one part-time employee to 35 full-time employees and about 25 seasonal workers. The number of samples the lab runs has increased from 16,460 in 1984 to 368,353 in 2015. In addition to soil testing, the lab analyzes plants, feed, forage, water, manure and fertilizer, and performs other special testing, such as testing for nitrate and minerals in beer. Now internationally known, the lab tests samples from South Africa, Ukraine, the United Kingdom and other countries.

Although the instrumentation and technology have changed tremendously since the 1980s, Ward's favorite soil testing tool continues to be a tile spade.

"I still tell farmers to set a spade in the ground. You can tell so many things just by looking at the soil," Ward said.

That was part of the knowledge Ward gained from Harold Rhodes and Robert Olson, two "great teachers and great researchers," when he earned his undergraduate degree in soil conservation in 1959 and master's degree in soil fertility in 1961 from the College of Agricultural Sciences and Natural

Resources (CASNR). A lot of the soil science principles Ward learned at the university are still applicable, he said.

Ward, who grew up on a farm near Western, has these goals: help production agriculture use its resources as efficiently as possible; provide information and data for developing the best use of soil and water resources while maintaining



Ward also has many memberships in scientific and honorary academic societies and organizations.

CASNR HENRY BEACHELL AWARD

Ray Ward is the recipient of the 2016 Henry Beachell Distinguished Alumni Award from the College of Agricultural Sciences and Natural Resources.

Beachell, who grew up on a farm near Waverly, Nebraska, earned an agronomy degree from the University of Nebraska in 1930. A groundbreaking rice breeder, he was a co-recipient of the 1996 World Food Prize. Beachell, who received an honorary doctorate degree from the University of Nebraska in 1972, has been called "one of the most important individuals in rice improvement in the world."

The CASNR Beachell award, which recognizes exemplary service to CASNR, the CASNR Alumni Association or Nebraska agriculture and natural resources in general, has been presented annually since 2005.

environmental quality; be involved with value-added agriculture; and provide accurate laboratory data for maintaining production enterprises.

Ward continues to be connected to the university, including serving on the Agronomy and Horticulture Alumni Advisory Board and the Nebraska LEAD Board.

In addition to receiving the 2016 Henry Beachell Distinguished Alumni Award from CASNR, Ward's numerous recognitions include the Soil Science Industry Award and the Soil Science Professional Service Award from the Soil Science Society of America; the University of Nebraska Alumni Service Award; and the Service to Agriculture Award from the Nebraska Ag Relations Council. In 2011, Ward, who has a doctorate in soil fertility from South Dakota State University, became just the fourth American to receive an award from the international Soil and Plant Analysis Council for his contributions to soil testing and plant analysis.

Although Ward has been mentoring his grandson, Nick Ward, to take over the business, the 79-year-old has no intention of retiring. "I'm having too much fun with all the new things to retire," he said.

When he's not in the lab, Ward and his wife, Jolene, enjoy spending time with their children, grandchildren and great-grandchildren.

By: Linda Ulrich

"SUSTAINABILITY AND SURVIVABILITY: THE BALANCING ACT TO FEED THE WORLD"
January 10, 2017 » 7:00 PM
 Nebraska Innovation Campus Conference Center

SPEAKER
MARK POESCHL
 Chief Executive Officer of
 National Future Farmers of America



LIVE WEBCAST: heuermannlectures.unl.edu
#hlseries » @heuermannseries



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From border to border, Nebraska Extension is making an incredible impact on the success of Nebraska. With expertise in areas such as agriculture, nutrition and technology, extension professionals support youth, families, farms and ranches, communities and the economy.

Whatever question is facing Nebraskans, an extension professional can help find the answer.

Meet a few experts with Nebraska Extension who are Nebraska natives and graduates of the College of Agricultural Sciences and Natural Resources at UNL.



ALLISON LEIMER

Extension Educator, 4-H Youth Development, Saunders County

UNL has always held a special place in Allison Leimer's heart. Growing up in Mead, Nebraska, she majored in animal science at UNL. Following two study abroad trips to Puerto Rico and Namibia, she received her master's degree in wildlife science at New Mexico State University. Prior to joining Nebraska Extension in the summer of 2016, Leimer served as an Extension 4-H youth and development agent in Carlsbad, New Mexico, for three years.

Leimer is passionate about science, natural resources, wildlife and healthy living. In her role as an Extension educator she now has the opportunity to pass along those passions to 4-H youth in Saunders County.

"If I can get youth excited about science, they can go on to become environmentalists, biologists, scientists, nutritionists or chemists and hopefully help better the world in their own ways."



MITCH STEPHENSON

Range and Forage Management Specialist, Panhandle Research and Extension Center

Growing up on cattle ranches in Nebraska and Wyoming greatly influenced Mitch Stephenson's interest in studying range management. He received an undergraduate degree in animal science from Brigham Young University-Idaho before pursuing his master's degree at UNL, evaluating grazing systems in the Nebraska Sandhills. Stephenson spent time as a range ecologist in Wyoming and earned a Ph.D. in range science from New Mexico State University before joining Nebraska Extension in the spring of 2015.

Stephenson considers his return to Nebraska as coming home. His role as range and forage management specialist allows him to explore his fondness and interest in the Great Plains ecosystems and share his knowledge with Nebraska ranchers.

"The importance of agriculture to Nebraska is something that I appreciate about the state, and it's what drew me to the University of Nebraska-Lincoln."



ASHLEY MUELLER

Extension Educator, Disaster Education Coordinator

Ashley Mueller is a native of Geneva, Nebraska. She earned her undergraduate degree in food science and technology at UNL, and has a master's degree in agricultural education from Purdue University. Before joining Nebraska Extension in the fall of 2014, Mueller held positions with the Kansas Foundation for Agriculture in the Classroom, Great Plains Interactive Distance Education Alliance and South Dakota State University Extension.

In her role as disaster education coordinator, Mueller works with faculty and staff in all Extension program areas to help Nebraskans prepare for, and recover from disasters and widespread emergencies. She does this by offering support to county-based faculty and staff, sharing situational awareness with colleagues and Extension partners, and developing disaster education resources.

"I'm fortunate to work for an institution with a great reputation, where I get to collaborate with and learn alongside some of the brightest and amazingly talented people, and most importantly to me, bring the University to the people across our great state."



DARAN RUDNICK

Irrigation Specialist, West Central Research and Extension Center

As a Nebraska kid, Daran Rudnick was naturally drawn to UNL and the educational opportunities it offered. Following his undergraduate degree in biological systems engineering, Rudnick pursued his postgraduate degrees under the supervision of Suat Irmak, Harold W. Eberhard Distinguished Professor of Biological Systems Engineering.

Working at UNL is ideal for Rudnick because it allows him to pursue his research interests. He is able to share with producers his research findings in full and deficit irrigation management, soil sensing technologies for use in irrigation scheduling, soil water uptake dynamics and the effects of water and nitrogen fertilizer interactions on crop performance.

"I enjoy working with colleagues from different backgrounds, interacting with graduate students and most of all, spending time with Nebraska producers."



Jennafer Glaesemann

CASNR Power

Just like the chants that echo at Husker sporting events, the College of Agricultural Sciences and Natural Resources power is loud and clear on campus. Another semester has begun and new students, new buildings, and a new chancellor fill campus with energy and excitement. We hope you join in our exciting activities.

The Burr/Fedde & Friends Reunion will take place June 10, 2017. Experience Burr and Fedde Halls one last time, get a sneak peek of the new residence hall on East Campus, and connect with friends! All guests must have a ticket to participate. Tickets are \$75 and include all meals and tours. Purchase a ticket by going to <http://casnr.unl.edu/burr-fedde-reunion>. Registration fees will increase on January 1, 2017, and space is limited. The events schedule is as follows:

- 8:00 a.m.** Breakfast, Nebraska East Union
- 9:00 a.m.** UNL East Campus Tours
- Noon** Lunch featuring Valentino's, Nebraska East Union
- 2:00 p.m.** UNL City Campus Experience
- 4:30 p.m.** Social Time, Cornhusker Hotel
- 6:00 p.m.** Kickin' Back 50s Style Dinner and Celebration, Cornhusker Hotel

Husker attire is suitable for all meals and activities. Keep up to date about the event by visiting www.facebook.com/burrfedde. Please continue adding old photos, reconnecting with friends, and reminiscing about good times in Burr/Fedde.

The CASNR Alumni Association would also like to congratulate CASNR graduate, Jennafer Glaesemann, D.V.M., who was recently recognized as one of this year's University of Nebraska Alumni Masters. Glaesemann is the owner and veterinarian at two veterinary clinics in Nebraska, Blue Valley Veterinary Clinic in Beatrice and Pickrell Veterinary Clinic in Pickrell. She is also an adjunct professor at Southeast Community College. Alumni Masters Week, held November 7-11, is an annual program sponsored by the Nebraska Alumni Association, Scarlet Guard (the alumni association's student group) and the UNL Chancellor's Office.

CASNR has a lot to be proud of and the excitement continues to build thanks to you. We appreciate your continued support in promoting our mission, to cultivate and enhance the entire CASNR network.



Steve Kaiser
Steve Kaiser
 CASNR Alumni Association
 President

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