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DEPARTMENT OF AGRONOMY AND HORTICULTURE

ANNUAL NEWSLETTER 2015

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln

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COVER University of Nebraska–Lincoln Backyard Farmer Garden

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Welcome to another edition of our annual newsletter! We continue to strive for timely reporting, and this year we are closer to our self-imposed deadline of a January/February publication of the previous year’s accomplishments and news.

Undergraduate and graduate enrollments continued to increase in 2015, especially in our Agronomy undergraduate major and our distance education certificate programs. Long-running and very successful traditional and historical extension events were complemented with new delivery methods, including award-winning, web-based programs and social media. We continue to grow with outstanding faculty hires, and I refer you to the body of the newsletter for specifics on our new faculty in 2015 as well as the plethora of outstanding accomplishments of our department.

In a deviation from previous letters, this year I would like to highlight strategic changes in our staffing over the last several years. In a unit as robust as Agronomy and Horticulture, the demand for engaged and creative staff has never been greater. Marketing and reporting activities, coupled with the need for a strong presence on social media, resulted in the creation of a media team. Our existing media individual plus an opportunity from the restructuring of IANR Ed Media formed a dynamic duo (not sure who is Batman and who is Robin, I’ll leave it up to them to decide!) of Fran Bonne and Lana Johnson. Both have outstanding and complementary media experience, making their office a one-stop shop for the media needs of faculty and staff.

We partnered with the Nebraska Turfgrass Association to create an executive director for the NTA and an event planner to the body of the newsletter for specifics on our new faculty in 2015. Dr. Roch Gaussoin

Roch Gaussoin
Professor and Department Head

...the Department of Agronomy and Horticulture continues to be an ever-evolving, dynamic, progressive and productive academic unit.” — Roch Gaussoin

The photograph to the left was taken at the Greenhouse Innovation Center on the Nebraska Innovation Campus, which is an example of the steady growth in the role of technology in what we do in agriculture. This facility enables researchers to automatically manage and evaluate individual plants for specific traits or under specific stress conditions. The facility uses a range of multi- and hyperspectral scanners to assess plant response throughout the duration of the study. Our faculty have the capacity to take what is learned in this facility to the field, where a range of sensor systems are increasingly used to investigate plant response in field environments. Conversely, issues that are identified in the field can be brought into the lab or greenhouse for more detailed evaluation. Faculty in our department are increasingly using a range of innovative technologies in their research, teaching and extension efforts, and some of these are highlighted in this newsletter.

While the NITC greenhouse complex is an example of state-of-the-art, high-tech research facilities used by our faculty, Nebraska crop producers also continue to employ new technologies as they seek to gain efficiencies in crop production. Sensors of various types are common today on farms and farm equipment. Irrigated growers, for example, frequently rely on soil moisture sensors to schedule irrigation. Multispectral sensors are increasingly used to evaluate crop status during the growing season. Effectively advising growers for such complex systems requires an interdisciplinary approach, and our faculty collaborate with colleagues in other departments, such as Biological Systems Engineering, Agricultural Economics, the School of Natural Resources and others as well as industry in conducting relevant research and extension programming. Our faculty are very active in efforts such as the Nebraska Agricultural Technologies Association and the Nebraska On-Farm Research Network—efforts which allow producers to learn about emerging technologies together, with involvement from researchers and educators. These are exciting times to be in agriculture! Hopefully that message is shared through this newsletter.

Sincerely,

Richard Ferguson
Professor and Associate Department Head

NEW FACULTY IN 2016

Nevin Lawrence - Integrated Weed Management Specialist at the Panhandle Research and Extension Center, started January 1, 2016

Rodrigo Werle - Cropings Systems Specialist at the West Central Research and Extension Center, starts April 15, 2016

Sam Wortman - Environmental Horticulturist, starts May 15, 2016

STAFF AWARDS 2015

Cheryl Bogenrief - Staff Advisory Committee Special Contributions Award

Judy Fredrick - SAC Special Contributions Award

Stephanie Gamets - University of Nebraska Viticulture Program and Nebraska Wine and Grapes Growers Association C.J. Schwietzer Award

Ronnie Janssen - SAC Special Contributions Award 2014

Kathryn Schindler - University of Nebraska Office Professionals Association Floyd S. Oldt Outstanding Staff Award

Susan Thomas - UNOFA Floyd S. Oldt Silver Pen Award

UNDERGRADUATE FALL ENROLLMENT 2015

Agronomy 212
Horticulture 62
Plant Biology 21
Turfgrass & Landscape Management 33

ALUMNI ADVISORY COUNCIL MEMBERS 2015–2016

Julie Abendroth
Heather Byers
Mark Cooper
Thomas Hoegemeyer
Joe Keashall
Richard McConnell
Jasen Meyer

Chris Petersen
Rob Robinson
Bart Ruth
Dave Stock
David Vetter
Roy Ward

DR. RICHARD FERGUSON

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Richard Ferguson
Professor and Associate Department Head

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Richard Ferguson
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Chris Petersen
Rob Robinson
Bart Ruth
Dave Stock
David Vetter
Roy Ward
GREGORY TEICHMEIER
Research Manager

IN JUNE OF 1977 I STARTED MY EMPLOYMENT WITH UNL AS A STUDENT working in the Department of Agronomy and Horticulture for wheat-breeding pioneers Dr. Virgil Johnson and Dr. John Schmidt. Because of that experience, my interests shifted. Intending to pursue a degree in wildlife management, I switched to soil science. I continued to work for the department until graduation, when I was fortunate to land a research technologist position in soil fertility. I worked the next nine years for Professor Robert Olson and Dr. Don Sander. In 1992 I started working as a research manager under the supervision of Dr. Dan Walters for the Lincoln-based soil fertility/management program until his passing in 2012. A short time later I started in my current position as the research and production coordinator for the department under the direction of T.J. McAndrew managing agronomy research farms at East Campus, Havelock and Mead. T.J. is a quality supervisor, and he made the transition an easy one for me. Assisting faculty and staff and helping meet the needs of the various research projects can be a challenge, but I thoroughly enjoy it.

My employment for the department has spanned nearly 40 years, and I feel a sense of pride for having worked in one place for so long.

Sarah Johnson
Financial Associate

I CAME TO LINCOLN WHEN I WAS ABOUT 10 YEARS OLD after moving around due to my dad and stepdad being in the military. After graduating from Nebraska Wesleyan University with a bachelor’s degree in business administration, I worked as a bank teller and then as an administrative assistant for an investment firm. I started at UNL in the HAPPI Business Center in February of 2015, and I have enjoyed getting to know the faculty and staff I grew up in the city, so it’s been fun to see all the different aspects involved in agronomy and horticulture.

My primary job duties include working with state and gift/foundation-funded accounts, deposits, travel and NTA accounting. There is a lot to learn, but so far it is going well. I like to work in an environment where I can ask a lot of questions and where learning is encouraged.

In my spare time outside of work, I enjoy running, fishing and pretty much anything outdoors as long as it’s warm. I also like to spend time with friends, family and my two dogs (a chiweenie and a puggle). My boyfriend recently bought a house, so I am spending a lot of time painting, decorating and making it a home.

LIZ JESKE
Research Technologist and Lecturer

I WAS DESTINED FOR A CAREER IN SOIL SCIENCE FROM AN EARLY AGE. My mom claims that, as a toddler, I ate the potting soil out of the house plants on a regular basis. I didn’t discover this dirty secret until I enrolled in a geography of soils class in college. I was hooked and went on to the University of Wisconsin-Madison to pursue an M.S. in soil science.

One husband, two children and three states later, we moved to Omaha in 1995, and I began what has turned into a 20-year working relationship and friendship with Rhoe Drijber. Over the years, we have done a lot of fun and interesting research into the hidden world of soil microorganisms. I have truly enjoyed working with graduate students and visiting scientists from all over the world. We added two children to our family here in Nebraska, and I was able to begin work on my Ph.D. after the youngest started school. It only took me eight years to finish.

We are happy to live in Nebraska, which has been a wonderful place for our kids to grow up. With an empty nest looming, I should be able to put a little more effort into my flower and vegetable gardens and try some new recipes. I also look forward to traveling with my husband.
ONCE AGAIN, THE RANGE MANAGEMENT CLUB WAS BUSY with fundraising, annual meetings and social activities. The spring semester started out with the final preparations for the annual Society for Range Management meeting, which was held in early February in Sacramento, California. The club members did eventually arrive at the meeting after several flight issues and winter weather troubles. The Undergraduate Range Management Exam team had several major successes. The URMME team took first place as a team, Jake Drzaza placed third overall, and a majority of the rest of the team placed in the top 25 percent. The UNL Range Management Club also participated in the plant identification contest, undergraduate presentations, graduate presentations and extemporaneous speaking.

The club members attended the Nebraska Section of the SRM meeting in North Platte during the early fall. The club had a successful fundraising auction, thanks to both the generous donors and the auction bidders. The rest of the fall semester included preparing for the Annual International Meeting for the SRM, a tour of the rare plant research at Omaha’s Henry Doorly Zoo and a few social activities, such as the club’s annual Christmas party.

The club kept busy during the school year with plant sales each semester. Members worked together in the spring to raise vegetables and bedding plants for our annual Spring Sale. The sale was a tremendous success, as we sold out of many plants halfway through the first day of the sale! The fall semester was devoted to growing poinsettias that were sold at our Winter Poinsettia Sale during Dead Week. A portion of the proceeds raised from the pink poinsettias was donated to a Breast Cancer Research Fund.

With the funds raised from our sales, we are able to travel out of state every year over spring or fall break to tour different horticultural industries across the country. Last year over spring break we traveled to Denver, Colorado, where we toured an aquaponics operation, Echter’s nursery, Tagawa nursery and the Denver Botanical Garden. We also spent some time looking at native Flora along a foothills path and touring Hammond’s Candy Factory.

Like UNL Horticulture Club on Facebook to keep up with important information about our sales. Mark your calendars for our annual Spring Sale during the last week of April! —Kara Sousek, UNL Horticulture Club President

THE CROPS JUDGING TEAM ATTENDED THREE CONTESTS: IOWA STATE, KANSAS STATE AND THE NATIONAL COMPETITION IN MABINE, ILLINOIS. CROPS JUDGING CAPTAINS ARE NEAL FULTON, CODY MCCLELLAN AND CHARLIE BLOWERS. OFFICERS OF THE AGRONOMY CLUB ARE AMANDA VODVARKA, PRESIDENT; TRAVIS WALLINGER, VICE PRESIDENT; ALLISON LEISING, SECRETARY; BRAD MEUSCH, TREASURER; CODY KUESTER, ASSISTANT TREASURER; AND KRISTIN ALBRECHT, SOCIAL MEDIA/HISTORIAN.

The Agronomy Club had two fundraisers in the fall, including selling mulligans at the Nebraska Turfgrass Association Golf Tournament and card night at Wellington Greens. The card night was also a networking social event as participants included a variety of turf industry professionals. The fundraisers, which help support travel and social activities, are an important aspect of the club.

In October we challenged Kansas State University’s Turf Club to a golf match at Hillcrest Country Club. We came up short this time, but we hope to bring the Corn-Cat Challenge trophy back to Lincoln this spring.

Now we are looking forward to another great year! —Kara Sousek, UNL Horticulture Club President

The Agronomy Club hosted an Emeriti Banquet. “OUR ROOTS RUN DEEP” WAS THE THEME FOR THE UNL AGRONOMY CLUB, and it definitely paved the way for a memorable year as the club grew to 70 members. As a way to say thank you to past professors, especially those who served as Agronomy Club advisers, the club hosted an Emeriti Banquet.

After hearing the stories of the Emeriti members, club members clearly recognized that all of the hard work of past professors and researchers has made a difference for students and club members today. The Emeriti Banquet was a huge success and will now become an annual tradition.

Throughout the year, the Agronomy Club invited various employers to give presentations and inform members about the industry and professionalism. One way that the Agronomy Club explored the agriculture industry firsthand was by attending the regional Students of Agronomy, Soils and Environmental Sciences conference in Madison, Wisconsin. SASES attendees had a chance to see how agriculture in Wisconsin differs from that in Nebraska. The conference consisted of speakers from the industry, four different tours of Wisconsin agriculture and a banquet.

The Craps Judging team attended three contests: Iowa State, Kansas State and the national competition in Mabine, Illinois. Craps Judging captains are Neal Fulton, Cody McClellan and Charlie Blowers. Officers of the Agronomy Club are Amanda Vodvarka, President; Travis Wallinger, Vice President; Allison Leising, Secretary; Brad Meusch, Treasurer; Cody Kuester, Assistant Treasurer; and Kristin Albrecht, Social Media/Historian. —Amanda Vodvarka, UNL Agronomy Club President

Turf Club Provides Networking, Learning Opportunities

Turf Club is a venue where new turf students can get to know other students within the Turfgrass Management Program. The students begin to learn, on a small scale, the importance of developing their professional network as undergraduates and share experiences of past internships and provide pointers for upcoming classes.

This past year has been one of the club’s busiest years. In January the club had a booth at the Nebraska Turfgrass Conference. For students staffing the booth, it was a good opportunity to meet current professional turf managers. In addition, a poster was developed that showcased students’ diverse internship experiences over the past three years.

In February, 10 students traveled to Orlando, Florida, to participate in the Collegiate Turf Bowl Competition at the Golf Course Superintendents Association Education Conference. Four guest speakers from all aspects of the turf industry visited with the club during the fall semester. We had the pleasure of hearing from Dan Parr of Midwest Turf and Irrigation, Larry Ryan of Ryan Lawn and Tree, Dr. Zac Reicher of Bayer and our very own Dr. Roch Gaussoin of UNL.

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In October we challenged Kansas State University’s Turf Club to a golf match at Hillcrest Country Club. We came up short this time, but we hope to bring the Corn-Cat Challenge trophy back to Lincoln this spring.
I'm a native Nebraskan, so attending UNL as an undergraduate seemed natural, but the opportunity to work with world-class scientists kept me here for graduate school too. The opportunity for multidisciplinary studies that are meaningful at both local and global scales is one of the reasons I am thrilled to work in the Department of Agronomy and Horticulture with Dr. Roch Gaussoin, who has served as a co-adviser for my Ph.D. program along with Dr. Vicki Schlegel of the Food Science Department. With a bachelor’s degree in biochemistry as a strong foundation, I have been able to approach agronomic problems from a variety of perspectives.

Another research interest is examining nutraceuticals and pharmaceuticals that can be obtained from plants and converted to industrial products to lower incidences of chronic inflammation related to human disease. We have been evaluating plant extracts in both animal and human cell cultures and hope to move on to animal models soon.

An opportunity that has been very rewarding is teaching the Life Sciences Fundamentals of Biology lab. While this course is outside of Agronomy and Horticulture, it has helped me improve my teaching skills and given me the chance to apply my research and training from this department in a classroom setting.

Working in Agronomy and Horticulture has been an incredible experience. As I approach the end of my degree program, I am grateful for everything that I have been able to learn and do here. —Matt Pedersen, doctoral student
Internships take undergrad on fields across the Atlantic

MY NAME IS JEFF LENIHAN, AND I AM A JUNIOR TURFGRASS & LANDSCAPE MANAGEMENT STUDENT. UNL has provided me numerous opportunities to grow on both an individual and professional level. I have been able to work and travel in 10 different European countries, meet hundreds of professionals in my industry and become a Turf Club officer, all while pursuing a degree and career that I enjoy.

“UNL has provided me numerous opportunities to grow on both an individual and professional level.”

In the summer of 2014, I had the opportunity to intern at Columbus Crew SC, the Major League Soccer team in Columbus, Ohio. From the connections I made at that job, I was able to secure an internship abroad last summer at Campy Turf Care, an England-based turf machinery company. They have partnered with Imants, a Netherlands-based manufacturer, and GT Air Inject, a Jacksonville-based aeration company, to deliver innovative turf care machinery to greenkeepers and groundsmen around the world.

As an intern with Campy Turf Care, I traveled all over Europe, including Finland, Denmark, Germany, Holland, Hungary, Scotland and Ireland. At each stop, we showed turf industry professionals a wide range of products and explained the benefits they provide. These products include the Imants Shockwave, Koro Field Top Maker and the Air262. TurfNet.com also allowed me to write a blog about my summer—Jeff Lenihan: Pitch Prep in the UK 2015.

On these trips, we took time to look at many famous venues. I talked with the groundsmen at Manchester United, Arsenal, the Old Course at St. Andrews and Wimbledon. I met many great people in the turf grass industry, and I get to see the big differences between what they do in Europe and what is done here in the United States. Because of the people I met during that internship, I will be heading back next summer.

—Jeff Lenihan, turfgrass & landscape management major
Agriculture has been changing dramatically in recent years, and this rate of change is likely to escalate. While the full range of these changes is unpredictable, it is clear that the future of agricultural production will increasingly be centered on the application of advanced knowledge in the field to improve production efficiency and yields and enhance sustainability.

The Doctor of Plant Health program is a professional doctoral-level program that focuses on providing interdisciplinary training across all aspects of plant health. The Department of Agronomy and Horticulture, along with the Entomology and Plant Pathology Departments and the School of Natural Resources, is an integral part of the DPH program. Comprehensive education across these disciplines is coupled with the requirement for extensive internship experience. DPH graduates are plant practitioners who have the knowledge, skills and abilities to provide industry, government and academia with comprehensive diagnostic and integrated management expertise for all plant production systems.

There has been high employer demand for internship opportunities with our DPH students, and our six graduates to date have found employment in each of their high-priority areas. Four of the six have been employed by industry (Syngenta, DuPont-Pioneer, BASF and Coors), and the remaining two have found excellent opportunities. One formerly worked at the Borlaug Institute of International Ag and now works as Deputy Chief of Party for the International Fertilizer Development Center in Ghana, and the other is an arborist with New York City Parks. Some of these positions were created specifically for the graduates after their employers experienced their capabilities during an internship.

With the success of our graduates, we are looking to attract more students to expand our program. We are very interested in creating partnerships with agribusiness throughout Nebraska and the country to develop educational opportunities to build their applied science capacity for the future of agriculture.

The DPH program provides a dramatically different model for graduate education to supply professionals capable of meeting a wide range of applied needs. Graduates of the DPH program (i.e., plant doctors) will help provide the knowledge-intensive leadership required for sustainable plant production systems in the 21st century. —Professor Gary Hein, Department of Entomology and Director of Plant Health
a lot of collaboration. Just over 800 EMGs together to participate in learning Gardeners, faculty and staff to come an opportunity for Extension Master “Horticultural Horizons in the Heartland.” The 2015 IMGC highlighted the theme Lincoln Extension Master Gardeners, University and University of Nebraska-Mid-America Center in Council Nebraska and Iowa were fortunate to have well over 50 EMGs volunteer many hours to make the 2015 IMGC a huge success! These EMGs helped in various committees—food, tours, silent auction, decorating and registration table, just to name a few. However, two EMGs took it to the next level by volunteering to be co-chairs for the event. Diane Nolan from Nebraska and Preston Stuart from Iowa kept all the committees organized and the conference running smoothly. One other feature of the IMGC is the Search for Excellence Awards, which recognize outstanding EMG projects in seven different categories: (1) Community Service, (2) Demonstration Gardens, (3) Innovative Projects, (4) Special Needs Audiences, (5) Research, (6) Workshop or Presentation and (7) Youth Programs. SFE Awards is a great opportunity for EMGs to show off their volunteer projects. Watch this year’s winners talk about their projects on the national EMG blog at blogs.extension.org/mastergardener. —Terri James, UNL Extension Master Gardeners Coordinator, Nebraska Extension Assistant

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RESEARCH | GENETICS
TO BE, OR NOT TO BE
AT THE BENCH
LIKE MANY SCIENTISTS AT A SIMILAR CAREER STAGE, ASSOCIATE PROFESSOR DAVID HOLDING HAS UNDERGONE SIGNIFICANT CHANGES in the short years of his assistant professorship. Perhaps one of the most significant, according to Holding, is the transition from spending most of his time doing experiments at the bench—as one does as a graduate student, postdoc and new independent investigator—to spending the majority of his time directing the research while advancing as a teacher and valued citizen of the department, IANR, CASNR and the wider community. Now, his own postdocs, graduate students and undergraduates with their diverse skills, creativity and enthusiasm are his “research hands.” As a team, they push forward in their quest for advancement of basic and applied scientific knowledge. This shift in roles is not without its challenges, Holding said, but seeing one’s students develop and begin to share the passion for scientific creativity is truly satisfying.

From the first days as an undergraduate researcher, as the first one to isolate and observe the protein products encoded by the small, extra nuclear mitochondrial genome of Arabidopsis thaliana, Holding has been hooked on learning new things about what builds a plant. During his Ph.D. at King’s College London, Holding characterized several Arabidopsis mutants that increased the understanding of the development of roots, leaves and chloroplasts. During a postdoc at UC Riverside, he continued focusing on Arabidopsis mutants that shed light on how plants form their vascular system and how the endosperm of the seed forms. During this time, he became interested in functional genomics—casting the net wider to try to understand how genes from the whole genome function together. When Holding felt a need to steer his skills and interests to a more applied system, he took a second postdoc at the University of Arizona, where he worked on maize seed functional genomics. Along with characterizing new genes controlling the development of the seed endosperm, he identified genes controlling the high lysine trait in Quality Protein Maize. Understanding and utilizing Quality Protein Maize continues to be a main focus for Holding at UNL, and his group is currently breeding this trait into commercial popcorn varieties. Maize seed functional genomics is also a central theme, and his group is advancing mutant populations generated in maize and sorghum, both for creating new varieties with improved protein quality (and digestibility in the case of sorghum) and as a more general seed functional genomics resource for themselves and the wider field. Holding and his group are pioneering new ways to rapidly map and identify the causative gene in these mutants. Even though Holding still has a very hands-on approach in the field and greenhouse to advance these populations and “think like a geneticist,” he is happy to leave most of the wet bench and bioinformatics work to his team. —David Holding, Plant Molecular Genetics

SEEING ONE’S STUDENTS DEVELOP AND BEGIN TO SHARE THE PASSION FOR SCIENTIFIC CREATIVITY IS TRULY SATISFYING.
**NEW SOLUTIONS for the sustainability of rangelands**

INTERACTIONS AMONG CLIMATE, VEGETATION, FIRE, HERBIVORES AND PEOPLE ARE RESPONSIBLE FOR THE CREATION AND MAINTENANCE OF THE GRASSLANDS THAT TYPFY THE GREAT PLAINS BIOME. These interactions have led to a diverse array of ecosystem services that continue to be valued in society. Over the last century, land management has attempted to simplify grassland systems in an effort to make them more predictable for livestock. Unfortunately, that simplification has led to “slow” changes that threaten the productivity, diversity and resilience of these systems.

Woody plant invasions, one of the most profound changes, are directly associated with the simplification of fire. Dirac Twidwell, Department of Agronomy and Horticulture assistant professor and rangeland ecologist, is part of a group of scientists working around the globe to understand the consequences of woody plant invasions of grasslands and to provide new solutions to this challenge.

In Nebraska, Eastern redcedar, a fire sensitive tree that was rare historically because of frequent occurrences of fire, was listed in 2014 by the Nebraska Conservation Roundtable as the biggest threat to conservation in the state. UNL’s research, and the research of others, demonstrates that Eastern redcedar is responsible for catastrophic losses in livestock production and grassland biodiversity while markedly increasing wildfire danger. Increases in Eastern redcedar have also been linked to streamflow reductions and human health issues (e.g., asthma and allergies).

Twidwell’s laboratory is currently working alongside rangeland ecologists and natural resource agencies in the state to limit impacts of Eastern redcedar invasions. Given the unsustainably costs of mechanical and chemical methods at statewide or broader levels, these groups are consistently looking to fire as a potential solution to the woody invasions.

**To bridge science and practice, Twidwell’s lab has developed the mechanistic basis for how fire limits Eastern redcedar spread. They are also incorporating models from fire science to propose new ways of designing landscapes, controlling fires and reducing risks to people and property. This has led to interesting collaborations with faculty in Computer Science and the School of Natural Resources. They recently unveiled an unmanned aerial vehicle equipped with “dragon eggs” (delayed ignition balls) that can be used to overcome a lack of people or resources, two major limitations of rangeland fire management.**

Moving forward, Twidwell’s lab will be expanding upon their network of experimental fire studies, located throughout the Great Plains and using spatial modeling techniques to prioritize the use of fire and other management interventions at regional and continental levels. Dirac Twidwell, Rangeland Ecology

**RESEARCHERS SEEK TO UNDERSTAND**

**How Grazing Strategies Affect Nutrient Cycling**

**RANGELANDS ARE LOW-INPUT SYSTEMS (E.G., NO FERTILIZERS, NO IRRIGATION) WHERE MANAGEMENT OF GRASSING AND FIRE DISTURBANCE BECOMES CRITICAL TO system productivity, sustainability and resilience. Grazing strategies are designed to target the spatial and temporal utilization of rangelands by regulating defoliation frequency and intensity. In addition to plant defoliation, grazing induces pulses of energy and nutrients through trampling of vegetation and litter, deposition of dung and urine, and root exudation.**

A multidisciplinary team of scientists from rangeland ecology, soil science, entomology, modelling and statistics is evaluating grazing strategies’ effects on carbon and nitrogen cycling, greenhouse gas emission and dung beetle abundance and distribution at the Barta Brothers Ranch and on rangelands of collaborating ranchers in the Nebraska Sandhills. Dung beetles, which are important drivers of dung decomposition rates and carbon and nitrogen cycling, are common in the Sandhills, but their distribution appears to be sensitive to livestock and rangeland management practices. The overall goal of the project is to contribute to the understanding of how grazing strategies influence the nature and rate of nutrient pulse at both the macro and micro (pasture) scales in rangelands. Research results will advance knowledge of how spatial and temporal patterns of nutrient return associated with different grazing strategies can influence nutrient recycling at the landscape scale, thereby gaining insight into sustainability of grazing lands and their contributions to soil quality, the long-term mitigation of greenhouse gases, and improving existing nutrient cycling models.

—Martha Mamo, Soil Science, and Walter Schacht, Rangeland Ecology

**THE RESEARCH, FUNDED BY THE NATIONAL INSTITUTE OF FOOD AND AGRICULTURE’S AGRICULTURE AND FOOD RESEARCH INITIATIVE, ADDRESSES THE FOLLOWING SPECIFIC QUESTIONS:**

- What are the effects of grazing strategies on the amount and composition of nutrients returned to the system?
- How do grazing strategies impact the temporal and spatial distribution of the nutrient return?
- What is the influence of grazing strategies on patterns of nutrient return, soil nutrient availability and dung beetle abundance?

**What is the influence of grazing strategies on patterns of nutrient return, soil nutrient availability and dung beetle abundance?**

**Walter Schacht, Rangeland Ecology**

**Martha Mamo, Soil Science**

**RANGELAND ECOLOGY**
Ronnie Green, Harlan Vice Chancellor for Administration, opened the Growing Our Future 2015 conference on Nov. 6 at the Cornhusker Hotel in Lincoln, Nebraska. The event provided attendees with a glimpse of the department’s many activities, including breakthrough research and student involvement. After a day of presentations, more than 120 stakeholders along with University of Nebraska–Lincoln administrators, faculty and staff had a better understanding of the amazing breadth and impact of the department.

Ronnie Green, Harlan Vice Chancellor of the Institute of Agriculture and Natural Resources at UNL and vice president of Agriculture and Natural Resources for the Nebraska system, provided opening remarks. He said the Department of Agronomy and Horticulture receives 10 percent of the total research dollars at UNL. Increased undergraduate enrollment at UNL has driven the growth in faculty positions. IANR has made phenomenal strategic investments in talent to grow tenure-track faculty ranks by 27 percent by 2016.

Following Vice Chancellor Green, Roch Gaussoin, the department head, highlighted departmental accomplishments and activities. The Department of Agronomy and Horticulture is growing along with IANR and becoming a leader in cutting-edge research. In addition to the accomplishments of IANR and the department, Gaussoin described the diversity and scope of the research, teaching, extension and staff components of the department in Lincoln and across the state of Nebraska.

After Gaussoin’s remarks, the day consisted of three 30-minute faculty presentations that represented the spectrum of department-related research, nine fast-break presentations where faculty gave brief overviews of specific topics, two 15-minute faculty presentations, and six student club updates. Richard Ferguson, associate department head, served as moderator. Prior to lunch, Mike Stewart, Central Great Plains regional director for the International Plant Nutrition Institute, presented graduate student Zachary Stewart with the prestigious International Plant Nutrition Institute Scholar Award. Stewart is one of six recipients from the United States and is currently working on his Ph.D. in agronomy under the supervision of Professor Charles Shapiro.

Lunch concluded with a demonstration of an unmanned aerial system used in research by Bill Kreuser, assistant professor and extension turfgrass specialist. At the conclusion of the presentations, 15 graduate student posters were displayed. Students were available to discuss their research and answer questions.

A listing of the entire day of events is available at agronomy.unl.edu/growing-our-future-2015-videos.
MEGAN SINDELAR Assistant Professor of Practice

MEGAN SINDELAR GREW UP AS THE YOUNGEST OF SIX CHILDREN ON A DAIRY FARM IN UPSTATE NEW YORK and attended school in Greenwich, New York. This school district had a strong FFA program, which fostered her interest in plant and soil sciences. In addition to feed for their dairy cattle, her family farm also produced high-quality forage for the nearby horse breeding and racing industry.

Sindelar has bachelor’s degrees in agronomy and international agriculture from Iowa State University and a master’s degree and Ph.D. in agronomy from Kansas State University. Sindelar came to the Midwest to be at the center of agronomic studies. She met her native Nebraskan husband during graduate school in Kansas, and they have returned to Nebraska to be closer to his family. Both Sindelars are agronomists and glad to be working in the pro-agriculture environment of Nebraska.

Her current appointment is 100 percent teaching, which Sindelar says is her favorite part of any faculty position. She has a role in the introductory plant science and introductory soil science courses and has been assisting with the development of student assessment methods besides exams.

Sindelar has also developed some instructional material for younger audiences including the Nebraska State Soil Booklet available at NRCS offices and the Soils4Teachers website of the Soil Science Society of America.

MORIARTY, NEBRASKA, MAY 2015

The grazing livestock industry is a priority for her, especially time with her nieces and nephews. She also enjoys traveling internationally and within the United States.

CODY CREECH Dryland Cropping Systems Specialist

CODY CREECH WAS RAISED ON A DAIRY FARM LOCATED ON THE UTAH/IDAHO BORDER. He attended Utah State University, which was 30 minutes from the family farm, for both his bachelor’s and master’s degrees. While earning his B.S. in business operations management with a minor in economics, he managed a 3,000+ acre dryland wheat farm. He returned to Utah State after a year away from school to earn an M.S. in plant science. His research focused on understanding the factors that influence the germination of the perennial plant forage kochia.

Creech continued his education at the University of Nebraska-Lincoln, completing a Ph.D. in weed science under the direction of Dr. Greg Kruger. His doctoral research focused on understanding the impact of herbicide application technologies on herbicide spray characteristics and performance.

Creech joined the department as an assistant professor and dryland cropping systems specialist at the Panhandle Research and Extension Center May 1, 2015. Now he is establishing a long-term crop rotation study to evaluate crop synergism and productivity. As part of this, alternative crops and forages for livestock will be evaluated to see if and where they can fit into the cropping system.

Creech lives near Scottsbluff with his wife Natalie and three children. His family has enjoyed Nebraska, and they were excited to purchase their own house with a small acreage. In the few months they have been there, their little farm has grown. They now have three steers, a pony, 12 chickens, two dogs and a cat to keep them busy.

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David Hyten

**Associate Professor, Soybean Genetics/Genomics**

**David Hyten was raised on a small farm near Mcleansboro, Illinois.** He received a bachelor’s degree in microbiology from Southern Illinois University, master’s degree in plant breeding and genetics from the University of Tennessee and Ph.D. in crop genetics from the University of Maryland. Hyten joined the department July 1, 2015, as a weed management assistant extension educator.

His primary interest is in improving integrated pest management systems for managing herbicide-resistant weeds. Currently, he is working on helping producers better understand how to integrate cover crops into their cropping systems and the role they may play in weed management. In his spare time, Hyten enjoys spending time with his kids and rock climbing. If he could travel anywhere in the world in a whim, he says he would go to Iceland.

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Christopher Proctor

**Weed Management Assistant Extension Educator**

**Chris Proctor is originally from Bend, Oregon.** He has bachelor’s and master’s degrees in crop science from Washington State University and a Ph.D. in agronomy from the University of Nebraska-Lincoln.

Proctor came to Nebraska in 2010 to work on his Ph.D. with Zac Reicher and joined the department July 1, 2015, as a weed management assistant extension educator.

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Humberto Blanco

**Promoted to Associate Professor with Tenure**

Hired: 2012, Ph.D. 2003, from the University of Missouri. Blanco’s research is on field applications of soil physical processes that influence water, carbon and nutrient cycling under different management scenarios (cover crops, crop residue removal, conservation tillage, dedicated bioenergy crops and others). He teaches classes in soil management, applied soil physics and soil-water-nutrient relationships.

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David Holding

**Promoted to Associate Professor with Tenure**

Hired: 2009, Ph.D. 1997, from Kings College London, United Kingdom. Holding’s research focuses on functional genomics of seed development in maize and sorghum. He is especially interested in understanding basic aspects in the molecular genetic control of seed endosperm filling and maturation in relation to protein quality. He has applied breeding projects aiming to improve protein quality and digestibility.

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John Guretzky

**Promoted to Associate Professor with Tenure**

Hired: 2009, Ph.D. 2002, from Iowa State University. Guretzky’s research interests include structure and function of grassland systems, forage-beef production systems and integrated agronomic systems. He teaches an undergraduate course in forage crop and pasture management and a graduate course in forage evaluation.

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Adam Liska

**Promoted to Associate Professor with Tenure**

Hired: 2009, Ph.D. 2003, from Max Planck Institute of Molecular Cell Biology and Genetics and Technical University of Dresden, Germany. Liska holds a joint appointment with Biological Systems Engineering and the Department of Agronomy and Horticulture. His research includes biofuels, life-cycle assessment, greenhouse gas emissions and energy security.

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Devin Rose

**Promoted to Associate Professor with Tenure**

Hired: 2010, Ph.D. 2008, from Purdue University. Rose holds a joint appointment with Food Science and Technology and the Department of Agronomy and Horticulture. Research in Rose’s lab is aimed at improving the quality and health-promoting properties of cereal grains and their products, with a particular emphasis on whole grains and dietary fibers.

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Timothy Shaver

**Promoted to Associate Professor with Tenure**

Hired: 2009, Ph.D. 2009, from Colorado State University. Shaver’s research interests include precision nutrient management, irrigated and water-limited cropping system nutrient management, management effects on soil physical properties and remote sensing. His extension work is in nutrient management, soil and water relationships and GPS/GIS applications.

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Harkamal Walia

**Promoted to Associate Professor with Tenure**

Hired: 2010, Ph.D. 2005, from the University of California Riverside. Walia’s research lab focuses on stress tolerance during developmental stages that are particularly sensitive to abiotic stresses resulting in yield and biomass losses. His goal is to discover genes and genetic variants that can be used to improve crop performance in sub-optimal growing conditions.

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Brian Waters

**Promoted to Associate Professor with Tenure**

Hired: 2008, Ph.D. 2002, from the University of Missouri. Waters’ research is in plant nutritional physiology and molecular genetics. He seeks to gain a mechanistic understanding of how plants respond to mineral nutrient limitation; the physiological processes that move minerals from the soil, through the plant, and into the edible portions; and to determine which genes or gene regulates these processes.
IN REMEMBRANCE

DONALD HENRY SANDER
April 21, 1933 – September 12, 2015

Emeritus Professor Donald Sander, age 82, passed away Sept. 12, 2015. Dr. Sander earned his M.S. degree in agronomy (soils) from the University of Nebraska in 1958. From 1958 to 1964 Dr. Sander served as a research soil scientist with the United States Forest Service in Lincoln working on soil-tree relationships in the Great Plains. In 1964 he accepted an extension soil fertility position with Kansas State University, and upon receiving his Ph.D. in 1967, he returned to the University of Nebraska as extension soils specialist and associate professor of agronomy (soils) with an extension and research appointment. He was promoted to professor in 1973 and was appointed to serve as the agronomy extension coordinator in 1976. Dr. Sander’s research was primarily in dryland wheat production, although he also was actively involved with increasing the effectiveness of fertilizer for corn. His early efforts were effective in increasing wheat grain protein in western Nebraska. Coordinating 25 states and area specialists, Dr. Sander provided the leadership for a large and complex extension program in agronomy and was instrumental in developing an outstanding soil fertility extension program, which included both in-depth soil and fertilizer management training for farmers. He authored and co-authored 100 extension and research publications. From 1977 to 1983 he served as associate editor of the Soil Science Society of America Journal.

LAURIE HODGES—26 YEARS

Laurie Hodges Retired June 30, 2015. Hodges received her Ph.D. from Auburn University, Alabama in plant pathology in 1984. She started at UNL as an assistant professor and UNL Extension specialist in 1989. She was granted tenure and promoted to associate professor in 1996. Her research and extension programs focused on the diversification of agriculture with emphasis on commercial vegetable, cut flower and herb crops through increasing sustainability both economically and socially, while also providing alternative sources of income for farmers with fewer resources.

HERMAN JACOB GORZ
November 22, 1920 – May 17, 2015

Emeritus Professor Herman Gorz, age 94, passed away May 17, 2015. Dr. Gorz had been a research geneticist for the United States Department of Agriculture and an agronomy professor for UNL for 35 years. Dr. Gorz had been a member of the plant breeding and genetics group in the department from 1954 until his retirement in 1988. He conducted research on the genetics, breeding and biochemistry of sudangrass, forage sorghum, switchgrass, indiangrass, sweetclover and red clover. He published over 275 articles and received the USDA Distinguished Service Award.

FRANK NOLAN ANDERSON
July 18, 1928 – November 4, 2015

Emeritus Professor Frank Anderson, age 87, passed away on Nov. 4, 2015. Dr. Anderson was employed as assistant county extension agent in Sherman County for two years and then returned to the University of Nebraska to earn his Master of Science degree in agronomy in 1959. He was an agronomy instructor for seven years before being promoted to assistant professor in 1967 and associate professor in 1972. An extension soils specialist, Anderson was based at the Panhandle Research and Extension Center in Scottsbluff. He was a member of the American Society of Agronomy and AAS of Sugar Beet Technologists.
A HEAD FOR BUSINESS, A HEART FOR TREES

LONG BEFORE SHE COULD SPELL "ENTREPRENEUR, HEATHER BYERS ('06) WANTED TO BE ONE. "I always knew I wanted to own my own business." Her great grandfather started a rural telephone exchange, her parents developed several businesses over the years, and numerous cousins are all in business for themselves. "Everybody started their own thing," she said.

With an entrepreneurial mindset, Byers wanted to do something with horticulture. She just had to figure out what. She said she was used to the science side of things, and having to think about everything from the business angle was challenging. "When I made it to the second round, I was astonished."

In the end, Byers walked away with first place and the confidence she needed to go after her dream. (Byers went on to represent UNL at the 20th Annual New Ventures World Competition, where she received honorable mention.)

INFLUENTIAL PROFESSORS

While entrepreneurship is in Byers’ DNA, several professors at UNL’s Department of Agronomy and Horticulture pointed her in the right direction. “They were very positive instructors who were interested in me as a student.” For example, Associate Professor Kim For example, Associate Professor Kim.

Todd tailored her planting design course for Byers, whose interests leaned more toward production. “She let me research how to propagate the plants on our list and learn about them in a production way.”

Associate Professor of Practice Dave Lambe, who taught agribusiness entrepreneurship, helped Byers narrow her big ideas to come up with the business plan that not only won awards but has also proved successful in the real world.

THE WINNING PLAN

One of the requirements for the senior-level course was to compete in the UNL Venture Plan Competition, which is hosted by the College of Business Administration’s Center for Entrepreneurship. Byers said that going to City Campus and presenting her plan was intimidating. With Lambe’s guidance, Byers weeded out less profitable ideas, considered market value and opportunity and discovered that what she really loved was trees.

The family business is a way of life. “This isn’t just a job for us. It’s our whole lifestyle. Our kids are here with us.” Indeed, the couple’s four children, Finley (8), Bristol (6), Gracyn (3) and Griffin (1), are growing up right alongside the 75-plus species of trees and shrubs at the nursery.

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REGIONAL FOCUS

By focusing on growing quality regional natives, Byers created a niche for tree sales. “Our whole purpose is to create long-living community forests.” Their trees and shrubs withstand drought, heavy snowfall, high winds, extreme temperatures and insect pressure.

Great Plains Nursery sells trees and shrubs to municipalities and retail nurseries across Nebraska and into Iowa and Kansas. Bur oak and red oak are best sellers, and most of the nursery’s trees are planted to re-establish habitats in communities, on campuses and for commercial reforestation.

As consumer interest in local seed sourcing has grown, the nursery has added direct sales in recent years, and Byers said their business may expand to include landscape design for acreages and parks.

Given Byers’ passion for trees and propensity for business, the growth of Great Plains Nursery seems as certain as the strength of the oak trees potted there.
THE STORY OF Ray Ward’s Laboratory...

TO BE CONTINUED

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At an irrigation convention in Sioux Falls, South Dakota, Ed Curry of Curry Seeds joked that Ward should start a soil testing lab in Elk Point, South Dakota. The nine-hour drive back to Dodge City gave Ward and his wife Jolene plenty of time to give that idea some serious thought. “By the time we got home, I’d decided to try it,” he said. But not in Elk Point.

While the early 1980s were tough years for agriculture, Ward surmised that a laboratory in Kearney, Nebraska, might make it. “The farmers in the Platte River Valley were the only ones with any money,” he said, and “Nebraska guys were used to soil testing.” At the time there were already labs in Scottsbluff, Roscoe, Casad, Fremont, Lincoln and Omaha.

With the help of Mark Kottmeyer, a UNL graduate and crop analyst for Central States Agronomics, Ward went into business for himself in 1983. The first few years were difficult, Ward said, and he struggled to keep the business afloat. By 1988, however, the farm economy began to square up and Ward’s laboratory had survived.

When Ray Ward began to think about business succession planning in the late 1990s, none of his four children were interested, and the idea of selling didn’t feel right. “The laboratory had become another kid, and you just don’t sell kids,” he said.

His oldest grandson, who was 12 at the time, spoke up. “Grandpa, why don’t you keep it and let me run it.” And thus began the beginning of the handoff from grandfather to grandson.

After a few summers interning as an undergraduate, Nick Ward learned more about the family business and confirmed that his boyish dream was a viable career. He changed his major to agronomy and went on to earn bachelor’s and master’s degrees from Kansas State University in 2007 and 2010.

Nick finished his doctoral program at UNL in August of 2015, and he now has two years under his belt as the vice president of Ward Laboratories, Inc. Even as Ward grooms his grandson to continue the family business, it’s clear that he is taking his time. “My intention is to keep working and be a mentor at least another 10 years.”

Powerful words from an out-of-stater. But that’s exactly what Andrew Getty, a South Dakota native, says about being here. He feels right at home at UNL, majoring in Turfgrass and Landscape Management. He hopes to become a golf course superintendent.

It’s a big job. A tough job. But he can’t imagine doing anything else. He’ll get to do so thanks to his drive and the scholarships he has received.

To help students like Andrew reach their potential, make a gift at nufoundation.org/agronomyandhorticulture or contact Josh Egley at josh.egley@nufoundation.org or 402-458-1202.

“There’s no place like Nebraska and there’s no place I’d rather be.”