

POTS PLOTS AND PLANTS

DEPARTMENT OF AGRONOMY AND HORTICULTURE
UNIVERSITY OF NEBRASKA-LINCOLN
ANNUAL NEWSLETTER 2015

DPH PROGRAM
TRAINS PLANT
DOCTORS

INTERNSHIPS
TAKE UNDERGRAD
ON FIELDS ACROSS
THE ATLANTIC

GROWING
OUR FUTURE
2015



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ANNUAL NEWSLETTER 2015

Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln

EDITORS Fran Benne, Kara Danforth, Richard Ferguson,
Roch Gaussoin, Lana Johnson

CONTRIBUTOR Chantel Koerwitz

LAYOUT/DESIGN Fran Benne

ADVERTISING Lana Johnson

SUBSCRIPTIONS, INQUIRIES AND ADDRESS CHANGES

202 Keim Hall, Lincoln, NE 68583-0915

402-472-2811, agrohort@unl.edu, agronomy.unl.edu

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UNIVERSITY OF
Nebraska
Lincoln



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

— Roch Gaussoin



RICHARD FERGUSON (LEFT) AND ROCH GAUSSOIN IN THE GREENHOUSE INNOVATION CENTER ON NEBRASKA INNOVATION CAMPUS, WHICH FEATURES A LEMNATEC HIGH-THROUGHPUT PLANT PHENOTYPING SYSTEM.

DR. ROCH GAUSSOIN

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 Benne 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 for the department. Wendy Morrissey provides logistical support for the majority of extension and outreach events in the department, including field days, conferences and other public

offerings as well as department social events (translation: great food and company). If you have attended one of our stakeholder events, you have seen firsthand the great work we do and the fantastic support Wendy provides.

Personal safety and regulatory compliance are critical for the success of an academic department. We reclassified one of our existing technologists, Mike Livingston, to serve as department safety coordinator. Mike primarily oversees the laboratory safety in three of our buildings (Keim Hall, Plant Sciences Hall and Kiesselbach), negotiates lab equipment purchases for our new faculty and coordinates events related to safety training. In his youth, Mike reached the level of Eagle Scout, and he brings the Scout motto “be prepared” to work every day to ensure safety in the workplace. I single out these four individuals to describe the new positions we’ve created to increase foundational support for the great work of our department, including existing staff and faculty.

Winston Churchill is quoted as saying, “To improve is to change; to be perfect is to change often.” Although not yet perfect, the Department of Agronomy and Horticulture continues to be an ever-evolving, dynamic, progressive and productive academic unit. I hope, as you peruse this newsletter, you share the excitement and energy I have the privilege of witnessing almost every day. Enjoy.

Respectfully submitted,

Roch Gaussoin
Professor and Department Head

DR. RICHARD FERGUSON

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 those are highlighted in this newsletter.

While the NIC 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 4, 2016

Rodrigo Werle – Cropping 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

Stephen Gamet: University of Nebraska Viticulture Program and Nebraska Wine and Grape 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: UNOPA Floyd S. Oldt Silver Pen Award

UNDERGRADUATE FALL ENROLLMENT 2015

 **212** Agronomy

 **62** Horticulture

 **21** Plant Biology

 **33** Turfgrass & Landscape Management

ALUMNI ADVISORY COUNCIL MEMBERS 2015–2016

Julie Abendroth
Heather Byers
Matt Giese
Thomas Hoegemeyer
Joe Keashall
Richard McConnell
Jason Meyer

Chris Petersen
Rob Robinson
Bart Ruth
Dave Stock
David Vetter
Ray 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.

Born and raised in Lincoln, I have been married to my wife Lori for 35 years. We have two married daughters, Nicole and Tiffany, and two granddaughters, Harper and Isabella. Outside of work I enjoy outdoor recreation of all kinds. I'm a member of the United States Powerlifting Association and compete in three or four powerlifting competitions a year.

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 Rhae 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.



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 pugle). My boyfriend recently bought a house, so I am spending a lot of time painting, decorating and making it a home.



KAY MCCLURE-KELLY Office Supervisor

BORN AND RAISED IN SOUTH-CENTRAL NEBRASKA, I AM TRULY A SMALL-TOWN GIRL. My dad had a small farm and later worked for a feed dealer. With that background, it took some time to acclimate to Lincoln when I married and moved here in 2008.

Because of my appreciation for farming and the environment, I knew getting to work at the Department of Agronomy and Horticulture would be a great fit. I haven't been disappointed. From getting a chance to hear about faculty research to simply being near the greenhouses and gardens, I'm happy to come to work every day.

As the office supervisor my duties include working with a great group known as the office professionals. We provide academic support, technology assistance and a wide range of office services. I also provide backup to the department head's administrative associate. In this large department there is a wide variety of opportunities, and I enjoy each new challenge.

I love working in an academic environment and have been fortunate to do so for 16 years. My first position at UNL was at the South Central Research and Extension Center on the MARC near Clay Center in 2000. Working with that terrific group of people gave me a real appreciation for agricultural research and the service extension provides to Nebraska.

With four children and five grandchildren, I spend much of my personal time with family. Every summer I love having my backyard garden to grow my own food as well as cooking and preserving our harvest. Every year we try to add new flowering plants to the yard. My winter hours are spent reading, quilting and baking. And of course looking through seed catalogs.





RANGE MANAGEMENT CLUB MEMBERS AND ADVISER, PROFESSOR WALT SCHACHT (RIGHT) ATTEND THE SPRING APPRECIATION BANQUET.

STUDENTS GET INVOLVED

RANGE MANAGEMENT CLUB TRAVELS, COMPETES

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 URME team took first place as a team, Jake Drozda 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.

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 finished out the semester with a tour of Bluestem Valley Farms and an end-of-the-year potluck dinner.

The Range Management Club would like to thank everyone who helped and supported us in making this year such a success. We are looking forward to another great year!
—Kyra Baldwin, UNL Range Management Club President



UNL TURF CLUB (BACK ROW) AND KSU TURF CLUB HOLD INAUGURAL CORN-CAT CHALLENGE.



HORTICULTURE CLUB MEMBERS GROW AND SELL POINSETTIAS.

PLANT SALES ENABLE CLUB TO TRAVEL

THE UNL HORTICULTURE CLUB'S MISSION IS TO PROMOTE INTEREST AND FURTHER EDUCATION IN HORTICULTURE. We accomplish this mission by providing learning experiences, both through industry tours and growing experience.

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

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 upperclassmen 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.

The 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.

To get to know each other outside of turf activities, we have an intramural basketball team. It is nice to have a bond outside of the things we do within the club. Our goal as a club is to utilize our resources to gain knowledge, expand our professional networks and develop friendships. To learn more about us, follow @unlturfclub on Twitter. —Gustavo Rodriguez, UNL Turf Club President



THE AGRONOMY CLUB HOSTS THE EMERITI BANQUET.

AGRONOMY CLUB PAYS TRIBUTE TO ITS ROOTS WITH 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.



AGRONOMY CLUB MEMBERS ATTEND THE SPRING APPRECIATION BANQUET.

The Crops Judging team attended three contests: Iowa State, Kansas State and the national competition in Moline, 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.
—Amanda Vodvarka, UNL Agronomy Club President

CLUB PROVIDES FUN, SUPPORT FOR GRADUATE STUDENTS

THE AGRONOMY AND HORTICULTURE GRADUATE STUDENT ASSOCIATION SERVES THE GRADUATE STUDENTS OF THE DEPARTMENT by promoting student and faculty relations and by offering activities and career development opportunities that are not otherwise available. Our organization meets monthly for business meetings, student research presentations and networking that is enjoyed with food.

AHGSA strives to help students transition into graduate school. We offer a mentor program for all incoming students as well as an orientation and welcome event with the department in the fall and spring.

We engage in many social and fundraising activities throughout the year. Many of the activities are themed according to the season or holiday, such as a fall barbecue with a dessert contest, a Thanksgiving dinner get-together and a winter white elephant gift exchange. Our association also held a chili cook-off competition during a regular meeting with prizes



AHGSA CLUB MEMBERS HOST THE SPRING APPRECIATION BANQUET.

for the top winners, and we organized a spring banquet for the department. We finished the spring semester with a grill-out and games on East Campus with grilled food items, sand volleyball and roasting marshmallows for s'mores!

During the summer we toured facilities and fields of multiple companies in York. We also took a trip to a local apple orchard and pecan co-op. New this year, AHGSA volunteered to help pick Dr. Oscar Rodriguez's sweet corn for the department to enjoy.

Thank you for all of your support of the graduate students throughout the year, and we look forward to continued fun activities! —**Leah Ruff, President; Sunil Kumar, Vice President; James Han, Treasurer; and Kelsie Musil, Secretary**

GRADUATE STUDENT AWARDS

Jack Arterburn: David H. & Anne E. Larrick Memorial Travel Fund, Irvin A. & Agnes E. Nelson Memorial Fellowship, Wildwood Trust Scholarship Graduate Travel Grant, Hutchinson Travel Grant

Ethann Barnes: First-place North Central Weed Science Society Graduate Student Poster – Agronomic Crops, Third-place Weed Science Society of America Weed Olympics Graduate Student Team

Madhav Bhatta: Monsanto Beachell-Borlaug International Scholarship Program

Christine Bielski: W.R. Chapline Fellowship

Thomas Butts: First-place NCWSS Graduate Student Poster – Equipment and Application Methods, Second-place NCWSS National Weed Contest Overall Graduate Team, Third-place WSSA National Weed Contest Overall Graduate Team

Cody Creech: NCWSS Outstanding Graduate Student 2015

Kenneth Evans: Second-place ASA-CSSA-SSSA Graduate Student Poster – Environmental Quality

Katherine Frels: Henry M. Beachell Fellowship, Gerald O. Mott Award

Feyera Liben: Widaman Distinguished Graduate Fellowship Award

Ben Loseke: American Society for Enology & Viticulture Scholarship, Eastern Section

Margarita Marroquin-Guzman: Hardin Distinguished Graduate Fellowship, Milton E. Mohr Fellowship – Biotechnology Degree Program Recipient, UNL Spring Graduate Research Fair Graduate Student Poster Winner, 28th Fungal Genetics Conference Eukaryotic Cell Outstanding Young Investigator, Agronomy and Agriculture Graduate Student Travel Grant

Darrell Michael: Henry M. Beachell Fellowship

Joshua Miller: J. Artie & Arra Browning Plant Medicine and Health Travel Award, North Central Extension-Industry Soil Fertility Conference Outstanding Graduate Student Award, Farmers Company National Fellowship

Matt Pedersen: North American Colleges and Teachers of Agriculture Graduate Student Teaching Award of Merit, ARD-IANR John & Louise Skala Fellowship

Spencer Samuelson: Second-place NCWSS National Weed Contest Overall Graduate Team, Third-place WSSA National Weed Contest Overall Graduate Team

Debalin Sarangi: WSSA Best Graduate Student Poster, Second-place NCWSS Graduate Student Poster – Agronomic

Crops, WSSA Graduate Student Travel Award, Second-place NCWSS National Weed Contest Overall Graduate Team, Third-place WSSA National Weed Contest Overall Graduate Team

Bradley Schick: Daniel T. Walters Graduate Student Travel Fund Award, Third-place ASA-CSSA-SSSA Robert F. Barnes Graduate Student Poster Contest – Grazinglands Division

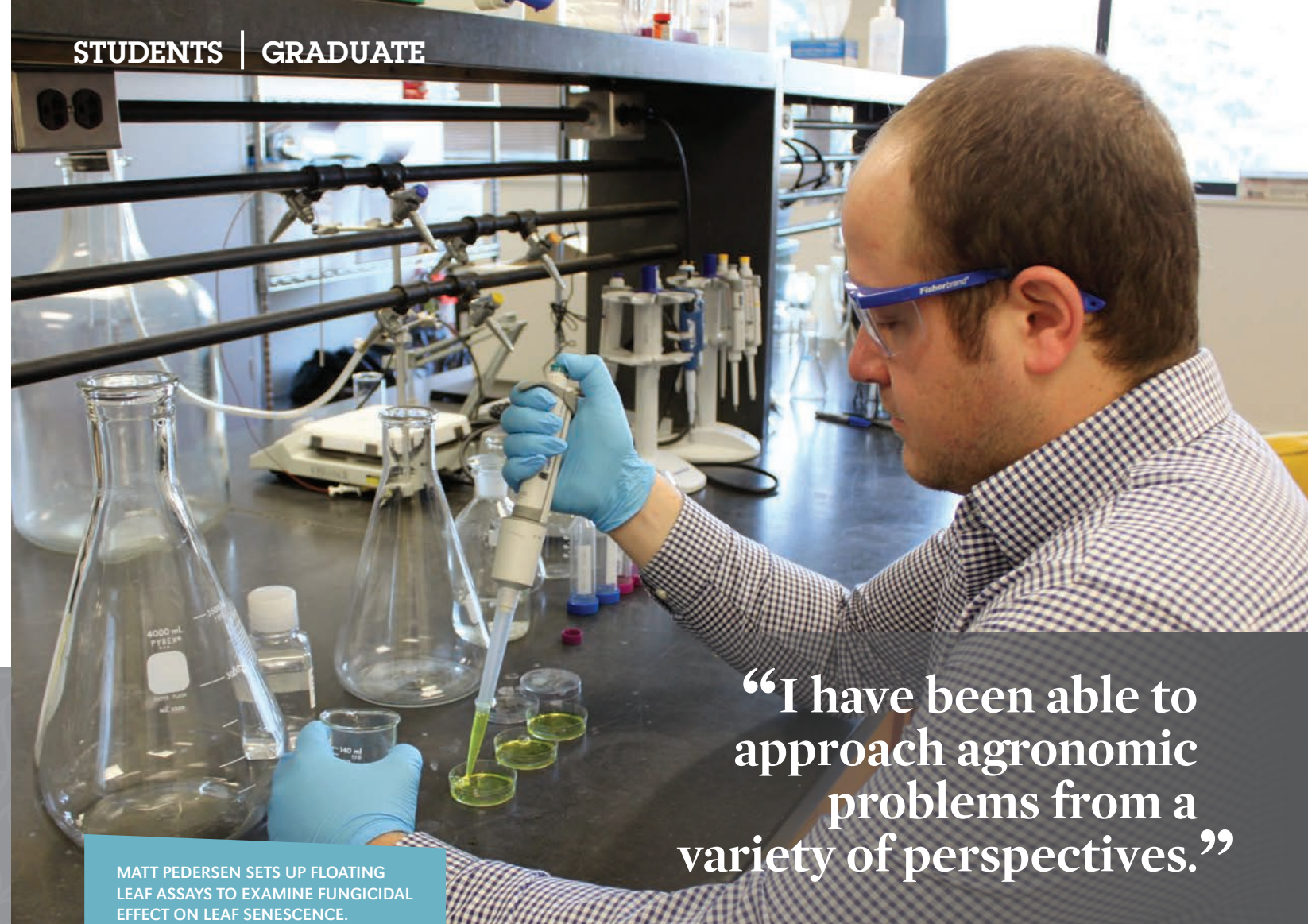
Zachary Stewart: ASA-CSSA-SSSA Future Leaders in Science Award, International Plant Nutrition Institute Scholar Award

Kayla Tarr: Arthur W. Sampson Fellowship

Grace Troupe: Valuable Contributions to UNL Agronomy and Horticulture Graduate Student Association Award

Rodrigo Werle: Milton E. Mohr Award – Biotechnology Degree Program Recipient, Third-place WSSA Poster Contest, First-place NCWSS Graduate Student Paper – Weed Biology, Ecology and Management, First-place NCWSS Outstanding Paper Presentation, Second-place NCWSS

National Weed Contest Overall Individual, Second-place NCWSS National Weed Contest Overall Graduate Team, Third-place WSSA National Weed Contest Overall Graduate Team, UNL Dean's Fellowship, Third-place WSSA Outstanding Poster Presentation



MATT PEDERSEN SETS UP FLOATING LEAF ASSAYS TO EXAMINE FUNGICIDAL EFFECT ON LEAF SENESCENCE.

“I have been able to approach agronomic problems from a variety of perspectives.”

DOCTORAL PROGRAM OFFERS

multidisciplinary approach

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.

An exciting project I have been working on examines the ability of artificial respiration inhibitors to alleviate abiotic stress in turfgrass. To do this we have evaluated respiration in isolated wheat mitochondria and explored new methods of plant metabolomics. Now we are examining how reducing mitochondrial respiration affects plant metabolism, hormones and gene expression in creeping bentgrass. The results of this

research could improve turfgrass aesthetics as well as increase yield of agronomic crops.

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



JEFF LENIHAN

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 with Campey 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 groundsman around the world.

As an intern with Campey 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 Air2G2.

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 groundsman at Manchester United, Arsenal, the Old Course at St. Andrews and Wimbledon. I met many great people in the turf grass industry, and I got 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 overseas to intern at Arsenal FC's training ground in London next summer.

—**Jeff Lenihan, turfgrass & landscape management major**

WE ARE THE CHAMPIONS

NEBRASKA WEED SCIENCE TEAM IS CROWNED NATIONAL CHAMPIONS AT WEEDOLYMPICS

THE UNL UNDERGRADUATE WEED SCIENCE TEAM TOOK FIRST PLACE IN THE NATION at the 2015 National Weed Contest July 21. Hosted by the Weed Science Society of America, the national contest was held at The Ohio State University at the Western Agricultural Research Station near South Charleston, Ohio.

UNL Weed Science, represented by 26 graduate and undergraduate students, had a successful showing, bringing home 13 total awards—the most ever by a university.

Members of the national championship undergraduate team were agronomy majors Brad Meusch and Jacob Nikodym and former agronomy undergraduates Bret Rausch, who now works for Green Cover Seed, and Don Treptow, an agronomy graduate student. The team was recognized Feb. 8 at the WSSA annual meetings in San Juan, Puerto Rico.

Meusch was the runner-up individual champion. The team and Meusch also took first at the regional society level.

The UNL graduate team of Spencer Samuelson, Rodrigo Werle, Tommy Butts and Debalin Sarangi took third place at the national level and second place at the regional society level.

The National Weed Contest (WeedOlympics) is a joint activity

between the Northeastern, North Central, Southern and Western Weed Science Societies. The purpose of this national contest is to provide an educational experience for students from universities across the country to broaden their applied skills in weed science as they interact with one another, other researchers and industry professionals.

Nearly 250 graduate and undergraduate students from 25 universities in the United States and Canada participated. Awards were given at the national level and at each regional weed science society level. The contest included five events: Weed Identification, Unknown Herbicide Symptoms Identification, Written Calibration, Farmers Problem Solving and Team Spray Calibration.

Coaches for the team were Greg Kruger, cropping systems specialist, and Lowell Sandell, former weed management extension educator. Josh Miller, Doctor of Plant Health and Ph.D. candidate, and Werle, agronomy doctoral student, also taught a weed science contest prep course for students interested in competing. Miller and graduate student Butts are teaching the one-credit course again this spring semester.



GRADUATE NATIONAL THIRD-PLACE TEAM (LEFT TO RIGHT) SPENCER SAMUELSON, RODRIGO WERLE, COACH GREG KRUGER, TOMMY BUTTS AND DEBALIN SARANGI

UNDERGRADUATE AWARDS

1. **National Level First-place Team:** Brad Meusch, Jacob Nikodym, Bret Rausch and Don Treptow
2. **National Level Second-place Individual:** Meusch
3. **WSWS First-place Team:** Meusch, Nikodym, Rausch and Treptow
4. **WSWS First-place Individual:** Meusch
5. **WSWS Third-place Individual:** Treptow
6. **WSWS Third-place Team:** Cale Pallas, Colton Craig, Frederico Guimaraes and Luis Andre Tobias

GRADUATE AWARDS

7. **National Level Third-place Team:** Spencer Samuelson, Rodrigo Werle, Tommy Butts and Debalin Sarangi
8. **NCWSS Second-place Team:** Samuelson, Werle, Butts and Sarangi
9. **NCWSS Second-place Individual:** Werle
10. **NCWSS First Individual Weed Identification:** Sarangi
11. **WSWS Second-place Team:** Bruno Vieira, Josh Miller, Parminder Chahal and Zahoor Ganie
12. **WSWS Third-place Team:** Ethann Barnes, Guilherme Alves, Matt Nelson and Maxwell Oliveira
13. **WSWS Third-place Individual:** Oliveira

UNDERGRADUATE STUDENT AWARDS

Sam Foltz: Named to UNL Franco's List

Erin Kinley: Longwood Graduate Program in Public Horticulture Scholars Award

Melinda Knuth: College of Agricultural Sciences and Natural Resources Spirit Award

Dylan Mangel: Western Seed Association National Scholarship

Brad Meusch: Martin Massengale Outstanding Senior Award, Weed Science Society of America National Collegiate

Weed Science Contest Team Champion, Second-place WSSA Collegiate Weed Science Contest Overall Individual, First-place Western Society of Weed Science Undergraduate Team, First-place WSWS Undergraduate Overall Individual

Jaclyn Nelson: National Floral Endowment Scholarship

Jacob Nikodym: WSSA National Collegiate Weed Science Contest Team Champion

Andjela Obradovic: Second-place

North Central Weed Science Society Undergraduate Student Poster

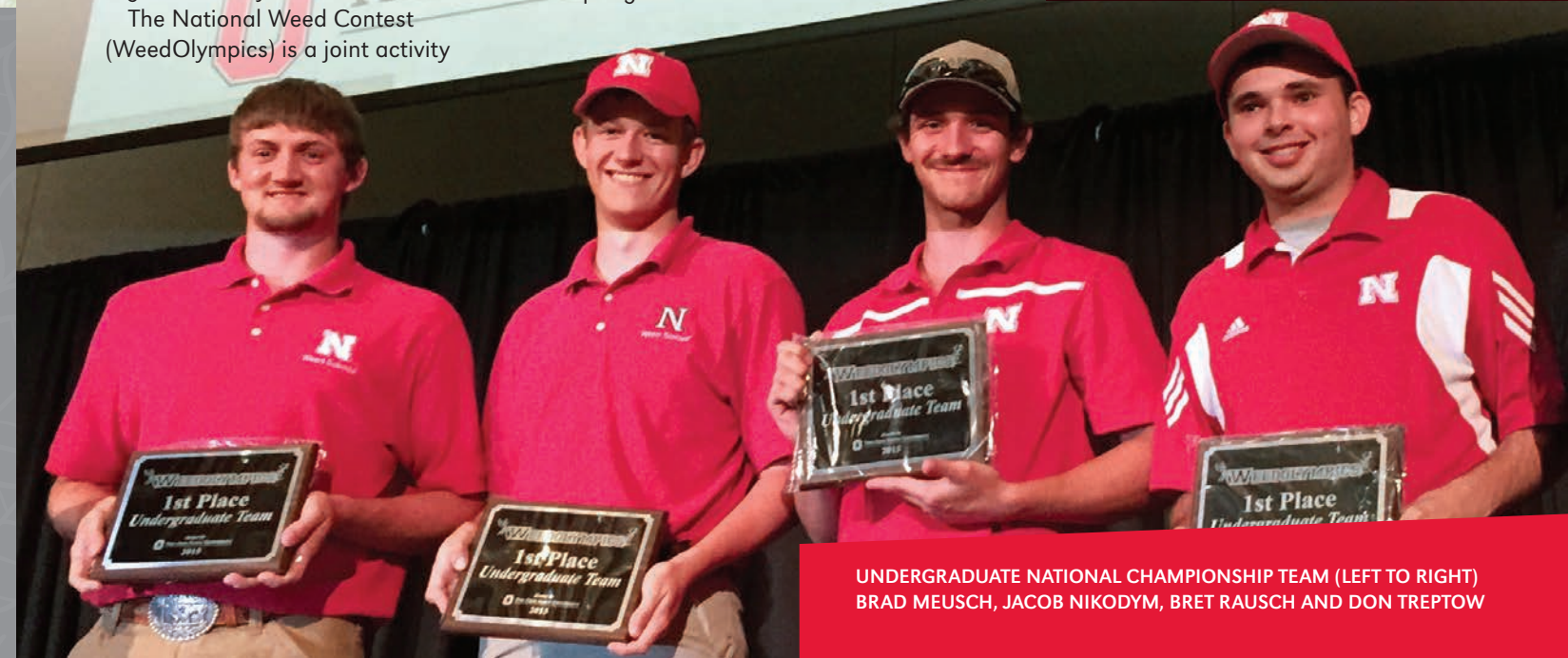
Cale Pallas: Western Seed Association National Scholarship

Alex Peyton: First-place 3-2-1 Quick Pitch – UNL Center for Entrepreneurship

Bret Rausch: WSSA National Collegiate Weed Science Contest Team Champion

Don Treptow: WSSA National Collegiate Weed Science Contest Team Champion

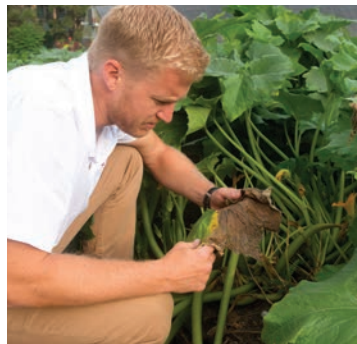
Milos Zaric: First-place NCWSS Undergraduate Student Poster



UNDERGRADUATE NATIONAL CHAMPIONSHIP TEAM (LEFT TO RIGHT) BRAD MEUSCH, JACOB NIKODYM, BRET RAUSCH AND DON TREPTOW



ABOVE: DPH STUDENTS, SALVADOR RAMIREZ (FROM LEFT), JUSTIN MCMECHAN AND DEREK PRUITT, INSPECT SOIL STRUCTURE IN CORN. TOP RIGHT AND DOWN: RAMIREZ IMPROVES HIS PHOTOGRAPHY SKILLS. STUDENTS TAKE A TOUR OF THE SYNGENTA SEED PLANT IN WATERLOO, IOWA. DPH STUDENT JOSH MILLER IDENTIFIES DISEASE ISSUES IN ZUCCHINI.



DPH PROGRAM TRAINS PLANT DOCTORS

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.



GARY HEIN

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**



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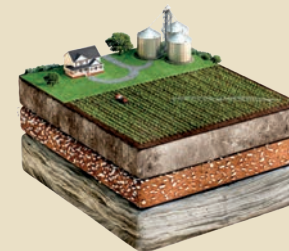
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UNL EXTENSION MASTER GARDENERS HELP HOST INTERNATIONAL CONFERENCE



THE BIENNIAL INTERNATIONAL MASTER GARDENER CONFERENCE CONVENED SEPT. 22–25, 2015, at the Mid-America Center in Council Bluffs, Iowa. Hosted by Iowa State University and University of Nebraska-Lincoln Extension Master Gardeners, the 2015 IMGC highlighted the theme “Horticultural Horizons in the Heartland.”

The international conference is an opportunity for Extension Master Gardeners, faculty and staff to come together to participate in learning sessions, tours, keynote presentations and a lot of collaboration. Just over 800 EMGs

(from 39 states, two Canadian provinces and South Korea) partook in more than 70 learning sessions, including both traditional classroom style and hands-on workshops, three keynote sessions (presented by J. Schwanke, Mark Hirsch and Gary Oppenheimer) and 10 fantastic tours (two of which highlighted the states of Nebraska and Iowa).

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

TO BE OR NOT TO BE AT THE BENCH



DAVID HOLDING SURVEYS A NEW ALLELIC VARIATION OF SUGARY 1 SWEETCORN GENERATED IN HIS FUNCTIONAL GENOMICS PIPELINE.

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

“SEEING ONE’S STUDENTS DEVELOP AND BEGIN TO SHARE THE PASSION FOR SCIENTIFIC CREATIVITY IS TRULY SATISFYING.”

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

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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 TYPIFY 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 conversions 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 ranchers and natural resource agencies in the state to limit impacts of Eastern redcedar invasions. Given the unsustainable 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.



Photo by Craig Chandler, University Communications

SEBASTIAN ELBAUM (FROM LEFT), DIRAC TWIDWELL AND CARRICK DETWEILER HAVE DEVELOPED A NEW PATENT FOR SETTING RANGE FIRES WITH SMALL DRONES.

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 ranchers and agency personnel, required to conduct prescribed burns.

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 GRAZING 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 fate of the nutrient pulse at both the micro and macro (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 to patterns of nutrient return, soil nutrient availability and dung beetle abundance?



LEFT: STUDENTS COLLECT GREENHOUSE GAS SAMPLES. ABOVE: ENTOMOLOGY GRADUATE STUDENT PAT WAGNER SETS UP DUNG BEETLE TRAPS IN THE FIELD. RIGHT: ADJUNCT ASSISTANT PROFESSOR ANA WINGEYER COLLECTS DUNG PAT PLACED IN WIRE MESH TO EXCLUDE DUNG BEETLES.

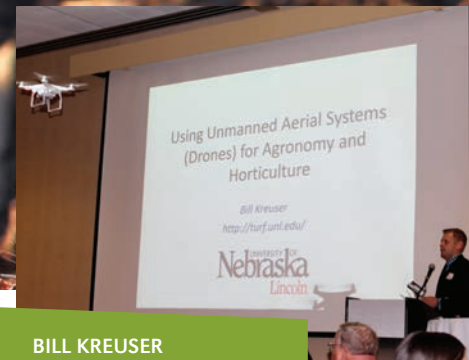


COPRIS FRICATOR (DUNG BEETLE)

Illustration by Lana Koepke Johnson

Photo by Jessica Maly at Gudmundsen Sandhills Laboratory

GROWING OUR FUTURE 2015



BILL KREUSER



ROCH GAUSSOIN



MIKE STEWART (LEFT) AND ZACH STEWART

THE DEPARTMENT OF AGRONOMY AND HORTICULTURE, THE LARGEST ACADEMIC DEPARTMENT ACROSS THE UNIVERSITY OF NEBRASKA SYSTEM, hosted the Growing Our Future 2015 conference on Nov. 6 at the Cornhusker Marriott 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.

FACULTY PRESENTATION HIGHLIGHTS

- **Daniel Schachtman**, professor and director of the Center for Biotechnology, shared his exciting research looking at microbes in soil that may help plants grow in Nebraska and in the Sandhills.
- **Harkamal Walia**, associate professor and plant molecular physiologist, discussed his research on phenotyping to capture the dynamic nature of salt stress tolerance in rice and wheat.
- **Leah Sandall**, assistant professor of practice, highlighted the thriving distance education program and provided a virtual tour of the remodeled Gooding Learning Center.
- **Oscar Rodriguez**, research professor, discussed the joint research agreement for popcorn breeding between ConAgra Foods and the University of Nebraska. The objective is to improve the agronomics and production characteristics of commercial popcorn hybrids of ConAgra Foods. Special emphasis is given to quality eating traits such as volume expansion, tenderness and flake shape.
- **Anne Streich**, associate professor of practice, announced a 73 percent increase in department undergraduate student enrollment between 2008 and 2015.
- **Roger Elmore**, professor and Heuermann Chair and Robert B. Daugherty Water for Food Institute Fellow, stated "Scientists are stewards." He then asked, "How can we be good stewards?" and discussed his research on implementation of cover crops in Nebraska corn and soybean cropping systems.
- **Brian Krienke**, assistant extension educator, and Laura Thompson, assistant extension educator, Southeast Research and Extension Center, work with Project SENSE, a team-based, on-farm research project to improve nitrogen use efficiency and reduce nitrogen loss to ground water.
- **Keenan Amundsen**, assistant professor, discussed his research on developing genetic markers in buffalograss to increase the breeding program and to develop improved native buffalograss cultivars to withstand leaf spot disease and chinch bugs.
- **Charles Shapiro**, professor, stated that although Nebraska has great soils, research in foliar analysis in nutrient management for high crop yields helps keep it that way.
- **Dirac Twidwell**, assistant professor, talked about using fire to stop the invasion of juniper woodland taking over grasslands and to restore grasslands back to their natural habitat.

- **Stacy Adams**, associate professor of practice, shared new research developments of growing hops in different soils of Nebraska.
- **Walt Schacht**, professor, discussed research where range nutrient cycling with higher grazing distribution and efficiency increases carrying capacity for cattle grazing.

STUDENT CLUB HIGHLIGHTS

- **Range Management Club** – Amanda Hefner, member and applied ecology, natural resource sciences graduate student
- **Turf Club** – Jeff Lenihan, vice president and turfgrass & landscape management major
- **Agronomy and Horticulture Graduate Student Association** – Leah Ruff, president and plant breeding and genetics graduate student
- **Agronomy Club** – Amanda Vodvarka, president and agronomy major, and Brad Meusch, treasurer and agronomy major
- **Pi Alpha Xi** – Alpha-Gamma Chapter, National Honor Society for Horticulture – Emily Stine, president and turfgrass & landscape management major
- **Horticulture Club** – Kara Sousek, president and horticulture major

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MEGHAN SINDELAR Assistant Professor of Practice

MEGHAN 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.



LEAH SANDALL Distance Education Coordinator



LEAH SANDALL IS A NATIVE NEBRASKAN WHO GREW UP JUST OUTSIDE OF YORK. She received her bachelor's and master's degrees in agronomy from the University of Nebraska-Lincoln. As a student at UNL, she discovered her interest in education while working as a teaching assistant.

After a brief time working in the small business sector, Sandall returned to UNL in 2008 as an extension assistant with the Pesticide Safety Education program. In 2010 she was hired as a lecturer/instructional designer in the department.

The Department of Agronomy and Horticulture's commitment to providing online and distance education for students is one of the reasons Sandall enjoys her current role as distance education coordinator.

One area Sandall is focused on in distance education is meeting the education needs of the non-credit, extension learner through online courses and the plant breeding and genetics professional certificate. The department offers both online academic credit and non-academic credit courses. Additionally, the online program administers the master's in agronomy, academic certificate and professional certificate programs. Sandall is excited to continue building on the online success of the department as she pursues academic and UNL Extension opportunities.

Outside of work Sandall enjoys spending time outdoors walking and biking. Time with family and friends is a priority for her, especially time with her nieces and nephews. She also enjoys traveling internationally and within the United States.



MITCHELL STEPHENSON Range and Forage Management Specialist

MITCH STEPHENSON IS ORIGINALLY FROM A RANCHING COMMUNITY IN THE SANDHILLS NEAR WHITMAN, NEBRASKA.

Growing up in such a unique grassland ecosystem drew him into the study of range management.

He received a bachelor's degree in animal science from Brigham Young University-Idaho with an emphasis on natural resources. Stephenson returned to Nebraska for a master's degree in range science where he studied the influence of grazing systems on vegetation and livestock characteristics. In August 2014, he graduated with a Ph.D. from New Mexico State University studying methods to alter grazing livestock distribution.

Stephenson joined the department April 1, 2015. It had been a goal for him to return to the Great Plains. The grazing livestock industry is an important component to the

Nebraska economy, and he has been intrigued with the opportunity to conduct research and extension programs that explore the ecological and economic sustainability of these valuable grassland resources.

Currently, Stephenson is conducting research using GPS-tracking technology to better understand grazing distribution patterns of cattle in western Nebraska. The objective of this research is to identify how livestock make grazing site decisions within large pastures over time. This research will help better understand how topography, aspect, weather data, and time of year affect where cattle are grazing on a landscape.

Stephenson was married in the fall of 2015, and he and his wife enjoy fishing, biking and all the great outdoor activities that western Nebraska has to offer.

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.





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.

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, Proctor enjoys spending time with his kids and rock climbing. If he could travel anywhere in the world on a whim, he says he would go to Iceland.

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 August 17, 2015. One of the main reasons Hyten left the private industry to work at the University of Nebraska-Lincoln is because he enjoys training new scientists in his area of research. More importantly,

he enjoys seeing them succeed in their careers and making an impact on improving crops.

Hyten's lab is focused on taking basic soybean genetic and genomic discoveries and translating those discoveries into applied methods that can be used for the real-world improvement of soybean varieties. One specific area of focus he will be studying is the genetics of drought tolerance and finding ways to improve crop production in drought conditions.

In his spare time, Hyten plays in a weekly eight-ball pool league.



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.

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.

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.

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.

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 particular emphasis on whole grains and dietary fibers.

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.

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.

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.



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Stacy Adams – UNL Teaching Council and Parents Association Contributions to Students Award

P. Stephen Baenziger – National Association of Plant Breeders Lifetime Achievement Award

Ken Cassman – Thomson Reuters' List of Highly Cited Researchers for Exceptional Impact in their Fields

Charles Francis – Honorary Doctoral Degree from the Swedish University of Agricultural Sciences

Roch Gaussoin – Crop Science Society of America President and UNL Teaching Council and Parents Association Contributions to Students Award

Patricio Grassini – 2015 Junior Faculty Excellence in Research Award, UNL Agricultural Research Division

George Graef – Nebraska Soybean Board Presidential Chair and NUtech Ventures Serial Innovator Award

Bill Kreuser – American Society of Agronomy Excellence in Extension Materials Award in the Website and Social Media Category for TurfiNfo

Dave Lambe – UNL Dinsdale Family Faculty Award, UNL Teaching Council and Parents Association Contributions to Students Award

Martha Mamo – UNL Outstanding Teaching and Instructional Creativity Award

Alexander Pavlista – The Potato Association of America 2015 Honorary Life Membership

Daniel Schachtman – 2015 American Association for the Advancement of Science Fellow

Anne Streich – UNL Teaching Council and Parents Association Contributions to Students Award

Richard Sutton – American Society of Agricultural and Biological Engineers Blue Ribbon Award for Stormwater Management: Green Roof Basics (lead author) and Great Plains Chapter American Society of Landscape Architects Merit Award for the UNL Green Roof Research Program

Kim Todd – Nebraska Statewide Arboretum's Educator of the Year and UNL Teaching Council and Parents Association Contributions to Students Award

Dirac Twidwell – Secretary for the Range Science Education Council

Jerry Volesky – Wendell Burgher Beef Industry Award

Charles Wortmann – Chair of Global Agronomy Section of American Society of Agronomy



George Graef (third from left) with Brad Roth (from left), Harvey Perlman and Prem Paul
NUtech Ventures Serial Innovator Award



Daniel Schachtman
2015 AAAS Fellow



Martha Mamo (left) with Ronnie Green
UNL Outstanding Teaching and Instructional Creativity Award

RETIREMENTS

GARY HERGERT—40 YEARS



GARY HERGERT RETIRED JUNE 30, 2015. Hergert received his Ph.D. in agronomy from Cornell University in 1975 and joined the department as a professor of agronomy and soil and nutrient management specialist with UNL Extension. He was based at the University of Nebraska-Lincoln's Panhandle Research and Extension Center for 11 years, and before that he had been at the West Central Research and Extension Center

for nearly 30 years. Hergert's research for the Institute of Agriculture and Natural Resources helped lay the foundation for UNL's nitrogen algorithm for corn.

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.

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*.

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 was a valued 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 1975. 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 AS of Sugar Beet Technologists.



“I always knew I wanted to own my own business.”

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.

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 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.



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.)

A FAMILY AFFAIR

After graduation, Byers married her husband Brian, who had a degree in construction—a fortuitous match for the

horticulturist who wanted to build a business—and worked for a year in nursery management.

In 2008 the couple decided the time was right to officially launch Great Plains Nursery, the venture plan Byers had pitched. Byers said her parents had recently sold their business, so they were available to help the startup get going. “We had a lot of support,” she said.

By the third year, the business had grown enough that Brian was also working full time. “He built all of our greenhouses and office space. Pretty much everything at the nursery, he has built himself,” Byers said.

As is often the case for families involved in agriculture, 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.

Every fall the family goes on long weekend trips all across the state to collect seeds from wild stands of native trees. It’s the strength of these regional natives that has made Great Plains Nursery successful.

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.

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THE STORY OF Ray Ward's Laboratory... TO BE CONTINUED

JUST 30 PERCENT OF FAMILY BUSINESSES MAKE IT TO THE NEXT GENERATION, and only 10 percent are passed to the third generation.* Ward Laboratories, Inc., is beating the odds, and the story of its success is closely tied to UNL's Department of Agronomy and Horticulture.

RECOUNTING HISTORY

After graduating from Fairbury Junior College, Ray Ward, president of Ward Laboratories, Inc., continued his studies at UNL, earning a bachelor's in 1959 and a master's in 1961.

According to Ward, three soil instructors—R. A. Olson, H. F. Rhodes and Robert L. Fox—influenced a lot of what he does today. "Those guys were excellent instructors, and I learned an awful lot."

After graduation Ward went to work at South Dakota State University, where he attained a doctorate in 1972. When the dean of agriculture, Duane Acker, started a research extension center in Redfield, South Dakota, he sent Ward to get it going. Acker later became the first vice chancellor of the University of Nebraska Institute of Agriculture and Natural Resources, which was established April 1, 1974.

Ward then started two more labs: a research extension center for Oklahoma State University in Stillwater, Oklahoma, and a commercial soil testing laboratory for Servi-Tech in Dodge City, Kansas. For the latter project, Ward designed the building, put the lab equipment together, hired and trained the people and created the software to print results. "After developing that whole system, we started making money, and I began to think maybe I could do that myself," he said.

TAKING A RISK

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, Cozad, 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.

SKIPPING A GENERATION

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.

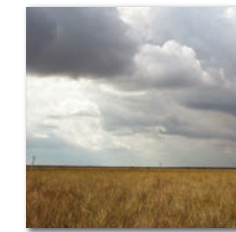
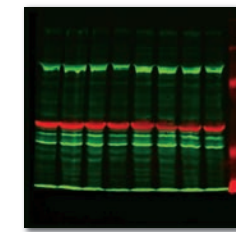
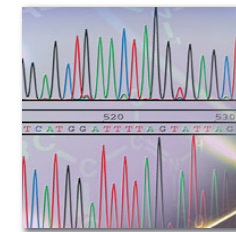
Nick finished his doctoral program at UNL in August of 2015, and he now has two years under his belt as the vice president of Ward Laboratories, Inc.

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."

*George Stalk, Jr. and Henry Foley. Avoid the Traps That Can Destroy Family Businesses. *Harvard Business Review*, January-February 2012.

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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.

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