

POTS PLOTS AND PLANTS



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DEPARTMENT OF AGRONOMY AND HORTICULTURE
UNIVERSITY OF NEBRASKA-LINCOLN
ANNUAL NEWSLETTER 2014



POTS PLOTS AND PLANTS

DEPARTMENT OF AGRONOMY AND HORTICULTURE ANNUAL NEWSLETTER 2014

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Institute of Agriculture and Natural Resources

Find our newsletter online at agronomy.unl.edu/newsletter.



Staff news and student club updates

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Charles Wortmann's research project aims to increase profits for African farmers



Beadle Center



Plant Sciences Hall

DR. ROCH GAUSSOIN, DEPARTMENT HEAD

Whoa Nellie!

Sports commentator legend Keith Jackson was often cited as the source of the “Whoa Nellie” idiom, yet Mr. Jackson himself credits the phrase to his grandfather, a farmer in the southeast United States (<https://www.youtube.com/watch?v=tNeOEHGpYyc>). If you are a Google fanatic, you will find references to an early 1940s pinball machine called the “Whoa Nellie.” Regardless of the origin, the catchphrase is totally appropriate to describe yet another year of growth and accomplishment by faculty and staff in the Department of Agronomy and Horticulture. Historically we are on a six-year run of new and replacement hires with nearly 20 tenure and nontenured faculty hired from 2000 to 2013.

In 2014 six faculty began their career at the University of Nebraska–Lincoln. Please see pages 18–20 of this newsletter for profiles of this outstanding group of hires. We also completed searches and hires for 2015 at the Panhandle Research and Extension Center in Scottsbluff—Mitchell Stephenson, range and forage management specialist, and Cody Creech, dryland cropping systems specialist. We are currently anticipating searches for nine or more replacement or new hires in 2015. Three faculty were promoted and/or received tenure in 2014 (see page 3).

Our undergraduate enrollment in the Agronomy and Plant Biology majors continues to grow, while our Horticulture and Turfgrass & Landscape Management majors are holding their own. Our undergraduate students are seeing record opportunities and compensation for completion of their degrees in our department. While students, they also are receiving honors and awards too numerous to describe.

The department has had a banner year in competitive grant acquisition. Grants received by faculty topped \$10 million and represent an amazing synergy among the new faculty hires, mentoring by senior faculty and successful collaboration with faculty in Biochemistry, Biological Systems Engineering, the Center for Plant Science Innovation, Entomology, Plant Pathology and the School of Natural Resources. The department also continues to build strong industry collaborations with key partners.

We also bid adieu in 2014, via retirement, to soybean legend Jim Specht and Panhandle Research and Extension Center weed management specialist extraordinaire Bob Wilson. We also regrettably, and with indisputable respect for their contributions, acknowledge the passing of three emeriti faculty in 2014: Charles “Charlie” Gardner, 94, on Jan. 27,

2014; Don Hanway, 95, on Jan. 30, 2014, and Dale Swartzendruber, 89, on Oct. 21, 2014. May they rest in peace.

If you are one who ponders “where have I heard that before?” I will save you a few moments of your time. My closing comments are very similar to past department newsletters. I continue to be amazed, pleased and excited to be facilitating evolution and vision for, all bias aside ☺, arguably one of the best plant science-based departments in the world. What the heck, let’s change that last sentence to—not *one* of the best, but *the* best in the world. To capture my thoughts, I quote a good friend in the industry who describes the goal of his small ag product distributor business as “Earth first, we will save the rest of the planets for later.” All I can say is—the Martians have been warned!

I am blessed to be the head of the Department of Agronomy and Horticulture at UNL. Positive support from the administration in the Institute of Agriculture and Natural Resources is acknowledged and very much appreciated. The incredible faculty, staff, students and alumni are part of a remarkable extended family. They make my livelihood easier and must be recognized, as they are responsible for the continued and positive momentum and the impact-rich activities and accomplishments of our research, teaching and extension programs. I simply drive the boat. A huge thank you to all of you!

Enjoy the newsletter.

Respectfully submitted,



Roch Gaussoin
Professor and Department Head
President, Crop Science Society of America

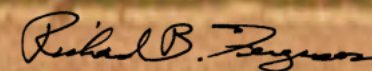
DR. RICHARD FERGUSON,
ASSOCIATE DEPARTMENT HEAD

After moving onto East Campus in 2003 (I began my University of Nebraska career at the former South Central Research and Extension Center), I’ve had the opportunity to become more engaged with students at multiple levels. It’s probably coincidental that our department’s undergraduate student numbers soon began to increase after several years of decline, approximately doubling between 2008 and 2014.

The senior level course that I teach in site-specific crop management has more than tripled in enrollment in the same period. The last five to seven years have been one of the most optimistic periods in production agriculture in recent decades, as commodity prices have fueled renewed enthusiasm for careers in agronomy and associated disciplines. Increased student numbers have certainly stretched our department’s capacity in many ways—courses have waiting lists for enrollment, classrooms are crowded with extra seats, and lab sections have been redesigned to deal with larger groups of students. Our graduates have little trouble finding employment in their field. While current reduced commodity prices may somewhat slow the rate at which new jobs become available, forecasts generally suggest a very positive job market in production agriculture for the foreseeable future. It is truly an exciting time to be in our department—as students, staff or faculty.

At the same time, it is interesting to observe the increasing lack of understanding of agriculture in much of our society today. I had the opportunity this winter to attend a dinner with some of our department’s undergraduate student leaders as part of a Women in Science Conference, which included top high school students from Nebraska with an interest in STEM fields (science, technology, engineering and mathematics). In general, the high school students I visited with anticipated studying medicine or physics in college; they didn’t really associate agriculture with being a STEM field. It was gratifying to observe our department’s student leaders—all women—articulate that disciplines such as agronomy, plant biology, range science, horticulture and turf science all have sound science at their core and that there are exciting, fulfilling jobs in these fields upon graduation.

Sincerely,



Richard Ferguson
Professor and Associate
Department Head

NEW FACULTY IN 2015

Mitchell Stephenson – Range and Forage Management Specialist at Panhandle Research and Extension Center, started April 1

Cody Creech – Dryland Cropping Systems Specialist at Panhandle Research and Extension Center, started May 1

Christopher Proctor – Weed Science Assistant Extension Educator, starts July 1

PROMOTIONS AND TENURE

JEFF MOWER

Promoted to Associate Professor with Tenure



Hired: 2008, Ph.D. 2005 from Indiana University Bloomington. Mower holds a joint appointment with the Center for Plant Science Innovation and the Department of Agronomy and Horticulture. The Mower lab addresses fundamental questions on the evolution of genome structure, function and content in plants using a combination of experimental and computational approaches.

CLYDE OGG

Promoted to Extension Educator



Hired: 1986, M.S. 1989, B.S. 1986 from the University of Nebraska–Lincoln. During his time at UNL, Ogg became an assistant extension educator in 2002 and an associate extension educator in 2008. He directs the Nebraska Pesticide Safety Education Program, which includes Integrated Pest Management for home and school environments and certification for pesticide applicators.

DIPAK SANTRA

Promoted to Associate Professor with Tenure



Hired: 2008, Ph.D. 1999 from the University of Pune, India, and Washington State University. Santra develops and enhances germplasm and cultivars of new and existing alternative crops for sustainable production under dryland farming conditions in the northern High Plains of the United States.

DAVE SCOBY Research Technologist

AFTER GRADUATING FROM PURDUE WITH AN UNDERGRADUATE DEGREE, I came to UNL in 1982 for a master's degree in sorghum physiology. I spent 16 years studying sorghum cropping systems and production as a research technologist with Dr. Max Clegg. I helped train many graduate students in field research methods under the auspices of the INTSORMIL project.

Along the way I obtained another master's degree in agribusiness. As faculty retired and grain sorghum became less economically important in Nebraska, I worked with Dr. Jerry Maranville and Dr. Robert Caldwell. In 2001 I began working in research and extension soil fertility and biosolids under Dr. Charles Wortmann.

Since 2003, I have worked with Dr. Tim Arkebauer in field-oriented physiological research examining the relationships between plants and their environment. Working mostly on the U.S. Department of Energy-funded Carbon Sequestration Project Team, we examine leaf and soil surface carbon dioxide exchange and fluxes



of greenhouse gases from the soil. We also quantify various aspects of crop growth and development. More recently our project has started investigating photoprotective mechanisms in plants such as chloroplast avoidance movement and other plant stress responses.

The crops, equipment and my research emphasis have changed over the past three

decades, but my enjoyment of working with motivated and creative faculty and students continues to make each day interesting and rewarding.

Away from work I volunteer my time with several animal rescue and advocacy groups. I also serve on the board of directors of the Great Plains Trails Network and the Nebraska Trails Foundation.

FRAN BENNE Design and Communications Specialist

AS A UNIVERSITY OF NEBRASKA-LINCOLN COLLEGE OF JOURNALISM GRADUATE and former athlete, I consider myself a Husker for life. So it felt like coming home when I accepted a position in the department in 2012 after working in the private advertising and graphic design industry for 18 years.

My first exposure to the department came in 2011 when I decided to follow my passion for gardening and landscaping and become an Extension Master Gardener volunteer. Having grown up on a farm near Arapahoe, Neb., I respected the agriculture industry and I wanted to get back to my roots and learn more about plants. Little did I know that someday I would get the chance to work on beautiful East Campus and merge my interests and skills into a job I love.

It has been a blessing to collaborate with such positive and inspiring faculty, staff and students. I am thankful for the opportunity to create, design and communicate to the public, students and the university the new and interesting research, educational opportunities and events happening in our department. I basically get to do a little bit of everything I enjoy—photography, layout and design, website management and design, social media marketing, writing, editing and video production.

Away from work I'm involved with my daughter's activities and volunteering at my church. I like running on the trails with friends, gardening, boating and fishing with my family, and working on house and landscaping projects with my husband.



CHERYL BOGENRIEF Accounting Associate

I CAME TO THE UNIVERSITY OF NEBRASKA-LINCOLN IN THE FALL OF 2008 after having worked for a propane service and an interior design firm. My work experiences as an office manager and bookkeeper prepared me for my position in the HAPPI Business Center, where I have been an accounting associate for more than six years.

I enjoy helping faculty and staff with the financial aspects of their teaching and research. My primary accounting duties involve general customer service, revolving accounts, purchasing cards, deposits and travel. Working in the Department of Agronomy and Horticulture has been a nice experience for me because of the great group of co-workers and students. I like having the opportunity to help others with their work.

Originally from Brunswick, Neb., I graduated from Plainview High School and came to Lincoln to go to school and never left. I currently volunteer with the Lancaster County Election Commission, so you might see me working at a polling place on Election Day.

Antiquing—consignment stores and flea markets—collecting cookbooks, sewing and crafting are a few of my hobbies. I also like to do a bit of traveling and I have been to Alaska twice to visit my sister.



STEPHEN GAMET Research Technologist

IN AUGUST OF 2002 I DECIDED A CHANGE WAS NEEDED in my lifelong goals. I was fortunate to find an opening in a new horticultural program at the University of Nebraska-Lincoln called viticulture—the study of wine grapes—in the corn state of Nebraska. Who could have imagined? Dr. Paul Read did, and viticulture has been a perfect fit for both of us.

In 2000 my immediate family established a vineyard in western Nebraska. Now I work with grapes in eastern and western Nebraska with only 325 miles in between.

I received a degree in agronomy with an emphasis in horticulture from UNL and have worked in the Nebraska nursery industry for more than 25 years. Before joining Dr. Read and the viticulture program, I enjoyed working for UNL Landscape Services as an area manager on City Campus. Eventually I began looking for something more unique and challenging that I could continue after retirement.

Grapes in Nebraska fit the bill better than anything I could have imagined. Along with working with Dr. Read, I have helped establish a growers group in western Nebraska that has a combined vineyard acreage of more than 25 acres. We have also purchased the first mechanical grape harvester in the state. We now do custom harvesting and last year harvested over 60 acres of grapes.

Besides growing grapes I also enjoy making and drinking wine, so it's an all-encompassing passion. My wife Kim of 29 years and two daughters, Mikayla, 22, and Meredith, 13, are also very involved in all aspects of what we call "grapes." My oldest builds wine racks and the youngest is out in the field helping, particularly at harvest time. Kim is my cheerleader. And when I'm not playing in the grapes, I try to get in a little golf.



RANGE MANAGEMENT CLUB COMPETES

THE RANGE MANAGEMENT CLUB started out the year with the Welcome Back Barbeque in conjunction with the Agronomy Club. In October, some of the club members attended the Nebraska Section Society of Range Management meeting in Ainsworth, Neb. During this meeting and joining with the Chadron State College Ag Club, the club held an annual auction fundraiser. The auction was a success and the generosity of the donors was greatly appreciated.

The rest of the fall consisted of preparing for the Annual Society of Range Management meeting in early February. Members practiced their presentations and prepped for competitions. The club was also able to tour Spring Creek Prairie Audubon Center near Denton, Neb. The fall semester ended with a bowling event and the annual Christmas party hosted by Dr. Walt Schacht.

The beginning of the spring semester was very busy as the final preparations were made for the Annual SRM meeting in Orlando, Fla. The club had excellent participation in the meeting with 11 undergraduates and two graduate students attending. The graduate students presented their research projects. The undergraduates competed in at least two of the following: the plant identification contest, the range management exam, extemporaneous speaking



Range Management Club

and the paper contest. While in Florida the club toured The Nature Conservancy's 11,500-acre Disney Wilderness Preserve and Deseret Cattle & Citrus Ranch.

The club finished the school year discussing a couple of possible tours to take in the fall semester. During Dead Week and finals the club participated in laser tag and held a potluck dinner.

The UNL Range Management Club would like to thank everyone who helped and supported the club—making this year such a success. —Kyra Baldwin, Range Management Club President

ADVENTURES IN HORTICULTURE

THE YEAR WAS BOTH BUSY AND EXCITING FOR THE UNL HORTICULTURE CLUB. The fall semester included a fall foliage sale and the club's annual poinsettia sale. For the second year, the poinsettia sale also included a philanthropy project. Pink poinsettias were sold to support breast cancer research, and a percentage of the profits were donated to the Breast Cancer Research Fund.

The club also sponsored and helped with the November activity for Hartley Huskers, a program that brings agriculture to students at Hartley Elementary in Lincoln. Club members took pie pumpkins to the school and helped children decorate them as turkeys to take home for Thanksgiving.

The club kicked off the spring semester by sending several members to the Great Plains Growers Conference in St. Joseph, Mo.

A highlight of the semester was a trip to Florida over spring break. Twelve club members and the club's two advisers, Stacy Adams and Dave Lambe, traveled to Orlando to explore the region's expansive horticulture industry. The trip included visits to Busch Gardens, several area growers, a nursery and garden center, Leu Gardens and the beach. They ended the trip with a behind-the-scenes tour of the Flower and Garden Festival at Walt Disney World Epcot®.

The club returned from Florida to finish the semester with a very successful spring plant sale and once again had the opportunity to sell geraniums and vegetables at Lincoln's Spring Affair.

UNL Horticulture Club would like to thank all of its supporters for such a great year. —Erin Kinley, Horticulture Club Secretary



Horticulture Club members Erica Hughes, left, and Erin Kinley prepare for the spring sale.

GRADUATE STUDENT ASSOCIATION GROWS

THE MISSION OF THE AGRONOMY AND HORTICULTURE GRADUATE STUDENT ASSOCIATION is to serve as a representative body for graduate students in the Department of Agronomy and Horticulture while promoting student and faculty relations and investigating issues unique to graduate students. President Samantha McConaughy, Vice President Leah Ruff, Treasurer Sarah Schlund and Secretary Grace Troupe make up the executive committee for this school year. Our goals for the 2014–2015 school year include continuing to hold regular meetings, tours and events for graduate students. We are also conducting a survey of graduate students in the department to gauge what is going well for students and what can be improved for a better experience.

This was a successful year for AHGSA. The two main events of the year, the Fall Cookout and the department annual Appreciation Banquet, were well attended and enjoyed by all. In addition to our two annual events, we also met with a group of 20 prospective graduate students and helped the department put on Keim UnKorked. Keim UnKorked was extremely successful with more than 100 attendees. We also started our own Facebook group to encourage graduate students to contact each other through social media.

As the 2014–2015 president, I sincerely hope that both faculty and students look at AHGSA as an opportunity to supplement graduate education. I hope that we are building a community of support and inspiration for Agronomy and Horticulture



AHGSA members Jonathan Luetchens and Amritpal Singh converse at the annual Appreciation Banquet held at the Lied Center.

graduate students as well as giving graduate students a place to relax a little with their colleagues. I encourage all students to visit our meetings. The meeting schedule is published through email and at the AHGSA website, <http://agronomy.unl.edu/ahgsa>. For more information, or if you are interested in participating, contact me at samantha.mcconaughey@gmail.com. —Samantha McConaughy, AHGSA President

A BIG YEAR FOR THE AGRONOMY CLUB

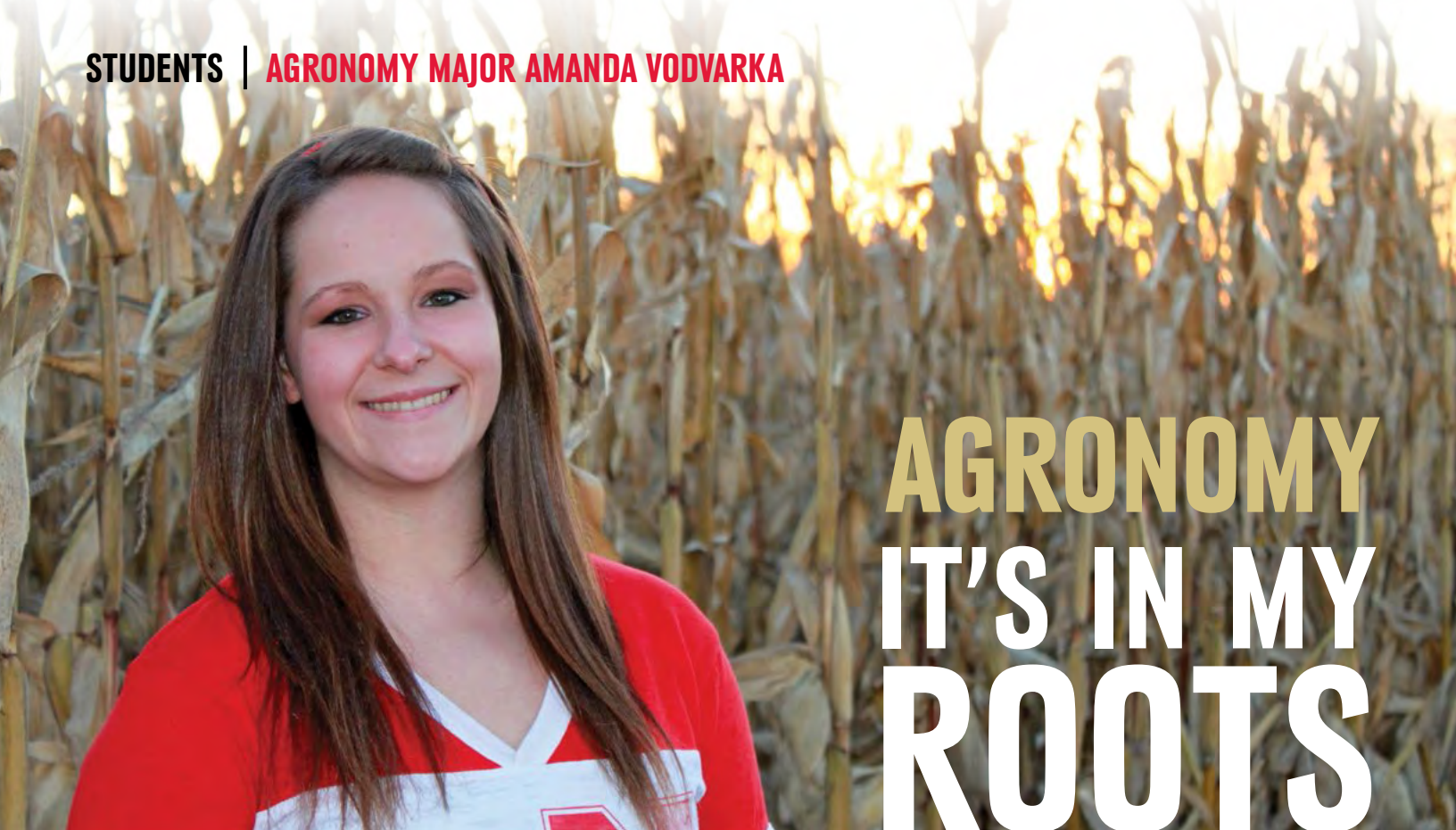
THE UNL AGRONOMY CLUB provides educational leadership opportunities and training for students outside of the classroom. Last year, we started off with the CASNR Club Fair followed by the first meeting at the Welcome Back Barbeque. UNL Agronomy Club meets on Wednesdays in Keim 150 at 6 p.m. During our meetings, industry professionals inform members about opportunities within their company and provide a chance to network.

Last school year the club raised more than \$40,000 for the Students of Agronomy, Soils, and Environmental Sciences regional conference in March. More than 200 college students from 22 universities across the United States attended the three-day conference. The SASES Regional Meeting was an opportunity for undergraduate students to get together to explore different aspects of agriculture throughout the nation. With the support of the Agronomy and Horticulture Department, the club highlighted Nebraska agriculture and the University of Nebraska to attending schools.

The Agronomy Club also assisted with Husker Food Connection and hosted the high school State FFA Agronomy Career Development Event.

Last year members of the Agronomy Crops Judging team competed regionally at nearby universities. The team is hoping to expand its numbers this year and get more members from the club involved.

The Agronomy Club and Crops Judging team are always happy to welcome new members. To find out more about the club and keep up to date with our events, like us on our [Facebook page—UNL Agronomy Club](#). —Molly Hoffbauer, Agronomy Club President



AGRONOMY IT'S IN MY ROOTS

EVER SINCE I WAS YOUNG I have had a passion for crop production and farming. My upbringing and work experience on my family farm sparked a desire to become an agronomist.

Three other job experiences and my classes at the University of Nebraska–Lincoln have aided in solidifying my future career path. My first job experience was working at Hoegemeyer Hybrids, where I was able to get a glimpse of both the agronomic and business side of a seed company. My office experience at Hoegemeyer Hybrids pushed me to take up an agricultural economics minor.

My second job experience, an internship this past summer for Ag Valley Co-op, has proven to be the most influential in confirming my future career as an agronomist. At Ag Valley Co-op I had the great opportunity to shadow an agronomist to see what the job entails. Additionally, I had the chance to go out on my own to scout fields, collect tissue samples and even meet up with a few of the producers.

Finally, becoming a UNL teaching assistant for the introductory plant science course AGRO 131 has allowed me to work on important skills including relationship building, communication, and effectively explaining concepts and ideas to those who are not familiar with them.

I'm currently involved in Crops Judging and Agronomy Club. I served as the club secretary for the 2014–15 school year and have been elected club president for 2015–16.

As a senior majoring in agronomy and minoring in agricultural economics, I've found that my passion for crop production has not wavered. My goal is to graduate, become an agronomist and return to our 1,500-acre family farm to assist with the production of row crops—corn, soybeans and alfalfa. The agronomy industry has the potential for growth in the years to come, and I honestly can't wait to see what is in store for me! —**Amanda Vodvarka**

UNDERGRADUATE STUDENT AWARDS

Marissa Grooms: Second Annual Engler Quick Pitch Junior/Senior Division Winner

Seth Gurley: Outstanding West Central Division Intern Award – Helena Chemical Company, company branch in Osmond, Neb.

Logan Smith: Engler Agribusiness Entrepreneurship Program Business Plan Competition Winner

Rachel Stevens: 3-2-1 Quick Pitch Winner – UNL Center for Entrepreneurship; Second-place Winner – North America Colleges and Teachers of Agriculture Four-year Division Collegiate Soils Contest

Amanda Vodvarka: Student Intern of the Year – Ag Valley Co-op, Edison, Neb.

UNDERGRADUATE FALL ENROLLMENT

Agronomy – 221
Horticulture – 65
Plant Biology – 17
Turfgrass & Landscape Management – 41

AGRONOMY CLUB HOSTS REGIONAL CONFERENCE

THE UNIVERSITY OF NEBRASKA–LINCOLN AGRONOMY CLUB raised more than \$40,000 for the 2014 Students of Agronomy, Soils, and Environmental Sciences Regional Conference on March 27–29, 2014. More than 200 college students from 22 universities across the United States attended the three-day conference.

The theme of the conference was “Promoting Agriculture through Social Media,” and SASES attendees were encouraged to make posts that advocated agriculture on Facebook, Twitter and Instagram.

During the conference students competed in a social media contest for the most creative post and the most valued post. These posts, on different social media sites with the hashtags #sases2014 and #media4ag, were about the conference, agriculture and the state of Nebraska.

Going along with the theme, different speakers expressed the importance of social media in agriculture. Janice Person, social media director at Monsanto, taught the students about the impact they can make by actively supporting agriculture through social media.

The Agronomy Club highlighted the UNL College of Agricultural Sciences and Natural Resources and showcased the importance of Nebraska agriculture.

SASES attendees walked through the Omaha Zoo jungle before eating supper in the Jungle Café on the first evening.

On the second day students were able to see Nebraska agriculture firsthand—touring 24 agricultural industries throughout the state. Some industries included Lindsay Corporation Irrigation, Behlen Manufacturing Co., DuPont Pioneer Hi-Bred and E Energy Adams.



The UNL Agronomy Club and adviser Tim Kettler hosted the 2014 SASES Regional Conference in Lincoln.

On the final day, students experienced career development sessions and heard NU Vice President and IANR Harlan Vice Chancellor Ronnie Green speak about the sexiness of agriculture. The evening ended with a live band and dance in celebration of the conference.

CASNRR Dean Steven Waller said the event was a success. “The Planning Committee and the entire Agronomy Club are to be complimented on this accomplishment. They are a role model for other clubs in their commitment to serving their profession,” Waller said. “The planning, financing, attention to detail, showcasing Nebraska and the University, program content, entertainment and hospitality were unparalleled and the equal of any professional meeting.” —**Molly Hoffbauer, Agronomy Club President**

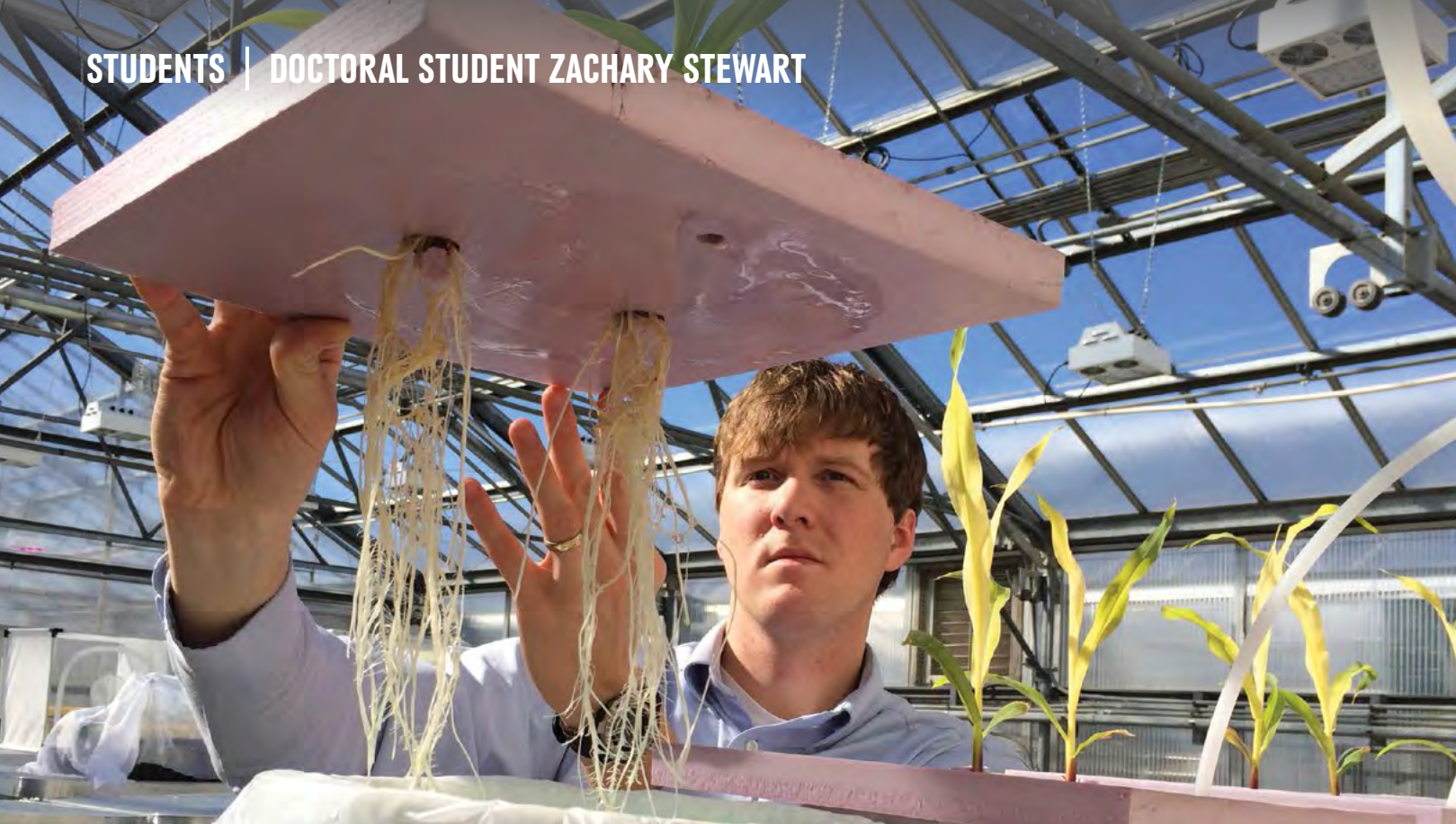
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WHEN HEALTH AND AGRICULTURE INTERTWINE

I'VE ALWAYS BEEN FASCINATED WITH AGRICULTURE, INSECTS AND HEALTH, yet at the beginning of my academic path, I wasn't quite sure how these interests would come together for a meaningful career. This connection first came when I was on a World Food Prize Borlaug-Ruan International internship at the International Center of Insect Physiology and Ecology in Kenya.

For the small-holder farmers of western Kenya, the barriers to food security were a dynamic interplay between inadequate agronomic techniques and the constant threat of malaria. During this experience, my research matched sugars found in mosquitoes' digestive systems to sugars found in local plants to determine feeding preference of *Anopheles gambiae* mosquitoes and how this affects their survival and fecundity. This experience played a key role in contextualizing the complex and uncertain obstacles in feeding a rapidly-growing global population. Food stability for the nearly 1 billion hungry is much more than food production alone. It contains a vast array of daily challenges from health- and disease-related issues to agricultural techniques. Each of these has an integral role in equitably supporting the nutritional needs of the global population to maintain an active and healthy lifestyle.

HEALTH AND AGRICULTURE ARE FUNDAMENTALLY INTERTWINED WITH THE DAILY STRUGGLES OF THE POOREST ONE BILLION IN ACHIEVING FOOD SECURITY.

Following this experience, I was awarded the World Food Prize John Chrystal award for this research in "improving international understanding and peaceful cooperation through agriculture and food security" alongside Senators Robert Dole and George McGovern, who were awarded the World Food Prize. What had once been fascinations of mine had suddenly become an opportunity to take my passions and apply them in a global setting.

After completing my bachelor's degree in biology, international relations, and environmental sciences at Creighton University, I completed a Master of Science degree in control of infectious diseases from the London School of Hygiene and Tropical Medicine in London, United Kingdom. During this degree, I completed my thesis research at the Pan African Malaria Vector Research Consortium in Tanzania in a small farming community located at the base of Mount Kilimanjaro in which I looked to bridge agricultural insecticides for the control of medically important disease vectors. Currently there are only four classes of medically important contact insecticides, all of which have insecticide resistance emerging against them. With limited development of contact insecticides, it was the aim of my research to develop a novel method to deliver agricultural oral insecticides. While it

is a common misconception that blood is the primary nutrient source for mosquitoes, mosquitoes actually rely on plant sugars for the majority of their lives as their primary food source, with females only blood feeding during periods of reproduction. This feeding behavior allowed me and my research team to develop and patent an exciting new tool for malaria control which uses several classes of ingestion-based insecticides and combine it with a plant-based attractant to attract and kill malaria-resistant mosquitoes. This attractive toxic sugar bait tool is hung in a hut and attracts mosquitoes which were originally attempting to blood feed on a human. After the mosquito feeds on the ATSB, nearly 100 percent of the resistant, malaria-transmitting mosquitoes were killed. The findings of this study were recently published in the journal PLOS ONE.

Currently I'm working on my Ph.D. in agronomy under the supervision of Dr. Charles Shapiro at the University of Nebraska-Lincoln, where I'm continuing to work on bridging agriculture and health. My current dissertation research is evaluating foliar micronutrient treatments as a tool to increase yields and biofortify (increase nutrient density) corn. In sub-Saharan Africa, appropriate agronomic techniques and improved soil fertility are keys to supporting genetically-improved crop varieties which spearheaded the achievements of the Green Revolution in Asia, Latin America and the Middle East. Soil fertility has been the limiting factor for Africa in hindering the huge crop yield increases from improved crop varieties as seen by the rest of the world during the Green Revolution. The potentials of genetically improved crops in Africa



Stewart's malaria trial site was located in Tanzania in a small farming community at the base of Mount Kilimanjaro.

cannot and have not been realized when soil properties and plant nutrients are depleted.

Health and agriculture are fundamentally intertwined with the daily struggles of the poorest 1 billion in achieving food security. There is much to be learned in this cross-disciplinary interaction in providing the fundamental right of every human to maintain security in supplying food for themselves and their families. It is my sincerest hope to be a part of the solutions to these monumental challenges, and I know my continued education at UNL within the Department of Agronomy and Horticulture will help me achieve my current and future goals. —Zachary Stewart

GRADUATE STUDENT AWARDS

Nonoy Bandillo: Hardin Distinguished Graduate Fellowship, UNL Plant Science Retreat Best Poster Presentation

Ben Beckman: W.R. Chapline Fellowship

Samuel Bledsoe: Gerald O. Mott Award for Meritorious Graduate Students in Crop Science

Cody Creech: Third-place North Central Weed Science Society Best Graduate Student Weed Science Team

Jason Danley: Hardin Distinguished Graduate Fellowship

Amanda Easterly: Othmer Fellowship

Katherine Frels: Henry M. Beachell Fellowship

Chenchou Han: Second-place Winner – New Venture Pitch Competition, Northwest Missouri State University

Lacy Jo Leibhart: Widaman Trust Distinguished Graduate Assistant Award; First-place NCWSS Paper Presentation

Luqi Li: Winner of the CSSA C-5 Turf Division Poster Contest for Management and Establishment

Jonathan Luetchens: Milton E. Mohr Fellowship

Julianne Matczyszyn: Milton E. Mohr Fellowship

Samantha McConaughy: Milton E. Mohr Fellowship

Darrell Michael: Henry M. Beachell Fellowship

Joshua "Jay" Miller: Third-place NCWSS Best Graduate Student Weed Science Team

Glen Obear: Presentation Competition Award Winner at CSSA Meeting

Matthew Pedersen: John & Louise Skala Fellowship

Pamela Peña-Perdomo: Widaman Trust Distinguished Graduate Assistant Award, Milton E. Mohr Fellowship

Miles Redden: Irvin A. & Agnes E. Nelson Memorial Fellowship

Leah Ruff: American Seed Trade Research Foundation's Roger Kruegar Scholarship

Debalin Sarangi: David H. & Anne E. Larrick Memorial Travel Award to attend NCWSS Annual Meeting, Third-place NCWSS Best Graduate Student Weed Science Team

Brad Schick: Daniel T. Walters Travel Fund

Zachary Stewart: North Central Extension-Industry Soil Fertility Conference Outstanding Graduate Student Award

Kayla Tarr: Arthur William Sampson Fellowship

Laura Thompson: International Society for Precision Agriculture Outstanding Graduate Student Award

Rodrigo Werle: University of Nebraska-Lincoln Dean's Fellowship, Milton E. Mohr Fellowship, McDonald Fellowship, Third-place NCWSS Best Graduate Student Weed Science Team

Organic Farming

RESEARCH IN IANR AND THE DEPARTMENT OF AGRONOMY AND HORTICULTURE

SALE OF ORGANIC FOODS IN THE UNITED STATES REPRESENTED \$42 BILLION IN 2014, and the sector is projected to grow at nearly 15 percent per year over the next decade. Several faculty in IANR conduct research related to organic farming production systems, and this article presents an overview of that work.

Faculty involved in these cooperative projects are in Entomology, School of Natural Resources, Food Science and Technology and Agricultural Economics in addition to Agronomy and Horticulture. Organic farmers are part of the research. In 2005 a group of IANR faculty received a USDA grant to develop four certified organic areas across the state. These were located near Sidney (HPAL), Clay Center (SCAL), Mead (ARDC) and Concord (HAL). After the three-year transition period, all sites were successfully certified. A second grant focused on winter wheat quality, and a third grant continued the research on organic farming practices and the assessment of the farm impacts on surrounding wildlife, with bird populations and diversity as indicators.

Based on principles of agroecology and uniqueness of place, and the diversity of land and climate as well as interests of faculty across Nebraska, each of the four sites has a research focus appropriate to that district. The main focus for all projects is to identify ways to improve organic production systems, not to compare to

conventional systems. At Sidney, the focus is rotations that contribute nitrogen through associated legume cover crops but do not use too much water. At Clay Center, we established several rotations to determine the benefits of a three-year versus a four-year rotation. The organic certified land at the ARDC site is located on the forestry section within the long-term windbreaks established over 50 years ago. The focus there is to verify the impacts of a winter wheat-soybean green manure-corn-soybean rotation. In addition, we studied the release of nitrogen from legume cover crops and the impact of underseeding clovers within the winter wheat.

Another noncertified long-term experiment at ARDC compares organic rotations based on animal manure for fertility with those based only on cover crops and recycling nutrients from residues. Since there are also conventional treatments, research on variety by system interactions has been conducted. Other organic experiments at ARDC look at crop/weed and crop/cover crop interactions and the effect competition for resources has on plant physiology. At the Concord site the focus was on propane flame weeding and on nutrient management.

The propane flame weeding deserves special mention since the project, led by Dr. Stevan Knezevic, has developed into a world-renowned program that has produced dozens of publications including a comprehensive

manual available on the Internet. It has resulted in additional grants from the Propane Foundation, established linkages with heat shield engineers and produced a spin-off business. Most importantly from the organic farming perspective, the project has developed equipment that is safer and more energy efficient than before, and our



specialists have demonstrated how to utilize this weed management method successfully on organic farms.

The nutrient management component includes on-farm trials that are placed on certified organic farms located primarily in the eastern third of Nebraska. The goal is to investigate the relative productivity of the organic farm nutrient and weed management systems. On these farms, extra nutrients were provided with additional manure or compost, and extra weed control was provided by timely management. For the most part, with the exception of one farm that was severely deficient, the additional inputs had only minor yield enhancing effects. The intent is to determine whether additional nutrient or weed management would increase productivity.

Engaging with organic farmers and those interested in organic farming has been a substantial part of the project. During the life of the two main USDA grants, annual advisory meetings were held to enhance project collaboration. There have been on-farm trials of the farmer's choosing to determine the effects of multiple and site-specific production practices. Of much interest to the organic farming community is the reduction of tillage by the use of a

roller crimper that is used to kill a cover crop, leaving a mulch to suppress weeds and reduce the need for tillage and several cultivations. The short answer for this research on farms and at the research laboratories is that cover crops need to be crimped early in the season and the weather has to cooperate; otherwise, the late planting and cover crop regrowth will combine to severely limit grain crop production.

There is a UNL course on science-based organic farming that has been taught in spring term every year since 1998. This continues to attract students from our department as well as the School of Natural Resources and an increasing number of interested students from urban backgrounds. The course is taught in the evenings to accommodate people from the community with an interest in organic practices and systems. One spin-off from the course is a student Community-Supported Agriculture organic farm, initiated in 2013 based on interest generated in a course in agroecology, and in the organic farming course. In 2014 their new CSA had 13 subscribers, and they are recruiting younger students to take a leadership role. A recently-funded project from the corn and soybean check-off boards is supporting cover crop research across the

state, with results highly valuable for organic farmers. There is a new Hatch project, recently approved, that will focus on long-term experiments, including rotations and cover crops, and will provide an integrated research platform for cooperative projects that will serve both organic and conventional farmers across Nebraska.

With the ending of the large USDA grants, the status of organic farming research at IANR is at a crossroads. Funding for the organic farming extension educator position ended in 2013, and there is now no one with organic farming extension in their position description. Several of the faculty who were on the original 2006 grant have retired, left the university or will be leaving soon. Two of the four sites are not certified as organic, and the other two have an uncertain future. Active faculty with research interests in the areas of weed control, cover crops, food quality, plant breeding, environmental impact and other disciplines remain. It is essential that our department seeks continuing internal as well as grant support to continue these projects that can inform farmers about organic practices and systems that fuel the growing markets in this special sector of U.S. agriculture. —Charles Shapiro, Soil Science and Crop Nutrition

Top: A field of yellow sweet clover and hairy vetch cover crops before termination. **Bottom left:** Stevan Knezevic's graduate student, Santiago Ulloa, flames a cover crop with a hooded flamer. **Bottom right:** Charles Shapiro (left), visiting Dutch weed specialist (middle) and Stevan Knezevic (right) inspect organic soybeans at the Haskell Agricultural Laboratory near Concord, Neb.



THE DAUGHERTY WATER FOR FOOD INSTITUTE: FEEDING A GROWING WORLD



IMAGINE WATCHING A RIVER BASIN AS THE WINTER ICE MELTS AND WILDFLOWERS STRETCH UP FROM THE GROUND, clouds rolling overhead like cotton balls dumped out of a giant bag in the sky, flowers blooming, weeds growing, seeds blowing in an autumn breeze, then snowflakes covering the dry grass as the year circles back—all within 60 seconds.

This is a glimpse of the Phocalstream project, one of several research projects supported by the Robert B. Daugherty Water for Food Institute at the University of Nebraska. The project involves taking one photo an hour of areas up and down the Platte River Basin to develop a time-lapse view of the land and weather. Using advanced software, researchers can quickly navigate the 1.5 terabyte image library, linking rich photographs to data from the US Drought Monitor or USGS Water Data. Through Phocalstream, audiences can literally see man and nature's impact on land and water.

The institute supports and shares this type of research to address the global challenge of achieving food security with limited water resources. In the next 35 years, the world's population is expected to grow beyond 9 billion. Water shortages already occur in many of the world's major food production areas, and growing municipal and industrial demands are shifting water resources away from agriculture. At a time when agriculture must produce more food, water supplies are stretched to meet increasing demands and a changing global climate.

Founded in 2010, the institute spans all campuses of the University of Nebraska to maximize the university's vast education, research and outreach expertise in agriculture, water management, food science and natural resources. Furthermore, the Nebraska Water Center, which has a long track record of

engagement with the people of Nebraska, is now an integral part of the institute. Working together with other universities and public and private sector organizations locally, regionally and across the globe, the institute supports the efforts of small- and large-holder farmers to deliver innovative solutions to this complex global challenge.

Research is at the core of institute programs to develop effective solutions to sustainably manage water and increase food security, inform policy and give students hands-on experience in the lab and field. Collaborative research programs are currently underway in Nebraska and agricultural areas of the United States, India, Brazil, China, sub-Saharan Africa, the Middle East, North Africa and Latin America. These projects include sustainably increasing crop yields and water productivity using mapping, modeling and information systems; increasing the sustainability and productivity of crops and livestock in water-limited conditions; and improving drought management and climate change adaptation through monitoring, preparedness strategies and stronger warning systems.

Closer to home, 50 Faculty Fellows within the University of Nebraska system are contributing to the institute's research, engagement and education programs. Among them are nine from UNL's Agronomy and Horticulture Department: P. Stephen Baenziger, Kenneth Cassman, Tom Clemente, Roger Elmore, Patricio Grassini, Martha Mamo, Teshome Regassa, Harkamal Walia and Haishun Yang. Their institute-supported research is developing wheat genomics for pest and disease resistance; drought and salt-tolerant rice; a holistic approach to food security in rural Ethiopia; and the Global Yield Gap and Water Productivity Atlas, an interactive, web-based map that estimates land with the greatest potential to increase agricultural production.

To carry out its mission, the institute encourages collaborative research between Fellows with different backgrounds. For example, Cassman, Grassini and Yang are leveraging their respective expertise in plant nutrition and crop physiology, yield-gaps, resource and energy-use efficiency and crop modeling to configure the GYGA in a comprehensive manner. Mamo, a soil scientist, and Regassa, a cropping systems expert, worked with three Fellows outside their department to assess food security in Ethiopian villages. This included interviewing scores of farmers, meeting with nongovernmental organizations and collaborating with two Ethiopian universities. Ultimately, their groundwork led to an Ethiopia study abroad experience this summer for eight UNL undergraduates.

In addition to supporting and promoting the Fellows' water- and food-related research projects and sharing news and data with a variety of stakeholders, including policy makers, the institute hosts an annual Water for Food Global Conference. These conferences bring together global thought leaders and experts to discuss potential solutions to the challenge of doubling our agricultural production by 2050 and doing it with less water than we use today.

The 2014 conference included more than 250 participants from 25 countries and focused on the role of data and information in transforming our agricultural yields and water management. Videos from the conference sessions and blog summaries are available at waterforfood.nebraska.edu/wff2014.



Left: Sandhill cranes roost in the Platte River. This photo is part of the Platte Basin Timelapse project led by Faculty Fellows Michael Forsberg and Michael Farrell of the University of Nebraska-Lincoln.

Top right: A team of international students from the UNESCO-IHE Institute for Water Education in the Netherlands conducts stream sampling in Nebraska. **Above:** Dr. Kenneth Cassman explains the benefits of the Global Yield Gap and Water Productivity Atlas at the 2014 Water for Food Global Conference.

You can learn more about the institute and join the conversation about feeding our growing world through any of these online resources:

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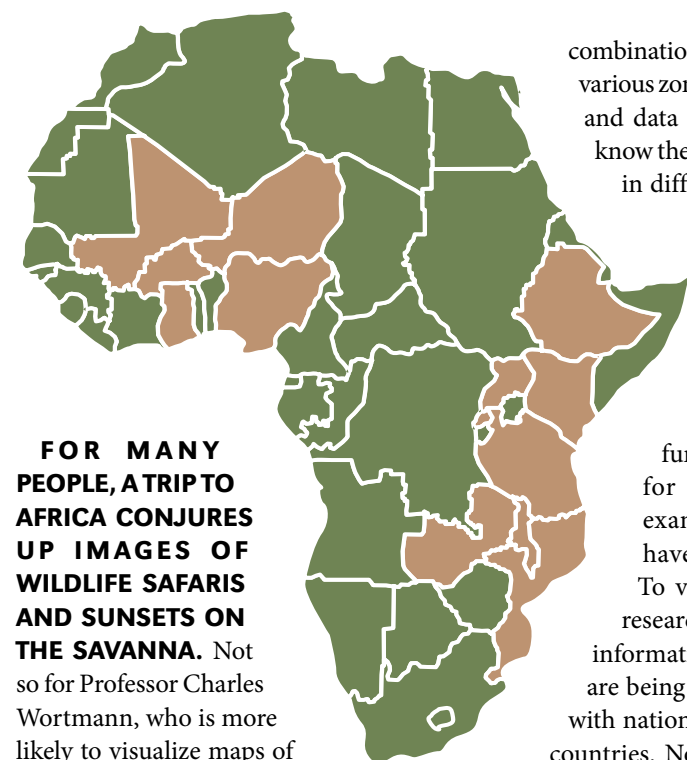
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INTERNATIONAL RESEARCH PROJECT AIMS TO INCREASE PROFITS FOR AFRICAN FARMERS



FOR MANY PEOPLE, A TRIP TO AFRICA CONJURES UP IMAGES OF WILDLIFE SAFARIS AND SUNSETS ON THE SAVANNA.

Not so for Professor Charles Wortmann, who is more likely to visualize maps of soil properties, spreadsheets of crop data and charts of response functions. Since the July 2013 launch of his project, Optimizing Fertilizer Recommendations in Africa, Wortmann has filled more than 30 pages in his passport and has visited all 13 countries participating in the three-year project: Burkina-Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Tanzania, Uganda and Zambia. Agriculturally important to Africa, these sub-Saharan countries represent portions of about 40 different agroecological zones and grow annual food crops such as maize, sorghum, rice, dry beans and soybeans.

CHARTING RESPONSE FUNCTIONS

Existing data on crop-nutrient response functions, together with new data, is being used to determine the most profitable rate of fertilization for various crops. For example, farmers growing maize can maximize the return on their investment by applying nitrogen at the rate where the response curve is steepest (i.e., where the yield is greatly increased with the least cost of fertilizer).

So far OFRA has created approximately 3,500 response functions for different

combinations of crops and nutrients in various zones. Yet more work remains, and data collection continues. “We know there’s still quite a lot out there in different people’s files and we just haven’t convinced them to let it go,” said Wortmann.

CONDUCTING FIELD RESEARCH

While a lot of response functions have been charted for some crops—maize, for example—other target crops have received less attention. To verify data from previous research and to fill in gaps where information is missing, field trials are being conducted in partnership with national teams from each of the countries. Nouri Maman, who earned master’s and doctoral degrees from UNL, serves as the regional coordinator for western Africa, and Kayuki Kaizzi fulfills that role for eastern and southern Africa.

Field research on another continent involves understanding local farming systems and how they influence crop production. The poor soil in Mali and Niger, for instance, is improved by the presence of a unique tree that loses its leaves during the rainy season (reverse leaf phenology). Crops are able to grow beneath these trees where the soil is enriched without competing for sunlight.



COVERING MORE GROUND WITH SPATIAL INFORMATION

“Another thing we’re doing, which is quite novel, is to use spatial information. Even here in the United States we underutilize this potential,” said Wortmann. Crop response information from parts of Africa with similar crop growing conditions is applied for agroecological zones of interest to fill in information gaps using spatial soil and climate information. Spatial information from the Africa Soil Information Service and the UNL-developed Global Yield Gap Atlas allows OFRA to extrapolate, or predict, crop-nutrient response functions across agroecological zones.



Bottom left: Niger researchers Addam Saidou, soil scientist, (left) and Nouri Maman, agronomist, (far right) conduct in-field soil tests with a research assistant and farmer. **Top left:** A farmer weeds pearl millet with an oxen-drawn weeder in Niger. **Top right:** On-farm wheat and faba bean trials in Ethiopia. **Above:** Korodjouma Ouatarra, director of agricultural research in Burkina Faso (middle, in blue jacket), visits with a district agricultural development officer at an upland rice trial in Burkina Faso. The field is enclosed with trees that contribute to soil productivity. **Left:** A panicle of pearl millet. **Bottom right:** Charles Wortmann (left), Maman (second from right) and two Nigerian farmers pose for a photo.

CONVERTING SOIL SCIENCE TO ECONOMIC GAIN

All of the research becomes meaningful for African farmers through the Fertilizer Optimization Tool, a computer program developed in 2012 by graduate student Jim Jansen, who is now a UNL Extension educator in northeast Nebraska. Users input variables such as the area of each crop to be planted, anticipated grain values, fertilizer costs and the amount of money available for fertilizer. The tool then uses response functions to determine which crop-nutrient-rate combinations provide the best return on investment. Outputs include the recommended fertilizer and application rate for each crop, the estimated mean effect on yields and the expected net returns of fertilizer use.

In Uganda alone, more than 700 advisors of farmers have been trained to use this tool. The goal is that this practical tool will help African farmers make scientifically-sound decisions about fertilizer application. As a result, yields and farmer profitability will increase—ultimately helping to reduce hunger across Africa.

Building on previous work in Uganda, Wortmann wrote the preliminary proposal for the project and works closely with the Centre for Agriculture and Biosciences International in the United Kingdom. CABI provides project management, while UNL offers technical and scientific leadership. Funding for the \$5.6 million project is provided by the Bill & Melinda Gates Foundation through the Alliance for a Green Revolution in Africa.



ROGER ELMORE Extension Cropping Systems Agronomist

ROGER ELMORE MAY HAVE A FAMILIAR FACE TO MANY NEBRASKANS. He has returned to the University of Nebraska–Lincoln after a nine-year hiatus in Iowa. Elmore returned in January 2014 as a cropping systems agronomist with UNL Extension.

He received his B.S. in agriculture/biology from Illinois State University and his M.S. in agronomy and Ph.D. in agronomy (International) from the University of Illinois.

Raised on a grain and livestock farm near Princeton, Ill., he served as a Peace Corps volunteer in Malaysia after his undergraduate degree at Illinois State University. His graduate work at the University of Illinois focused on corn, soybean and grain sorghum intercropping systems. After receiving his Ph.D., he worked 24 years as a UNL Extension crops specialist, initially at the South Central Research and Extension Center, Clay Center, and then on campus in Lincoln. He worked with cultural practices for irrigated corn and soybean systems and with nonirrigated winter wheat and grain sorghum.

After his initial work at Nebraska, he served almost nine years with Iowa farmers and students in order to improve corn productivity for Iowa State University Extension as a corn agronomist. A major accomplishment there was the publication of “Abendroth et al. 2011, Corn Growth and Development,” *Iowa State Univ. Extension PMR 1009*.



Now at UNL he co-leads a new cover crop research project supported by the Nebraska Soybean Board and the Nebraska Corn Board with Humberto Blanco and several other colleagues. He is also a B. Keith and Norma Heuermann Chair and Robert B. Daugherty Water for Food Institute Faculty Fellow.

He enjoys his family and working outside. Elmore and his wife Ann live in Lincoln and have three adult children, two adult children-in-law, four grandsons and one granddaughter.

DANIEL SCHACHTMAN Plant Molecular Physiologist



DANIEL SCHACHTMAN JOINED THE DEPARTMENT IN FEBRUARY 2014. Professor Schachtman’s area of focus and current projects include the root microbiome, elucidating how soil microbes influence crop productivity and how plants influence their root-associated microbes. He is also currently the director of the University of Nebraska–Lincoln Center for Biotechnology.

Schachtman received his Bachelor of Science in agricultural economics and his Master of Science in plant physiology from the University of California, Davis. He received his Ph.D. from The Australian National University in plant physiology and genetics.

Schachtman joined the faculty from Monsanto, where he was project lead and Science Fellow. Prior to Monsanto, Schachtman was a principal investigator and full member at the Danforth Plant Science Center in St. Louis. A plant

molecular physiologist, Schachtman researched how plant roots respond and adapt to stressful conditions in soil. His research has led to seminal findings on the mechanisms of salt tolerance in wheat, the molecular identification and functional characterization of sodium, potassium and auxin transporters and the signal transduction networks controlling root response and adaptation to low nutrient conditions. His current research focuses on the interactions between plant roots and soil microbes and their impact on plant performance.

Schachtman grew up in Chicago with a strong interest in gardening and indoor plants and eventually found his career in agricultural research during his master’s degree at UC Davis and Ph.D. at CSIRO in Australia.

Schachtman’s hobbies include hiking, biking, travel, wines, the stock market and food—eating and growing.

WILLIAM “BILL” KREUSER Extension Turfgrass Specialist

BILL KREUSER JOINED THE DEPARTMENT AS AN ASSISTANT PROFESSOR IN JANUARY OF 2014. He also serves as the turfgrass specialist with UNL Extension.

Kreuser is a native of Wisconsin and became interested in turfgrass management after building a golf course green in his backyard as a teenager.

He received his bachelor’s and master’s degree in soil science at the University of Wisconsin–Madison with a specialization in turf and grounds management. His master’s work focused on putting green nutrient requirements and plant growth regulator degradation. Kreuser received his Ph.D. from Cornell University, where he studied products designed to increase plant health and reduce reliance on pesticides.

His extension goal is to increase the turfgrass management precision. To achieve his goal, Kreuser is developing new web-based tools and education opportunities to help turfgrass managers apply water and fertilizer when and where it’s required.

The Kreuser research lab focuses on turfgrass soil and water management. Current studies include turfgrass desiccation physiology and prevention during both winter and summer, impermeable iron layer formation in sand-based putting greens and environmental models to predict growth regulator applications.

Kreuser is married to department Research Technologist Katherine Kreuser. He is also a pilot, and he and Katie enjoy flying around Nebraska.



DAREN REDFEARN Forage/Crop Residue Specialist



DAREN REDFEARN JOINED THE FACULTY IN JUNE 2014 as a part of an interdisciplinary research and extension team focused on enhancing and developing integrated forage-based crop and livestock production systems. Prior to his arrival in Nebraska, he was with Oklahoma State University Extension for 14 years as a forage and pasture management specialist. He completed his Ph.D. in agronomy with a range and forage specialization

from the University of Nebraska–Lincoln in 1995. A unique opportunity exists in Nebraska to guide sustainable utilization of forage crops and crop residue and to integrate these products into beef cattle production systems on rangeland and pastureland. The opportunity to develop a new extension and research program area of focus that highlights integrated forage, crop, and beef systems is the principal reason Redfearn joined the faculty in Agronomy and Horticulture at the University of Nebraska. His goal is to build on the continuing strength of forage-based livestock agriculture in Nebraska.

According to Redfearn, one measure of success is to identify forages that can produce high rates of livestock gain during each

month of the year. Simultaneously, Redfearn feels it is also critical that proper grazing and harvest management techniques are developed to maintain or enhance soil health and water use for these types of forage and crop residue systems. Overall, the adoption and implementation of these system components will hinge largely on the enhancement and long-term sustainability by identifying species suitable to meet overall management goals without compromising the long-term production and sustainability of the systems.

These integrated programs will be implemented in collaboration with faculty in Agronomy and Horticulture, Agricultural Economics and Animal Science to address the transdisciplinary requirements needed to address these diverse production systems. Redfearn’s extension program incorporates and enhances the use of crop residues and annual forage crops into existing beef production systems, as well as implementing economical crop residue harvest and grazing methods. His research program will address the management, production and utilization strategies for annual double crop forages, study the influence of crop residue management systems on establishment of annual forage double crops, and create unique crop residue management systems that facilitate the use of annual forage double-crop systems.

Redfearn is joined in Lincoln by his wife Kasi, who is employed by Lincoln Public Schools as the librarian at McPhee Elementary School. His two daughters, Kelsi and Shelbi, were both born in Lincoln during his graduate program. Kelsi is currently employed with NASA at Johnson Space Center in Houston, Texas, as an ETHOS flight controller, and Shelbi is initiating her pursuit of graduate studies in speech and language pathology.

JAMES SCHNABLE Computational Biologist



JAMES SCHNABLE JOINED THE DEPARTMENT IN MAY 2014.

His research focuses on comparative genomics of grain crops. His lab is working on identifying the genetic changes that make many grain crops more tolerant of cold and more efficient in their use of water than corn and sorghum as well as supporting genomics-assisted breeding of Nebraska grain crops such as proso millet.

Schnable, who grew up in Iowa, received his undergraduate and graduate training in New York and California respectively. He is very happy his career has brought him back to the Midwest.

BRIAN KRIENKE Soil Assistant Extension Educator



BRIAN KRIENKE GREW UP IN PIERCE, NEB., WHERE HE ENJOYED HELPING ON THE FAMILY GRAIN FARM.

This exposure and experience drove Krienke's passion for agriculture. He received his B.S. and M.S. in agronomy from UNL, and he is currently a Ph.D. candidate finishing his degree in agronomy.

Krienke became a soil assistant extension educator in the department in May 2014. Much of his background is with soil fertility with corn and soybean production. He has experience with nitrogen management, which includes using remote sensing technologies such as unmanned aerial vehicles in his research. Current projects with regard to soil fertility include updating resource material for producers, conducting on-farm research and developing curriculum for producers that connects the classroom environment to the experience from the field on soil fertility issues.

Krienke loves to spend time with his wife of eight years, Abbey. The two enjoy hiking/backpacking, gardening, having friends over for game night and something as simple as a good cup of coffee.

FACULTY AWARDS

Stephen Baenziger: Daugherty Water for Food Institute Fellow, National Council of Commercial Plant Breeders Genetics and Plant Breeding Award

Roch Gaussoin: CSSA President-Elect, Outstanding Alumni Award from the Department of Plant & Environmental Sciences – New Mexico State University

John Guretzky: 2014 Agronomy Journal Outstanding Associate Editor

Gary Hein: NACTA Teaching Award of Merit Certificate

Greg Kruger: NCWSS Young Scientist Award

Dave Lambe: IANR Dinsdale Family Faculty Award, UNL Teaching Council and Parents Association Contribution to Students Award, Black Masque Chapter of Mortar Board February Professor of the Month

Sally Mackenzie: Gates Foundation Award

Deana Namuth Covert: Holling Family Senior Faculty Teaching Excellence Award

Daren Redfearn: Editor – Forage and Grazinglands

Zac Reicher: CSSA Chair-Elect of C5 Turf Division, UNL Teaching Council and Parents Association Contribution to Students Award

Richard Sutton: UNL Teaching Council and Parents Association Contribution to Students Award

Kim Todd: Tau Sigma Delta Honor Society – Architecture and Allied Arts (nominated and accepted into membership)

Dirac Twidwell: Society for Range Management, Texas Section – 2014 Publication Award

Anita Wingeyer: 2014 Outstanding Postdoc Award

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FACULTY | RETIREMENTS

Hoegemeyer takes second retirement



TOM HOEGEMEYER, PROFESSOR OF PRACTICE at the University of Nebraska-Lincoln, retired on Jan. 15, 2015. Again.

Hoegemeyer previously retired in 2008 as the CEO of Hoegemeyer Hybrids, the family business that he had no intention of joining. That first retirement is what enabled him to top off a career in plant breeding at UNL, where his interest in genetics took root.

UNDERGRAD WITH GOOD FORTUNE

Hoegemeyer didn't know what he wanted to do when he arrived at UNL in 1966. Then he had a genetics class with Professor Dave McGill. "I just really liked him and the subject matter," Hoegemeyer said.

Later, Hoegemeyer worked for Professor Charlie Gardner, a corn quantitative geneticist. "He was also really good to me," Hoegemeyer said. When it was time to choose a graduate school, Gardner called people he knew. "He was the one who made connections for me," Hoegemeyer said. "I was fortunate to have had such great mentors."

WORLD-RENOWNED CORN BREEDER

After Hoegemeyer obtained his doctorate in plant breeding at Iowa State University in 1974, he decided to help run the family seed business for a few years.

A few years turned into a few decades, and the little seed company in Hooper, Neb., grew to be a significant player in

the industry. Along the way, Hoegemeyer became an internationally recognized breeder of corn hybrids.

In 2005, Hoegemeyer sold the genetics and breeding portion of the company to Syngenta and worked as a scientist for them for several years.

HIGHLY REGARDED FACULTY MEMBER

Initially recruited for a UNL fund-raising campaign in 2009, Hoegemeyer signed on to teach as well. "After having been out of the academic world as long as I had been, I was a little intimidated at first," Hoegemeyer admitted.

But Hoegemeyer found the transition to be smoother than expected. "The department has been so gracious to me," he said. "I am just very appreciative of all the opportunities I've been given."

Colleagues, too, expressed sentiments of appreciation. "Having Tom in the department was one of the highlights of my experience here. In the corn breeding nursery, I was able to satisfy Tom's addiction to corn breeding. In exchange, my students and I benefited from Tom's vast knowledge, which he freely shared in the field," said Aaron Lorenz, former assistant professor.

"As the department's first plant breeder in residence, Tom was superb and will be the model for all who follow," said Professor Stephen Baenziger, who taught a plant breeding course with Hoegemeyer.

In addition, Hoegemeyer wrote and taught three other courses offered to both resident and distance-learning students. These courses gave students all over the world access to Hoegemeyer's firsthand experience in the field. "Tom was our window into private plant breeding, and our students will be forever in his debt. He helped shape their futures while shaping ours," said Baenziger.

Easing out of academic life, Hoegemeyer will serve in an adjunct capacity while he assists several graduate students to finish their programs. He will also continue helping students make connections with people in the plant breeding industry, just as Professor Gardner once helped make a connection for him.

SEED-PLANTING, GLOBE-TROTTER RETIREE

So what's next for a fellow who has planted seeds most of his life? "I'm going to plant some wild rice and grow some hops," Hoegemeyer said.

He is also looking forward to spending time with his family and traveling. In July, he and his wife Linda plan to trade Nebraska cornfields for fields of lavender and wine tasting in Provence, France.

"I've lived a charmed life," said Hoegemeyer.

Perhaps. But one gets the sense that Hoegemeyer has simply reaped what he has sown.

THOMAS ELTHON—25 YEARS



THOMAS ELTHON PARTIALLY RETIRED APRIL 25, 2014, AND WILL FULLY RETIRE IN 2016. He received his Ph.D. in botany in 1983 from Iowa State University. Elthon joined the department in 1989 and became an associate professor in 1995 and a faculty member of the Center for Plant Science Innovation. His main area of focus is responses of plants to environmental stresses, plant mitochondrial function and proteomic methods. Elthon also teaches plant growth and development, plant anatomy and botany.

JAMES SPECHT—40 YEARS



JAMES “JIM” SPECHT RETIRED JUNE 30, 2014. He received his Ph.D. in genetics in 1974 from the University of Nebraska. Specht joined the department in 1974 and was promoted to full professor in 1985. He was honored with the Charles E. Bessey Professorship in 2004 and as the Francis and Dorothy Haskins Professor of Agronomy in 2010. Specht was a soybean physiologist and geneticist and studied soybean yield response to drought and water irrigation. Early in his career, he helped Nebraska soybean growers by sharing information about proper irrigation for optimized crop yield and how irrigated soybean production could be more productive and more profitable. He has also served on research teams funded by the United Soybean Board that led to better understanding of the soybean plant and how genetics may be used to make plants more tolerant of drought. Specht was the lead PI with respect to developing the national Nested Associated Mapping populations that will serve as an exceptionally valuable resource for the soybean genetics and physiology research community for many years to come. His recent honors and awards include the Louise Pound-George Howard Distinguished Career Service Award in 2015, Special Meritorious Service Award from the American Soybean Association in 2015 and induction into the Nebraska Hall of Agricultural Achievement in 2012. Specht’s professional affiliations include the American Association of Advancement of Science, American Society of Agronomy, Crop Science Society of America, American and Nebraskan Soybean Association, Sigma Xi Science Honorary, Gamma Sigma Delta Honorary and Alpha Zeta Honorary.

ROBERT WILSON—39 YEARS



ROBERT “BOB” WILSON RETIRED DEC. 31, 2014, AFTER 39 YEARS WITH THE DEPARTMENT. Wilson received his Ph.D. in 1975 from Washington State University. He was hired by the University of Nebraska in 1975 and promoted to full professor in 1985. Wilson’s main area of focus was sugarbeet production and demonstrating new technology and developing sustainable weed control systems involving cultural practices, tillage and herbicides for sugarbeet, dry bean, corn, alfalfa, chicory, selected horticulture crops and rangeland. He also explored the root yield and economic potential of chicory in western Nebraska. He is a member of Gamma Sigma Delta, Sigma XI Scientific Research Society, Weed Science Society of America, North Central Weed Science Society, American Society of Sugar Beet Technologists and Western Society of Weed Science.

TOM HOEGEMEYER—SIX YEARS



TOM HOEGEMEYER RETIRED JAN. 15, 2015, AFTER SIX YEARS WITH THE DEPARTMENT. Hoegemeyer received his bachelor’s degree in crop science from the University of Nebraska in 1970 and his doctorate in plant breeding from Iowa State University in 1974. Hoegemeyer retired in 2008 as the chief executive officer of Hoegemeyer Hybrids, where he was an internationally recognized breeder of corn hybrids. In retirement, Hoegemeyer assisted with a UNL fund-raising campaign in 2009 and started teaching in the Department of Agronomy and Horticulture as a professor of practice. He became the department’s first plant breeder in residence. Hoegemeyer also wrote and taught three other courses offered to both resident and distance-learning students. He will serve in an adjunct capacity while he assists several graduate students to finish their programs.

STAFF AWARDS

- Tomie Galusha:** Staff Advisory Committee Special Contributions Award
- Ben Loseke:** SAC Professional Development Award
- Matt Sousek:** SAC Professional Development Award

ALUMNI ADVISORY COUNCIL HOLDS MEETING

THE AGRONOMY AND HORTICULTURE ALUMNI ADVISORY COUNCIL HELD ITS INAUGURAL MEETING ON FRIDAY, DEC. 5, 2014, on UNL East Campus. The AHAAC is built on the voluntary participation of alumni with notable early and late career credentials. The mission of the AHAAC is to aid and counsel the head of the department in alumni engagement, financial stability, industry relations and student interaction with alumni. Members participate in a semiannual meeting with the department and throughout the year as needed.

The meeting allowed opportunities for council members to interact with members of the department and the Institute of Agriculture and Natural Resources. Council members participated in student and faculty “fast break” sessions where five-minute speeches were given on specific topics of interest. In addition to the fast break sessions, council members had the opportunity to hear NU Vice President and IANR Harlan Vice Chancellor Ronnie Green share information on the progress of the institute and anticipated changes taking place over the next few years. AHAAC members were also invited to attend the department’s holiday luncheon to further engage with staff and faculty.

Roch Gaussoin, professor and head of the department, commented, “I see this as the beginning of a long and mutually beneficial relationship with our stakeholders. Putting the department in the position to have a meaningful interaction with alumni will be a tremendous opportunity for positive growth and relevance as an academic unit.”

IN REMEMBRANCE

DALE SWARTZENDRUBER

July 6, 1925 – October 21, 2014



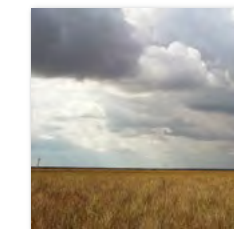
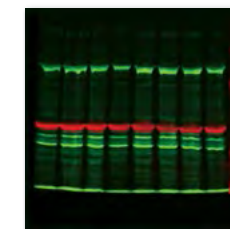
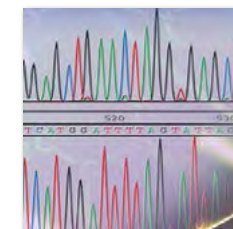
Emeritus Professor Dale Swartzendruber, age 89, passed on Oct. 21, 2014. Dr. Swartzendruber was a soil physics professor at the University of Nebraska–Lincoln from 1977 to 1998, when he retired. He was dedicated to excellence in research and teaching and was a member of the Soil Science Society of

America and the American Geophysical Union. Prior to coming to the University of Nebraska, Swartzendruber was a distinguished member of the faculty at Purdue University. Some of his honors include SSSA and ASA Fellow as well as the Soil Science Society of America’s Distinguished Service Award, and he authored more than 85 publications throughout the course of his career.

Dr. Darrell Nelson, UNL emeritus professor and colleague of Swartzendruber, said, “Dr. Swartzendruber was one of the preeminent soil physicists in the United States. His work on water and heat flow in porous media was of ground breaking quality and led to his receiving the SSSA Research Award.”

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GROOMS RISES TO THE TOP

MARISSA GROOMS, A FORMER UNIVERSITY OF NEBRASKA-LINCOLN UNDERGRADUATE from Valentine, Neb., won the second annual Engler Quick Pitch Competition last spring. Rising to the top in a field of nearly 80 applicants, Grooms pitched a business idea for a soil-sampling lab for area producers with a high level of customer service and won \$1,000 for her efforts.

Shortly after winning, Grooms graduated with a B.S. in agronomy and started a job with agricultural giant Cargill. Cargill, one of the largest privately held corporations in the United States, provides food, agriculture, financial and industrial services, and products to 67 countries around the world.

Grooms believes the degree she received from UNL was well-rounded and beneficial in preparing her for a career in agronomy.

“I’m glad I made connections and took advantage of the opportunities offered, such as Agronomy Club and out-of-state internships in New York and Kansas. My professors were good mentors—they enjoyed visiting with their students and offered advice,” Grooms said.

She chose the soil science option under the agronomy major and took as many plant-related classes as possible while still graduating in three years. She appreciated the opportunity to choose her classes and mentioned her favorite class as AGRO 405 taught by Department of Agronomy and Horticulture Professor Steve Mason.

“His class allowed me to look into the future. It gave me real-life experience and was easily the most difficult but beneficial and realistic class I took,” Grooms said.

Now she is putting her skill set to work at Cargill improving the efficiency of food production, and her future is looking bright. Grooms is currently working as a sales agronomist for the company. She sells crop inputs such as fertilizers, fungicides, insecticides and herbicides, as well as meeting with producers and finding solutions for their operations.

“I’m in the office at times and other days I’m checking fields or visiting with producers, so it varies,” said Grooms. “I really enjoy my work and I am thankful for the opportunities and experiences I had at UNL which helped shape my future.” —Anthony Vance

“IT (AGRO 405) GAVE ME REAL-LIFE EXPERIENCE AND WAS EASILY THE MOST DIFFICULT BUT BENEFICIAL AND REALISTIC CLASS I TOOK.”

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BECOMING A VISITING SCIENTIST WAS A GOAL I WISHED TO FULFILL AFTER I FINISHED GRADUATE SCHOOL. My name is Piyaporn Phansak, but most people at UNL know me as Bee. I received my doctoral degree from the Department of Agronomy and Horticulture, University of Nebraska–Lincoln in 2010.

Under the supervision of Dr. James Specht, I worked with the soybean breeding program to complete my dissertation “Detection of soybean seed protein QTLs using selective genotyping.” After finishing my Ph.D., I decided to do postdoctoral research with Dr. Specht and Dr. Roch Gaussoin for another two years.

I returned to my home country, Thailand, in 2013. I soon wished to return to the United States to gain more research experience and learn new techniques and methods. With much kindness, Dr. Harkamal Walia accepted me to work in his lab as a visiting scientist.

At first, I was a little nervous. I didn’t know what the experience would be like or what type of work I would be doing. However, after only a couple weeks in the lab, I learned the system and became comfortable in the environment. My projects focused on salt tolerance in rice and submergence tolerance in maize. Responsibilities included designing experiments, planting, collecting and analyzing data and assisting other lab members in time of need. Most of my work was in the greenhouses. Some days I worked in the field with graduate students, while other days I worked in the lab.

Working as a part of Walia’s lab, I saw not only the importance of people willing to help others but also how the lab members work



as a family by lending assistance to get things done on time. It is this family-like environment that I also enjoy as a researcher and teacher in Thailand.

The Walia lab has been a great experience. Even though I worked as a visiting scientist for a short period of time, it was rewarding to experience the joy of a day’s work, people who help others, new techniques that can be applied to my future work and a place to make new friends. —Piyaporn “Bee” Phansak

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For this scholarship winner,
there's nothing stronger
than his Nebraska roots.

Aaron Rerucha considers himself to be incredibly lucky. This Nebraska native has received both the Engler Scholarship and the Cabela's Scholarship.

The financial aid he received while still a student at UNL's Department of Agronomy & Horticulture helped him start Oxbow Natural Landscaping on a 24-acre plot of land that has been in his family for generations.

Aaron is grateful for the scholarships he received. Grateful to all of the donors who make students' dreams possible. Grateful to be able to make his grandfather and his great-great-great-grandfather proud.

You have the chance to make other students' dreams come true. Give online at nufoundation.org/agronomyandhorticulture or contact Ann Bruntz at 402-458-1176 or abruntz@nufoundation.org.

