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ANNUAL NEWSLETTER 2017



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DEPARTMENT OF AGRONOMY AND HORTICULTURE
ANNUAL NEWSLETTER 2017

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln

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

COVER PHOTO Laura Thompson

An Inspire drone with a multispectral sensor is used to assess a soybean on-farm research experiment on a producer’s field. Thompson earned a bachelor’s and a master’s degree in agronomy with a focus on soils from the University of Nebraska–Lincoln. She is an Ag Technologies Nebraska Extension Educator and co-coordinates the statewide Nebraska On-Farm Research Network. Find more information at cropwatch.unl.edu/on-farm-research.

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2017

“These efforts are but a glimpse of many in which our faculty are engaged across Nebraska, the United States and the globe...”

Richard Ferguson

Martha Mamo (from left), Richard Ferguson and Roger Elmore stand near the research fields at the University of Nebraska–Lincoln Havelock Research Farm in Lincoln.



RICHARD FERGUSON

The year 2017 has been one of transition and continued achievement in the Department of Agronomy and Horticulture. Starting in July 2011, I worked alongside Department Head Roch Gaussoin as Associate Head until July 2017 when Roch stepped down as Head and returned to new adventures among our faculty. We greatly appreciate Roch’s leadership and vision over the past six years. I took on the role of Interim Head last July and have been capably assisted by Interim Associate Heads Martha Mamo and Roger Elmore.

In November 2017, our department underwent a successful Academic Program Review. The review affirmed that we have a productive, impactful group of faculty, staff and students, but it also identified some areas for us to refine over the next couple of years. Two of those recommendations are already underway: revising our undergraduate curriculum and hiring a full-time undergraduate student recruiter.

Our international engagement continues to expand. Two initiatives on opposite sides of the world utilize the expertise of several of our faculty. We are engaged with other IANR faculty and Nebraska industries in developing a Nebraska demonstration farm near Yangling, China. Last fall IANR had over 100 undergraduate students from Rwanda, most of which are taking courses in our department, working on degrees in

integrated sciences. At its peak the CASNR Undergraduate Scholarship Program is set to grow to 200 students from Rwanda, which significantly impacts and enriches our department’s undergraduate courses. Faculty in Agronomy and Horticulture are also helping develop a new agricultural educational institution in Rwanda, the Rwandan Institute for Conservation Agriculture.

These efforts are but a glimpse of many in which our faculty are engaged across Nebraska, the United States and the globe to share our expertise in careful stewardship of the landscape, in developing new and more productive crop genetics as well as crop and livestock systems, in protecting our soil and water resources, and in helping our home and community landscapes be enjoyable places to live and work. It is a privilege to work alongside this community of around 500 students, staff and faculty, and I trust this newsletter will provide greater insight into some of our efforts.

Sincerely,

A handwritten signature in black ink that reads "Richard B. Ferguson".

Richard B. Ferguson
Professor and Interim Department Head

MARTHA MAMO

THIS YEAR HAS BEEN A YEAR OF CHANGE—WITH LEADERSHIP, FACULTY TRANSITIONS AND ADDITIONS. We had key faculty leaders in our undergraduate program who retired; their dedication and contributions to the Agronomy and Horticulture teaching program have been remarkable.

Teaching faculty, particularly the curriculum committee, have been engaged in reflection and discussion on curriculum revision, and a renewed momentum is currently in motion in our undergraduate program. “Finding a common path” is our theme to connect all undergraduate students. We hope to build students’ capacity in communication and system analysis, and problem solving.

As a step forward, faculty will engage in curriculum discussion at the 2018 spring retreat to address several goals: defining the generation 2020+ students; the needs of stakeholders in the coming years; the progression of learning experiences students need; and the support needed for effective curriculum change. We feel the review will generate a better program that prepares confident graduates and professionals.

I’m privileged to serve and blessed to have committed faculty and staff investing in the capacity building of our students.

Sincerely,



Martha Mamo
Professor and Interim Associate Department Head

ROGER ELMORE

IN THE PHOTO TO THE LEFT, MY COLLEAGUES AND I, ALL WITH DIVERSE EXPERIENCES AND TALENTS, STAND ON A HAVELOCK RESEARCH FARM FIELD LANE IN NORTHEAST LINCOLN. Havelock is one of the several field research facilities in Nebraska that faculty and staff use for research and extension activities.

But do you find yourself wondering what lies around the bend or, perhaps, what secrets lie hidden, awaiting discovery by competent scientists in Nebraska’s fields, rangelands and labs?

It doesn’t take a seed-bag full of experience to know that the problems down the lane will be more difficult than the problems we have already tackled. How will we feed two plus billion more people by 2050—all with increased per capita consumption of both food and other resources?

The encouraging aspect of being a part of the University of Nebraska–Lincoln and this administrative team is knowing that faculty and staff work to develop solutions to these problems. We’re well situated to face the challenges that lie around the bend, and I am honored and humbled to serve the great people of Nebraska and the Department of Agronomy and Horticulture!

Sincerely,



Roger Elmore
Professor and Interim Associate Department Head

PROMOTION AND TENURE

KEENAN AMUNDSEN

Promoted to Associate Professor with Tenure



Hired: 2011, Ph.D. 2010, from George Mason University. Amundsen is a turfgrass geneticist in charge of the turfgrass breeding program. He develops new turfgrass cultivars, with an emphasis on buffalograss. As a computational biologist, he has capitalized on opportunities to expand his research program into other specialty crops including ornamental pearl millet and hops.

STAFF AWARDS

Marlene Busse: Nebraska Board of Regents Kudos Award, Staff Advisory Committee Special Contributions Award

Diane Nolan: University of Nebraska–Lincoln Horticulture Club and Pi Alpha Xi President’s Citation

Susan Thomas: University of Nebraska Office Professionals Association Rose Frolik Award

Joanne “Annie” Vance: SAC Special Contributions Award

UNDERGRADUATE FALL ENROLLMENT



146 Agronomy



39 Horticulture



27 Plant Biology



19 Turfgrass & Landscape Management

ALUMNI ADVISORY COUNCIL

Julie Abendroth	Richard McConnell	Bart Ruth
Heather Byers	Jason Meyer	Dave Stock
Matt Giese	Chris Petersen	David Vetter
Tom Hoegemeyer	Rob Robinson	Ray Ward

NEW FACULTY HIRES 2018

Michael Kaiser: Applied Soil Chemist, started Jan. 1.

Marc Libault: Root Biologist, starts July 1.

Rebecca Young: Soil Professor of Practice, starts July 15.

STAFF SPOTLIGHT

LANA JOHNSON

Design and Communications Specialist

AGRICULTURE HAS ALWAYS BEEN PART OF MY LIFE.

Growing up on a farm in northeast Nebraska, I worked alongside my parents and nine siblings to raise garden produce, crops, livestock and a menagerie of kids and pets.

My career path has been a long and winding adventure. I earned a bachelor's degree in biology and natural science with the intent of attending medical school. This trajectory drastically changed when I took my first art class as a college junior to satisfy requirements for a liberal arts degree.

While I attempted to figure out what I wanted to be when I grew up, I worked as a hospital lab tech, human anatomy and physiology and biology instructor and a pharmacology research technician. Then I discovered scientific illustration — a career that combines art and science — and went to study at the University of Arizona. Eventually I returned to the University of Nebraska–Lincoln and earned a master's in museum studies with a minor in fisheries and a scientific illustration specialization.

During my 25-year tenure at Nebraska, I have worked as an illustrator, technology trainer, designer, project manager and instructor. I have also freelanced as a scientific illustrator. I am now blessed to work in this department as a multimedia design and communications specialist. Through design, illustration, photography, writing and web graphic design, I communicate science research and department happenings.



I have taught an entomology graduate course in presentation skills for many years and currently teach an online graduate scientific illustration course. Since 2002, I have taught an art and nature drawing course to children for Lincoln's Bright Lights summer enrichment program. An active member of the Guild of Natural Science Illustrators, I currently serve as president of the Great Plains Chapter.

My husband and I are now part-time empty nesters with our son a freshman at Augustana University in Sioux Falls, South Dakota. I love to spend my spare time with my friends and my large, entertaining family. I also volunteer at our church, sew and create art.



HEATHER STEFFENS

Financial Associate

RAISED BY A SINGLE DAD ALONG WITH THREE BROTHERS ON A SMALL FARM IN NORTHEAST NEBRASKA, I WAS QUITE THE TOMBOY. With so many

boys around, though, I was left to help mostly with the cooking and cleaning, and I was not involved with agriculture.

My college career consisted of a short stint at the University of Nebraska at Kearney majoring in graphic design. After one semester, I transferred to the University of Nebraska–Lincoln and earned a bachelor's degree in business administration.

After working 10 years in the banking industry, I accepted a position at Nebraska in September 2012 within the P-Card administration. I soon realized it was not a good fit for me, so I pursued an opportunity within the HAPPI Business Center in February 2015.

HAPPI has been a great place to work, and the environment on East Campus is wonderful. I only wish I would have paid more attention to agriculture when I was younger — that knowledge would have come in handy!

My position allows me to work with and get to know faculty and their research. My primary responsibilities are to assist faculty with grant submissions, help develop budgets for those submissions, and help manage the funding throughout the award period.

I have been married to a wonderful man for five and a half years, and we have two boys: Isaac, 4, and Evan, 2. In my free time (the little that I have with two young children) I like to watch movies and Husker sports, work out, play with my kids, and hang out with friends and family. I have also enjoyed being a Husker track official for the last three years.

ASHLEY BURNS-HASSEBROOK

Research Technologist I

I GREW UP ABOUT TWO HOURS NORTH OF SAN FRANCISCO IN THE LITTLE HIPPIE TOWN OF UPPER LAKE, CALIFORNIA, which has a population of about 1,000 people. My family owned a small walnut orchard, and growing up I was extremely active in 4-H and FFA, raised meat goats and dairy goats, and ran cross-country.

I came to the University of Nebraska–Lincoln in 2009. Exploring several majors during my first few years, I eventually settled into grassland ecology and management and graduated in December 2013.

I've been working off and on for the Department of Agronomy and Horticulture since 2010 when I received my first job working for Jon Soper in the Range and Forage Lab. Between jobs with the university, I collected an array of titles including GIS specialist, freelance writer, advertising account executive and interim day care director.

In December 2015 I came back to the university to work full-time for Daren Redfearn. In my current position, I conduct and coordinate cover crop and integrated cropping systems research. I'm usually standing in a field of turnips or oats and coming up with bad puns, or I'm trying to get our forage harvester to cooperate.

When I'm not at work, I'm usually at the rock-climbing gym pretending I'm the next Alex Honnold or at home in Seward waging war with my yard.



SHIRLEY SATO

Lab Manager

I WAS BORN AND RAISED IN LOMBARD, ILLINOIS, A SUBURB OF CHICAGO. I attended Bradley University, where I earned a Bachelor of Science in biology in 1975.

Following graduation, I was recruited and hired by Will Carpenter, who was instrumental in initiating the agriculture biotechnology effort at Monsanto. While

at the company, I was a team member of the Plant Transformation group and worked on a number of plant species including maize, alfalfa, sugar beets, soybean and wheat.

Over the course of my 21 years with Monsanto, I maintained an active lifestyle outside of work. I thoroughly enjoyed my time as a professional cheerleader for the St. Louis soccer team, The Storm, and the city's former professional football team, the Cardinals.

I also participated in the disco phase of the 1970s. My disco dancing led to a stint on American Bandstand and the winning of several disco dance competitions in the St. Louis area. This culminated in my being named the St. Louis representative in the Playboy-sponsored national disco dance contest, where the finals were judged by Hugh Hefner.

My life changed forever when I met a young postdoctoral researcher at Monsanto in May of 1993, and we were joined in holy matrimony at the Little White Wedding Chapel in Las Vegas in the winter of 1996.

I joined the laboratories of Steve Baenziger and Amit Mitra in the summer of 1996 to establish a reliable transformation protocol for wheat. In the summer of 1999 I joined the Plant Transformation Core Research Facility within the Center for Biotechnology, where I have served as the laboratory manager for the past 18 years.

As per my dancing days, I continue to follow my dance passion through participation in the Lincoln Contemporary Dance Project.



CLUBS OFFER FUN, FELLOWSHIP, OPPORTUNITIES

ABOVE: Horticulture Club members Morgan Von Seggern (from left) Kaitlin Taylor and Kara Philips sell poinsettias in the Nebraska East Union. LEFT: Members receive a behind-the-scenes tour of the Denver Botanic Gardens with club adviser, Stacy Adams, on right.



Over spring break, members traveled to Denver, Colorado, where they visited production greenhouses including The GrowHaus and Gulley Greenhouse & Garden Center. The highlights of the trip included zip-lining through the mountains and receiving a behind-the-scenes tour of the production greenhouses at Denver Botanic Gardens.

The Horticulture Club had record sales at its annual flower, vegetable and herb sale in April. The club created several new planters and offered new varieties of vegetables this year along with designing the planters for May graduation.

In the fall, the club sparked interest with many students on campus through its succulent-cutting workshop at the East Campus Welcome Back Fair. Through this event, members created awareness about the horticulture industry and growing plants.

Be sure to like UNL Horticulture Club on Facebook to keep up with important updates about the club's sales and activities. The club continues to seek growth in knowledge and relationships through greenhouse tours, industry professional guest speakers and traveling to horticultural destinations and operations.

Current officers are Megan Franklin, president; Morgan Von Seggern, vice president; Kaitlin Taylor, secretary and treasurer; and Miranda Earnest, head grower. Stacy Adams and Sam Wortman are club advisers. —Kaitlin Taylor, Horticulture Club secretary and treasurer

HORTICULTURE CLUB EXPERIENCES GROWTH IN MEMBERSHIP, SALES AND COMMUNITY INVOLVEMENT

TO START OFF THE YEAR, MANY HORTICULTURE CLUB MEMBERS VOLUNTEERED TO CLEAN AND ORGANIZE A GREENHOUSE at the Nebraska Outdoor Living Center in Lincoln. This was a great way to increase community involvement, and the club celebrated with a member potluck.

To educate members on the horticulture industry, the club hosted guest speakers this year. Bob Henrickson spoke to members about the Nebraska Statewide Arboretum on campus and gave a talk about trees. Julie Van Meter discussed important regulations in transporting and producing plants.

AGRONOMY CLUB CONTINUES TO GROW DIVERSIFIED MEMBERSHIP

THE AGRONOMY CLUB CONTINUES TO SHINE AS AN AVENUE FOR LEARNING, PROFESSIONAL DEVELOPMENT and forming new friendships for all students. Beyond the growth in numbers by agronomy-focused students, the club has seen an increase in the number of students in plant biology; fisheries and wildlife; agricultural leadership, education and communication and more, further diversifying the club's student membership.

This past year, the agronomy club hosted the annual emeriti banquet, with honorary guests including emeriti members, faculty and staff. The banquet included a video presentation showcasing current and past agronomy club activities and offered networking opportunities for club members with emeriti attendees.

During the year, various meetings and tours kept student members busy and involved. Numerous guest speakers from all aspects of the agriculture industry attended meetings to give students advice and tips on mastering career fairs, internships and career opportunities, and shared information and knowledge on their business.

The club toured the Monsanto DEKALB corn seed production facility in Waco, Nebraska. Members also had an opportunity to teach a group of first-grade students at Kloefkorn Elementary in Lincoln about where food comes from and soil biology.

Students traveled to Brookings, South Dakota, for the annual Students of Agronomy, Soils, and Environmental Sciences conference. There, members connected with other college students in agriculture programs across the Midwest, were given the opportunity to tour South Dakota ag industries and listened to a variety of speakers.

In the spring, club members Kolby Grint and Kristen Albrecht received the outstanding underclassman award and the American Society of Agronomy's outstanding senior award, respectively, at the Agronomy and Horticulture Awards Banquet.

The club sent four members to compete and learn at the American Society of Agronomy conference in Tampa in November. The club's poster, "Down to the Roots—Teaching Soil Health to First-grade Students," placed third. Club officers Rodger Farr and Shawn McDonald presented the club's proposal to host the regional SASES conference, and it was awarded to Nebraska for 2018.

Since then, the club has been busy planning for SASES. Officers have been organizing various tours, lining up a variety of speakers, and planning all of the venue details to give students attending a great experience and a look at Nebraska's agriculture industry.


The agronomy club is looking forward to another great year! Current officers are Samantha Teten, president;

McDonald, vice president; Grint, secretary; Katie Harrell, treasurer; Farr, assistant treasurer; and Moriah Heerten, historian. Meghan Sindelar, assistant professor of practice, and Chris Proctor, assistant extension educator, are club advisers. —**Moriah Heerten, Agronomy Club historian**

Nebraska to host SASES 2018

THE UNIVERSITY OF NEBRASKA-LINCOLN AGRONOMY CLUB will host the Students of Agronomy, Soils, and Environmental Sciences regional conference April 12–14 in Lincoln. More than 250 students are expected to attend this three-day event for undergraduate students in agronomy, soils and environmental studies from across the United States. This will be an opportunity for students to hear from speakers, attend Nebraska agricultural industry tours and network with others who share an interest in agriculture.

Visit go.unl.edu/sases18 for more information.



The Agronomy Club gathers at the 2017 Agronomy and Horticulture Awards Banquet in April with club adviser, Meghan Sindelar, on right and associate member and crops judging coach, Adam Striegel, on left. The club is currently preparing for the 2018 Students of Agronomy, Soils, and Environmental Sciences regional conference to be held April 12–14 in Lincoln.



Club members Autumn Dunn (from left), Cecile Renfro, Dakota Altman, Ethan Frees, Nicholas Coffey, Ellen Dolph and Hannah Miller travel to St. George, Utah, for the International Meeting of the Society for Range Management.

MEMBERS EXPERIENCE RANGE MANAGEMENT

EACH YEAR DURING SECOND SEMESTER, THE RANGE MANAGEMENT CLUB ATTENDS THE INTERNATIONAL MEETING OF THE SOCIETY FOR RANGE MANAGEMENT. The aim of attending is to give students an experience at networking with professionals, an opportunity to attend seminars and stay

current on rangeland issues and research, and the chance to improve their knowledge of imperative topics in range management by participating in various competitions.

This last year at the meeting in St. George, Utah, the club competed in the plant identification contest, undergraduate range management exam and extemporaneous speaking contest. Nebraska placed 11th overall.

Members went on a camping trip to Kearney, Nebraska, in mid-March. They observed the sandhill crane migration and visited the Audubon Center at Rowe Sanctuary and the Crane Trust Nature and Visitor Center.

In April, students attended the Nebraska Prairie-Chicken Festival in Burwell, Nebraska. They observed the lekking of the greater prairie-chicken and the sharp-tailed grouse and learned about the proper techniques for management of these grassland birds. They also attended talks given by range management professionals, observed birds around Calamus Reservoir and met festivalgoers from all over the world.

In the fall, the club was busy preparing for the Nebraska Section Meeting for the Society for Range Management, which was October 17–18 in Chadron, Nebraska.

The club continues to work hard developing their skills for the next international meeting and formulating a new fundraising event to take place in the spring of 2018.

Current officers are Ethan Freese, president; Cecile Renfro, vice president and treasurer; and Nicholas Coffey, primary programmer. Professor Walter Schacht is the club adviser.
—**Ethan Freese, Range Management Club president**

CLUB OFFERS CONNECTIONS WITH PROS IN THE TURF INDUSTRY

THE TURF CLUB IS A PLACE WHERE UNDERGRADUATE STUDENTS CAN GET TOGETHER AND “TALK TURF.”

The club’s primary goal is to connect turfgrass management students with each other and with professionals in the turfgrass industry. These connections may lead to future internships and career opportunities after graduation.

In January, students attended the Sports Turf Managers Association annual meeting in Orlando, Florida. There, they competed in the annual Student Challenge competition, attended the trade show and met with turf industry professionals from all over the world. The club had a booth at the Nebraska Turfgrass Conference in Omaha, which offered members an opportunity to get to know Nebraska Turfgrass Association members from golf courses, sports turf facilities, lawn care operations and retail companies that support the industry.

In February, students traveled back to Orlando to attend the Golf Industry Show and compete in the annual Turf

Bowl contest. There, the team competed against other universities in the Student Challenge and claimed eighth place. Both the Student Challenge and Turf Bowl tested students on their knowledge of weeds, diseases, insects, grasses, seeds, equipment, pesticides, business practices, and turfgrass growth and management.

During the year, the club also hosted guest speakers from FM Lawn Care, Winfield Solutions and Midwest Turf and Irrigation.

Outside of turf, the club hosts occasional bowling nights on East Campus and organizes an intramural basketball team. To keep up with the latest happenings and learn more about Turf Club, follow @unlturfclub on Twitter.

Current officers are Logan Leigh, president; Matt Hellbusch, vice president; Ben Roth, secretary; and Cole Batenhorst, treasurer. Anne Streich, associate professor of practice, is the club adviser.
—**Logan Leigh, Turf Club president**



Turf Club members Andrew Musil (from left), Matthew Hellbusch, Alex Dredge, Logan Leigh, Andrew Getty, Kyle Trewhitt, Kenton Fritson, Ben Roth and Cole Batenhorst attend a meeting at the East Campus turf research plots.



AHGSA members celebrate their achievements at the Agronomy and Horticulture Awards Banquet. Each year, the club helps organize and promote the event.

GRADUATE STUDENT ASSOCIATION CONNECTS STUDENTS

A DIVERSE GROUP, THE AGRONOMY AND HORTICULTURE GRADUATE STUDENT ASSOCIATION MEETS ONCE A MONTH to plan activities, listen to presentations oriented toward graduate students and share cultural experiences and food.

Every spring AHGSA members, along with the undergraduate clubs in the department, organize and promote the Agronomy and Horticulture Awards Banquet to celebrate student, faculty and staff achievements.

This summer, members partnered with Professor Oscar Rodriguez to harvest sweet corn—the club’s biggest fund-raiser. Members hand-harvested the corn, distributed it for free on both campuses and received donations for their efforts.

Member Martina La Vallie led the New-Student Orientation this fall. During the event, new graduate students were introduced to department faculty and staff, and they received information about campus, the university, city attractions and resources.

Over the last couple of years, AHGSA members have organized and promoted the R-Club where students share their expertise about R software at meetings twice a month. About 60 students signed up to discuss topics such as data manipulation, plotting and analysis.

A big part of the AHGSA meetings is the invited speaker lectures. This year, Brian Waters, assistant professor of agronomy and horticulture, presented “Tips for Writing a Literature Review”; Leslie Delserone, associate professor of University Libraries, presented “Fair Use of Information, Copyright, and Plagiarism Prevention in Science”; and Brian Olson from Monsanto’s Gothenburg Water Utilization Learning Center presented “Monsanto Overview and Opportunities at the Gothenburg Water Learning Center.”

The social committee, led by Dinesh Panday, organizes many events throughout the year, including a fall barbecue, bowling night, pumpkin carving, faculty and staff appreciation coffee and other themed parties.

Professional development activities include industry tours. The club toured Dow AgroSciences in York in August and LI-COR in Lincoln in November.

Current officers are Leonardo Bastos, president; Jaspinder Singh, vice president; Mary Happ, treasurer; and Morgan McPherson, secretary.

Follow AHGSA on Twitter (@ahgsa_unl) and Facebook (UNL AHGSA.) —**Leonardo Bastos, AHGSA president**



AHGSA members harvest sweet corn.



Brian Waters, invited speaker, presents to the club.

“There is no better way to feel at home than by joining with other people who share a similar passion.”

Elizabeth Lutz

Proud Cornhusker earns horticulture degree

I AM A NEBRASKA-BORN NATIVE FROM GRAND ISLAND. My passion for horticulture blossomed during summers with my grandparents in the Sandhills. There, native perennials graced the hills like jewels waiting to be noticed.

At the age of 8, I decided that I would attend the University of Nebraska–Lincoln, be a great Cornhusker, and carry the name with pride.

There is no better way to feel at home than by joining with other people who share a similar passion. I have had the privilege of being a member and officer

of clubs on East Campus, including the National Horticulture Society, Pi Alpha Xi and Horticulture Club. My most influential time at Nebraska was while I was president of the Horticulture Club. During my tenure, the club held three record-breaking plant sales and took a Colorado trip to tour horticulture production greenhouses.

My internship with the Nebraska State Arboretum cemented my professional goals to be a producer and to one day own and operate a greenhouse that specializes in native Nebraska plants.

I hope to locate this business in my hometown.

Throughout my academic career, I was honored to have a horticulture professor who advocated for me while encouraging, supporting and mentoring me to be successful. I graduated from the university Dec. 16, 2017, with a Bachelor of Science in horticulture production. I have accepted a position with Dallas Johnson Greenhouses in Council Bluffs, Iowa, where I will continue my passion for plant production. —**Elizabeth Lutz, horticulture graduate**



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UNDERGRADUATE STUDENT AWARDS 2017

Blake Anderson: Second-place team North American Colleges and Teachers of Agriculture Judging Conference National Collegiate Competition – Precision Agriculture, Third-place team NACTA Judging Conference National Collegiate Competition – Knowledge Bowl, Third-place team NACTA Judging Conference National Collegiate Competition – Crops Judging, Third-place team Iowa State University Four-year Academic Crops Contest

Kristen Albrecht: American Society of Agronomy–Crop Science Society of America–Soil Science Society of America’s National Student Recognition Program

Nikola Arsenijevic: Second-place team NCWSS Student Weed Contest

Bryant Biskup: Second-place team NACTA Judging Conference National Collegiate Competition – Precision Agriculture, Third-place team NACTA Judging Conference National Collegiate Competition – Knowledge Bowl

Matthew Blunck: Chancellor’s Scholar

Brittney Cihal: First-place Engler Quick Pitch with a Twist Competition

Michaela Cunningham: America’s Farmer Grow Ag Leaders Scholarship, Western Seed Association Scholarship

Nathan Duffy: Milton E. Mohr Awards Program for Biotechnology Scholarship

Rodger Farr: Milton E. Mohr Awards Program for Biotechnology Scholarship, Second-place team Nebraska College of Technical Agriculture Collegiate Crops Judging Contest – Four-year University Division, Second-place team NCWSS Student Weed Contest, Third-place team ASA–CSSA–SSSA International Meeting Crops Judging

Olivia Fiala: Milton E. Mohr Awards Program for Biotechnology Scholarship

Kelsey Foster: Martin Massengale Outstanding Senior Award, First-Place Engler Quick Pitch with a Twist Competition

Megan Franklin: Milton E. Mohr Awards Program for Biotechnology Scholarship

Jacob Fuehrer: Eighth-place team Golf Course Superintendents Association of America Collegiate Turf Bowl

Andrew Getty: Eighth-place team GCSAA Collegiate Turf Bowl

Kolby Grint: First-place team Region V Soil Judging, Tenth-place ASA–CSSA–SSSA International Meeting Crops Judging, Third-place ASA–CSSA–SSSA International Meeting Club Poster, Third-place team ASA–CSSA–SSSA International Meeting Crops Judging, ASA Agronomic Travel Study Undergraduate Scholarship, Second-place team NCTA Collegiate Crops Judging Contest – Four-year University Division

Matt Hellbusch: Eighth-place team GCSAA Collegiate Turf Bowl

Cody Kuester: Third-place team NACTA Judging Conference National Collegiate Competition – Crops Judging, Third-place team Iowa State University Four-year Academic Crops Contest, Second-place team NCTA Collegiate Crops Judging Contest – Four-year University Division

Ryan Langemeier: Milton E. Mohr Awards Program for Biotechnology Scholarship

Cody McClellan: Second-place team NACTA Judging Conference National Collegiate Competition – Precision Agriculture, Third-place team NACTA Judging Conference National Collegiate Competition – Knowledge Bowl, Third-place team NACTA Judging Conference National Collegiate Competition – Crops Judging, Third-place team Iowa State University Four-year Academic Crops Contest, Second-place team NCTA Collegiate Crops Judging Contest – Four-year University Division

Shawn McDonald: Third-place team ASA–CSSA–SSSA International Meeting Crops Judging

Nick Meister: Eighth-place team GCSAA Collegiate Turf Bowl

Jennifer Myers: Milton E. Mohr Awards Program for Biotechnology Scholarship

Jacob Nikodym: Second-place team NCWSS Student Weed Contest

Trey Stephens: First-place NCWSS Meeting Undergraduate Poster – Agronomic Crops

Samantha Teten: First-place team Region V Soil Judging, Second-place team NCWSS Student Weed Contest, First-place NCWSS Student Weed Contest – Weed ID, Second-place NCWSS Student Weed Contest, Second-place team NCTA Collegiate Crops Judging Contest – Four-year University Division, Eighth-place ASA–CSSA–SSSA International Meeting – Crops Judging, Third-place ASA–CSSA–SSSA International Meeting Research Poster, Third-place team ASA–CSSA–SSSA International Meeting – Crops Judging, Independent Professional Seed Association Scholar

Collin Thompson: Second-place team NCTA Collegiate Crops Judging Contest – Four-year University Division, Third-place team NACTA Judging Conference National Collegiate Competition – Knowledge Bowl

Barbara Vukoja: Second-place NCWSS Poster – Equipment and Application Methods



MONSANTO  **Gothenburg Water Utilization LEARNING CENTER**

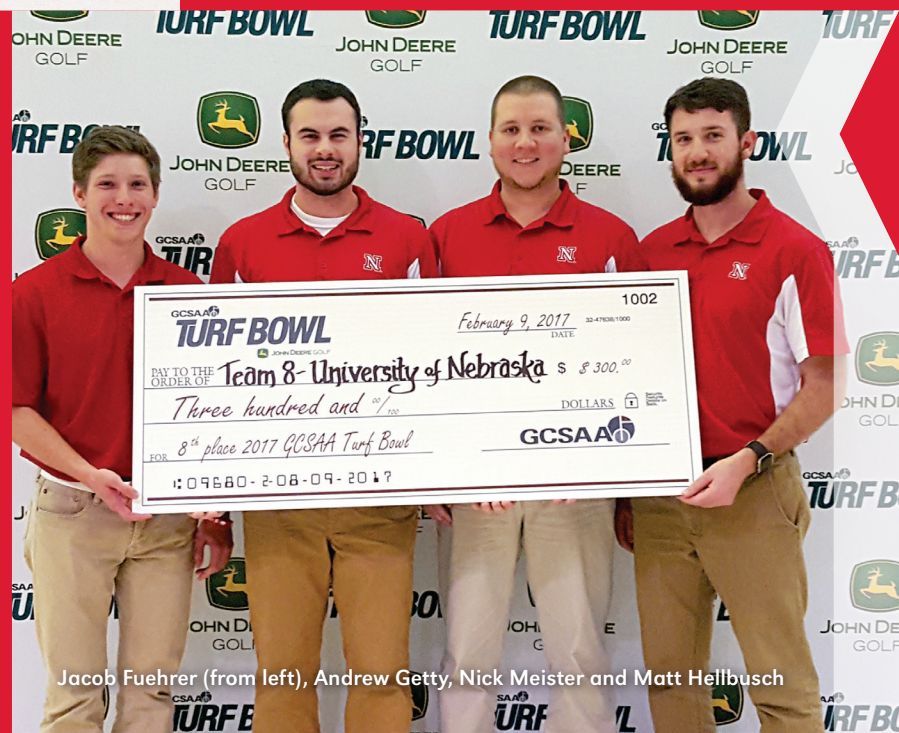
To book a tour or meeting at the Learning Center please contact Khris or Lisa.
khris.a.jinks@monsanto.com
lisa.m.bihlmaier@monsanto.com



Crops Judging Team and coach Adam Striegel

THE UNIVERSITY OF NEBRASKA–LINCOLN GRADUATE STUDENT WEED SCIENCE TEAM TOOK FIRST PLACE AND THE UNDERGRADUATE TEAM SECOND IN THE NORTH CENTRAL WEED SCIENCE SOCIETY STUDENT WEED CONTEST JULY 27. Hosted by Iowa State University, the contest was held at the ISU Field Extension Education Laboratory west of Ames, Iowa. The Nebraska team, represented by 14 undergraduate and 12 graduate students, had a successful showing, bringing home 16 team and individual plaques. Nine students also took top honors at the North Central Weed Science Society Annual Meeting in St. Louis Dec. 4-7.

THE UNIVERSITY OF NEBRASKA–LINCOLN CROPS JUDGING TEAM COMPETED IN THE IOWA STATE UNIVERSITY CROPS CONTEST ON FEB. 11, 2017, AND PLACED THIRD IN THE FOUR-YEAR COLLEGE DIVISION AGAINST OTHER MIDWEST UNIVERSITIES. The team placed second in the four-year university division at the Nebraska College of Technical Agriculture collegiate crops judging contest March 11 in Curtis, Nebraska. Nebraska then took top honors at the North American Colleges and Teachers of Agriculture Judging Conference national collegiate competition at Kansas State University in Manhattan, Kansas, April 6. The team placed second in the Precision Agriculture contest and third in both the Crops Judging Contest and Knowledge Bowl.



Jacob Fuehrer (from left), Andrew Getty, Nick Meister and Matt Hellbusch



Martin Massengale (left) and Kelsey Foster

KELSEY FOSTER WAS AWARDED THE MARTIN MASSENGALE OUTSTANDING SENIOR AWARD AT THE DEPARTMENT OF AGRONOMY AND HORTICULTURE AWARDS BANQUET APRIL 4. The award honors Massengale, the president and chancellor emeritus and founding director of the Center for Grassland Studies and Foundation Distinguished Professor.

FOSTER WAS ALSO ONE OF THREE WINNERS IN THE UNIVERSITY OF NEBRASKA–LINCOLN ENGLER QUICK PITCH WITH A TWIST COMPETITION APRIL 13. She graduated in May with a degree in horticulture and returned to her family farm in Broken Bow, Nebraska, to expand the operation which specializes in seed production of native grasses.



Weed Science Teams with coaches Rodrigo Werle (back row, fifth from left) and Greg Kruger (back row, right).

THE UNIVERSITY OF NEBRASKA–LINCOLN TURF TEAM FINISHED EIGHTH IN THE GOLF COURSE SUPERINTENDENTS ASSOCIATION OF AMERICA COLLEGIATE TURF BOWL. Attracting teams from all over the United States and Canada, the GCSAA competition was held Feb. 9, 2017, during the Golf Industry Show in Orlando, Florida.

LEONARDO BASTOS WAS SELECTED AS INTERNATIONAL PLANT NUTRITION INSTITUTE SCHOLAR AWARD RECIPIENT AT THE NORTH CENTRAL EXTENSION-INDUSTRY SOIL FERTILITY CONFERENCE IN DES MOINES, IOWA, NOV. 15. Bastos is an agronomy doctoral student working in agronomy, soil fertility and precision agriculture.

SUNIL KUMAR KENCHANMANE RAJU WAS HONORED WITH THE AGRONOMY AND HORTICULTURE GRADUATE STUDENT ASSOCIATION OUTSTANDING MEMBER AWARD AT THE DEPARTMENT OF AGRONOMY AND HORTICULTURE AWARDS BANQUET APRIL 4. Kumar received his doctorate in agronomy, specializing in plant breeding and genetics, in May.



AHGSA members Leonardo Bastos (from left), Mon-Ray Shao and Sunil Kumar Kenchanmane Raju



Soil Judging Team

THE UNIVERSITY OF NEBRASKA–LINCOLN SOIL JUDGING TEAM SWEEP THE REGION 5 COMPETITION SEPT. 28 IN REDFIELD, SOUTH DAKOTA, BEATING OUT SEVEN OTHER TEAMS TO EARN FIRST PLACE FINISHES ACROSS THE BOARD. The win qualified the team, made up of 17 students from the School of Natural Resources and the Department of Agronomy and Horticulture, for the 2018 National Soil Judging Contest March 18-23 at the University of Tennessee at Martin.

GRADUATE STUDENT AWARDS 2017



Joel Crowther, International Plant Nutrition Institute Scholar Awardee

Ethann Barnes: Chancellor's Fellowship, First-place North Central Weed Science Society Meeting Video Contest – Research, First-place team NCWSS Student Weed Contest – Sprayer Calibration, Second-place NCWSS Meeting Paper – Weed Biology, Ecology and Management

Angela Bastidas Gutierrez: U.S. Borlaug Fellow on Global Food Security

Leonardo M. Bastos: International Plant Nutrition Institute Scholar Award, Third-place North Central Extension-Industry Soil Fertility Conference Poster

Clint Beiermann: First-place team NCWSS Student Weed Contest

Madhav Bhatta: Hardin Distinguished Graduate Fellowship, Milton E. Mohr Fellowship–Biotechnology Degree Program Recipient, First-place Nebraska Plant Breeding Symposium Poster, First-place Kansas State Plant Breeding and Genetics Symposium Poster

Carlos Bolanos Carriel: Milton Mohr Fellowship

Thomas Butts: Shear-Miles Fellowship, First-place NCWSS Student Weed Contest – Weed ID, First-place team NCWSS Student Weed Contest, First-place American Society of Agronomy–Soil Science Society of America–Crop Science Society of America Meetings – Agronomic

Production Systems Section Oral Paper, Second-place NCWSS Student Weed Contest, Second-place ASA–CSSA–SSSA Meetings – Agronomic Production Systems Section Poster, CSSA Gerald O. Mott Meritorious Student in Crop Science Award

Nicolas Cafaro la Menza: Widaman Distinguished Graduate Assistant Award

Parminder Chahal: NCWSS Meeting Outstanding Graduate Student Award, First-place Weed Science Society of America Annual Meeting Ph.D. Poster, First-place team NCWSS Student Weed Contest – Sprayer Calibration, Second-place NCWSS Meeting Video Contest – Research, Farmers National Company Fellowship in Agriculture, Honorable Mention University of Nebraska–Lincoln Outstanding Research and Creative Activities Award

Maxwel Coura Oliveira: First-place NCWSS Meeting Poster – Herbicide Resistance, First-place team NCWSS Student Weed Contest, First-place NCWSS Student Weed Contest – Herbicide ID

Joel Crowther: IPNI Scholar Award, First-place team NCWSS Student Weed Contest – Sprayer Calibration, North Central Extension-Industry Soil Fertility Conference Graduate Student Award

Andre de Oliveira Rodrigues: First-place team NCWSS Student Weed Contest – Sprayer Calibration

Amanda Easterly: Henry M. Beachell Fellowship

Nikita Gambhir: First-place Spring Graduate Research and Creative Activities Poster, Widaman Distinguished Graduate Assistantship

Zahoor Ganie: First-place WSSA Outstanding Ph.D. Poster

Elnazsadat Hosseiniaghdam: Widaman Distinguished Graduate Assistantship

Waseem Hussain: Kansas State Plant Breeding and Genetics 2017 Symposium – Invited Speaker

Sunil Kumar Kenchanmane Raju: Department of Agronomy and Horticulture Graduate Student Association Outstanding Member Award, University of

California, Davis Plant Science Symposium – Invited Speaker

Dinesh Panday: Second-place ASA International Annual Meeting Student Poster – Soil Carbon and Greenhouse Gas Emissions

John Parrish: North Central Extension-Industry Soil Fertility Conference Graduate Student Award

Manbir Kaur Rakkar: Shear-Miles Fellowship, Third-place ASA–CSSA–SSSA Meetings Soil and Water Management and Conservation Division Oral Presentation

Salvador Ramirez: North American Colleges and Teachers of Agriculture Graduate Student Teaching Award of Merit Certificate

Caleb Powell Roberts: William Ridgely Chapline Fellowship

M. Benjamin Samuelson: North Central Region-Sustainable Agriculture Research and Education Graduate Student Grant

Amanda Shine: Fourth-place ASA–CSSA–SSSA Annual Meeting ASA Poster – Nutrients and Environmental Quality Community, Arthur W. Sampson Fellowship in Nebraska Pasture and/or Range Management

Adam Striegel: First-place team NCWSS Student Weed Contest – Sprayer Calibration, Second-place NCWSS Meeting Poster – Cover Crops

Don Treptow: Second-place NCWSS Meeting Paper – Weed Biology, Ecology and Management

Jorge Venegas: American Seed Research Foundation Roger Krueger Memorial Scholarship, ASA–CSSA–SSSA Annual Meeting – Biomedical, Health Beneficial, and Nutritionally Enhanced Plants Division Invited Speaker

Bruno C. Vieira: Henry M. Beachell Fellowship, First-place team NCWSS Student Weed Contest, First-place NCWSS Meeting Student Paper – Weed Biology, Ecology and Management

All awards are listed at agronomy.unl.edu/student-awards.



**GRADUATE STUDENT SPOTLIGHT:
ETHANN BARNES**

“During graduate school, one of my favorite activities has been teaching both students and growers.”

Ethann Barnes

NATIVE SON CHOOSES NEBRASKA, AGAIN AND AGAIN

I GREW UP ON A RANCH NEAR GOTHENBURG, NEBRASKA, WHERE MY PASSION FOR AGRICULTURE BEGAN. As a native Nebraskan, I had only one place in mind when it came to picking a college. I started my bachelor’s degree in agronomy at the University of Nebraska–Lincoln in the fall of 2010.

Throughout my undergraduate years, my experiences in the Department of Agronomy and Horticulture fostered my passion. I was very involved in the Agronomy Club, which gave me many opportunities for traveling and networking. This is also where I met my wife, Allison, who is now a doctoral candidate in the biochemistry department.

I began my master’s degree in January of 2015 studying a glyphosate-resistant common ragweed population in Gage County, Nebraska. I completed my thesis, “Emergence, Competition, and Management of Glyphosate-resistant Common Ragweed (*Ambrosia artemisiifolia* L.) in Nebraska Soybean,” in April of 2017 and decided to stay on for a doctoral degree.

My dissertation research focuses on multiple aspects of popcorn production in Nebraska. Nebraska is the top producer

of popcorn in the United States, accounting for 45 percent of the U.S. supply. More specifically, my research aims are to improve weed control, contribute valuable information regarding popcorn injury due to herbicides and improve weed control in popcorn. I am also researching pollen-mediated gene flow from dent corn to popcorn in an effort to protect the dent sterility system which popcorn utilizes.

During graduate school, one of my favorite activities has been teaching both students and growers. I have had the opportunity to teach the agronomic plant science lab and the invasive weeds lab. This has helped me develop my teaching skills while providing undergraduates with hands-on agronomic experience. Being part of the Amit Jhala (assistant professor of weed science) Lab has also allowed me to interact with producers at extension field days and crop scout trainings.

I am very grateful for the opportunities this department has given me. Knowing I have a great foundation from Nebraska makes me excited to see where my future leads. —**Ethann Barnes, agronomy doctoral student**

Project SENSE

SEVERAL YEARS AGO, FACULTY IN THE DEPARTMENT OF AGRONOMY AND HORTICULTURE AND THE BIOLOGICAL SYSTEMS ENGINEERING DEPARTMENT NOTICED A COUPLE OF ISSUES. First, while trends of increasing efficiency of nitrogen (N) fertilizer use for corn production have been very positive over the past 50 years, over the past decade there has been relatively little gain. In 1970, Nebraska corn growers were producing around 35 pounds of corn grain for every pound of nitrogen fertilizer applied. By 2000, efficiency had grown to around 60-65 pounds of grain for every pound of nitrogen fertilizer. However, there has been little gain in efficiency since 2000, suggesting that current N management practices (using preplant application and predictive N rate equations) may have reached a limit in terms of further gains in N use efficiency (NUE).

Second, faculty noted there has been little adoption of sensor-based, in-season N management for corn. The technology for using active crop canopy sensors, which use an internal light source and measure reflectance of this light from the crop canopy, has been commercially available for over a decade and has shown the capacity to significantly increase NUE. Project SENSE (Sensors for Efficient Nitrogen Use and Stewardship of the Environment) began in 2015 to encourage adoption of in-season N management to increase NUE. Research in Nebraska has shown that crop canopy sensor use with in-season N application can significantly increase NUE.

Partnering for a Purpose

From 2015 through 2017, Project SENSE has been a collaborative on-farm research/educational effort to explore the impacts of in-season, sensor-informed N management on crop yield, NUE and profit. The project combined resources of the Nebraska Corn Board, the University of Nebraska–Lincoln On-Farm Research Network, and five Natural Resources Districts along with cooperating growers. Sites were located in areas of the state which already have elevated levels of groundwater nitrate.

A total of 54 study sites, mostly on cooperating producer fields, were conducted over three years. At a cooperators' site, field-length treatment strips compared the grower's standard N fertilizer management approach to sensor-based management. Treatments were randomized and replicated to allow statistical evaluation. In-season application was conducted by university staff with a sensor-equipped, high-clearance fertilizer applicator in order to allow the treatment approach to be relatively the same across sites. Yield was measured by cooperators using their yield-mapping combines.

Sharing the Results

Averaged across all 54 sites from 2015 to 2017, in-season N management using crop canopy sensors reduced N application by 29 lb/acre, from 191 lb N/acre for grower treatments to 162 lb N/acre with sensor-based management. Grain yield was

reduced slightly (4 bu/acre) with sensor-based management, from 223 bu/acre on average with grower treatments to 219 bu/acre with sensor-based management. Marginal net return was slightly higher (\$2.63/acre) with sensor-based management, while fertilizer NUE (partial factor productivity for N [FPF_N]) increased significantly with sensor-based N management, from 68 lb grain/lb fertilizer N for grower treatments to 81 lb grain/lb fertilizer N for sensor-based treatments. That is an additional 12 pounds of grain produced for every pound of fertilizer N.

Over the three-year project, a total of 15 field days were held (one in each participating NRD each year), and results were shared annually at Nebraska On-Farm Research Network grower meetings. Surveys taken of attendees at field days and winter meetings indicated favorable recognition of the value of sensor-based, in-season N management. In addition, the project received substantial media coverage each year.

Expanding the Research

While in-season N application using a sensor-equipped, high-clearance applicator increased NUE on average, for some sites there was no advantage (or even a disadvantage) with sensor-based management. More detailed research by graduate students John Parrish and Joel Crowther has focused on understanding these situations and providing direction for refinement of sensor-based management. Also, Parrish's research explored the use of sensor-equipped drones to inform the use of high-clearance applicators for in-season application.

Based on input from growers, NRDs and other project partners, the project is exploring ways to broaden sensor-informed management beyond the use of high-clearance applicators. One approach for 2018 and beyond is to use drones equipped with multispectral sensors to schedule fertigation (fertilizer application through the irrigation system.) While over 8 million acres of Nebraska cropland is irrigated, only a small fraction of that area is currently fertigated. Project leaders believe crop canopy sensors will be particularly useful for Nebraska producers to manage fertigation and to significantly expand the area of Nebraska in which fertigation is practiced. Another increasingly viable option for crop management are sensor-equipped drones, as are manned aircraft or satellite-based sensors. Project SENSE is evolving to provide direction to growers on the use of sensors in general for improved in-season N management.

University of Nebraska-Lincoln faculty and staff participating in Project SENSE include Crowther and Parrish, project technologist; Dean Krull, research technologist; extension educators Laura Thompson, Keith Glewen, Troy Ingram, Brian Krienke and Nathan Mueller; and extension specialists Joe Luck, Taro Mieno, Tim Shaver and Richard Ferguson. —**Richard Ferguson, professor and interim department head**

DRONES IN AGRICULTURE

THE TOTAL ECONOMIC IMPACT OF UNMANNED AERIAL SYSTEMS (DRONES) INTEGRATION IN NEBRASKA IS PROJECTED TO REACH \$149 MILLION BY 2025, ACCORDING TO A 2013 REPORT BY THE ASSOCIATION FOR UNMANNED VEHICLE SYSTEMS INTERNATIONAL.

There are numerous opportunities for drone use in crop production. According to Ag Technologies Nebraska Extension Educator Laura Thompson, multispectral sensors that can be mounted on drones are an exciting technology that can provide new insight into crop condition and stresses. In some cases, multispectral sensors are being used to direct site-specific nitrogen fertilizer management.

Multispectral images taken with drones show an infrared view as well as a visual spectrum view. Growers are then able to analyze this data and make decisions about crop management.

According to conservative estimates as stated by the UVSI report, annual sales of UAS for agriculture in the United States is expected to reach 160,000 units by 2025. Actual sales could be far greater.

LEFT AND CLOCKWISE: A Project SENSE applicator runs on a cooperater field. Photo taken by Richard Ferguson with a drone. Participants attend a Project SENSE field day in Filmore County in 2016. Agronomy graduate student and research technician John Parrish operates a Project SENSE system in a grower's field in Merrick County in 2017. Parrish (right) launches an eBee SQ drone during a Project SENSE demonstration Aug. 16, 2017, at the farm of Ken Seim northwest of Chapman, Nebraska.



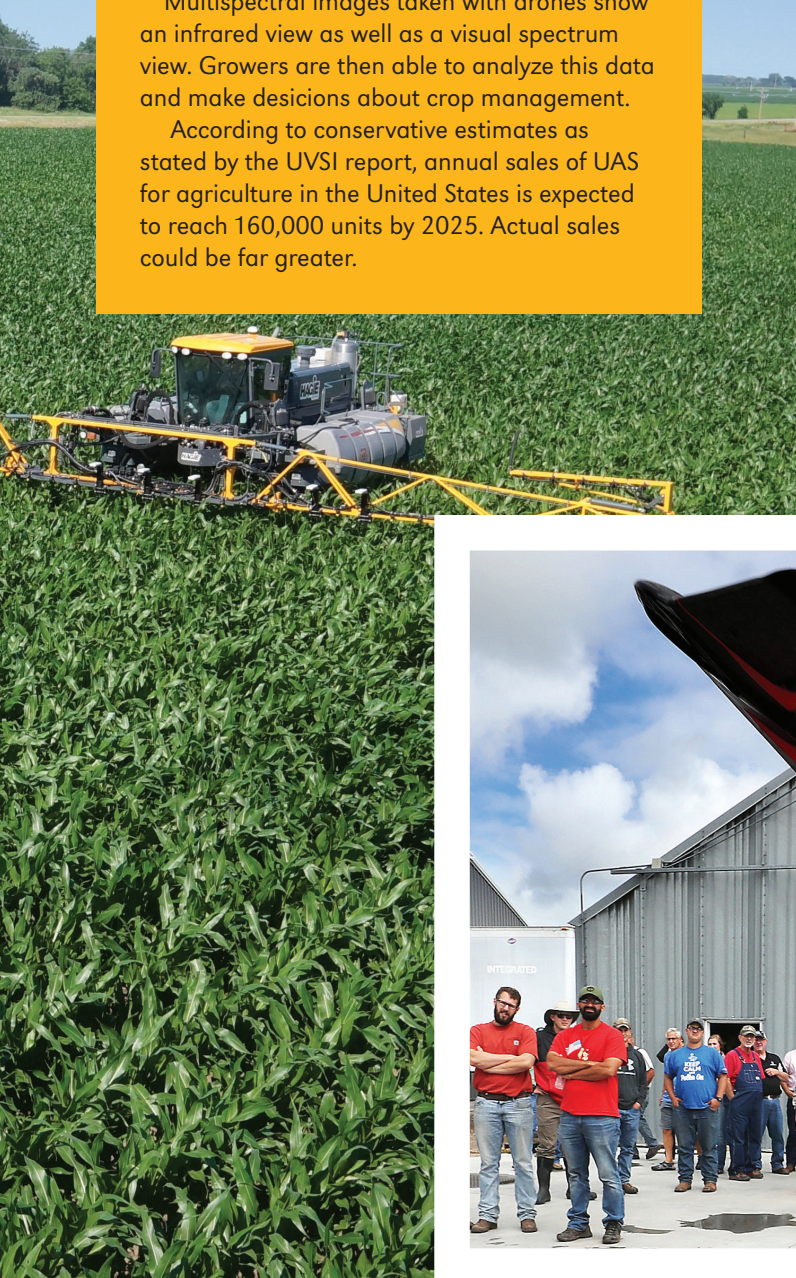
Richard Ferguson



Richard Ferguson



Barrett Stinson | Grand Island



EXPERIENTIAL LEARNING

AT NEBRASKA

INTERNSHIP EXPERIENCE FOR THE FUTURE

Applied Plant Systems

LECTURE HALLS AREN'T THE ONLY SETTING WHERE THE UNIVERSITY OF NEBRASKA IS WORKING TO PREPARE STUDENTS FOR THE CHANGING LANDSCAPE OF AGRICULTURE. Featuring hands-on research, peer interaction and science literacy, an internship program launched in the summer of 2017 takes a triangular approach to developing agriculture and natural resource professionals who are equipped to meet the future challenges of food production and the environment. Led by Weaver Professor of Agronomy and Horticulture Martha Mamo with assistance from graduate coordinator Salvador Ramirez II, an agronomy doctoral student, the Applied Plant Systems Experiential Learning Program aimed to not only provide research experience but also improve undergraduate students' systems thinking, decision making and ability to communicate with diverse audiences.

Match-Making: Research interests guide student-mentor pairings

The program paired undergraduate students from various academic



Nicholas Brozovic, director of policy at Robert B. Daugherty Water for Food Global Institute at the University of Nebraska, discusses how policies and the Natural Resource Districts influence water management in the state of Nebraska during an Applied Plant Systems Think Tank.

institutions with faculty at the University of Nebraska-Lincoln who matched their research interests. For example, Marlynn Cadena, a microbiology major at the University of Texas-El Paso, was paired with Lisa Durso, a research microbiologist with the U.S. Department of Agriculture's Agricultural Research Service. Under the guidance of Durso, who works at the USDA-ARS Agroecosystem Management Research Unit on East Campus, Cadena profiled antibiotic resistance genes in soils from Nebraska organic farms.

"I live in the desert, so experiencing Midwest farms was a new and different opportunity," Cadena said. "As a

microbiology student, this has just opened a new career path option for me."

Jackson Stansell, a student at Harvard University, investigated the impact of a rye cover crop on nitrogen efficiency in a no-till corn cropping system by using drones to capture aerial images. Stansell's research was overseen by Professor Richard Ferguson and Laura Thompson, assistant extension educator.

The program enjoyed Nebraska talent as well. Nebraska student Alyssa Converse, mentored by Associate Professor Keenan Amundsen, researched trait segregation in ornamental pearl millet populations.

CONTINUED ON PAGE 20.

Doctor of Plant Health alumnus Justin McMechan, an extension assistant professor at the Eastern Nebraska Research and Extension Center, shows Professor Don Lee and APS students Jackson Stansell (from left), Marlynn Cadena, Katja Duerig and Alyssa Converse disease symptoms in soybean during an academic, extension and government research tour at ENREC in July.

MAKING BETTER PEOPLE, WORLD

Fellowship in Integrated Agronomic Systems

FOR SOME COLLEGE STUDENTS, SUMMER BRINGS A LITTLE TIME OFF FROM CLASSES OR WORK. FOR OTHERS, IT'S AN OPPORTUNITY TO INTERN IN THEIR FIELD OF STUDY AND GAIN EXPERIENCE.

For 10 weeks this summer, seven students from around the nation were awarded an Undergraduate Research and Extension Experiential Learning Fellowship in Integrated Agronomic Systems at the University of Nebraska–Lincoln.

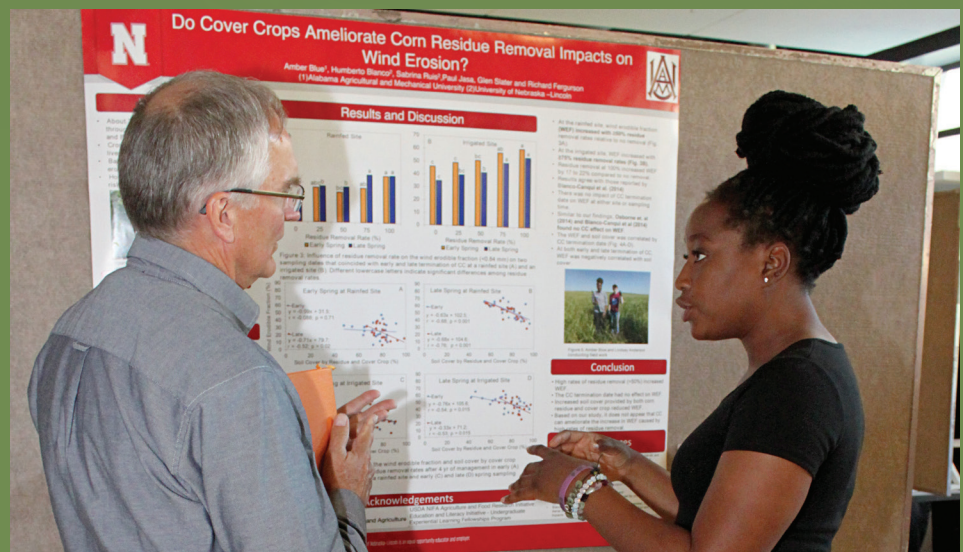
Awarded through the Department of Agronomy and Horticulture, the fellowship offered an opportunity to experience real-life agronomic career situations. The program, which finished Aug. 10, provided a unique learning opportunity for undergraduate students to work directly with faculty mentors in agronomy with expertise on corn/soybean cropping systems, cover crop/crop residue management, pasture ecology and soil management.

The fellowships were funded by a three-year grant from the U.S. Department of Agriculture NIFA AFRI Food, Agriculture, Natural Resources and Human Sciences Education and Literacy Initiative.

Having finished the second year of

the program, coordinator John Guretzky said this kind of experiential learning for undergraduate college students is beneficial not only for the students but to the agriculture industry.

CONTINUED ON PAGE 22.



Integrated Agronomic Systems student intern Amber Blue discusses her research poster on rye cover crops reducing wind erosion with Professor Roger Elmore during the poster presentations at Keim Hall on University of Nebraska–Lincoln East Campus.



ABOVE: Aaron Franssen from Syngenta shares about crop protection technology in corn with APS students during a Nebraska industry research tour in July. RIGHT: APS director Martha Mamo (from left), Archie Clutter, dean of Agricultural Research Division, and Tim Carr, interim associate vice chancellor and dean of graduate education (far right), gather with program students during the poster presentations in August at Keim Hall on East Campus.

INTERNSHIP EXPERIENCE FOR THE FUTURE, CONTINUED FROM PAGE 18.

While the research experiences alone were valuable in these undergraduate students' development as future leaders and innovators in agricultural sciences, the goal of the program is to bridge the gap between undergraduate research and understanding how that research relates to important agricultural challenges.

"I had never really thought of being a plant scientist before," Cadena said. "Now, I'm really thankful for having this opportunity—this area of plant biology is where I belong."

Connecting: Weekly think tank sessions explore relevance of research

Mamo and her team enhanced the research internship experience by creating a set of think tank sessions. The goal of the weekly sessions was to help students see how their internship research was related to current and future challenges in agriculture.

Each of the think tank sessions looked a little different. Some were outdoors; some, indoors. Some highlighted invited speakers; others depended on student participation. But all of the sessions were possible because of the wealth of talent at Nebraska.



Themes for the weekly sessions included team building and decision making, systems thinking, entrepreneurship, and science communication and literacy.

Team Building and Decision Making

The team building and decision making session was led by Gina Matkin, associate professor of agricultural leadership, education and communication, and Jenny Dauer, assistant professor of science literacy in the School of Natural Resources. After hearing from Matkin and Dauer, students were challenged to make a set of decisions using Dauer's decision making tool.

Systems Thinking

The think tank session for systems thinking took a different approach. Rather than seeking a qualified faculty member to speak about it, Mamo and her team designed a systems-thinking experience. Multiple speakers were invited to share various perspectives on water usage in Nebraska: Don Lee, a

professor in the Department of Agronomy and Horticulture who focuses on plant breeding, genetics and molecular physiology; Nicholas Brozovic, the director of policy at Robert B. Daugherty Water for Food Global Institute, whose research areas are in water resource management and policy, environmental and resource economics, and entrepreneurship; Steve Tippery, president and CEO of IntelliFarm, who provided a technical and economic perspective of water management in Nebraska by sharing the array of technology they have developed; and Brant Burkey, director of product at IntelliFarm, who shared his experiences as a producer in Nebraska.

After considering water usage in the state of Nebraska from an academic perspective, a plant physiological perspective, a policy and economic perspective, an industrial and technological perspective, and a previous farmer's perspective, students began to understand the intricacies of this system and were challenged to form connections between these diverse approaches to water usage.

Think Tank Session Tours

Some think tank sessions were tours. One such session consisted of an industry tour where students met with Nebraska alumnus Aaron Franssen, who worked in crop protection in corn and soybeans; Nebraska alumnus Sid Kment, who works with Syngenta producing hybrid seed corn; Nebraska alumnus Bend Ford, a corn hybrid breeder at the Goehner Syngenta Breeding station; and Jess Spontaksi, who also mentored a participating student, with Midwest Research Labs.

Another session was a tour of academic, extension and government research at the Eastern Nebraska Research and Extension Center. On this tour, students met with Justin McMechan, crop protection and cropping systems extension specialist; Virginia Jin, research soil scientist with the USDA-ARS; and Ramirez, who shared his research as a graduate student.

McMechan discussed the history and role of land grant universities and extension, concepts that were unfamiliar to most students, and gave students a tour of several field experiments at ENREC. Jin discussed the USDA-ARS, its research mission and specific ARS research projects at ENREC. These studies included sites that compared conservation versus conventional management effects on biofuel, grain and animal production, which prompted discussions on the challenges of a bio-based economy, how conservation management practices can enhance environmental stewardship and adaptability to climate change, and the logistic/economic challenges to producers to balance the needs of a rural economy with environmental quality and sustainable production of food, fiber and fuel.

Finally, since a goal of this summer research program was to recruit students to attend graduate school (specifically at Nebraska), Ramirez provided an overview of his graduate work characterizing the impact of three different agroecosystems on soil microbial communities before taking them to his field studies sites. This allowed students to relate experimental design and data collection to the actual data site data.

Overall, the students on the ENREC tour said they gained an appreciation of how



research is conducted in different settings as well as how their summer research related to each of these entities.

Nebraska horticulture undergraduate Converse is now interested in continuing her education.

“Based on my experiences in the program, I’ve been exposed to various research opportunities that I really enjoyed,” Converse said. “I will definitely be looking into graduate school at the University of Nebraska.”

Cadena said the whole experience opened her mind to new opportunities in plant science and graduate school or earning a doctorate from Nebraska.

“As a first-generation college student, I’m very thankful for programs like this because it has opened a whole new world for me,” she said.

Showcasing: Students share their research

Science and literacy extension, the third component of the summer program, was led by Leah Sandall, distance education coordinator, and Jennifer Keshwani, assistant professor and biomedical engineer. At the end of their internship, students shared their research experiences during a symposium where they showcased their work in poster sessions. By creating a professional outreach/extension product, students applied their research knowledge and developed their skills in communicating about science.



TOP: Virginia Jin interacts with APS students Marlynn Cadena (from left), Phoebe Hartvigsen and Alyssa Converse during an academic, extension and government research tour in July at the Eastern Nebraska Research and Extension Center near Mead. **ABOVE:** Marlynn Cadena describes her summer research to David Lambe, associate professor of practice, and APS graduate student coordinator Salvador Ramirez II in August at Keim Hall on East Campus.

The landscape of agriculture is changing. Undergraduate internships, too, must change to prepare students for the future of food production and the environment. Mamo’s blueprint for a summer research experience is a good place to start. Endeavoring to create future leaders for tomorrow’s agriculture and natural resources, she and her team will repeat the program during the summers of 2018 and 2019. —**Salvador Ramirez II, agronomy doctoral and Doctor of Plant Health student**



Integrated Agronomic Systems program interns Grace Kurtz (from left), Caroline Lancaster, Amber Blue, Ivori Schley, Lindsey Anderson, Hillary Booher and Alexa Johnson attend a picnic, sponsored by the University of Nebraska–Lincoln Summer Research Program, for all summer undergraduate fellowship program students.

Loeren Rye | Pixel Lab

**MAKING BETTER PEOPLE, WORLD,
CONTINUED FROM PAGE 19.**

According to Guretzky, who is a grassland systems ecologist, developing student skills in conducting research, communicating findings, and educating crop and livestock producers in the emerging area of integrated agronomic systems needs to be a priority.

Guretzky had a similar summer internship at the University of Minnesota as an undergraduate at Nebraska, and he said that’s what drew him to apply for the grant.

“These students are extremely talented and produce extraordinary work in a short amount of time,” Guretzky said. “They get the opportunity to interact not only with faculty mentors, but with students from other schools and backgrounds—so it’s a well-rounded experience.”

Co-principle investigators in agronomy and horticulture, Humberto Blanco, a soil scientist; Roger Elmore, an extension cropping systems specialist; and Daren Redfearn, a forage and crop residue management specialist, said they feel the same.

“This is an exceedingly rewarding experience for undergraduate students to

learn how to conduct research in the field and laboratory, develop research outputs and disseminate the findings,” Blanco said.

For some student interns from urban environments, this was their first time in the Midwest around agricultural cropping systems. Ivori Schley, an Atlanta native and North Carolina Agricultural and Technical State University undergraduate in environmental studies, had no prior knowledge of large-scale farming and irrigation before coming to Lincoln.

Mentored by Blanco, she worked with Sabrina Ruis, a postdoctoral research associate, and studied how long-term tillage affects green-house gas fluxes and related soil properties.

“I learned a lot about agronomy and soils,” Schley said. “The fellowship helped narrow my interests to plant science and sustainable growing and production.”

Goals for the interns were assigned—improve understanding of integrated agronomic systems; learn how agronomic experiments are designed; measure and analyze fundamental crop and soil variables; develop an extension case study to address a producer concern; effectively communicate extension and research

outcomes; develop networks with other students, government scientists, industry leaders, faculty and extension personnel in the field of integrated agronomic systems; and acquire specific skills necessary to apply to graduate school.

Agronomy and horticulture faculty and staff who served as research mentors or provided guidance included Blanco, Ashley Burns-Hassebrook, Elmore, Katja Koehler-Cole, Redfearn and Ruis. Michelle Howell-Smith, Nebraska Academy for Methodology, Analytics and Psychometrics, provided support to faculty with regard to assessment of project outcomes and communicated with students about their needs and program expectations.

Redfearn said the fellowship was an excellent opportunity for students to learn about extension. Except for a few students familiar with youth 4-H programs, many of the students had no prior experience with extension.

“One of the things that’s unique about this internship program at Nebraska is the opportunity to shadow a Nebraska Extension educator during a typical work day,” he said. “All the students have said that experience was very beneficial.”

Students spent a week heavily immersed in extension-related activities with Nebraska Extension educators. Some students shadowed Nathan Mueller and Jenny Rees, who work with on-farm research. They set up soil moisture sensors and did some crop scouting. Others visited a farm with Gary Lesoing and collected data from on-farm research trials. With Tyler Williams, some students had an opportunity to visit a producer who was doing cover crop research for the U.S. Department of Agriculture Natural Resources Conservation Service. They checked soil moisture sensors and Aaron Hird, with NRCS, talked to them about soil health. Another producer was dealing with damage to a large area of his pasture, and students listened and learned as Williams offered solutions.

Schley believes her chance to work with an extension educator was a valuable experience and says she would now like to work with people and, in particular, youth.

During the summer, students developed a poster presentation and CropWatch article (go.unl.edu/jas-interns18) related to their research. These articles and posters illustrated the students' ability to learn about their assigned topic and effectively communicate their findings.

The students had the opportunity to enter their poster in and attend the American Society of Agronomy annual meeting in Tampa, Florida, Oct. 22-25.

Interns and their research topics included Lindsey Anderson, University of Missouri, "Using High-Carbon Char as a Soil Amendment to Improve Soil Properties"; Amber Blue, Alabama A&M University, "Can a Rye Cover Crop Reduce Wind Erosion from Fields with Little Residue Cover?"; Hillary Booher, Purdue University, "Does Seeding Rate Affect Establishment-Year Growth and Long-term Forage Yield of Indiangrass?";

Carolina A&T State University, "Long-term Tillage and Soil CO₂ Fluxes."

Guretzky said some students would be a great fit for graduate programs at Nebraska, and the university does receive a few each year who choose to continue their education. But according to the mentors, that's not the main goal of the program or why the faculty and staff from agronomy and horticulture decide to share of their time, knowledge and experience.

"We do it because it's the right thing to do. We are making better people and a better world."
Daren Redfearn

Alexa Johnson, University of Nebraska-Lincoln, "Does Weed Control Method Impact Indiangrass Establishment and Persistence?"; Grace Kurtz, Seattle University, "Switchgrass Barriers as a Soil Water Conservation Practice"; Caroline Lancaster, Virginia Polytechnic Institute and State University, "Rain-Fed Corn Growth and Development Following Cover Crops in 2017"; and Schley, North

"We are getting students exposed to this field and bringing up the next generation of educators and researchers, working to feed everyone," Redfearn said. Echoing the mission of the department and the university, he said, "We do it because it's the right thing to do. We are making better people and a better world." —**Fran Benne, design and communications specialist**



ABOVE CLOCKWISE: Intern Grace Kurtz measures water infiltration into the soil under switchgrass hedges in July. Interns Amber Blue (left) and Lindsey Anderson harvest wheat from the center two rows in a plot to determine grain and residue yield for an experiment near Tecumseh, Nebraska. Interns Hillary Booher (front) and Alexa Johnson take soil samples in July in a research field at the Eastern Nebraska Research and Extension Center near Mead, Nebraska.

FACULTY MENTOR RWANDAN SCHOLARS

Summer internships in Nebraska provide valuable experiential learning opportunities

FOR GLORIA MWISENEZA AND OTHER RWANDAN SCHOLARS, THE SUMMER OF 2017 WAS FILLED WITH NEW OPPORTUNITIES AND HANDS-ON LEARNING ABOUT AGRONOMY AND HORTICULTURE.

"I learned techniques I hope to apply in Rwanda to develop the agriculture industry there," Mwiseneza said.

Mwiseneza is one of 105 Rwandan students who, as of Aug. 17, 2017, have received a scholarship and are currently participating in the University of Nebraska–Lincoln College of Agricultural Sciences and Natural Resources Undergraduate Scholarship Program. These students are pursuing a Bachelor of Science in Integrated Science from CASNR that is focused on conservation agriculture, entrepreneurship, leadership and innovative thinking and is aligned with areas of need identified by the Rwandan Ministry of Agriculture and Animal Resources.

During their first and second summers, scholars are paired with faculty and agricultural organizations to gain practical, hands-on experience in the lab, with production, in research, in data collection and with fieldwork.

Faculty from the Department of Agronomy and Horticulture worked with many of the scholar interns. Professor Richard Ferguson mentored Mwiseneza and Jean Claude Mbarushimana. They assisted agronomy doctoral student Leonardo Bastos at the South Central Agricultural Laboratory near Clay Center, Nebraska, with field work related to assessing ammonia volatilization losses from nitrogen fertilizer in the field and using passive and active crop canopy sensors.

"This experiential learning contributed to the choice of courses I'm now taking as well as to my career goals," Mwiseneza said.

Assistant Professor Bijesh Maharjan mentored Tonny Ruhinda and Joviale Uwase at the Panhandle Research and Extension Center in Scottsbluff, Nebraska, where Maharjan is an extension soil and nutrient management specialist. The scholar interns helped with two research projects: using high-carbon char as a soil amendment and measuring environmental nutrient losses from fertilized soils.

Maharjan said the interns were instrumental in collecting soil and gas samples. "Tonny and Joviale caught on quickly to our research, and they were a good fit with the rest of my team," he said.



Ruhinda and Uwase presented their summer experience at a poster competition sponsored by Global Engagement, CASNR and Robert B. Daugherty Water for Food Global Institute at the University of Nebraska. Their poster, which linked their work to their learning and goals for Rwanda, earned second place and a trip to the 2017 Borlaug Dialogue International Symposium Oct. 18–20 in Des Moines, Iowa.

Other faculty mentoring at the PREC included Associate Professors Carlos Urrea and Dipak Santra and Assistant Professor Nevin Lawrence.

Intern Peace Munyahna assisted Urrea with dry bean breeding activities. In the field, she learned how to lay out an experiment, prepare and plant beans and take data. She also helped install watermarks for drought/heat experiments. In the greenhouse, Munyahna learned how to make bean common mosaic inoculations and took readings (scores), and she learned how to make hybridizations.

Santra mentored Liliane Umuhiza, who assisted with planting nine commercial varieties of peas as a randomized replicated trial. Plants were collected from each plot, and she helped collect data for plant height, first pod height, number of fertile nodes, number of pods per plant, number of seeds per plant, and seed weight per plant.

Professor Stephen Baenziger mentored Precious Nyabami and Maurice Tuyishime. Working alongside Baenziger's small-grains breeding program team, they learned how to take plant height and flowering notes, how to harvest in the greenhouse and in the field, and how to process seeds.

"These are very professional, outstanding students who work hard, and they have the same concerns and goals as the American undergraduate students," Baenziger said.

Professor Martha Mamo and Sam Wortman, assistant professor, mentored Ange Agasaro, who studied the effect of a



ABOVE: Carlos Urrea, a dry edible bean breeding specialist (left), and intern Peace Munyana plant experiments at the Panhandle Research and Extension Center in Scottsbluff, Nebraska. **RIGHT:** Intern Tonny Ruhinda collects a soil sample in a field at the PREC.

mycorrhizal fungi soil inoculant on tomato growth and yield.

“I found that plants are sensitive, almost like humans, and they need a lot of attention to grow better and produce,” Agasaro said.

“This experience helped me apply what I learned in plant and soil science classes into scientific practice, improved my communication skills and helped me form professional connections,” she said. “All of this is preparing me to find solutions to the challenge of global food security and improve Rwandan agriculture.”

Mamo also mentored Elisabeth Kamikazi, who assisted with researching how livestock grazing strategies influenced nutrient recycling at the Barta Brothers Ranch in the Nebraska Sandhills.

Kamikazi said working with a team was new for her. “After this experience I feel working together with others has become easier, and I want to be someone who helps others, no matter the circumstances,” she said.

Interns at the West Central Research and Extension Center in North Platte attended several extension programs, field days and tours. Professor Jerry Volesky, former Assistant Professor Rodrigo Werle and Associate Professor Greg Kruger all mentored interns.

CONTINUED ON PAGE 26.





FACULTY MENTOR RWANDAN SCHOLARS, CONTINUED FROM PAGE 25.

Christian Dukunde and Jefferson Habanineza assisted Volesky with data collection for various annual forage trials, grazing studies and lab work, and they worked at the Barta Brothers Ranch and the Gudmundsen Sandhills Lab.

Prossy Umotoni and Jean d'Amour Ndatira worked with Werle and the WCREC Cropping Systems program with several research projects. One of the projects involved investigating the impact of cover crop species selection, planting and termination time on subsequent crop yield under irrigation and rainfed conditions. Umotoni and Ndatira presented some of the research findings from the program to local producers during a field day.

Bonheur Ndayishimiye assisted Kruger and worked on understanding the interactions that exist between different herbicides.

In their third summer, students go back to Rwanda to further develop their acquired skill set and knowledge within a local context through projects and internship opportunities.

Professor Roch Gaussoin guides the juniors, preparing them for experiential learning back in Rwanda between their junior and senior year. Scholars learn to develop a resume. Rwandan internship providers and other organizations remote-in to class to interact with the students. Later, they are connected with a diverse group of Rwandan agriculture-related companies and government agricultural agencies in areas such as food science, food safety, natural resource conservation, traditional agronomy and engineering.

"We're using all the resources here at the university that are available for any student at Nebraska," Gaussoin said. "It's really fun." For instance, scholars complete an interview exercise where they utilize the One Button Studio on campus to produce a video and then evaluate it.

Offering a great cultural interchange between students, faculty and staff, the program enriches the university community.

"They are certainly a group of extremely committed students," Gaussoin said. "They're engaged and dedicated to helping Rwanda and feel agriculture offers a great opportunity for an impactful, rewarding profession that supports their love for their country."

CASNR expects to host up to 200 Rwandan undergraduate students over the next eight years. Upon completion of the program, participants return to Rwanda and fulfill a five-year commitment to serve in critical areas across research, extension and training. With the support of key stakeholders and the university, these students are well positioned to advance agriculture in Rwanda. —**Fran Benne, design and communications specialist**



TOP: Intern Joviale Uwase records the soil temperature in a field at the Panhandle Research and Extension Center in Scottsbluff, Nebraska. **MIDDLE:** Interns Gloria Mwiseneza (left) and Jean Claude Mbarushimana (right) assist agronomy doctoral student Leonardo Bastos (center) at the South Central Agricultural Laboratory near Clay Center, Nebraska. **LEFT:** Intern Liliane Umuhoza (left) presents her experiential learning poster titled "Analysis of Agronomic Traits of Pea Varieties" at a poster competition sponsored by Global Engagement, CASNR and Robert B. Daugherty Water for Food Global Institute at the University of Nebraska.

Morgan Spiels | Daugherty Water for Food Global Institute



SCIENTIFIC WRITING

A move to improve student communication skills

A RECURRING TOPIC AT THE ANNUAL FACULTY TEACHING RETREAT HAS BEEN THE NEED TO INCREASE STUDENT EXPOSURE TO WRITING EXERCISES WITH THE GOAL OF BOLSTERING STUDENT COMMUNICATION SKILLS.

Brian Waters, associate professor of agronomy and horticulture, heard the call and is making some moves to assist his fellow instructors and University of Nebraska–Lincoln students in achieving this goal.

Waters' first move was partially shifting his research emphasis to Discipline-Based Education Research, which focuses on scientifically studying the most effective methods for teaching and learning. In DBER, Waters' focus is on "writing to learn" which will lead to effective strategies for designing writing activities or assignments that simultaneously improve communication skills and cover discipline-specific course content.

Based on this research he has consulted faculty on how to design classroom writing assignments and evaluation methods.

The second move by Waters was to open the Scientific Writing Help Desk — a facility where students can seek help with writing-related assignments. The help desk began in a newly renovated space in Plant Sciences Hall in August 2017. This space provides a learning environment where students can come to write, discuss writing topics, or meet tutors and consultants for help with assignments or papers.

One of the first courses to take full advantage of the help desk was Agronomy/Horticulture 131 Plant Science. Waters and plant science instructors Professor Don Lee, Associate Professor David Holding, Distance Education Specialist Robert Vavala and Professor of Practice Anne Streich hope that introducing writing in this introductory-level course will set the foundation for more advanced writing in future courses. Waters also teaches the senior and graduate-level course Agronomy/Horticulture 403/803 Scientific Writing and Communication.

Brian Waters (left) and undergraduate student assistant Karynn Brown (right) help Ryan Ochsner, an undergraduate agronomy student, with a lab report at the newly constructed Scientific Writing Help Desk in Room 385, Plant Sciences Hall.

He has added weekly workshops for students, postdocs and faculty who want to attend. Most weeks, he holds Sit Down and Write sessions where participants set goals and write together in a social environment for periods of time. At the end, there is a group discussion about their writing. He also holds professional skills workshops such as career development planning and marketing for scientists.

Students and faculty can find Waters each day at the Scientific Writing Help Desk in Room 385, Plant Sciences Hall, where his office has been relocated, or contact him at bwaters2@unl.edu.

—Brian Waters, associate professor, plant breeding, genetics and molecular physiology



Peppers grow in the bioplastic mulch at the IANR Panhandle Research and Extension Center in Scottsbluff. LEFT: Research technologist Tomie Galusha and graduate student Ben Samuelson use a bed shaper/mulch layer to apply experimental fabric biomulch by 3M in the pepper fields at PHREC. ABOVE: Peppers grow in biomulch at the University of Nebraska–Lincoln East Campus horticulture research plots.



Sam Wortman

BIOMULCHES WITH SOIL AMENDMENT

a potentially sustainable alternative

DRIVEN BY CONSUMER DEMAND FOR FRESH, LOCAL PRODUCE, THE NUMBER OF FRUIT AND VEGETABLE GROWERS IN NEBRASKA HAS INCREASED SEVEN-FOLD OVER THE LAST DECADE. In the Midwest, vegetable growers often rely on plastic mulch film to warm spring soils, control weeds and conserve soil moisture. Unfortunately, annual removal and disposal of plastic films is an economic and environmental nuisance.

Bio-based and biodegradable mulches, or biomulches, are a potentially sustainable alternative because they can be composted or tilled into the soil at the end of the season to be decomposed

by microbes. However, many of these biomulch products are slow to degrade, and the residues can accumulate in soil over time. Funded by a recent USDA National Institute of Food and Agriculture grant, Sam Wortman and Rhae Drijber in the Department of Agronomy and Horticulture are studying possible soil amendments and microbial inoculants that could speed the degradation of biomulch in soil.

Developing alternatives to plastic mulch film has been a popular space for agricultural innovation over the past decade. Building on this as a case study,

Wortman used project funding to develop a new class, Agronomy/Horticulture 375 Innovations for Agriculture, in the College of Agriculture and Natural Resources. Wortman hopes the class, offered for the first time in the fall of 2017, equips students with the critical thinking and product design skills necessary to become the next innovators in our food system. As a final project, students use resources at the Nebraska Innovation Studio to research, develop, prototype, test and pitch an innovation of their own creation. —Sam Wortman, assistant professor of environmental horticulture



LEFT TO RIGHT: Early, on-time and late planted wheat at the High Plains Ag Laboratory near Sidney, Nebraska, in the fall of 2016.

Updating recommendations for winter wheat

NEBRASKA WINTER WHEAT ACRES MIGHT NOT BE WHAT THEY WERE WHEN THEY PEAKED IN THE EARLY 1980S, BUT WITH OVER A MILLION ACRES PLANTED ANNUALLY, WHEAT HAS AN IMPORTANT PLACE IN MOST CROPPING SYSTEMS IN THE WESTERN PART OF THE STATE. The benefits of wheat include enhanced water utilization, weed suppression, reduced soil erosion and residue that conserves soil moisture and increases soil organic matter. Despite the many benefits wheat offers, recently producers have had a hard time justifying growing wheat because of the low prices.



Cody Creech

Current research conducted in western Nebraska aims to identify ways to increase wheat yields and the profitability of wheat producers. Research is being conducted on residue management to increase the persistence of wheat residue, gibberellic acid as a seed treatment or foliar spray to enhance establishment and yield, and planting decisions to maximize yield potential.

The research that will have the most immediate impact is evaluating planting dates, seeding rates and row spacing. The current recommendation for wheat planting dates was developed in the early 1960s. Since then, production practices have changed, varieties are more advanced and the climate is different.

The goal of this research is to update the planting date recommendations and link that with the ideal seeding rate to achieve optimal yields. It is envisioned that the project will lead to updated recommendations in time for the 2018 planting season.

Upon completion of these projects, work will continue on a limited basis to further validate the recommendations while the focus shifts to wheat fertility recommendations, which have not

been updated in over 20 years. Providing wheat producers with this updated information will help them get the most out of their wheat crop and ultimately increase profitability. —Cody F. Creech, assistant professor, dryland cropping systems specialist, Panhandle Research and Extension Center

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Integrated PRODUCTION SYSTEMS

OF THE NEARLY 49,500,000 TOTAL LAND ACRES THAT IS NEBRASKA, ONE HALF IS MANAGED AS RANGELAND, PASTURE AND FORAGE PRODUCTION WITH 50 PERCENT MANAGED AS CROP PRODUCTION.

Together, these support the state's beef cattle industry and produce food, feed and fuel. Coupled with this is a need to increase efficiency of resource utilization by livestock, improve grazing and harvest management of crop residues and enhance soil health to ensure economic viability for all sectors of Nebraska's agricultural industry.

Daren Redfearn is a member of a multidisciplinary team focused on enhancing and developing forage-based beef production systems. His efforts focus on developing, analyzing and implementing integrated crop-forage-livestock systems. His program emphasizes improvement of management, production and utilization strategies of annual forage cover crops that are double-cropped following row crops.


He is also involved in evaluating the influence of crop residue management systems on forage cover crop establishment and creation of unique crop residue management systems that facilitate use of annual forage cover crops. His extension program focus areas are enhancing the use of crop residues and annual forage cover

crops into existing beef production systems and implementing economical crop residue harvest and grazing methods.

Across much of the Great Plains, there is increasing competition for land use. This conflict has concentrated ruminant livestock production near the grassland resources, which are often separated from areas of concentrated crop production. Increased specialization in management has reduced the number of integrated crop-forage-livestock systems that were once common in the Corn Belt.

Although the number of acres is small, the possibility to provide consistent grazing capacity of high-quality forages on cropland is reasonably straightforward following wheat, hybrid seed corn and corn silage production. Challenges remain for systematically integrating livestock into corn and soybean cropping systems.

Key findings include the following: Forage yield and nutritive value for fall-planted forage cover crops can be substantial. Changes in yield and nutritive value over winter can be negligible for fall-grown small grains regardless of cropping system. Delayed fall planting reduces fall growth potential, and these effects also carry over into the spring. —**Daren Redfearn, associate professor, extension forage and crop residue management specialist**



Associate Professor Daren Redfearn stands in an oat field at the University of Nebraska–Lincoln Havelock Research Farm. Redfearn is studying oats, which are fast growing and have a high forage quality, as a cover crop.



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Postdoc discovers rich soils, researches cropping system diversity in Nebraska

GROWING UP ON A DAIRY FARM, I BECAME INTRIGUED BY HOW FARMING IS SHAPED BY GEOGRAPHY, POLITICS AND CONSUMER DEMAND. In my home state of Thuringia, Germany, farms were larger (relative to the rest of Germany), a remnant from the communal farming operations of communist East Germany. Most land was in small grains or pasture. I attended Hohenheim University in southwest Germany near Stuttgart, an area known for its vineyards, orchards and vegetable farms. Farms were more diverse but much smaller, usually less than 50 hectares, than what I was used to at 500 acres.

When I first came to the Midwest, I was struck by two things: First, how beautiful and rich the soils were. Coming from a place where people have been farming for 500-plus years, I was amazed to see these dark, deep prairie soils. The second thing that struck me was how little cropping system diversity there is in the Midwest. Kilometer after kilometer of just corn and soybeans basically cover an area the size of Europe!

“MY GOAL IS TO LEARN WHERE, WHEN AND HOW TO INCREASE THE DIVERSITY OF OUR MIDWEST CROPPING SYSTEMS WITH COVER CROPS.” KATJA KOEHLER-COLE

During my graduate studies in the School of Natural Resources, I learned how farming only two crops has serious ecological consequences for soils and ecosystems. In my research, I focused on how to improve ecosystem service provision in a corn-soybean-wheat rotation by including undersown legumes. The main thing I took away from my research was that adding diversity back into the system has many benefits, but it also comes with many unknowns.

When I started as a postdoc in the Department of Agronomy and Horticulture, I was excited about the opportunity to work with cover crops in corn-soybean systems and turn some of the “unknowns” into actual knowledge. My goal is to learn where, when and how to increase the diversity of our Midwest cropping systems with cover crops so that we can maintain our precious soils for the next 300 years of farming.



Outside of work, I mostly spend time with my family, which includes four daughters from preschool to high school age. We are suburbanites, but I try to keep the kids connected to their farm roots by growing a backyard garden with lots of veggies and fruit. I do most of the work; they do most of the eating!

—Katja Koehler-Cole, postdoctoral research associate

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FACULTY AWARDS 2017

P. Stephen Baenziger: Prem S. Paul Innovator of the Year Award

Tom Clemente: Crop Science Society of America Crop Science Research Award

Roger Elmore: CSSA Fellow, American Society of Agronomy Agronomic Education and Extension Award

Richard Ferguson: Fertilizer Industry Roundtable Recognition Award: Innovative Technologies Advancing the Fertilizer Industry

Charles Francis: North American Colleges and Teachers of Agriculture Educator Award, Center for Rural Affairs' Seventh Generation Award

John Guretzky: *ASA Agronomy Journal* Outstanding Associate Editor

Amit Jhala: Weed Science Society of America Early Career Outstanding Weed Scientist Award, North Central Weed Science Society Distinguished Achievement Outstanding Young Weed Scientist Award

David Lambe: Inaugural University of Nebraska-Lincoln Entrepreneurship Fellowship Program Fellow, UNL Teaching Council and Parents Association Certificate of Recognition for Contribution to Students

Donald Lee: UNL Teaching Council and Parents Association Certificate of Recognition for Contribution to Students

Dennis McCallister: UNL Teaching Council and Parents Association Certificate of Recognition for Contribution to Students

Martha Mamo: Soil Science Society of America Soil Science Education and Extension Award

Jeffrey Mower: UNL Teaching Council and Parents Association Certificate of Recognition for Contribution to Students

Leah Sandall: ASA Extension Educational Materials Program Certificate of Excellence for Posters, Junior Faculty Holling Family Award for Teaching Excellence

Daniel Schachtman: American Society of Plant Biologists Fellow

James Schnable: Agricultural Research Division of the Institute of Agriculture and Natural Resources Junior Faculty Award for Excellence in Research

Brandi Sigmon: UNL Teaching Council and Parents Association Certificate of Recognition for Contribution to Students

Mitchell Stephenson: Innovative Extension New Employee Award

Richard Sutton: American Society of Landscape Architects Honor Award for Research

Kim Todd: UNL Teaching Council and Parents Association Certificate of Recognition for Contribution to Students

Dirac Twidwell: ARD of IANR Junior Faculty Award for Excellence in Research

Jerry Volesky: Society for Range Management Fellow Award

Sam Wortman: *Journal of Environmental Quality* Best Paper – Reviews & Analyses

POSTDOCS

Katja Koehler-Cole: Second-place Soil Health Conference Poster

Debalin Sarangi: WSSA Annual Meeting Outstanding Photography Award, University of Nebraska-Lincoln Fall Research Fair Outstanding Science Slam Talk Award – Postdoc Edition

EMERITI

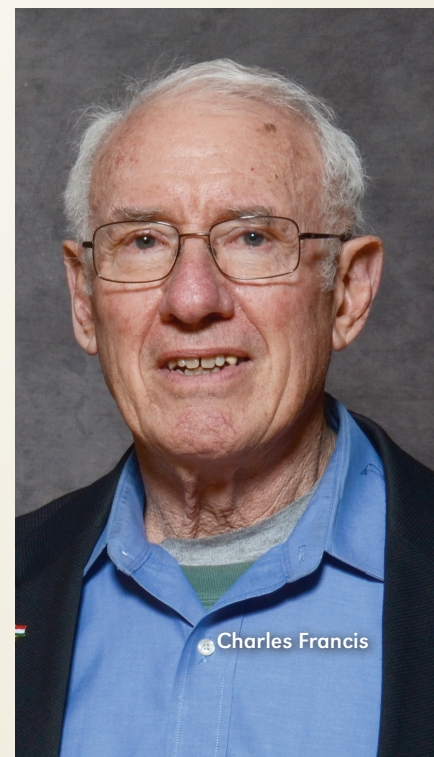
Kenneth Cassman: Swedish Academy of Sciences Bertebos Prize



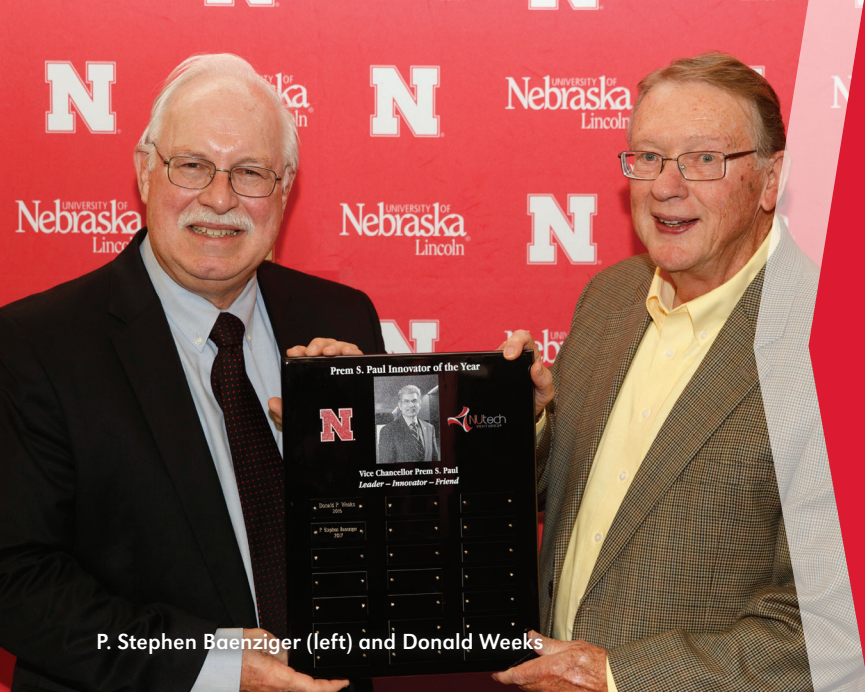
Jerry Volesky



James Schnable (from left), Archie Clutter and Dirac Twidwell



Charles Francis



P. Stephen Baenziger (left) and Donald Weeks

PROFESSOR P. STEPHEN BAENZIGER, WHEAT GROWERS PRESIDENTIAL CHAIR, WAS PRESENTED WITH THE PREM S. PAUL INNOVATOR OF THE YEAR AWARD DURING THE NUTECH VENTURES 2017 INNOVATOR CELEBRATION NOV. 9 AT NEBRASKA INNOVATION CAMPUS.

The award recognizes an individual who exemplifies innovation and entrepreneurship by advancing novel research into significant commercial utilization.

Baenziger's long and distinguished career and leading-edge program in wheat and small grain breeding and germplasm development has resulted in numerous wheat, barley and triticale varieties. Many wheat varieties seen across Nebraska were developed at the University of Nebraska.

LEAH SANDALL, ASSISTANT PROFESSOR OF PRACTICE AND DISTANCE EDUCATION COORDINATOR, WAS PRESENTED WITH A JUNIOR FACULTY TEACHING EXCELLENCE AWARD ON TUESDAY, MARCH 14, 2017.

The Holling Family Awards for Teaching Excellence honors outstanding teaching in the Institute of Agriculture and Natural Resources.

Sandall is known to use the full scope of teaching and engagement that is possible for the online learner. Her online learning environment design blends video, animation, visuals, presentation, reading and instant feedback quizzing to keep the learner in an active role, underpinned by the learning outcomes.



Roch Gaussoin (left) and Leah Sandall

PROFESSOR ROGER ELMORE, HEUERMANN CHAIR, NEBRASKA EXTENSION CROPPING SYSTEMS SPECIALIST AND DAUGHERTY WATER FOR FOOD GLOBAL INSTITUTE FACULTY FELLOW, WAS NAMED A CROP SCIENCE SOCIETY OF AMERICA FELLOW IN 2017. This is the highest recognition bestowed by the CSSA. Elmore has spent his entire career addressing agronomic issues relevant to the immediate needs of crop producers. He provides research information that is science-based, timely and relevant to a diverse audience.

ELMORE HAS ALSO BEEN AWARDED THE AMERICAN SOCIETY OF AGRONOMY AGRONOMIC EDUCATION AND EXTENSION AWARD. This award recognizes excellence in education and/or extension and the educational innovations and unique approaches developed and used successfully to encourage learning.



Roger Elmore

NEW FACULTY HIRES



Andrea Basche

Assistant Professor

ANDREA BASCHE JOINED THE DEPARTMENT DEC. 1 AS AN ASSISTANT PROFESSOR IN CROPPING SYSTEMS. She is teaching two undergraduate courses in crop management and researching opportunities for Nebraska cropping systems to remain productive and profitable into the future.

Basche was born and raised in southern New Jersey, a few miles from the Jersey shore.

She earned a Bachelor of Science degree from Fordham University in biological sciences, a master's degree from Columbia University in applied climate science and a doctorate in crop production and sustainable agriculture from Iowa State University.

Basche has studied and worked on agriculture and environment issues in New York City, Washington D.C. and Iowa, but she is thrilled now to be in Lincoln.

Nebraska was an attractive opportunity for Basche to share her experiences with students who will become the next generation of agricultural decision-makers in the state. Nebraska is also an agriculturally diverse state, and she is eager to contribute to the exciting work within the department.

Basche is exploring partnerships with ongoing research within the department to apply her expertise in agricultural systems modeling and data synthesis.

She has been an avid runner all of her adult life and more recently began road bicycling. In 2015, she rode RAGBRAI (the large annual bicycle ride across Iowa) with her partner Aaron, a Nebraska native, and they plan to find more outdoor adventures and endurance activities in the future.



Juan Ignacio Rattalino Edreira

Research Assistant Professor

JUAN RATTALINO GREW UP ON A CROP AND LIVESTOCK FARM IN THE ARGENTINEAN PAMPAS. He joined the Department of Agronomy and Horticulture Jan. 9, 2016, as a postdoctoral researcher and became a research assistant professor June 1, 2017.

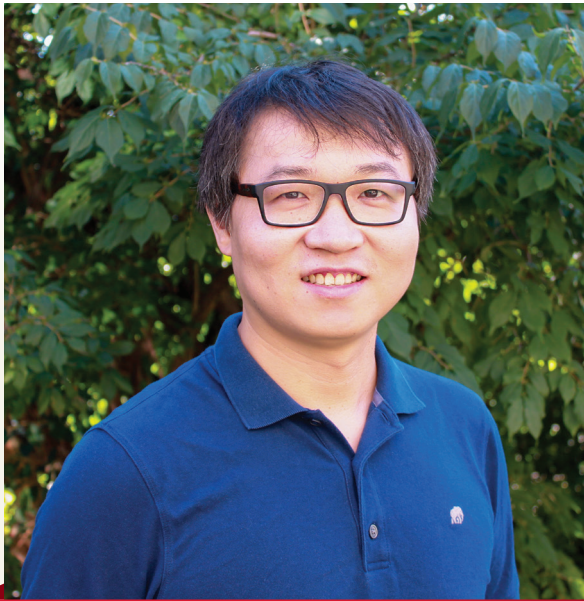
He came to the University of Nebraska–Lincoln from Monsanto, Argentina, where he worked for three years as the TD Corn System & Agronomic Practice Supervisor for Latin America (Argentina, Paraguay, Chile, Uruguay.)

He earned a bachelor's degree in agronomy with high distinction and a doctorate in agronomy from the University of Buenos Aires.

Rattalino's expertise is in crop physiology, resource use-efficiency, cropping systems, management practice recommendations and yield gap analysis.

His passion for new challenges and eagerness to learn brought him to Nebraska. He is currently working on yield gap estimation for the Global Yield Gap and Water Productivity Atlas (www.yieldgap.org), identification of causes for yield gaps in U.S. soybean based on producer self-assessment data, and yield forecasts for corn in the U.S. Corn Belt.

Rattalino is a sports enthusiast. He also enjoys traveling and spending time with his wife, Agostina, and daughter, Antonia.



Jinliang Yang

Assistant Professor

JINLIANG YANG COMES FROM HEBEI PROVINCE OF CHINA. He received his doctorate in genetics in 2014 from Iowa State University. His doctoral research focused on dissecting the genetic components controlling phenotypic variations in maize using genome-wide association studies. Jinliang conducted his postdoctoral research in the Department of Plant Sciences at the University of California, Davis, where he worked on population genetics and epigenetics of maize and its wild ancestor, teosinte.

He joined the Department of Agronomy and Horticulture faculty at the University of Nebraska-Lincoln on July 1, 2017, as an assistant professor in plant quantitative and statistical genomics.

His current research focuses on bridging the gap between genotypes and phenotypes. At a broader scale, he is keen to integrate various large-scale biological datasets, such as phenomics, genomics, transcriptomics, methylomics data and functional annotations to boost the power of genome-wide association study and genomic selection.

In his spare time, Yang enjoys spending time with his family, such as playing games with his lovely daughter, exploring different types of food together and traveling around the country.

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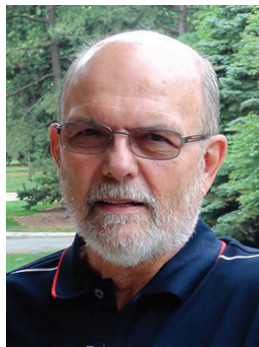
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RETIREMENTS

STEPHEN MASON — 33 YEARS



STEPHEN MASON RETIRED SEPT. 5, 2017, AFTER 33 YEARS AT THE UNIVERSITY OF NEBRASKA—LINCOLN. Mason began his career in the department in 1984 as an assistant professor in crop production and management with a 75 percent teaching and 25 percent research appointment. He was moved to a 50/50 appointment in the early 1990s and promoted to full professor in 1994.

Mason was involved with instruction of all undergraduate grain crop production courses at Nebraska including Agronomy 132 Plant Science Laboratory (plant level), Agronomy 204 Resource Efficient Crop Management (field level) and Agronomy 405 Crop Management Strategies (farm level) and co-led CASNR/Education Study Tours to Argentina.

He was the principal investigator for the INTSORMIL Collaborative Research Support Program from 1986 to 2007 and regional coordinator for INTSORMIL Central America Program for seven years. He was a member of a four-year research project in Burkina Faso and served as the IANR point person for collaboration with the University of Zagreb in Croatia for numerous years.

Mason's research at Nebraska focused on production practice and environment effects on grain quality of maize and grain sorghum, dryland production practices for maize and grain sorghum including plant population and planting date, yield component analysis, grain sorghum/soybean rotation, production practices for pearl millet as an alternate grain crop as well as international research in Africa and Latin America.

He has received numerous honors and awards including CASNR and university undergraduate teaching and advising awards, the Nelson Outstanding Graduate Student Advising Award and outstanding teaching awards from the American Society of Agronomy and Crop Science Society of America. He also was named a Fellow of the ASA, CSSA and National American Colleges and Teachers of Agriculture.

DENNIS MCCALLISTER — 37 YEARS



DENNIS MCCALLISTER RETIRED JULY 31, 2017, AFTER 37 YEARS AT THE UNIVERSITY OF NEBRASKA—LINCOLN. The professor of soil science began his career in the department in 1980 in a teaching and research appointment. He was promoted to full professor in 2003.

During most of his time at Nebraska, McCallister was involved with instruction in Agronomy 153 Soil Resources, in which he

was responsible for introducing thousands of students to the study of soils. He was also responsible for Agronomy 455/855 Soil Chemistry and Mineralogy. More recently, he developed Agronomy 453 Urban Soil Properties and Management and cooperated in the agronomy majors' careers course Agronomy 201 Agronomic Internship and Career Preparation.

McCallister's research activities included reactions of soil minerals and their contribution to plant nutrient availability, phosphorus availability as affected by crop rotation and biosolids management, phosphorus dynamics in sandy soils, soil impacts of concrete grinding residue and physical stability of green roof growth media. He has also been involved in research related to innovative instructional methods.

He served as teaching coordinator in the department from 2005 until his retirement.

McCallister earned his doctorate in soil science from Texas A&M University. He was honored with the Distinguished Teaching Award and the Russel K. Crowe Outstanding Undergraduate Advising Award from Nebraska. He was also recognized as a Teacher Scholar by the North American Colleges and Teachers of Agriculture.

ALEX PAVLISTA — 29 YEARS



ALEX PAVLISTA RETIRED MARCH 31, 2017, AFTER 29 YEARS AT THE UNIVERSITY OF NEBRASKA PANHANDLE RESEARCH AND EXTENSION CENTER IN SCOTTSBLUFF. A Nebraska

Extension specialist and professor in the Department of Agronomy and Horticulture, Pavlista was the university's lead potato expert.

Born in Praha, Czechoslovakia, he left the country in 1948 and migrated to the United States. Growing up in New York City, he attended Manhattan College, where he received a bachelor's degree in biology with minors in chemistry and theology.

He received a doctorate in plant physiology at City University of New York after two years at Oak Ridge National Laboratory as a National Institute of Health research trainee.

In 1988 Pavlista was hired as the potato specialist and crop physiologist at the PREC. At the center, Pavlista developed connections to the potato industry on the local, state and national levels.

In 2004 Pavlista and his wife, Victoria, hosted the Potato Association of America meeting in Scottsbluff, and in 2008 he served as PAA president. In 2015 he was awarded an Honorary Life Membership in PAA.

A collection of his research has been published online as the Potato Education Guide, a comprehensive, practical guide on potato varieties; soil management; insect, disease and weed management; irrigation; physiological disorders; and production practices.



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NEBRASKA FARMER



IN 2004, WHILE YET AN UNDERGRAD AT THE UNIVERSITY OF NEBRASKA—LINCOLN, RYAN PEKAREK STARTED PEKAREK'S PRODUCE AND PLANTED HIS FIRST CROP ON THE FAMILY FARM NEAR DWIGHT. "At about one-half acre, it was really an overzealous home garden," he said. Despite this early foray into farming, when Pekarek finished his bachelor's degree in horticulture at Nebraska in the spring of 2006, he didn't plan on being a farmer.

PH.D. PLANS

Pekarek figured he'd probably end up with a Ph.D. at a university somewhere. To that end, Professor Emeritus of Horticulture Jay Fitzgerald, Pekarek's adviser, encouraged him to get out of state and go see something else, as did Professor Emeritus Gerald Horst. And so Pekarek and his wife Katie, who earned a degree in biological systems engineering from Nebraska, set out for graduate school at North Carolina State University.

Two years later, the Pekareks left Raleigh, North Carolina, with a pair of master's degrees. Upon finishing his M.S. in weed control in vegetable crops, though, Pekarek was ready to be done with school. He knew he didn't want to work in industry, and he realized that there could be a lot of politics involved

with academic pursuits. "It was Ph.D. or posthole digger, and I picked posthole digger," he said.

A BIG SMALL FARM

Pekarek, who began farming full-time with only vegetable crops in 2009, currently grows row crops (corn and soybeans) in addition to about 50 varieties of vegetables. Among vegetable farmers in Nebraska, he said, "We're probably one of the smallest of the larger veg operations."

During the 2017 planting season, Pekarek's Produce had about 15 acres in vegetable production along with another quarter-acre under plastic (a greenhouse and five high tunnels). That's a 2,950 percent increase from the first crop just 13 years ago! Not bad for a first-generation vegetable farmer in his 30s.

"You start this because you like farming, and then if you're good at it, you do less and less as you get bigger and bigger. I get to farm on Sunday morning by myself, and then the rest of the week I'm managing people, making phone calls, or selling, going for parts, or fixing this or that," Pekarek said.

Even while Pekarek acknowledged that he's one of the biggest small vegetable growers in the state, he said his operation is absolutely small when compared to

growers on the coasts. "Everybody that does this in Nebraska is small. Even the couple growers that are big are really tiny on the national scale. We're all just different versions of small, whether we've got two acres or 200," he said.

OUT OF THE FIELD AND ONTO LOCAL TABLES

For Pekarek, who doesn't have a background in business or marketing, the hard part of his operation is getting the produce into the hands of consumers. "It's easy to grow this stuff; it's hard to sell it," he said. "Growing it is the easy, fun part. Getting it sold will turn your hair white."

Since the beginning, farmers' markets in Seward and Lincoln have provided a means to sell his colorful harvests to people who value the home-grown goodness of local produce. One such shopper, Professor Paul Read, under whom Pekarek did his honors thesis at Nebraska, said, "He is one of the most impressive vendors at various farmers' markets, including the Haymarket Farmers' Market."

More recently, Pekarek's Produce has generated income through community supported agriculture programs. Summer CSA subscribers prepay a flat fee in the early spring and then pick up boxes



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ABOVE CLOCKWISE: Ryan Pekarek, owner and operator of Pekarek's Produce, hangs with the aptly named family dog, Tater, on his vegetable farm near Dwight, Nebraska. Pekarek harvests carrots from his field. Ryan and wife Katie Pekarek have four children: Michael (7), Jacob (10), Margret (8) and Lukas (3 months). Beyond being a busy mom, Katie manages the CSA programs, does bookwork, and fills in for the field crews. She's also an associate extension educator in the School of Natural Resources at the University of Nebraska–Lincoln. Fresh-picked green peppers sit in a crate waiting to be washed. Unable to compete with corporate growers in California, Texas and Mexico, Pekarek's Produce capitalizes on the value of locally sourced produce.

of farmer-selected produce for 18 weeks from June to early October. A fall CSA is also available for subscribers wanting to extend produce boxes into November and December.

In addition, Pekarek's Produce does wholesale sales to grocery stores such as Super-Saver and HyVee and some restaurants in Omaha and Lincoln through Lone Tree Foods, which handles sales and transportation for 20 to 30 small farms. "If we cut something on Monday, it's in the stores on Wednesday," he said.

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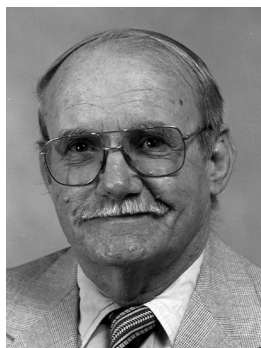
Pekarek continually works with faculty at the Department of Agronomy and Horticulture. For example, Pekarek's Produce was the industry partner for the 2013–14 strawberry grant led by Professor Ellen Papanozzi, and Pekarek frequently makes his farm available for field trips and Sustainable Agriculture Research and Education tours. Pekarek also consults with Dave Lambe, associate professor of practice, and Stacy Adams, associate professor of practice, when he needs to figure something out, and he has been a guest speaker for a class taught by Assistant Professor Sam Wortman. While he chose not to seek a Ph.D., Pekarek is clearly doing much more than digging postholes.

—Chantel Koerwitz, contributor

IN REMEMBRANCE

JAY B. FITZGERALD

January 28, 1942 – August 17, 2017



PROFESSOR EMERITUS JAY B. FITZGERALD, AGE 75, DIED AUG.

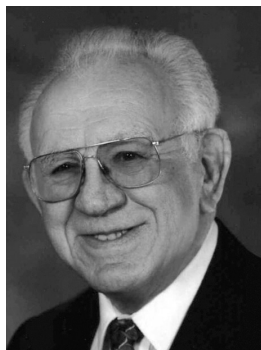
17, 2017. Fitzgerald grew up in Palo Pinto, Texas. He earned a Bachelor of Science degree in 1965 and Master of Science degree in 1969 from Texas Tech University and a doctorate in 1976 from Texas A&M University. He served three tours of duty as a quartermaster in the U.S. Navy from 1968 to 1971.

In 1980, Fitzgerald came to Nebraska, where he remained until his retirement. He specialized in ornamental horticulture, landscape ecology and design, greenhouse design and cut flower production. He was the statewide floriculturist and a frequent guest on *Backyard Farmer*.

Fitzgerald was honored with the University of Nebraska Teaching Council/Parents Association Outstanding Service to Students award numerous times. He was given the Chancellors Award for Exemplary Service to Students in 1999 and the L.K. Crowe Award for Outstanding Advising in 1985. He was awarded Emeritus Great Plains Fellow: Agronomy and Horticulture. He received the Nebraska Florist Society Award for Leadership and Service in 1986 and the Nebraska Certified Nurseryman of the Year in 1989. In 1999, he was given the Nebraska Association of Nursery and Landscape Award Lifetime Membership Award for Exemplary Industry Service. He started the Nebraska FFA greenhouse program and received the FFA Distinguished Service Award for the State of Nebraska in 2005. In 2006, Fitzgerald was honored with the Nebraska Statewide Arboretum Commendation Award in recognition of his significant contributions to landscape horticulture, plant conservation and education efforts in Nebraska.

ALBERT DALE FLOWERDAY

June 14, 1927 – June 10, 2017



PROFESSOR ALBERT DALE FLOWERDAY, AGE 89, DIED JUNE 10,

2017. Flowerday was a University of Nebraska alumnus, and he worked at the university for 27 years, more than half with the Department of Agronomy. He earned a Bachelor of Science degree in 1950, a Master of Science degree in 1951 and a doctorate with an agronomy focus in 1958—all from Nebraska.

He served in the U.S. Army during the Korean War before becoming an agronomist and first superintendent with the Northeast Experiment Station at Concord, Nebraska, in 1956. From 1964 to 1967, Flowerday led

agronomy extension and out-state testing activities. He accepted a position as deputy director of the university's mission to Colombia in 1967, and he was named vice chair of agronomy in 1969. In 1971, he became an associate professor of agronomy with teaching and research responsibilities, and he was promoted to full professor in 1973.

Flowerday's research areas included irrigation, soybean yields, water use and simulated hail damage at what is today the Eastern Nebraska Research and Extension Center near Mead, Nebraska.

In 1983, Flowerday retired from the university to become an agronomy manager with Pioneer Hi-Bred International.

He received numerous honors during his Nebraska career, including the UNL Student Foundation Builders Award for Teaching; the university's Distinguished Teaching Award in science and technology; and the Outstanding Teaching Award from the Nebraska chapter of Gamma Sigma Delta. Flowerday was named to the Northeast Nebraska Agriculture Hall of Fame in 1987 and the Nebraska Hall of Agricultural Achievement in 2000. He also received the Nebraska Cooperative Extension Association Meritorious Service Award in 2001.

EDWIN J. PENAS

January 16, 1935 – December 18, 2017



ASSOCIATE PROFESSOR EMERITUS EDWIN J. PENAS, AGE 82, DIED

DEC. 18, 2017. Penas was a Nebraska Extension soil specialist for the University of Nebraska-Lincoln until he retired in 1994.

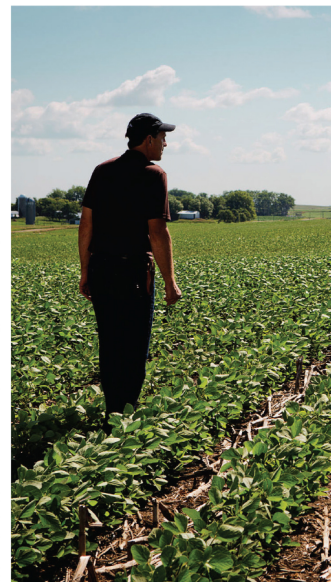
An Ord native, Penas spent his entire academic and professional career at Nebraska. In 1957, he received his bachelor's degree in animal husbandry. After graduation, he was a county extension agent for six years. In 1963 he moved to Lincoln and became an assistant extension agriculturist with the job of encouraging fertilizer use through on-farm demonstrations and associated fertilizer trials. He completed his master's degree in agronomy in 1967. In 1970, he was promoted to extension soils specialist. He completed his doctorate in agronomy (soil fertility) in 1973, and in 1975, he was promoted to associate professor with tenure.

Penas provided leadership to the Extension Managing Nitrates and Groundwater team by developing educational programming for extension educators, field demonstrations, workshops and program material development. In the early 1990s, he led the Nebraska Soybean Profitability Project to determine the most profitable production practices for soybeans and feed grains.

Penas was a member of the American Society of Agronomy, Soil Science Society of America, Nebraska Cooperative Extension Association, Epsilon Sigma Phi and Gamma Sigma Delta. In 1987, he was awarded a Superior Service Award from the Federal Extension Service, USDA. He received an Excellence in Programming for the Crop Focus Team from the Nebraska Cooperative Extension Service in 1988.



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Much of Samantha Teten's love of agriculture comes from youthful days spent helping sow seeds on her parents' corn and soybean farm in southeast Nebraska. It's also what led her to become an agronomy major. But it's Samantha's drive and dedication that have resulted in numerous awards, internships and scholarships. Now, the University of Nebraska–Lincoln junior is working toward graduation so that she can begin helping producers manage their resources and make their farms more profitable.

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