

DEPARTMENT OF AGRONOMY & HORTICULTURE
UNIVERSITY OF NEBRASKA-LINCOLN

ANNUAL NEWSLETTER 2013



NEWS FROM THE DEPARTMENT OF AGRONOMY & HORTICULTURE



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DEPARTMENT OF AGRONOMY & HORTICULTURE
ANNUAL NEWSLETTER 2013

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Lincoln, NE Email: agrohort@unl.edu
68583-0915 Web: agronomy.unl.edu, hort.unl.edu
Facebook: facebook.com/unlagrohort

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Institute of Agriculture and Natural Resources

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Soil physical processes and properties research with Humberto Blanco

LETTERS FROM THE HEAD AND ASSOCIATE HEAD

Dr. Roch Gaussoin, Department Head

Welcome to the Department of Agronomy & Horticulture annual newsletter. Jeff Raikes, Ashland, Nebraska native and former CEO of Microsoft and the Gates Foundation, is quoted as saying “Everyone wants to drive the tractor, but sometimes everyone has to shovel pig manure.” After 2½ years as Department Head, I have come to the conclusion that the homespun Raikes’ remark describes a snippet of why the large, complex, dynamic Department of Agronomy & Horticulture is as productive and inviting as it is. I have witnessed firsthand that a sense of hierarchy is limited in our department. It is not uncommon to see endowed professors collecting data in production fields and burning the midnight oil in labs, greenhouses and offices. In turn, the junior faculty are mentored by example, creating an environment that no undertaking is beneath anyone, regardless of position or status. Technicians, post doctoral research associates, graduate students and undergraduate student workers continue the progression. Similar evolution is perceptible in Extension and teaching efforts. While by no means is the department perfect, we are striving to be relevant and responsive. We hope the information in this newsletter is a tasty morsel of the great work we do for Nebraska and the global community.

Numerous faculty were designated as “Fellow” in their respective scientific societies in 2013. Fellow is the highest and most prestigious recognition awarded by a society. Members of a society nominate worthy colleagues based on their professional achievements and meritorious service. In many societies the award is restricted to 0.3 percent of the Society’s active and emeritus members. Richard Ferguson was recognized by the Soil Science Society of America; Rob Mitchell, USDA-ARS was recognized by the American Society of Agronomy, Sally Mackenzie was designated as Fellow in the American Society of Plant Biologists and Ellen Paparozzi was recognized by the American Society for Horticultural Science.

Our department continues to experience incredible growth since the last annual newsletter. We were able to hire three new faculty in 2013, Patricio Grassini, Oscar Rodriguez and Dirac Twidwell. Be sure to read their profiles elsewhere in this newsletter. In 2014, the department will add five confirmed new faculty, a systems agronomist, a turfgrass specialist, a computational biologist, a molecular physiologist, and a forage/crop residue specialist. We will also be continuing searches for a range

specialist, and a dryland cropping specialist at the Panhandle Research & Extension Center. Each new faculty member will have the opportunity to hire technical support and recruit a graduate student, conservatively adding more than 60 individuals to our faculty-support personnel. We had one retirement in 2013, Roy Spalding, hydrochemist, after 39 years at UNL. We wish Roy well in his retirement.

It continues to be a privilege to be a part of this productive and creative department during the aggressive IANR driven hiring chapter. I use the term chapter to drive home the point that the hiring is only a part of a significant effort by IANR to position themselves as the global authority for all things agricultural. Please enjoy this year’s report. As always, feel free to contact me by phone (402-472-1555) or email (rgaussoin1@unl.edu) with questions, comments, concerns, clarification or compliments. I welcome and encourage the opportunity.

Respectfully,



Roch Gaussoin
Professor and Head



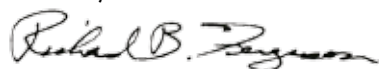
Dr. Richard Ferguson Associate Department Head

One of the privileges of working in Nebraska is the tremendous climatic variety across the state. Our location in the center of the Great Plains allows substantial variation in annual rainfall as well as soils. This creates a rich environment for research on cropping and landscape systems. Our department has the most faculty of any at UNL based at Research & Extension Centers (RECs) across the state, who partner with faculty from other departments and institutions in their efforts to develop more productive and efficient cropping systems. A group of seven faculty have been hired over the past two years as part of the Dougherty Water for Food Institute to better understand how to produce food while using limited water resources efficiently. Three of these faculty are based in our department, and will collaborate with faculty across the state as well as internationally in this effort.

In my unique role I am engaged in all facets of our department — teaching, research, Extension as well as administration, and it is exciting to see the level of enthusiasm among our students, clientele, and administration for the future of our department, and of agriculture in Nebraska in general. We have a record number of students in our majors, who are in demand for jobs in Nebraska and beyond. The University of Nebraska and the Department of Agronomy & Horticulture are positioned as global leaders for research and education in irrigated agricultural systems — pushing levels of productivity, but also learning to be better stewards of our soil and water resources.

One further evidence of national leadership from our department is Roch Gaussoin's election in 2013 as President-Elect of the Crop Science Society of America. Roch will serve as CSSA President in 2015, and joins a list of at least eight current and former faculty from our department who have served in this role. Congratulations Roch!

Sincerely,



Richard Ferguson
Professor and Associate Head

NEW FACULTY IN 2014

William Kreuser – Extension Turfgrass Specialist, started Jan. 6.

Roger Elmore – DWFI Systems Agronomist, started Jan. 13.

Daniel Schachtman – Molecular Physiologist, started Feb. 3.

James Schnable – Computational Scientist, starts May 1.

Daren Redfearn – Forage/Crop Residue Specialist, starts June 16.

FACULTY AWARDS

Richard Ferguson – Fellow, Soil Science Society of America

Roch Gaussoin – Crop Science Society of America Extension Education Award

David Holding – Jr. Faculty for Excellence in Research Award, UNL Ag Research Division

Greg Kruger – Jr. Faculty for Excellence in Research Award, UNL Ag Research Division and the IANR Irv Omtvedt Innovation Award

Aaron Lorenz – DuPont Young Professors Award Program Honoree for 2012

Sally Mackenzie – Fellow, American Society of Plant Biologists

Robert Mitchell – Fellow, American Society of Agronomy

Darrell Nelson – Soil Science Distinguished Achievement Award

Ellen Paparozzi – Fellow, American Society for Horticultural Science

PROMOTIONS AND TENURE

DR. GILLES BASSET

Promoted to Associate Professor with Tenure



Hired: 2007. Ph.D. 2000, University of Bordeaux, France. Basset holds a joint appointment in the Center for Plant Science Innovation and the Department of Biochemistry. Research in Basset's laboratory aims at understanding how plants synthesize and metabolize chemicals that are beneficial to human health, and at applying this knowledge to improve the nutritional value of plant-based foods.

ANNE STREICH

Promoted to Associate Professor of Practice



Hired: 2003. M.C.R.P. 2009; M.S. 1996; B.S. 1993 from the University of Nebraska–Lincoln. During her time at UNL, Streich has moved from an Extension appointment that focused on statewide coordination of the Master Gardner program to a role that divides her time among undergraduate student recruitment, teaching, and extension.

MEET THE STAFF, WITH A WORD FROM

Matt Sousek

Soon to start my sixth year at UNL, I feel lucky to have this job that I enjoy so much. Upon graduating from UNL with a bachelor's in horticulture, my intent was to become a golf course superintendent, but my adviser recommended I apply for a position here and my plans changed fast. In 2009 I started working as a research technologist and soon after that began working on a master's in horticulture, which I finished in May of 2012.

As everyone knows, there is more to life than work alone. In that same year of starting a new job, I married my wife Dana on lucky June 13, while also taking on the challenge of completely renovating a 1927 farmhouse near my hometown of Prague, Neb. Yes, Prague is on the map and is about 300 people strong.

Soon after marriage, another significant change in our lives was near — with not one, but two additions to the family. With all these changes in one year, times were busy, but could only get better. On Feb. 21, I became the proud dad of my daughter Bristol and son Brock, who are now three years-old and full of energy, keeping my wife and me plenty busy.

If I had to do it all over again I wouldn't change a thing. Working in this department with great people makes life easier. Over the past five years, many skills have been learned and new faces have emerged in the field of turfgrass science — making for an exciting future.

My main focus is turfgrass research where I get the opportunity to work with industry co-operators, professors, graduate students, and turf managers on numerous research trials. I'm responsible for providing the project leaders with support in designing, organizing, conducting, and reporting field and greenhouse experiments. Most of these trials are conducted at the John Seaton Anderson Turfgrass Research Facility at Mead, but I also have the opportunity to work with many turf managers across the state.



This job is so interesting to me because it's a constant learning experience. As times change so does research and its focus. We are all here to make a difference — whether it is big or small — and I'm here to conduct research to help improve turf management. •



Wendy Morrissey

I joined the department in 2012 and knew instantly this was a perfect fit for me. I worked at a local floral shop during the years I pursued a business degree from UNL. Throughout this time I developed a deep appreciation for horticulture as well as discovered my passion for event planning. After graduating from college I left horticulture behind and gained business experience working in banking, the non-profit sector and managing a high-end catering company before joining the department as Events Coordinator.

My interests and skills have merged here and it's an amazing opportunity to be a part of creating the many educational events our department has offers. Knowing the wealth of research that is disseminated to people across the state of Nebraska, the nation and even the world is astounding and I'm honored to play a small role in making that possible.

Coincidentally, my connection to agronomy and horticulture does not end at work, as I married an alumnus of the department. We both enjoy experimenting with new plants in our ever-changing home landscape and fruit and vegetable gardening with our children. We even purchased a home that has a greenhouse. •

David Orr

My name is David Orr and I came to the department as a temporary worker in November 2007. My main duties were to assist the Facilities Coordinator, who was Sam Shafer at that time. Most of my time was spent in Plant Sciences Hall, Keim Hall and the Stewart Seed Lab assisting faculty and staff with projects. Keim Hall was also scheduled for renovation, so a lot of my time was spent helping faculty, staff, and students move to new locations. In December 2011, I became a full-time Research Technician 1 under the supervision of Ruth Miller, greenhouse manager. In this position I assist with greenhouse pesticide applications, soil mix preparation, monitoring equipment/temperatures, mowing on campus field and garden areas, and many other miscellaneous duties such as growing killer plants in the Department Head's office.

I am a native of Lincoln and graduated from Northeast High School. I enjoy camping, fishing, and traveling with friends. Working with everyone in the department is very interesting and I enjoy my time here. •



Eugene "Gene" Hogan

LI Cool J would tell me not to call it a comeback, but after five years that's essentially what I've done. As many of you know, I spent from 2006–2008 in the HAPPI Business Center before spending five years in the Office of Sponsored Programs. Having spent the better part of those five years missing the interaction with faculty and students that occurs at the department level, I grabbed the first opportunity that I could to return to HAPPI. The faculty and staff have been extremely gracious in welcoming me back.

My role here has changed in my time away, and I've enjoyed the challenge that learning has presented. In the last five years, new faculty have been hired, the grants and financial picture has expanded, and many new processes have been put in place. There is much to be proud of — a beautiful new building, excellent staff, and exciting new opportunities here on campus and around the state of Nebraska.

As fortunate as I am to be here, my family is my biggest blessing. My wife, Jessica, is the most beautiful, gentle, intelligent, and funny woman that I've ever met. We have three wonderful little girls named Mena, Holly, and Maggie. We enjoy our summers in the backyard, and our winters hanging out and watching movies together. In my own spare time, I enjoy music (playing guitar and listening to albums/CDs), cooking, reading, and procrastinating about a litany of home projects. We had the opportunity to travel to New Mexico this summer to spend some time with Jessica's father, who happens to be a retired faculty member from the Colorado School of Mines. We did talk about university and grant finances, which confirms for me that I have either found my niche or my niche has found me and is willing to travel with me on family vacation. That's perfectly fine with me. •

Another great year for the Agronomy Club

by Don Treptow, Greg Rentschler & Molly Ann Hoffbauer, Agronomy Club Officers



2012–2013 UNL Agronomy Club members, with adviser Tim Kettler, at the SASES Regional meeting in College Station, Texas.

The UNL Agronomy Club, advised by Associate Professor Tim Kettler, added many new opportunities for members and doubled its membership last year with a total of 40 active members.

Last fall, the club participated in intramural sports with a flag football team. They may not have had the best record, but they had fun!

Five students attended the 2012 Tri-Societies National meetings in Cincinnati for the first time in more than five years. Allison Siekman was awarded a Golden Opportunity Scholar award, and Jared Aden, Ethann Barnes, Seth

Gurley, and Benjamin Trampe competed in the Quiz Bowl.

In the spring, the club sent 25 members to Students of Agronomy, Soils and Environmental Sciences Regional meeting in College Station, Texas. Last year the Agronomy Club started a Crops Judging team, which was initiated by transfer student Justin Loeffelholz. In April, the team attended the North American Colleges and Teachers of Agriculture Crops Judging competition in Lubbock, Texas and brought home a third place trophy. Jared Aden also placed seventh individually.

The club elected the 2013–2014 officers which include Allison Siekman, president; Benjamin Trampe, vice president; Ethann Barnes, treasurer; Greg Rentschler, corresponding secretary; Molly Hoffbauer, recording secretary; Don Treptow, Historian; Simon Walker, assistant treasurer; and Justin Loeffelholz, Crops Judging captain.

The UNL Agronomy Club was honored as the number-one choice to host the 2014 SASES Regional meeting. This will bring 250 to 300 undergraduate agronomy, soil science, and environmental science students from across the country to Lincoln and will give club members the incredible opportunity to show the rest of the country why there “is no place like Nebraska.”

The Agronomy Club and Crops Judging team are always happy to welcome new members. The Agronomy Club meets on Wednesdays in Keim 150 at 6 p.m. During their meetings, they have industry professionals attend to inform members about opportunities within their companies and provide a chance to network.

To find out more about the club and keep up to date with events, like them on Facebook at www.facebook.com/pages/UNL-Agronomy-Club/191078457631995.

Horticulture Club news

By Erin Kinley, Horticulture Club Secretary

UNL Horticulture Club continues to be a highly active organization both on campus and off. Last year, the club celebrated record poinsettia sales in December and went on a tour of horticultural industries in the Chicago area over spring break. They also began a new philanthropy by selling pink poinsettias and donating half of the proceeds to the Breast Cancer Research Foundation.

This year, they have already had a successful Fall Foliage Sale and are planning a trip to Florida in March to tour gardens, landscapes, orchards, and greenhouses. They also continue to hold their Annual Spring Sale with annual bedding plants, vegetables and herbs. They are looking forward to another year of successful sales and fun activities. If you'd like more information, please contact them at unlhortclub@yahoo.com.



Nine Horticulture Club members traveled with adviser Stacy Adams to Chicago over Spring Break. Members who took the trip are pictured above at the Garfield Conservatory.

Turf Club news

Luke Maddox, Turf Club President

After several years of being inactive, the UNL Turf Club was reactivated in 2012–13. The club helps bridge the gap between the lower and upper classmen who normally wouldn't interact due to different class schedules. It also gives younger students the chance to ask questions about which classes to take or the best ways to find internships and allows the upper classmen a chance to share their past summer internship experiences.

Thirteen students were actively involved in the club's activities. Two fundraisers, including a card night with golf course superintendents and industry suppliers and a service night at Noodles & Company were held. Proceeds go to support seven club members who attended and participated in the collegiate Turf Bowl at the Golf Course Superintendents Education Conference and Trade Show in San Diego, Calif. in February. The club also had a booth at the Nebraska Turfgrass Conference. For that booth, members developed a poster that showcased their diverse internship experiences.



Turf Club members at the 2013 GCSAA Conference in San Diego, Calif. in February (left to right) Jeff Wrage, Luke Maddox, Pat McGinn, Mike Radermacher, Adam Dredge, DJ Michael, and Chaz Berglin.

To wrap up the year, the club held an end-of-the-year bowling party. Members are looking forward to a new and exciting year at the University of Nebraska–Lincoln. •

Agronomy & Horticulture Graduate Student Association update

by Katherine Frels, AHGSA President



Sam Bledsoe and Juthamas Fakhthongphan help barbeque and serve food at the 2012 AHGSA Fall Cookout.

The mission of the Agronomy & Horticulture Graduate Student Association is to serve as a representative body for graduate students in the Department of Agronomy & Horticulture while promoting student and faculty relations and investigating issues unique to graduate students. President Katherine Frels, Vice President Ben Beckman, and Secretary/Treasurer Sam McConaughy make up the executive committee for this school year.

Our goals for the 2013–2014 school year include continuing to hold regular meetings, tours, and events for graduate students. We are also conducting a survey of graduate students in the department to gauge what is going well for students and what can be improved.

For AHGSA, 2012–2013 was very successful. We were able to hold regular meetings with 15–20 members present. The two main AHGSA events of the year, the Fall Cookout and the Department Annual Appreciation Banquet, were well attended and enjoyed by all. More than 100 students, faculty, and staff attended the banquet held April 12, 2013 at the Lied Commons. Dr. Larkin Powell was the invited speaker and spoke about the changing Nebraska landscapes for wild species. A silent auction was held during the banquet and the beautiful planter centerpieces, made by the Horticulture Club, were raffled off at the end of the night. AHGSA is looking forward to hosting the 2014 Appreciation Banquet on April 3, 2014 again at the Lied Commons.

During the 2012–2013 school year, AHGSA designed a new logo and ordered jackets to increase interest and pride in the association. We were excited to see almost 30 students order jackets. With new students joining the department and demand for another order, we will be placing a new order during the spring semester. For more information please contact an AHGSA member or officer.

As the 2013–2014 president, I sincerely hope that both faculty and students look at AHGSA as an opportunity to supplement graduate education. I hope that we are building a community of support and inspiration for Agronomy & Horticulture graduate students as well as giving graduate students a place to relax a little with our colleagues. I encourage all students to visit us at our meetings. The meeting schedule will be published as soon as it is known, both through email and at the AHGSA website at agronomy.unl.edu/ahgsa. For more information, or if you are interested in participating, you can contact me at katherine.frels@gmail.com. •

Range Club activities 2012–2013 *by Kayla Tarr, Range Club Secretary/Social Chair*

It was a busy year for the UNL Range Management Club — full of fundraising, attending annual meetings, and social activities. Early in the fall, the club attended the Nebraska Section of the Society for Range Management meeting, which was held in Ogallala. Club adviser Dr. Walter Schacht and graduate students Laura Snell and Lars Anderson entertained everyone with presentations about their research in Namibia. Together with the Chadron State College chapter, the club held a very successful auction, thanks to both generous donors and auction participants.

The rest of the semester was spent preparing to attend the National Meeting for the Society for Range Management, and working on a management plan for Prairie Pines, which has been an ongoing project for the club. Somehow, around all the work, the club managed to squeeze in intramural broomball and the occasional trip to the bowling alley. The annual Range Club Christmas party, hosted by Dr. Walter Schacht and his wife Carol, was a great way to end the year.

The beginning of the spring semester was a flurry of final preparations for the Annual Meeting for the Society for Range Management, which was held in February in Oklahoma City. Six undergraduate students and five graduate students actively participated in the student contests, sessions, and meetings. The club's Undergraduate Range Management Exam team placed 10th out of 24 teams. Two club members,



Undergraduate club members at the Department of Agronomy & Horticulture 2013 Spring Appreciation Banquet (left to right) Jack Arterburn, Kyle Schumacher, Kyra Baldwin, Jeanna Jenkins, Kayla Tarr, Vicki Simonsen, and Chelsea Luthy. Dr. Walter Schacht, club adviser, stands in the back row.

Vicki Simonsen and Kayla Tarr, finished in the top 10 percent of the students taking the exam. Club member Jeanna Jenkins continued in her role of promoting student membership in the Society for Range Management after being reelected Reporter of the International Student Conclave.

The UNL Range Management Club would like to thank everyone who helped and supported us in making 2012–2013 such a success. We are looking forward to another great year! •

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STUDENT AWARDS

Benjamin Trampe – Golden Opportunity Scholar by The Golden Opportunity Fund through the Agronomic Science Foundation

Scott Dworak – Gerald O. Mott Scholarship for Meritorious Graduate Students in Crop Science

FALL ENROLLMENT 2013

Agronomy – 204

Horticulture – 74

Plant Biology – 15

Turfgrass & Landscape

Management – 48

Golden opportunity *by Benjamin Trampe, Senior Undergraduate, Agronomy*

I had the honor of being selected as a Golden Opportunity Scholar, an award recognizing juniors or seniors excelling in Agronomy, Soils, or Crop Science. This award is funded by the Agronomic Science Foundation, which allowed me to travel to Tampa, Fla., where I attended the ASA, CSSA, and SSSA annual meetings.

Golden Opportunity Scholars are paired with a mentor to guide them for a year. The mentors are normally faculty from universities or industry professionals reflecting the student's future career path. At the annual meetings, scholars were divided into groups and asked to present how we would go about solving issues related to food, water, or energy. These presentations were then given to the mentors and discussion followed on how to address these challenges.

The scholars were selected nationwide from BYU-Idaho to Colorado State to North Carolina State University — just to name a few. Many of the scholars are planning to become the next generation of plant breeders. I was able to meet with one scholar that had plans of becoming a local Extension specialist and another scholar who really enjoyed working

on remote sensing applications and site-specific management.

While in Tampa, I participated on a turfgrass tour. The tour included stops at a Bermuda grass operation that produced sod and sprigs for golf courses and a stop at Raymond James Stadium, which is home to the Tampa Bay Buccaneers and Florida Atlantic Owls, where we discussed natural grass fields verses artificial turf fields.

I had the opportunity to listen to some amazing speakers, such as Matt Rush who spoke on how important agriculture is and how essential it is to share what you do in agriculture every day. Another speaker I enjoyed was Alan AtKisson. He spoke about the challenges that agriculture faces and the opportunities we have to resolve these challenges.

Thanks to being selected as a Golden Opportunity Scholar, I was able to meet with industry professionals who are experts in their field, network with professionals and professors from other universities, and network with other agronomy clubs across the nation. This allowed me to exchange ideas for fundraising, community service, and meeting activities.

There was also a boat cruise social around the

bay, which allowed undergraduates to meet and network with each other.

I would recommend this program to any undergraduate junior or senior who is interested in pursuing graduate school. The Green Scholar Award will be added for students planning to go straight into industry with plans of becoming a Certified Crop Advisor.

I feel like I gained useful knowledge and contacts from this trip. I encourage my fellow classmates to apply next year by visiting www.goldenopportunitiescholars.org for more information.

I'm currently an undergraduate senior majoring in agronomy with a minor in plant biology and I plan to graduate in May of 2014. I've worked for AgReliant Genetics and have completed internships with Ag Valley Cooperative and Dow AgroSciences. I have also been a teaching assistant for introductory plant science courses. I am currently the vice president of the UNL Agronomy Club, and have an undergraduate research project working with seed dormancy in buffalograss. I plan to go on to graduate school in plant breeding and my goal is to become a plant breeder with a multinational company. •

Rerucha wins first Engler Business Plan Competition



Aaron Rerucha, a senior Horticulture major, won the first-ever Engler Agribusiness Entrepreneurship Program Business Plan Competition on Dec. 6, 2013. Rerucha, from David City, Neb., took home the \$4,000 grand prize. Jordyn Lechtenberg, a senior Agribusiness major in the Engler Program, took runner-up and was awarded \$1,000.

The two-day competition, which aims to support and encourage entrepreneurship among UNL students, featured agribusiness-oriented business plans only. Ten out of 20 applicants were selected to compete in a rigorous semi-final round Dec. 3. Rerucha and Lechtenberg were chosen to move on to the finals Dec. 6.

Each student presented plans for 10 minutes then took questions for 10 minutes from a panel of judges in both series of competitions. There were two panels of judges for the semi-final round. Robin Coulter of Coulter Ranches, John Miller of Oxbow Animal Health, and Ed Pallesen of Goldman-Sachs made up the first panel. Judges for the

second-panel included Todd Johnson, the Big Plate; Jonathan Jank, Seward County Economic Development; Jerry Lentfer, First State Bank Nebraska; Dave Stock, Stock Seed Farms; Rick Stock, Cargill Animal Nutrition; and Terence Bowden, the Business Accelerator Director at UNL Innovation Campus.

Rerucha's business plan involved a landscape company — Oxbows Natural Landscapes — focusing on native, historic, and natural elements with an emphasis on reducing water usage in the environment and still providing functional spaces. His plan included furniture making in the winter months, harvested from trees on the land in which he would operate his business just south of Columbus, near Bellwood, Neb.

Judges for Friday night's final were Laura Ward, Senior Managing Director of First Republic Securities Company in San Francisco and Andrew Uden, Graduate student at UNL and business owner of Uden Cattle Company.

Rerucha, who is advised by Department of Agronomy & Horticulture Associate Professor Kim Todd, was enrolled in HORT 488 as a distance education student. The class, taught by Department of Agronomy & Horticulture Associate Professor David Lambe, is a business plan writing class focusing on student ideas and entrepreneurship where Lambe encourages his students to compete in on-campus business plan competitions. •

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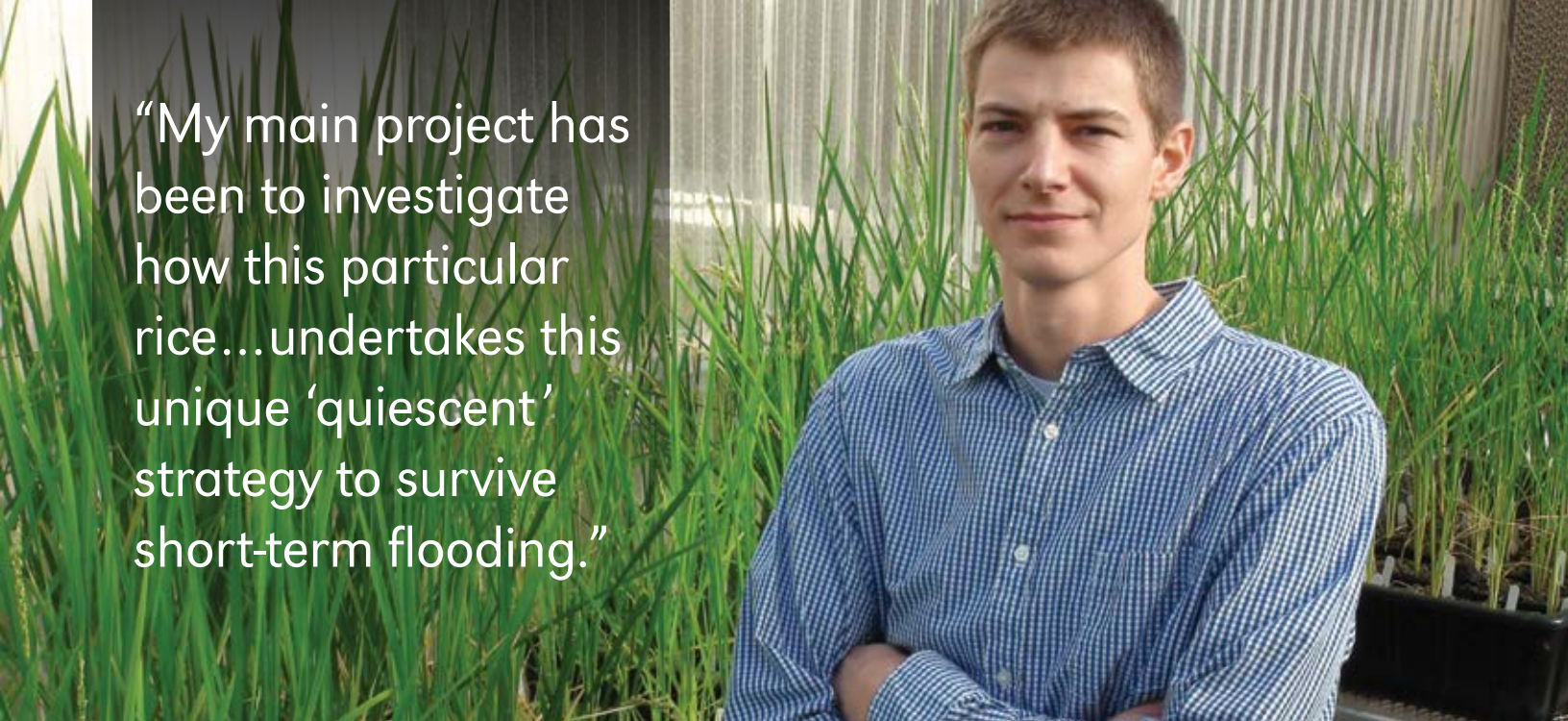
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“My main project has been to investigate how this particular rice...undertakes this unique ‘quiescent’ strategy to survive short-term flooding.”

Flood tolerance research in the Walia laboratory — a postdoc’s experience

by Aaron Schmitz, Postdoctoral Researcher

Two years ago I came to Lincoln to begin postdoctoral research. I had recently finished my doctorate in cell and molecular biology at Michigan State University — we love our football there as well. I was excited to work with crops for the first time in Dr. Harkamal Walia’s lab. My previous research experience utilized the small plant *Arabidopsis* — the first plant to have its genome fully sequenced. Although *Arabidopsis* is a good model to study genetics, cell biology, and plant development, every finding is not necessarily applicable to crop species. Also, many genetic resources now available for crop plants make it an exciting time to identify genes that may benefit farmers.

The laboratory was relatively new when I joined in 2011, but Harkamal already had a couple hard-working graduate students and a postdoctoral researcher that diligently established the groundwork for several projects. Today, the Walia laboratory continues to expand with talented students and postdocs. We also have several undergraduates that are gaining research experience in the laboratory, including students with undergraduate research assistantships (UCARE-sponsored). I really enjoy helping mentor these students. I had a similar research opportunity when I was an undergrad at the University of Illinois and I’m grateful to the wise and patient mentors then and every step along the way since.

Dr. Walia’s laboratory studies how cereal crops respond to abiotic stresses such as heat, salt, and drought, and works to identify genetic attributes that improve a plant’s tolerance to these conditions. Another stress that plants sometimes face is flooding. Flood-prone, lowland areas account for 18 percent of rice production worldwide and include about 29 percent of South and Southeast Asia’s rice acreage. Lowland rice normally grows in very wet soil — often centimeters of water. However, heavy rains cause the water level to rise several feet, resulting in temporary submergence of the rice plant. In order to try and gain access to the oxygen and carbon in the atmosphere, submergence intolerant plants rapidly elongate their leaves in an attempt to grow out of the flood water. These plants often die from depletion of their energy stores. As flood waters recede, those few submergence intolerant plants that are successful in breaching the surface often die because they are left weak and their spindly structure is easily blown over by the wind. On the other hand, a submergence tolerant plant will essentially become dormant, limiting growth and conserving its energy reserves. My main project has been to investigate how this particular rice, referred to as Sub1 (named after the major quantitative trait loci), undertakes this unique “quiescent” strategy

to survive short-term flooding. This major submergence tolerance gene, named Sub1, has recently been bred into many popular, high-yielding, rice varieties which have been introduced in Asia, greatly benefiting those farmers and villages dependent upon locally grown rice.

Gibberellin is the plant growth hormone that is responsible for the rapid leaf elongation that occurs in submergence intolerance plants. The *Sub1A* gene within the Sub1 QTL invokes conditions that block gibberellins. We have discovered that *Sub1A* gene accomplishes this, in part, through an increase in brassinosteroids, another plant hormone. We’ve proposed that brassinosteroids block gibberellin effects by increasing levels of proteins that prevent gibberellin signaling, adding a step absent from the model proposed by other researchers regarding Sub1 submergence tolerance. Also, we’ve proposed that brassinosteroids decrease the amounts of active gibberellins by increasing expression of a gene controlling gibberellin inactivation.

Currently, I am studying the *Sub1* tolerance mechanism in closer detail. I am also collaborating with Walia lab graduate student Malachy Campbell. He is spearheading a project to identify alleles that promote short-term submergence tolerance in maize. Thanks for sharing in my UNL experience. •



Department is popping and making marinara

by Roch Gaussoin, Department Head

The announcement in November of 2012 identifying ConAgra Foods as the first commercial partner with the University of Nebraska–Lincoln at Nebraska Innovation Campus confirmed the collaboration with newsworthy fanfare and celebration. The Department of Agronomy & Horticulture is an active participant in the partnership with research in tomatoes and popcorn. Through the collaboration, ConAgra Foods hopes to foster a culture of innovation related to both crops. The relationship will help further understanding and knowledge related to popcorn breeding and tomato production research and outreach. Graduate and undergraduate students will have the opportunity to work intimately with crops historically under-served in our education opportunities. While development and construction at NIC is active and on-going, ConAgra Foods has time sensitive needs relative to both crops.

The next generation of popcorn will have Nebraska roots

Popcorn enjoyed nearly a constant increase in sales during the second half of the twentieth century. This was due to significant advancements in popcorn quality (increased pop volume and reduction in number of unpopped kernels) as well as game changing innovations including microwave popcorn. Since this time, few technological advances have been introduced and sales of popcorn have decreased. Revival of popcorn popularity must include innovative game changing developments.

The transfer of ConAgra Foods' internal popcorn breeding program from its research facility in Indiana to the University of Nebraska–Lincoln and the Department of Agronomy & Horticulture in 2013 was a calculated risk by ConAgra Foods and a challenging opportunity for the department. The partnership between the industry giant and UNL/IANR primary objective is to aggressively develop the next generation of popcorn varieties for the consumer public. Oscar Rodriguez was hired as a popcorn breeder (see his profile elsewhere in this newsletter) and will be collaborating with David Holding, Aaron Lorenz, Tom Hoegemeyer and technicians, graduate students and postdoctoral research associates to increase yield and popping volume, gain a better understanding of popcorn genetics, and improve nutritional value of this popular snack food. Other collaborators include Tamra Jackson from the Department of Plant Pathology and Bob Wright from the Department of Entomology.

ConAgra Foods expects to harvest millions of pounds of Nebraska-grown popcorn annually, which is used in Orville Redenbacher's and ACT II popcorn available at most grocery outlets. Nebraska is frequently the No. 1 popcorn-producing state in the U.S. In the not too distant future, the popcorn you consume at home or at the movies may not only be grown in Nebraska soils but genetically originate from research conducted at UNL.

Tomato partnership growing new opportunities

Growing tomatoes in Nebraska greenhouses was an idea ConAgra Foods brought to UNL in the fall of 2011.

ConAgra Foods has a strong relationship with the UNL Food Science & Technology Department and through that connection, Rolando Flores recommended Extension Horticulture Specialist Kim Todd for this investigation.

Since then, Todd has led a team of agronomists, horticulturists and food scientists in experimenting with ways to mimic field conditions in a controlled environment of a greenhouse and grow tomatoes that meet ConAgra's standards for flavor, firmness, and quality.

ConAgra Foods' tomatoes are field grown in California, where harvests from July through October supply ConAgra Foods with tomatoes for their Hunt's tomatoes. A portion of these tomatoes are used in research, testing and evaluation.

"Now we're producing tomatoes for ConAgra Foods that allow for tests during a time of year when certain varieties are not available, and testing for variables such as canning quality and taste," said Todd. "It's all about taking the live (tomato) plant — to canned product — to table — to consumption," said Todd.

Given the need to duplicate, as closely as possible, the field grown fruit, growing tomatoes in a greenhouse can be problematic — humidity, temperature, fertilizer levels, light, and planting strategies (pots versus raised beds) — all factor into the growth, pollination, possibility of disease, and fruit production of the plants.

"It has been eye-opening for us to understand what it takes to grow tomatoes on a schedule that's driven by when a partner needs them," said Todd. "You have to build for potential crop failure and other adjustments into the work process."

It takes a number of Department of Agronomy & Horticulture personnel on UNL East Campus including T.J. McAndrew, Ruth Miller, research technologists and the greenhouse staff, to make sure the project runs smoothly. A team of volunteer Campus Master Gardeners, undergraduate and graduate students — including graduate student Josh Reznicek, and undergraduate

research UCARE students Erin Kinley and Emily Stine — help pollinate, collect data, and harvest. Two new recent hires, Carol Morgenson, Research Technologist and Claudia Torres-Holding, Postdoctoral Research Associate bring additional skills to compliment the ambitious effort.

Harvesting takes place approximately once-a-month and the results have been challenging and promising. Pollination had been done by hand with wands and now bees have been introduced to part of the greenhouse crop with excellent results.

East Campus also collaborated with Assistant Extension Educator David Lott at the West Central Research and Extension Center in North Platte where they grow tomatoes in high tunnels and in a field.

In addition to support from ConAgra Foods, the project is partially funded by the Nebraska Department of Economic Development's Business and Innovation Act research development program that helps businesses develop new technologies that stimulate job growth. This tomato project team from UNL was the first to receive funding through this program.

The department is extremely grateful to ConAgra Foods for its support and confidence in our department and UNL. On paper the partnership is between UNL and ConAgra Foods, and deservedly so. Off paper, as with any successful and progressive endeavor, partnerships are about the people involved.

In addition to the aforementioned dedicated departmental faculty, students and staff are our ConAgra Foods counterparts. Pam Newell, Mike Parker, Gordon Smith and Richard McArdle have been instrumental in making both the tomato and popcorn projects poised for relevant research and the potential for increased economic viability in Nebraska. Stay tuned. •



POPCORN FRIDAYS

Each Friday the smell of popcorn draws faculty, staff and students to gather in Keim Hall and sample fresh-popped Orville Redenbacher popcorn. With permission from UNL and ConAgra, the department has been gifted a brand-new popcorn machine for all to enjoy.



Office of Research & Economic Development





Top left: Pictured is a low-speed wind tunnel with the capacity to generate up to 15 mph winds. **Above:** Ryan Henry, Jeff Golus, Annah Geyer and Greg Kruger celebrate the opening of the new greenhouse and wind chamber in August 2013. **Right:** A high-speed wind tunnel with the capacity to generate up to 200 mph wind speeds was constructed to simulate air speed conditions of aerial applications.

Measuring droplet size with wind tunnels

by Greg Kruger, Cropping Systems Specialist

At the West Central Research and Extension Center in North Platte, Greg Kruger, with the help of many different scientists in the U.S., Australia and New Zealand, has constructed a set of wind tunnels for measuring droplet size from pesticide spray solutions. The droplet size measurements are then used to make recommendations for mitigating pesticide drift and maximizing pesticide efficacy.

The first wind tunnel is a low-speed wind tunnel which has the capacity to generate up to 15 mph winds. The low-speed wind tunnel is used to gain as accurate as possible measurements of droplet size for ground applications (self-propelled sprayers, pull-behind tractor-mounted sprayers and other sprayers used on the ground). The low-speed wind tunnel is also used to conduct drift simulation studies using sensitive species and measuring the biological response to pesticide exposure.

The second wind tunnel is a high-speed wind tunnel constructed to simulate air speed conditions of aerial applications (helicopters and airplanes). The high-speed wind tunnel has the capacity to generate up to 200 mph

wind speeds. The high-speed wind tunnel was constructed to collect droplet size data to support aerial applicators.

The wind tunnels in the Pesticide Application Technology Laboratory are a unique set of research equipment because they are constructed to examine nozzle design, pressures and spray solutions — including pesticides — that could be used by pesticide applicators. Because pesticides are used in the spray solutions, the facility has the ability to collect realistic data of spray solution effects on droplet size.

The PAT Lab collaborates closely with the USDA-ARS Aerial Application Technology Unit in College Station, Texas and the University of Queensland Gatton in Australia because they have similar capabilities of testing spray solutions with pesticides in both high-speed and low-speed wind tunnels. These collaborations have allowed the lab to verify results and start to develop datasets for the EPA, private industry and other industry groups in order to establish best management practices for pesticide applications.



Data generated from the wind tunnels has been made freely available in the form of a spray droplet calculator, which is available on iTunes and the Google Play Store — search Ground Spray. As the Lab becomes more established and generates more data, the app will become more robust giving pesticide applicators the latest information available.

To better understand the biological component of pesticide drift and efficacy, the PAT Lab has constructed a new greenhouse and spray chamber which allows them to conduct unique and cutting edge research. The greenhouse, which was constructed in August of 2013, is already in full use.

There are numerous tours every month through the wind tunnels. If you have interest in visiting the facility, contact Greg Kruger directly at gkruger2@unl.edu.



Herbicide-resistant weeds are challenging

by Amit Jhala, Extension Weed Management Specialist and Lowell Sandell, Weed Science Extension Educator

Herbicide-resistant weeds have become one of the most pressing issues facing Nebraska growers and land managers. This problem has received wide-spread attention with the evolution of glyphosate-resistant weeds in glyphosate-resistant crops. However, this problem far predates glyphosate resistance. In fact, the commercialization of glyphosate-resistant crops in 1996 was initially seen as a solution to weed resistance to other herbicide families, such as the acetolactate synthase (ALS) inhibitors (Pursuit, Raptor, Classic) and photosystem- II inhibitors (Atrazine). Unfortunately, over-reliance on glyphosate for weed control in glyphosate-resistant corn and soybean for several years has resulted in evolution of glyphosate-resistant weeds.

Seven weed species of agronomic importance have evolved resistance to several groups of herbicides in Nebraska. Four weed species including marestail, kochia, giant ragweed, and most recently, common waterhemp have been confirmed resistant to glyphosate in Nebraska. Control of herbicide-resistant weeds is one of the greatest challenges for crop producers not only in Nebraska but in several states. Preserving the efficacy of herbicides and of herbicide-resistant crop technology

depends on awareness of the increasing resistance of weeds to herbicides and coordinated action to address the problem by individuals at the farm level and beyond.

The Weed Science Research and Extension Team at UNL is actively involved with educating growers, crop consultants, and educators about herbicide-resistant weeds and their control. Herbicide-Resistance Weed Management Field Days (sponsored by the Nebraska Soybean Board) have been organized at several locations across Nebraska in last few years for on-site demonstration of herbicide options for control of glyphosate-resistant common waterhemp, giant ragweed, and kochia. Resistance Management Workshops have been organized at four locations to educate growers in a small group, hands-on-setting to develop an effective management strategy, based on selection of herbicides with different mode-of-action and using alternate options in an integrated weed management program. Several field-based experiments have been conducted across Nebraska and the results are being disseminated during the Crop Production Clinics, Field Days, and through Crop Watch articles and in the Guide for Weed Management in Nebraska (EC 130). •

Below left: Amit Jhala demonstrates research plots to growers during the 2013 Resistance Management Field Day in Fremont. **Below right:** Glyphosate-resistant marestail in a field near Lincoln.



Research efforts: Understanding soil physical processes and properties

by Humberto Blanco, *Applied Soil Physicist*

I am Humberto Blanco, an Assistant Professor in Soil Management and Applied Soil Physics, and I began working at UNL in July 2012. During this relatively short period of time at UNL, I have taken important steps toward establishing my research program in soils. My overall research goal is to conduct basic and applied research to investigate, characterize, and recommend management practices that improve soil productivity and enhance environmental quality for mitigating and adapting to changing climatic conditions or climatic extremes. My final goal is to deliver information with local, regional, national, and international implications.

My specific research focus is on addressing soil physical processes and properties that influence soil C and nutrient storage and cycling, greenhouse gas (CO_2 , CH_4 , and N_2O) fluxes, soil-water relationships, and others. I am conducting field and laboratory experiments to understand how different soil management practices (crop residue removal, establishment of cover crops, use of conservation tillage, growing dedicated energy crops, and others) modify soil physical processes and properties and their relationships with chemical and biological properties. I believe that a comprehensive assessment of basic soil processes (i.e., soil aggregation and fluxes of water, heat, and air) as well as characterization of basic soil physical properties such as structural, hydraulic, and compaction parameters can lead to a better understanding of soil-water-plant relationships. The goal is to integrate all soil properties for a mechanistic understanding of all processes and linkages affecting the role of soil in delivering essential ecosystem services.

In 2013, I established research work relationships with many on and off-campus colleagues in different departments or units (i.e., Agronomy & Horticulture, School of Natural Resources, Animal Science, Biological Systems Engineering, USDA-ARS, and others). I have identified existing long-term research experiments and initiated a few new projects. I have become more familiar with what has been done and what needs to be done in terms of soils research in Nebraska. New projects are being envisioned to fill the gaps in information.

One of the research areas that I am working on is crop residue management in relation to soil physical properties. Corn residue in Nebraska is facing many competing uses including 1) soil and water conservation, 2) animal feed, and 3) feedstocks for cellulosic ethanol. Corn residues are being removed as silage, baled forage, or by grazing, especially when other forage supply fall short. Residue is also used with distillers grains (co-product from grain ethanol production) for livestock production. Therefore, a research need exists to examine the implications that crop residue removal may have on crop production and soil and water resources. Information on the response of soil physical properties to different scenarios of residue management on regional scales is, for example, very limited. It is also important to evaluate if use of cover crops, forage crops, and animal manure can counteract any negative effects of residue removal at high rates.

Some of the questions that warrant additional research include: What are the effects of crop residue removal on crop yields, water use



efficiency, soil erosion, soil physical, chemical, and biological properties, water quality, carbon sequestration, greenhouse gas fluxes, and others in the short and long term? What are the permissible levels (i.e. partial removal or removal in alternate row and years) of residue removal? Can the use of cover crops and

Below left: Winter rye cover crop growing following residue baling in an irrigated strip till continuous corn field near Bellwood, Neb. **Below middle:** A three-year experiment of corn stover removal with and without winter rye cover crop under no-till continuous corn at UNL South Central Agricultural Laboratory near Clay Center. (Project leaders: Richard Ferguson and USDA-ARS scientists). Photo was taken in spring 2013 a few days after the cover crop was chemically terminated. **Below right:** Cattle grazing corn stover and cover crops during winter in a field near Shelby, Neb.





animal manure replace any significant losses of soil C and nutrients due to residue removal?

As a starting point to address the above questions, I am evaluating existing experiments and also establishing new experiments of residue baling and grazing across Nebraska. Starting in 2013, in collaboration with colleagues, I have been evaluating two existing experiments located at UNL's South Central Agricultural Laboratory near Clay Center and Water Resources Laboratory near Brule. I am studying how corn residue baling and grazing impacts soil structural properties, hydraulic properties (i.e., soil water retention and water infiltration), soil water and wind erodibility, soil C dynamics, and other indicators of soil quality. At the same time, I am also investigating if use of ameliorative practices such as cover crops and animal manure application could offset any adverse effects of crop residue removal on soil properties.

I am expanding my work from research plots to farmer's fields to better understand implications of crop residue baling and grazing on crop production and soil and water resources under real world conditions. I have collaborative projects funded by SARE, Corn

Board, UNL Research Council, and IANR Agroecosystem Research to conduct on-farm studies of crop residue management. I am establishing cover crops before and after corn stover baling on different farmer's fields and research sites. In close collaboration with Aaron Stalker, Rick Rasby, and Jim MacDonald, colleagues from the Animal Science Department, I am establishing about eight on-farm experiments of corn residue baling and grazing across the east to west precipitation gradient in Nebraska. My research program is unfolding with a strong emphasis on teamwork and interdisciplinary collaboration.

My future plans include further assessment of soil physical processes under a number of agronomic practices including single and mixed cover crops, conservation tillage (i.e., strip till, no-till), inorganic fertilization and organic amendments, conservation buffers, and other soil management practices for intensively managed agricultural systems in the state. Finally, I am eager to develop more collaborative relationships, listen to suggestions, and initiate additional new experiments to establish a successful program in soils at UNL with emphasis on applied soil physics. •

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Lindquist's lab receives awards *by John Lindquist, Plant Ecologist*

Agronomy & Horticulture Professor and Crop and Weed Ecologist Dr. John Lindquist's lab received two prestigious awards this year. A paper entitled 'Influence of two herbicides on soybean cyst nematode (*Heterodera glycines*) reproduction on henbit (*Lamium amplexicaule*) roots', authored by Mr. Rodrigo Werle, former M.S. student, was selected as the Outstanding Paper in Weed Technology. The paper was the result of collaborations with Drs. Loren Giesler in the Department of Plant Pathology and Mark Bernards, former Weed Management Specialist in Agronomy & Horticulture. Rodrigo's M.S. thesis focused on the growing prevalence of winter annual weeds in no-till agriculture and how henbit can serve as an alternative host to soybean cyst nematode. It highlighted the need for controlling winter annual weeds in the fall. Mr. Werle is currently working on his Ph.D. with Dr. Lindquist and recently won the North Central Weed Science Society's Outstanding Graduate Student Award for 2013.

Another paper entitled 'Local conditions, not regional gradients, drive demographic variation of giant ragweed (*Ambrosia trifida*) and common sunflower (*Helianthus annuus*) across northern US maize belt' authored by Dr. Sam Wortman, former Ph.D. student and currently Assistant Professor of Urban Food Production at the University of Illinois at Champaign/Urbana, won the Outstanding Paper in Weed Science. This paper was the result of a long standing collaboration Dr. Lindquist has had with numerous colleagues from across the North Central region. This group has long studied the regional variation in weed competition and population dynamics to understand why some weeds are more important in the eastern edge of the region, while others are more important in the west.

Dr. Wortman compiled the results from a common protocol experiment conducted across the region and applied data mining techniques to tease out what factors were more important in driving the demographics of these two species. Dr. Wortman was also the 2012 recipient of the Weed Science Society's Outstanding Graduate Student Award. Winning Outstanding Paper honors in two of the Weed Science Society of America's journals in the same year is unprecedented. These awards are a tribute to Dr. Lindquist's outstanding mentoring of graduate students in the performance of high quality science and exceptional writing. •



MEET THE FACULTY, INTRODUCING

Oscar Rodriguez

joined the faculty at UNL in March 2013 as research professor to lead the popcorn breeding program for the joint research agreement between ConAgra Foods and UNL.

Before joining UNL, in 2011 I joined ConAgra Foods where I was in charge of the popcorn breeding program at the ConAgra Popcorn Research Station in Brookston, Ind. ConAgra's popcorn program was originally started by Orville Redenbacher in Valparaiso, Ind. in the late 1950s. Later he sold the breeding program to Hunt-Wesson Company, which eventually became part of ConAgra Foods.

I was born in northeast Mexico along the border with Texas, and graduated from Ateneo Fuente High School in the city of Saltillo, the capital of my state of Coahuila.

After graduating from high school I attended Antonio Narro Autonomous Agrarian University in the Hacienda of Buenavista, located six kilometers south of the city of Saltillo, where I obtained my bachelor's degree in Agronomy and Plant Breeding.

Before graduating from college, I did my required internship for two years at the Mexican Maize Institute, which is part of UAAAN. At the Mexican Maize Institute I conducted my research work in corn improvement for my BS thesis. This December I celebrate 30 years of graduation from college.

After completing my bachelor's degree, I worked for the National Institute of Agriculture Research of the Mexican Department of Agriculture, as a corn breeder. I was stationed in the Bajío region of Mexico which is considered the grain basket of Mexico.

While working for the INIA I was able to obtain a scholarship from the National Council of Science and Technology of Mexico and returned to UAAAN to pursue my master's degree in Plant Breeding and Genetics. I graduated in 1989 with a master's degree with highest honors obtaining also a citation for Excellence in M.S. Research.

While finishing my master's degree I was admitted to Texas A&M University and offered a research and teaching assistantship by my adviser Dr. Richard A. Frederiksen,

to work with disease resistance in corn and sorghum. While at A&M, my research work focused on the genetics of the resistance to head smut in corn, but I was also able to make contributions documenting epidemics of Northern Corn Leaf Blight and was able to identify the genetic mechanism of the resistance to High Plains Disease of corn, which at that time, was a new viral disease of corn affecting crops in the high plains of the United States. My work was also supported by a scholarship from CONACyT of Mexico, and two additional scholarships from Pioneer HiBred Seed Company and ICI Chemical Company.

“I have a strong interest in improving popcorn's yield potential and agronomics...”

After graduating from A&M in 1995, I joined Pogue Seed Company in Kenedy, Texas as director of research and development to start a new breeding program on grasses for the semi-arid lands of South Texas, Mexico and similar arid and semi-arid areas of the world. My research focused on buffelgrass (*Cenchrus ciliaris*), klein grass (*Panicum col-*



oratum) and rhodesgrass (*Chloris gayana*), as well as some other native grasses.

With very limited resources, I initiated the research program and within four years, I was able to identify an epidemic occurring in more than 20 million acres of buffelgrass planted in South Texas and northeast Mexico, and released new commercial varieties resistant to this disease. Plant Variety Protection for these new varieties — five in total — was obtained and they were sold as mixtures to prevent the pathogen from overcoming the resistance to this disease. These were the first commercial varieties of this grass released in the United States. Recently, the sale of these varieties has extended to South America and the Middle East.

Buffelgrass transformed cattle production in the arid lands of Texas and Mexico when it was introduced in the late 1950s. The problem was that buffelgrass is an apomictic species (reproduces asexually) and all 20 million acres of this grass were planted to the same variety. The buffel blight epidemic was caused by *Pyricularia grisea*, one of the worst pathogens that can occur to any crop and with the genetic uniformity of this grass in more than 20 million acres, it was a recipe for disaster. Fortunately, I was able to identify the problem and come up with a solution for cattle producers, where the resistance has not been overcome by the pathogen after 10 years.

Rodriguez continued from page 20.

From 2000 to 2005, I worked for Monsanto Company in charge of the sorghum breeding program for South Central Texas and north-east Mexico. Before leaving Monsanto after they decided to reduce the program, I released DKS 37-07, the largest volume sorghum hybrid released and sold by Monsanto. This hybrid continues to sell more than 200,000 units of seed per year. The hybrid is also sold in Mexico and Argentina as DKS 40.

In the fall of 2005 I joined the faculty of Texas A&M University–Kingsville for one semester as visiting assistant professor where I taught courses in Agronomy and Plant Reproduction.

From 2006 to 2008 I worked for Syngenta Seeds as a sweet corn breeder in charge of the “shippers” sweet corn program for production areas in Florida, Georgia and Maryland. The focus of the program was on eating quality

traits and disease resistance utilizing Marker Assisted Selection. I was able to release hybrids for this market as well as for the European market.

In late 2008 I started working for Betaseed in Kimberly, Idaho as sugarbeet breeder for western states. I was in charge of developing hybrids with curly top resistance for all the western markets. I was in charge of the Roundup Ready conversion program for all U.S. markets, for production of all the experimental seed for all U.S. markets as well as in charge of all the foundation and pre-commercial seed production for U.S. and some European markets.

The major objectives of the joint research agreement between ConAgra and UNL includes the development of hybrids with better eating quality and disease resistance. I’m also participating in joint research projects with other scientists here at UNL where we will

try to improve the nutritional composition of popcorn, identify molecular markers associated with Goss Wilt resistance and develop an advanced genomics platform to accelerate the results of the research program.

Popcorn, because of its unique dent sterility characteristic, has been isolated from Dent Corn through its development and evolution. I have a strong interest in improving popcorn’s yield potential and agronomics via the introgression of such traits from Dent Corn, while keeping the popping and eating qualities of popcorn.

I would also like to pursue work studying the asexual reproduction in plants (apomixis) both in grasses as well as in species related to corn.

I would like to participate within the department leveraging my experience as plant breeder, teaching courses in Plant Breeding, Statistical Genetics, Breeding for Disease Resistance and Applied Statistics. •

Patricio Grassini

My name is Patricio Grassini and I am an Assistant Professor here at UNL Department of Agronomy & Horticulture. I arrived in Lincoln from Argentina back in 2007. At that time, I had just earned a bachelor’s degree in Agricultural Engineering from the University of Buenos Aires and I decided to apply for a Fulbright scholarship to enter the doctorate program in Agronomy at UNL under the advice of Dr. Kenneth Cassman. I learned that I was admitted in March 2007 and moved here in August of that same year.

The move was not easy: a new place, a new language, new people... but UNL proved to be a perfect environment to productively conduct my studies and research. At an academic level, I was constantly guided and encouraged in my studies, and at a personal level I made lots of good friends. In addition to the Fulbright scholarship, I also was awarded a Fling Fellowship and I finished my doctoral degree in 2010.

For my dissertation, I worked on yield gaps and water productivity of high-yield irrigated corn in Nebraska using producer-reported data coupled with crop simulation modeling and geo-statistical analysis. After that, I was appointed as a Postdoctoral Research Associate first and then as a non-tenured Research Assistant Professor. In May 2013 I applied for the position that I currently, proudly hold — Systems Agronomist.

I am very passionate about my work and I am thrilled to continue working for UNL as a tenure-track professor. My research interests center on crop physiology, yield potential, resource- and energy-use efficiency in crop systems, and simulation modeling. My research encompasses a diverse range of cropping systems, including dryland crops in South America and Sub-Saharan Africa and high-yield irrigated corn and soybean in the U.S. Corn Belt. A major on-going project I am involved in, is to develop a Global Yield Gap Atlas (www.yieldgap.org)

that provides estimates of gaps between potential and actual yield for major cropping systems. I am also leading a project to benchmark on-farm yields and input-use efficiency in irrigated corn and soybean systems in Nebraska, aiming to find opportunities to improve producer’s profit while protecting the environment.

I was born and raised in Temperley, a town in the outskirts of Buenos Aires, Argentina, but I am also an Italian citizen, since my grandparents migrated to Argentina in the late 1940s. Here in Lincoln, I met an Italian girl, Caterina, and we are going to get married next June, in Caterina’s hometown in Italy. Caterina is pursuing a doctorate in American Literature in the UNL English Department. We just moved to a house very close to East Campus and we like to take long walks around the neighborhood, but also to garden, bike through Lincoln’s beautiful trails, and to explore Nebraska’s small towns during weekends. I simply feel grateful for living such a rewarding life in both professional and personal terms! •



Dirac Twidwell

Dr. Dirac Twidwell joins the faculty in Agronomy & Horticulture as a Rangeland Ecologist. Rangelands are used for a diverse suite of ecosystem services, and how they are managed directly impacts livestock production, conservation of endemic biodiversity and rare species, carbon sequestration potential, water quality and quantity, the capacity to protect human life and property from natural disasters, as well as their cultural, aesthetic, and recreational value. To this end, Twidwell is developing a transdisciplinary research program at the crossroads of rangeland ecology, applied fire physics and ecology, land use and climate change, wildlife management, and urban-environmental planning. Twidwell is currently setting up his lab to begin integrating these focal disciplines as part of research projects funded by the Department of Defense

and the Joint Fire Sciences Program. These projects are a key step toward successfully realizing his long-term vision of developing innovative solutions to the emerging social-ecological problems that degrade rangeland ecosystems.

A unique motivation behind the research in Twidwell's lab is to provide leadership in disaster avoidance and mitigation at the interface between rangelands and urban areas. As an example, people in Nebraska and elsewhere around the globe are struggling to deal with the increasing wildfire problem at the wildland-urban interface. Twidwell has already conducted experiments in the southern Great Plains to show how to control wildfires in closed canopy Juniperus



woodlands, and an overarching goal is to show how landscapes can be engineered to mitigate for the loss of life and property around urban environments. This requires an interdisci-

IN REMEMBRANCE

WILLIAM ROSS

March 20, 1925 – June 5, 2013



Emeritus Professor William Ross, age 88, passed on June 5, 2013. Dr. Ross, a USDA-ARS Plant Breeder and Geneticist at UNL from 1969-1985, was recognized nationally and in-

ternationally as a leading authority of sorghum improvement. Some of his honors included an American Society of Agronomy Fellow and a National Grain Sorghum Producers Association Outstanding Achievement in Sorghum Improvement award. Colleagues and Emeriti Professors Herman Gorz and Francis Haskins agreed that Ross participated fully in all aspects of his research program, from the most menial to the most intellectually challenging, and that he was an excellent role model for his graduate students as well as his faculty colleagues.

CHARLES O. GARDNER

March 15, 1919 – January 27, 2014



Emeritus Professor Charles O. Gardner, age 94, passed on January 27, 2014. Gardner was a professor at UNL for 39 years, retiring in 1989. He was named Regents Professor

of Agronomy in 1970 and served as president of the Crop Science Society of America and the American Society of Agronomy. Friend and colleague Dr. Thomas Hoegemeyer said, "Charlie was one of the giants in the development of quantitative genetics. His work was instrumental to understanding the nature of hybrid vigor in corn, and the development of modern corn breeding practices and systems. His students are still influential in the crop breeding industry, and his teaching and research contributed to food production worldwide."

DONALD G. HANWAY

August 6, 1918 – January 30, 2014

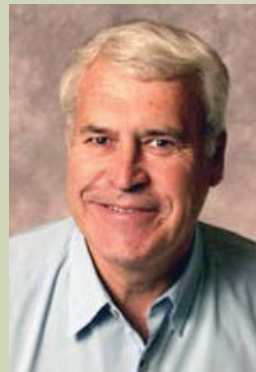


Donald G. Hanway, Sr., Emeritus Professor, age 95, passed on January 30, 2014. Dr. Hanway served as Chairman of the Agronomy Department from 1955-1976, retiring from UNL in

1984. He devoted much of his career to national and international plant breeding, genetics, soil fertility and conservation. Induction into the Nebraska Hall of Agricultural Achievement in 1970 was one of his many honors. Dr. Francis Haskins, UNL Emeritus Professor and colleague of Hanway said, "Although his participation in national and international agronomic affairs was extensive, it is fair to say that his knowledge of Nebraska crop production was unequalled and his desire to help Nebraska farmers was uppermost in his thoughts and actions."

FACULTY RETIREMENT

ROY SPALDING — 39 Years



Dr. Roy Spalding, hydro-chemist, retired Dec. 31, 2013 after 39 years with the Department of Agronomy & Horticulture. Spalding came to the University of Nebraska in 1974 and joined the department when he founded and assumed the directorship of the Water Sciences Laboratory in 1988. In the recent decade he has relinquished administrative duties

and remained with the department entirely on a research and teaching appointment. He currently is involved in research projects focused on groundwater nitrate contamination and the impacts of biofuel contamination on the vadose zone and groundwater. He presently serves on several national boards including chair of the National Water Research Institute's Clarke Prize Committee and as the academic representative for biofuel on the Interstate Technology and Regulatory Council of the states.

STAFF RETIREMENT

CHARLENE WENDT — 29 Years



by Charlene Wendt

In 1984, I remember being very nervous going to the 501 Building for a typing test. I was given two chances at the test to qualify for an interview. A call came, I interviewed with Agronomy and was hired. I started January 2, 1985 never imagining that the position would evolve into a lifetime career. Summer of 1987 brought a change and I

was fortunate to become secretary to the department head, Dr. Darrell Nelson. Serving six department heads, and an interim head during my career, I have been afforded the opportunity to meet and work with some of the world's greatest researchers and teachers in agriculture. Striving to serve this department, the faculty, staff, students and citizens of Nebraska in the best manner possible has given me a great sense of pride. It has been my honor and privilege to be part of its success. In closing my career, I think of the song comedian Carol Burnett would sing at the end of her TV show, "I'm so glad we had this time together. Just to have a laugh or sing a song. Seems we just get started and before you know it, comes the time we have to say so long."

plinary approach that combines his background in applied fire physics, spatial ecology, and plant ecology with the expertise of landscape architects, horticulturalists, agriculturalists, and urban planners and legislators. He feels the strong research and extension culture that has been established by faculty within Agronomy & Horticulture and elsewhere in the Institute of Agriculture and Natural Resources is an ideal environment to pursue these unique research interests.

The opportunity to leave a lasting impression on future generations of land stewards is a key reason why Dirac Twidwell is excited to teach and conduct research in Agronomy & Horti-

culture. Future generations of land stewards face a growing number of social-ecological challenges — from increased human consumption of natural resources to unprecedented rates of introductions of species to new continents to global increases in extreme climatic and disturbance events. Twidwell's personal philosophy as an educator is to develop students with life-long learning abilities that promote the types of skills needed to address these new social-ecological challenges. For this reason, he is looking forward to educating students in ways that help them successfully break down traditional disciplinary barriers in efforts to integrate knowledge across scientific domains. •

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Lincoln Saltdogs

Turf management at Haymarket Park

by Jeremy Johnson, Assistant Athletic Turf Manager, Haymarket Park

After graduating in December of 2012, I accepted the Assistant Athletic Turf Manager position at Haymarket Park in Lincoln. I am responsible for managing two fields for three different teams, ensuring pristine playing conditions and an aesthetically pleasing environment both inside and outside the facility.

Haymarket Park offers a truly unique experience, in terms of turf management. Our season begins in late January with the start of Husker baseball and softball practices. Typically, we host our first home games in the beginning of March, making us one of the most northern facilities to do so that early in the year. As the Husker season comes to a close in late May–early June, we begin the Lincoln Saltdogs season which lasts until late August–early September. During that time we host a variety of additional events to include Nebraska state baseball tournaments, recruiting tournaments, and camps. Activity on the field usually winds down near the end of November, with Husker fall practices and end of the year maintenance. Over the duration of a season, we host up to three times the number of events as other collegiate or minor league ball fields.

My career in turf management is very time consuming, and labor intensive. However, watching players and fans use and enjoy the product I help create is extremely rewarding.

The turf management program at the University of Nebraska-Lincoln was essential in my career development. I enrolled in the university as a non-traditional student after 8 years of service in the United States Army. Before enrolling, I had the opportunity to meet with advisers Anne Streich and Bob Shearman from the turf department. Meeting with them helped peak my interest in turf, and immediately declare a major in turf management.

The knowledge I gained from the professors in the turf program was invaluable. Unlike many students in turf, I had no prior experience in

the field. I learned everything from the professors such as identification, pesticide and fertilizer applications, and management practices. The capstone turf course was extremely valuable in preparing me for a career in this field. I gained first-hand experience in developing a budget and management program; I witnessed management problems and solutions in the field; and received assistance in obtaining a Nebraska pesticide license.

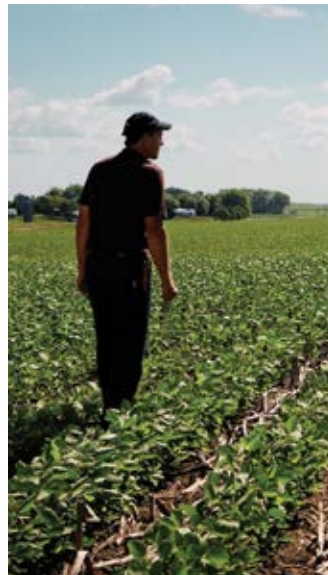
The most valuable part of my experience as a turf student at the University of Nebraska were the internship classes. The classes helped me identify and contact organizations with internship opportunities, improved the effectiveness of my resume and interviewing skills, and also provided additional career information through other students' internship experiences. Internships gave me the opportunity to apply what I had learned in class, as well as continued on-the-job training. The experience I gained while working directly under other turf managers was second to none.

The University of Nebraska-Lincoln has created a nationally respected turf management program. I have no doubt that the outstanding reputation of University of Nebraska turf students helped me land internships with the Lincoln Saltdogs and Philadelphia Phillies. These internship experiences had the greatest impact on where I am today. •





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To give or for more information, contact Ann Bruntz, abruntz@nufoundation.org, 402-458-1176.

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