



BLIZZARD WATCH

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Richard D. Horsley, Department Head

Dept. of Plant Sciences
NDSU Dept. 7670
PO Box 6050
Fargo, ND 58108-6050

Richard.Horsley@ndsu.edu
Phone: 701.231.7973
Fax: 701.231.8474

www.ag.ndsu.edu/plantsciences
www.ag.ndsu.edu/cerealscience
www.ag.ndsu.edu/foodscience
facebook.com/NDSUPlantSciences
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From the Department Head

Dr. Richard Horsley

When I look back at 2016, I will remember it first and foremost as the year of Dr. Hammond's passing. He was the conscience of the department, mentor of students and faculty, and kept all of our computers running. His absence has left a big hole in all of our lives. As we were completing this year's *Blizzard Watch*, we learned that our friend and colleague Michelle Grant passed away after a short stay in the hospital. Michelle was a highly respected member of our department and she will be missed. Dr. Shivcharan Singh Maan, former professor in the Department of Plant Sciences, and Dr. David Walsh, former associate professor in Cereal Chemistry and Technology also passed away in 2016.

The past year also was a time of retirements for Louise Heinz in the Plant Sciences office; and research specialists/technicians Bob Baumann, Mark Ciernia, Pete Gregoire, Bob Nudell, Ron Roach, and Theja Wijetunga. Collectively, these seven individuals worked a total of 223 years in the department. The knowledge and experience they had can't be replaced. Dr.

Dale Williams, director of the Foundation Seedstocks (FSS) Program retired on March 8, 2017. The knowledge and leadership he brought to the FSS Program will be difficult to replace.

In 2016, we had three new faculty join us in the department. Dr. Jiajia Rao is an assistant professor in the Cereal and Food Sciences group, Dr. Andrew Green is the new hard spring wheat breeder, and Dr. Grant Mehring is an assistant research professor working in the area of agronomy. We also added eight new faces to our research support staff, including two new bioinformatics positions created by the 2016 North Dakota Legislature. Dr. Kevin McPhee resigned his position as the leader of the pulse breeding program at the end of 2016 to take a similar position at Montana State University.

This year's *Blizzard Watch* is the longest ever because of the long list of awards and accomplishments by our students and faculty. Additionally, this year's *Blizzard Watch* includes profiles on Dr. Marisol Berti, who was awarded a \$2.15 million grant on cover



crop research from the USDA-NIFA; and a profile on our pulse research team. The Food and Agriculture Organization of the United Nations designated 2016 as the International Year of Pulses.

To make sure you keep up with the latest news and photos, you can access our web page at www.ag.ndsu.edu/plantsciences/, our Facebook page at [NDSUPlantSciences](https://www.facebook.com/NDSUPlantSciences), or our Twitter account at [@NDSUPlantSci](https://twitter.com/NDSUPlantSci). One of the items I really enjoy reading in the *Blizzard Watch* and on our web and social media pages are the profiles on our current students and alumni. If you are an alumnus, please visit our alumni page (www.ag.ndsu.edu/plantsciences/alumni) to tell us about your current position and how your experience at NDSU contributed to where you are today.

2016 also was a year of financial challenges for the university due to low crop and oil prices, which resulted in lower

(Continued on page 25)

Faculty Updates

New Faculty

Dr. Andrew Green joined NDSU in June as assistant professor and hard spring wheat breeder. He earned his B.S. in Agricultural Science with a Crop Science emphasis at Truman State University in Kirksville, Missouri, and his M.S. in Crop and Soil Environmental Sciences (Plant Breeding) at Virginia Polytechnic Institute and State University in Blacksburg. He earned his Ph.D. in Agronomy (Plant Breeding) from Kansas State University.



Green has extensive experience in wheat breeding. He worked in the wheat breeding programs as a graduate student at Virginia Tech and at Kansas State. He also interned with the Montana State University Spring Wheat Breeding Program.

Green's research at NDSU will be aimed at developing well-adapted and competitive spring wheat varieties for North Dakota.

Dr. Jiajia Rao is an assistant professor in the Cereal and Food Sciences program. Rao earned a B.S. in Food Science and Technology at Sichuan University of



Science and Engineering, China, and an M.S. in Pharmacology at Chongqing University, China, where she later held an assistant professor position in the School of Chemical Engineering. She earned her Ph.D. in Food Science at the University of Massachusetts, Amherst, where she was a postdoctoral associate following completion of her



degree. Prior to coming to NDSU, Rao was a senior scientist at PepsiCo, Inc.

Rao leads the Food Biopolymer and Ingredient research group, which works to identify the structure and functional properties of food biopolymers mainly from plant-based sources and their applications in food. She also teaches CFS 430/630 Food Unit Operations and CFS 480/680 Food Product Development.

Dr. Grant Mehring was hired as a research assistant professor in July. He earned his B.S. in Biology at the University of Jamestown (N.D.). He completed his M.S. and Ph.D. in Plant Sciences at North Dakota State University under M.S. adviser Dr. Harlene Hatterman-Valenti and Ph.D. co-advisers Drs. Joel Ransom and Jochum Wiersma. While completing his Ph.D., Mehring worked in Plant Sciences as a research specialist in Extension agronomy.



Mehring's work will focus on: 1) Small grains research focusing on physiology with high throughput phenotyping through the use of sensors; 2) Working with the on-farm research network of producers doing large scale research as Research Director at the Minnesota Wheat Research and Promotion Council; and 3) Facilitating the prioritizing and funding of research projects from the corn checkoff dollars in North Dakota as Research Director at the North Dakota Corn Utilization Council.

Faculty Promotions

Two faculty members earned promotions this year.

Dr. Marisol Berti was awarded tenure and promoted to professor. She earned her Ph.D. in Plant Sciences at North Dakota State University, and was hired as an associate professor in 2009. She leads the Forages and Biomass Crop Production project.



Dr. Greta Gramig was awarded tenure and promoted to associate professor. She earned her Ph.D. in Agronomy at the University of Wisconsin-Madison, and was hired at NDSU in 2008 as an assistant professor. She leads the Weed Biology and Ecology project.



Promotion acknowledges faculty members for professional competence and excellent service to NDSU. Tenure is affirmation of a faculty member's excellence and potential significant long-term contribution to NDSU.

Faculty Resignations

Dr. Kevin McPhee, professor and pulse crop breeder, left his position at NDSU at the end of December. He took a faculty position at Montana State University, where he will establish a pulse breeding program.

Dr. Chao C. Jen, adjunct professor in sunflower cytogenetics, retired from the USDA-ARS Northern Crop Sciences Lab at the end of December.

Staff Updates

New Staff

Dr. Yadav Gyawali was hired as a postdoctoral research fellow in wheat genetics and cytology with Xiwen Cai.

Dr. Ana Heilman-Morales and **Dr. Tom Walk** were hired as large database breeding pipeline managers. They will assist NDSU plant improvement teams in entering, managing, safeguarding and analyzing phenotype and genotype data using a variety of tools, including relational databases, software packages, and custom scripts, in order to expedite efficient advancement of germplasm through breeding pipelines for release and/or use as parental material in continued crossing efforts.

Research specialist **Martin Hochhalter** completed his M.S. degree and was promoted to assistant barley breeder under Rich Horsley. **John Grieger** joined the barley breeding program as a research specialist. **Jill Walkinshaw** was hired as an administrative secretary in the main office. She provides support to teaching faculty and undergraduate programs. **Darin Eisinger** is a research specialist in Extension crop production with Joel Ransom. **Thor Selland** is a research specialist in hard spring wheat breeding with Andrew Green. **Ashley Cooper** is an agricultural research technician in soybean breeding with Ted Helms. **Peter Ihry** is an agricultural research technician in Extension potato production with Andy Robinson.



Yadav Gyawali



Ana Heilman-Morales



Tom Walk



Martin Hochhalter



John Grieger



Jill Walkinshaw



Darin Eisinger



Thor Selland



Ashley Cooper



Peter Ihry



Staff Resignations

Individuals who resigned in 2016 are **Brad Schmidt**, research specialist in hard spring wheat; **Sydney Gilles**, research specialist in pulse crop breeding; **Alan Bingham**, research specialist in Extension potato production; and **Alex Nesemeier**, agricultural research technician in soybean breeding, transferred to the Agronomy Seed Farm.

In addition, seven Plant Sciences staff retired in 2016. See the full story on page 4.

Years of Service

5 Years

Hiroshi Ando
Joyana Baumann
Kamie Beeson
Sally Mann

10 Years

Jesse Underdahl
Kristin Whitney

15 Years

Mary Niehaus

30 Years

Allen Peckrul

35 Years

Albert "Jody" Vanderwal



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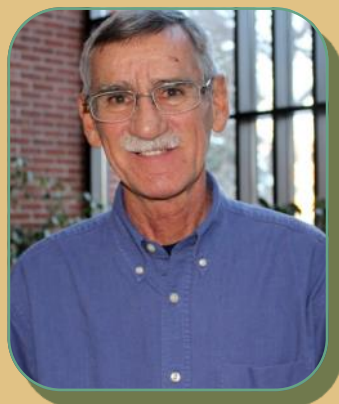


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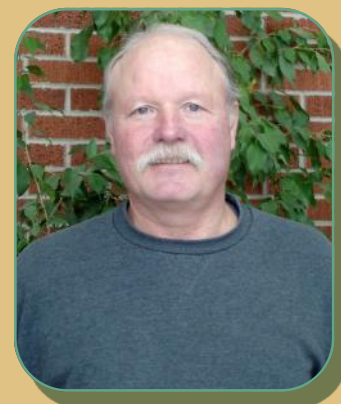
Seven Retire from Department of Plant Sciences



Louise Heinz



Bob Baumann



Mark Ciernia

By Karen Hertsgaard

Seven employees who worked a combined total of 223 years in the Department of Plant Sciences retired in 2016. Theja Wijetunga, Louise Heinz, Bob Baumann, Mark Ciernia, Ron Roach, Pete Gregoire, and Bob Nudell worked in the department's administrative office, and in the barley quality, crop physiology, forages, oat, weed science and wheat research programs. Baumann, Ciernia, Roach, Gregoire and Nudell were honored at a reception on December 22 in Loftsgard Hall. Celebrations honoring Wijetunga and Heinz occurred earlier in the year.

Louise Heinz retired on June 1, after 32 years of service. She began working at North Dakota State University in 1984 as a half-time administrative secretary with the Horticulture and Forestry Department under Department Chair Art Boe. When the Horticulture and Forestry Department and the Crop and Weed Sciences Department merged to become the Department of Plant Sciences in 1994, Heinz became part of the department and transitioned into a full-time position. She worked under Department Chairs Al Schneiter, Rod Lym, Dwain Myer, and Department

Head Richard Horsley. She provided secretarial support to faculty with teaching and undergraduate advising responsibilities and helped innumerable students make their way through all aspects of obtaining a degree. "My days were brightened by the daily contact with students!" said Heinz. "The biggest and most significant change has been the advances in technology."

Heinz was the recipient of the annual Mary McCannel Gunkelman Recognition Award in 1996. This award recognizes a student, faculty or staff member who contributed to a happy environment at NDSU. In 2005, she received the NDSU Agriculture and Extension Clerical Staff Award, and in 2015, she shared the NDSU Staff Recognition Award in the "Team" category with other members of the Plant Sciences Office Support Team.

Heinz said, "It's hard to believe that 32 years can pass so quickly! It was a journey filled with opportunities, challenges, support, and treasured friendships." She went on to say, "The Department of Plant Sciences has been my second home and I have enjoyed being a part of such a great department. I'm truly grateful for the caring faculty,

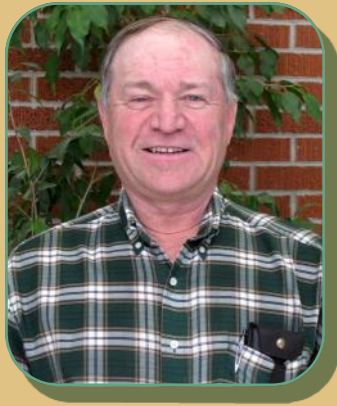
staff, and students I've met and worked with over the years." She and her husband look forward to moving to Lake Elmo, Minnesota, in the spring to be closer to their two daughters and families.

Bob Baumann began working in 1973 with project leaders Robert Busch and Richard Froberg in the hard red spring wheat project, and then with Ken Kofoid in 1979. In 1986, he began working with Bill Ahrens in the weed science program. He started working with Mike McMullen in the oat breeding project in 1987. McMullen somewhat jokingly said, "I enjoyed the opportunity to work for (with) Bob." McMullen also said that anything Baumann did "was done right," and he was always willing to help other projects.

Baumann received the NDSU Support Staff Award for Excellence in 1995 and the Rick and Jody Burgum Staff Award in 2014. He served on the NDSU Staff Senate from 2006 to 2007. During his 43 years of work, he also attended and helped host numerous meetings and crop tours at NDSU, South Dakota State University and the University of Minnesota.

Baumann commented that he will

Retirements



Ron Roach



Pete Gregoire



Bob Nudell

“miss working with good people but I look forward to spending time with family and friends, traveling, and enjoying my interests of hunting, fishing, farming and gardening.”

Mark Ciernia worked almost 30 years in the weed science program, with project leaders Bill Ahrens, John Nalewaja, George Kegode, Shane Friesen and Kirk Howatt. Howatt said, “Mark is a true friend to everyone who works with him. I will miss seeing the glint in Mark’s eye when [kidding around with] others in the project.”

Ciernia was the Field Research Director for the IR-4 Fargo location (residue trials to register pesticides on minor crops) and received the IR-4 Meritorious Service Award in 1999.

Ciernia looks forward to working at home and on his hobby ranch, where he raises meat animals and has pasture and hay land. He said that he hopes his “work at NDSU made a positive contribution to agriculture in North Dakota.”

Ron Roach had the most years of service of this group of retirees at 44 years. He worked closely with Ciernia, starting in the weed science program with project leaders John Nalewaja and Steve Miller in 1972 and then with

Kirk Howatt. Howatt said that Roach was always the first to arrive at work and parked his pickup in the best spot in the lot. Roach also filled him in on valuable information about farming in the Red River Valley. Howatt said, “I will miss starting my days with Ron and ending my days with Mark.”

Roach said he will miss his friends in the department.

Pete Gregoire began working in crop physiology with Ed Deckard in 1995 and most recently worked in weed science with Greta Gramig. He said, “It’s been a fast 22 years. Working with the people in our department is one of the best parts of the job. It’s a collaborative effort and a tremendous support network makes our jobs easier and enjoyable.”

Gramig said that she had been dreading the day of Gregoire’s retirement for a long time. As a new faculty member in 2008, she said she appreciates all Gregoire taught her, and his help in her first years in North Dakota. She thanked Gregoire “from the bottom of her heart” and said, “The collective loss of all these retirees is very big.”

Gregoire looks forward to traveling and enjoying his interests of wood working,

hunting, fishing, and landscaping work at home.

Bob Nudell had 31 years of service at NDSU, working in Facilities Management before transferring to the Department of Plant Sciences in 2002. He has worked as the agriculture research technician in the forages program with Dwain Meyer and in forages and biomass crop production with Marisol Berti.

Berti said that Nudell is a perfectionist in soil preparation and she will miss his good work. Nudell said he will miss working with the people in the department and appreciated hardworking hourly student workers.

During the December retirement party, Department Head Richard Horsley made final comments on the retirements, saying the department and the projects are “only as good as the people you work with.”

Howatt summed it up by saying that the “value of the resources we are losing is phenomenal and we will be losing lots of good knowledge.”

Best wishes, Theja, Louise, Bob, Mark, Ron, Pete, and Bob!

Faculty and Staff Awards and Honors

Horsley Named Fellow of Crop Science Society



Richard Horsley was honored as a Fellow in the Crop Science Society of America (CSSA) during the annual joint meeting with the American Society of Agronomy and the Soil Science Society of America in November.

Horsley has worked as the lead barley breeder for the NDSU barley breeding and genetics research project since 1988, serves as the coordinator of the malting barley improvement program and is the Department of Plant Sciences Head. He also served as the Assistant Department Chair from 2005 to 2010.

He has advised 23 graduate students and taught more than 1000 students statistical techniques and biometrics in his PLSC 724 Field Design I course. He also advises many students on specifics of design and analysis of research experiments, and periodically offers a short version of his course to technicians and researchers from private and public programs in the area.

Horsley was the chair of the CSSA committee for barley registration from 2001 to 2007. He serves on the board of trustees for the Wheat Quality Council and on the executive and steering committees for the United States Wheat and Barley Scab Initiative. His past professional service includes serving as chair of the National Barley Improvement Committee, as a member of the North American Barley Genome Mapping Steering Committee, and as a member of the Agronomy Journal Editorial Board.

Horsley has authored more than 150 professional publications. Five barley cultivars approved as malting barley

varieties by the American Malting Barley Association have been released from NDSU during his tenure as barley breeder.

NDSU Cereal Crops Extension Agronomist Joel Ransom says that Horsley's "leadership and administrative competence has allowed the Plant Sciences Department at NDSU to expand, be more productive, and to better meet the needs of scientific communities and the farmers of North Dakota and the surrounding region. He is hard working, persistent, productive, generous with his time, and fair and effective in his administration."

The Fellow award is the top award given by the society. It is given to only 0.3 percent of the CSSA membership and rewards outstanding contributions to agronomy through education, national and international service and research.

Lee Receives Friend of the Farmer Award



Chiwon Lee received the Northern Plains Sustainable Agriculture Society (NPSAS) Friend of the Farmer award for 2016. The

award recognizes individuals who support agriculture in the Northern Plains through dedicated work to enhance the sustainability of agricultural, food and distribution systems, and was presented during the NPSAS winter conference.

Lee has partnered with the NPSAS the last three years to conduct vegetable cultivar trials, working to select varieties that have preferred taste and texture, as well as the highest yield and percentage of salable production.

"Dr. Chiwon Lee has been an integral part of Northern Plains Sustainable

Agricultural Society's vegetable research efforts," said NPSAS Executive Director Edd Goerger.

In addition to receiving the award, Lee presented a session during the conference that described the breadth of specialty crop breeding at NDSU.

Hall and West Receive Faculty Excellence Awards

Clifford Hall received the Odney Excellence in Teaching Award and **Todd West** received the Outstanding Faculty Advisor Award during the NDSU Celebration of Faculty Excellence in May.



Clifford Hall

Hall has taught in the cereal and food sciences program at NDSU since 1998, serves as the food science undergraduate program coordinator, and also leads the pulse end quality project.

The Odney Award was established by the family of the late Robert Odney, a Fargo businessman and NDSU alumnus, to recognize outstanding undergraduate teaching by faculty at NDSU.



Todd West

West is the horticulture undergraduate program coordinator, teaches horticulture courses, and also leads the woody plant improvement project. He has worked at NDSU since 2011.

The Outstanding Faculty Advisor award recognizes faculty advisors who are committed to helping undergraduate students reach their full potential. The award was established by the Office of the Provost to highlight the importance of academic advising.

Faculty and Staff Awards and Honors

Hatterman-Valenti Chosen as Viticulture Society Chair



Harlene Hatterman-Valenti became the 2016-2017 Chair of the American Society for Enology and Viticulture-Eastern Section (ASEV-ES) during the annual meeting held in July. Hatterman-Valenti has been a member of ASEV-ES for five years and served as a member of the Board of Directors in 2014-2015 and as chair-elect in 2015-2016.

The ASEV-ES provides forums for researchers and students to learn about and publish research on grape and wine production, technology developments in enology and viticulture as well as solving problems of specific interest to researchers and producers in the Eastern United States and Canada.

Hatterman-Valenti leads the NDSU high value crops research program and is a professor and assistant department head.

Robinson Receives Excellence in Extension and Outreach Award



Andrew Robinson won the Myron & Muriel Johnson Excellence in Extension/Outreach Award at the NDSU Ag-

riculture and Extension Faculty/Staff Awards held in December. According to the Office of the Vice President for Agricultural Affairs, this award was established by the NDSU Extension Service to “encourage and reward exceptional engagement in programming and innovative Extension/outreach practices.” Robinson began work at NDSU in 2012 as an assistant professor and Extension agronomist in potato production.

Extension Program of Excellence Award

Tom Kalb, Esther McGinnis and Clifford Hall were members of the “Field to Fork: Enhancing the Safe Use of North Dakota Specialty Crops” team, which was awarded a Program of Excellence Award at the NDSU Extension and Research Extension Center Conference held in Fargo in October.



Tom Kalb



Esther McGinnis



Clifford Hall

The team designed a project to enhance knowledge and safe food handling of specialty food and vegetable crops from field to table.

Research Grants

Plant Sciences faculty are active in pursuing grants for research funding and support. Below is a snapshot of grant awards in 2016.

- ◆ A total of over \$8.8 million in grants were awarded
- ◆ 171 grants from \$1,000 to \$2.1 million were awarded to 34 faculty

The three largest grants awarded were:

- ◆ *A Novel Management Approach to Increase Productivity, Resilience, and Long-Term Sustainability in Cropping Systems in the Northern Great Plains*
Project Leader: Dr. Marisol Berti
Funded by: USDA/NIFA
Amount: \$2,147,839
- ◆ *Breeding of Improved Non-GMO Cultivars and Germplasm*
Project Leader: Dr. Ted Helms
Funded by: ND Soybean Council
Amount: \$245,481
- ◆ *Developing 6- and 2-Rowed Malt- ing Barley Cultivars with Enhanced FHB Resistance and Reduced DON Accumulation*
Project Leader: Dr. Rich Horsley
Funded by: USDA-ARS/USWBSI
Amount: \$185,552

The five agencies granting the most funds were:

- ◆ USDA/NIFA-Food Security Program: 1 grant; \$2,147,839
- ◆ ND Wheat Commission: 26 grants; \$1,063,722
- ◆ USDA/AMS-ND Dept. of Agriculture/ND Specialty Crop Block Grant: 11 grants; \$741,770
- ◆ USDA/ARS-USWBSI: 7 grants; \$651,932
- ◆ ND Soybean Council: 5 grants; \$516,930



Congratulations

Faculty Profile: Berti Leads Forages and Biomass Crops Program

By Karen Hertsgaard



Dr. Marisol Berti leads the Forages and Biomass Crop Production project in the Department of Plant Sciences at North Dakota State University.

Berti started working at NDSU in 2009 after 12 years at the Universidad de Concepción in Chillán, Chile. She received her B.S. in Agronomy in 1990 from Pontificia Universidad Católica de Chile in Santiago, her M.S. in Crop Production in 1993, and Ph.D. in Plant Sciences in 2007, both from NDSU. Her research in Chile was in production and management of oilseeds, medicinal, and nutraceutical plants. She was awarded over \$2 million in grants while working at the University of Concepción.

The goals of the NDSU forages and biomass crop production project are 1) to evaluate and improve current forage production practices, 2) to evaluate new and traditional crops as sources of biomass for bioenergy production, and 3) to increase the use of cover crops in current cropping systems in North Dakota. Visit the project webpage at www.ag.ndsu.edu/plantsciences/research/forages.



Forages and Biomass Crop Production project team

Forage Production

Berti's forage production research centers on best management practices including variety selection, and the effect of planting and harvest dates on forage quality in alfalfa and other perennial and annual forages. Data such as yield, quality, and alfalfa stand density is collected from fall harvested alfalfa and alfalfa-grass mixtures. The research team also focuses on developing a method to appraise alfalfa yield losses for use by the United States Department of Agriculture-Risk Management Agency (USDA-RMA) Multi-Peril Insurance programs.



Berti is well respected by producers and she spends considerable time presenting information at field days and research update meetings, as well as answering specific production questions throughout all seasons.

Biomass for Bioenergy Production

The second goal of Berti's project is to discover crops that yield high biomass for the purpose of bioenergy production. After evaluating numerous perennial grasses, she decided to focus on forage sorghum, which she says is ideal for biomass and bioenergy research. Some of the characteristics that distinguish forage sorghum for biomass research are that it surpasses all other crops for biomass yield, even in areas with low water availability, it can be used for second generation biofuel pro-



duction from sugars extracted from complex carbohydrates in the biomass, and it can be used as a double- and relay-crop with camelina, a winter oilseed for biofuels. Forage sorghum production also benefits the ecosystem by improving soil health, preventing soil erosion, and increasing biodiversity.

Berti was awarded a USDA-National Institute of Food and Agriculture-Agriculture and Food Research Initiative (USDA-NIFA-AFRI) - North Central Sun Grant project to study cold-tolerance in forage sorghum with the aim of earlier planting. For more information on this grant, see <http://bit.ly/2flEv39>.

Berti's interest and research in biomass/bioenergy production has led her to teach students about sustainable and renewable energies by leading PLSC 379/779, a study abroad course titled "Sustainable Agriculture and Renewable Energies in Europe". Over three years (2013, 2015 and 2016) she led and taught a total of 36 NDSU students in Central Europe and Scandinavia.



Faculty Profile: Berti



The groups visited universities, research centers, farms, and energy and farming industries in seven countries. The next course will be offered in the summer of 2018.

Cover Crops

The third area of research in Berti's project centers on using cover crops and camelina in double-, relay- or intercropping systems in corn, soybean or wheat production in the northern Great Plains and upper Midwest.

In April of 2016, Berti was awarded a



multi-state, multi-researcher USDA-NIFA Coordinated Agricultural Project (CAP) grant in the Global Food Security Program. The goal of the CAP grant is to increase the use of cover crops in the upper Great Plains to reduce soil erosion. She wrote and submitted this competitive proposal and is the Principal Investigator/Director of the project, titled "A Novel Management Approach to Increase Productivity, Resilience, and Long-Term Sustainability in Cropping Systems in the Midwest".

Thirteen researchers from the University of Minnesota, Iowa State University, the USDA-Agriculture Research Service Research Center in Morris, MN, and NDSU are participating in the two-year initial \$2.1 million grant. An additional \$1.6 million will be awarded in 2018 for an additional two years of the study.

For more information on this grant, see <http://bit.ly/2frYJCU>.

Teaching & Professional Affiliations

Besides PLSC 379/779, Berti teaches PLSC 320 Principles of Forage Production, PLSC 350 Sugarbeet Production and PLSC 711 Professional Development II. She currently advises five graduate students.



Berti is active in many professional organizations. She has been a board member of the Midwest Forage Association since 2009, was chair of the C-6 Forage and Grazinglands Division in

the Crops Science Society of America in 2015, and is a member of the Midwest Cover Crop Council (MCCC) Board. She serves on the North Central-221 cover crops committee of the MCCC, collecting all state cover crop research to write, edit and publish the annual North Dakota cover crops report. She also is a member of the scientific committee of the European Biomass Conference (EUBIA) that is held in different European cities every year in June. She is president of the Association for the Advancement of Industrial Crops (AAIC) and planned the 2016 annual meeting, held in Rochester, NY. Additionally, she has been editor-in-chief of *Industrial Crops and Products*, from Elsevier editorial, since 2012.

Berti's publication record includes 55 peer-reviewed publications, three book chapters, 20 proceedings publications, and 120 conference and symposium presentations. Through her membership in the scientific committee of the EUBIA, she collaborates and co-publishes with researchers from Italy, Portugal, Greece, and Austria.

In 2014, Berti received the Larson/Yaggie Excellence in Research Award from the NDSU College of Agriculture, Food Systems and Natural Resources. She also was elected president of the NDSU chapter of Gamma Sigma Delta (Honor Society of Agriculture) for the 2014-2016 term.



Research News

Berti Leads \$2 Million Cover Crop Research Grant

Published by NDSU Ag News, May 11, 2016



Marisol Berti

A nearly \$2.15 million grant the U.S. Department of Agriculture recently awarded to North Dakota Agricultural Experiment Station scientists at NDSU will be used for a project to demonstrate how cover crops can increase the resilience and productivity of crops such as corn and soybeans and improve soil health and land use efficiency.

"The use of cover crops, common in the eastern and central Corn Belt, are uncommon in corn-soybean systems in the Upper Midwest and northern Great Plains due to the short growing season and extreme fluctuations in temperature and precipitation within and across growing seasons," says Marisol Berti, the project's lead investigator.

She adds that the lack of soil cover in the winter increases the loss of organic matter and nutrients from the soil, requiring producers to apply larger amounts of fertilizer to maintain or increase their crop yields.

"Therefore, there is a critical need to alter current cropping systems in our region by incorporating technologies to improve long-term productivity while enhancing ecosystem services," Berti says.

This project is a collaborative effort of 13 researchers. Eight are from NDSU, which is leading the project. The remainder are from the University of Minnesota, Iowa State University and the U.S. Department of Agriculture's Agriculture Research Service Laboratory in Morris, Minn.

Researchers Contribute to World Food Security



Juan Osorno



Phil McClean

NDSU Dry Bean Breeder Juan Osorno is the lead investigator on a research project focused on "Genetic Improvement of Middle-American Climbing Beans for Guatemala". Collaborating researchers are NDSU Genomics and Bioinformatics Program Director Phil McClean and scientists from ICTA (Institute of Science, Technology & Agriculture), Guatemala. The project is part of the Legume Innovation Lab, an edible grain legumes research program funded by USAID/Feed the Future and housed at Michigan State University. Through the Legume Innovation Lab, Osorno's team is working to improve climbing bean cultivars adapted to a specific region in Guatemala for both



disease and pest resistance. In addition, they are training Guatemalan breeders in the breeding practices for long-term sustainability. This project and others hosted by the Legume Innovation Lab are contributing to economic growth and food and nutrition security in several developing countries. Read more at <http://agbioresearch.msu.edu/news/the-legume-innovation-laboratory>.



Industrial Hemp Research

North Dakota farmers are growing industrial hemp for the first time in more than 70 years, and the new crops research program at NDSU, led by Burton Johnson, is conducting research to assist them. The research is conducted at the NDSU Research Extension Center (REC) at Langdon, ND by agronomist Bryan Hanson.



Burton Johnson

Federal regulation of industrial hemp production changed recently. Previously, according to federal law (Controlled Substances Act of 1970), all *Cannabis sativa* plants were defined as marijuana regardless of the Tetrahydrocannabinol (THC) content. Industrial hemp is legally defined as less than 0.3% THC, which makes it unsuitable for drug and therapeutic uses. The first regulation change came when the Agricultural Act of 2014 (farm bill) allowed that research institutions and state departments may grow industrial hemp if allowed under state laws. North Dakota addressed this in March 2015 when Governor Jack Dalrymple signed House Bill 1436, which creates guidelines for industrial hemp production and helps to reduce federal policies that made industrial hemp production difficult and cost prohibitive. The North Dakota Department of Agriculture (NDDA) then implemented the industrial hemp pilot program. This allowed NDSU to begin conducting research in 2015 and allowed farmers to apply to be selected to produce industrial hemp under the state and federal guidelines.



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Seventeen farmers applied to the pilot project and four were chosen. The selected farmers' applications indicated that they would grow industrial hemp for hemp oil and a building material called "hempcrete", which is manufactured from hemp plant pulp, and as a transitional crop for conversion from conventional to organic production. Industrial hemp has other possible uses including fiber, food, paper and textiles, and also can help suppress weed growth and improve soil quality. NDDA Commissioner Doug Goering said, "The program's primary goal is to increase our knowledge of how industrial hemp fits into the existing agriculture landscape and economy."

The research at the Langdon REC in 2015 tested 12 industrial hemp varieties originating from Australia, Canada, Finland and France. Three of the tested varieties are used for both grain and fiber production, three are primarily for grain production and six are primarily for fiber production. All varieties were



Industrial hemp research team at Langdon REC.

evaluated for grain and fiber production as well as various agronomic traits such as seed mortality, seedling vigor, plant height and test weight. The results of the trials indicated the Canadian industrial hemp cultivars are better adapted to the Langdon region of North Dakota

and that grain and fiber yields were similar to those seen in Canada, where industrial hemp has been grown since 1998.

Rye Resurgence in North Dakota and Minnesota

Increased interest in growing rye in North Dakota and Minnesota has spurred researchers to update production information on the small grain crop. Growers are looking for alternatives for cash and cover crops, and there is a new interest in malting rye for craft brewing and distilling.



Rye field at NDSU Carrington REC. Photo credit Steve Zwinger

Tests on a new rye variety are in progress at the NDSU Research Extension Centers (REC). Carrington REC Research Specialist Steve Zwinger reports that over the past few years he has received requests for winter rye seed along with rye production information from growers. Because the last variety released in North Dakota, Dacold, was in 1989, researchers saw a need to develop and test a current variety. A new variety, identified as DR02, was the result of their research. Thirty-five acres of DR02 were seeded in the fall of 2015 to increase seed in anticipation of release of the variety in 2016.

Another project evaluating winter rye varieties is led by Jochum Wiersma, small grains specialist and professor at the University of Minnesota at Crookston. Wiersma says that rye is uniquely suited to the drought prone soils in

Minnesota and is the most winter hardy cereal crop. However, no new agronomic or performance data on winter rye has been published for more than two decades.

Several rye varieties tested by Wiersma were submitted to the malting barley quality laboratory at NDSU to determine basic malt characteristics. One of those varieties is DR02. Malting Barley Quality Specialist Paul Schwarz manages the laboratory and one of his M.S. students, Yujuan Wang, runs the rye malting research.

Schwarz says that there are specific difficulties in malting and brewing with rye, mainly because of the high soluble fiber (arabinoxylan) content of rye kernels, which causes problems with filtering during the brewing process and haziness in the final brewing liquid (wort). But, he says the unique flavors that rye imparts to beer are highly desired by brewers. These flavors are characterized as soft grain, tart, spicy and crisp.

Wang has completed her initial research to identify micro-malting conditions that could be used to screen rye genotypes for malt quality with the goal of obtaining high extract, minimal malt loss and lower arabinoxylans content in the wort, thus reducing wort viscosity. She plans to continue researching more of the varieties in Wiersma's study and also will look at flavor differences between rye varieties for her M.S. thesis.



Find more news on our website! www.ag.ndsu.edu/plantsciences/news

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Food Science: www.ag.ndsu.edu/foodscience

NDSU Pulse Research Program

By Karen Hertsgaard

The 68th United Nations Assembly/ Food and Agriculture Organization declared 2016 the International Year of the Pulse, focusing increased interest on pulse crop research programs, as well as the benefits of production and consumption of pulses worldwide.



Pulses are annual leguminous crops including lentils, edible beans, peas and chickpeas, which “fix” nitrogen from the atmosphere and increase soil fertility by adding nitrogen back into soil. They also use less water than many other cultivated crops and have a deep root structure, which is healthy for crop rotations. Pulse crops are nutrient dense and contain proteins, vitamins and dietary fiber. According to the United States Department of Agriculture National Agricultural Statistics Service, North Dakota is ranked #1 for edible bean and #2 for pea and lentil production. Close to 40% of U.S. dry bean production is from North Dakota.

The pulse program at North Dakota State University includes the dry edible bean breeding program led by Juan Osorno and the pulse end quality program led by Clifford Hall. Kevin McPhee ran the pulse breeding program from 2008 to December 2016. He now is the pulse breeder at Montana State University in Bozeman.

Osorno has worked as the NDSU dry edible bean breeder since 2007. The program originated in 1980. Osorno evaluates pinto, navy, black, kidney, great northern, small red and pink beans in the breeding program, working for improved disease resistance, seed yield and quality factors. Osorno has noticed increased industry interest

in improving the functionality of beans for food items such as snacks and convenience foods. Also of interest are products such as navy bean flour and bean products for 3D printing supplies.

Osorno also collaborates with Dry bean Geneticist and Biotechnologist Phillip McClean. NDSU was the leading institution, with McClean as the project leader, for research that developed the bean genome sequence published in *Nature Genetics* in 2014. (See story at <http://bit.ly/1O3Dn8d>.)

According to Hall, assessing the chemistry and processing of raw pulses is the main mission of the pulse end quality research program. Factors such as yield, moisture content, protein and starch composition, nutritional components, hydration and starch composition of pulse crops are measured yearly and compared to historical data in order to track the quality of regional pulse crops. He publishes a U.S. Pulse Crop Quality Survey yearly.

Innovative product development using pulses also is an important aspect of Hall’s research program. Current projects include working to improve the taste of pea flour for gluten-free foods, using pea proteins to replace eggs for emulsification in food products, utiliz-

ing pea proteins in protein drinks, and comparing edible bean cotyledons and whole beans for flour production.

Pan-African Grain Legume Conference

Osorno, McClean and graduate students Courtney Holdt, Lucy Lund, and Luz Montejo Dominguez attended the joint Pan-African Grain Legume and World Cowpea Conference in Zambia, Africa in March, one of 16 official events established to celebrate the International Year of the Pulse. The group presented research as part of their involvement with the Legume Innovation Lab, an edible grain legumes research program funded by USAID.



L to R: McClean, Montejo, Holdt, Lund, Osorno

North Dakota Pulses Trade Mission

Osorno was one of 14 individuals that represented North Dakota on a trade mission to Colombia in March 2016. Organized by the North Dakota Trade Office, the purpose of the trip was to promote North Dakota pulses to government officials and commodity importers in Colombia. North Dakota Department of Agriculture Commissioner Doug Goehring was part of the mission, as were several North Dakota bean dealers. The week was capped off with the inaugural Colombia-North Dakota “Better for You Food Ingredients” Conference and Exhibition.

Osorno prepares to present at the Colombia-North Dakota Conference & Exhibition.



Juan Osorno



Clifford Hall



Phillip McClean



Kevin McPhee

Variety, Germplasm Releases and Woody Plant Introductions

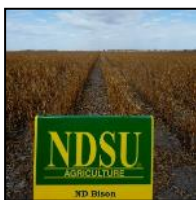
The North Dakota Agricultural Experiment Station (NDAES) released new crop varieties ND Bison soybean, ND Palomino pinto dry bean and ND Dylan winter rye in 2016. Boost and Surpass hard red spring wheat were released by the South Dakota Agricultural Experiment Station, and Shelly hard red spring wheat was released by the Minnesota Agricultural Experiment Station. ND Bison, ND Dylan, Boost, Surpass and Shelly were distributed for the first time by the North Dakota County Seed Increase Program, while ND Palomino was distributed to the North Dakota Dry Edible Bean Seed Growers Association.

For information regarding the availability of foundation or registered seed for these or other varieties, contact a county NDSU Extension Service agent, an NDSU Research Extension Center, the ND Foundation Seedstocks Project or refer to the North Dakota Field Inspected Seed Directory from the ND State Seed Department.

In addition, the NDAES and NDSU Research Foundation introduced one new woody plant selection developed by the NDSU Woody Plant Improvement program, and four new corn inbred lines were released.

ND Bison Soybean

Breeder: Ted Helms



and moderate SCN resistance.

ND Bison is a conventional soybean variety intended to replace Sheyenne. It has improved defensive traits and performed very well in the multi-state uniform regional test. General characteristics include high yield, medium-late relative maturity

ND Palomino Pinto Bean

Breeder: Juan Osorno



ta. Canning quality is within acceptable commercial ranges.

ND Palomino slow darkening pinto bean was jointly released by the NDAES and the USAD-ARS. Agronomic performance and seed color, size and shape are within acceptable commercial ranges of popular pinto bean cultivars grown in North Dakota.

ND Dylan Winter Rye

Breeder: ND Carrington REC/Steve Zwinger

ND Dylan is a high yielding, medium-late winter rye variety that has very good winter hardiness. It is a tall variety with good straw strength. Winter hardiness ratings and early season vigor scores demonstrate ND Dylan's potential for use as a grain, cover or forage crop. ND Dylan is named to honor the memory of Dylan Zwinger, a young man who loved the land.



Emerald Beacon™ Tianshan Birch

Betula tianshanica 'EmerDak'

Project Leader: Todd West

Emerald Beacon™ is a distinctive, cold hardy birch selection that grows in a narrowly pyramidal form. It sports emerald green foliage throughout the summer and bright golden-yellow foliage in autumn. Its slight exfoliating white bark is extremely showy, adding significant seasonal interest.



Corn Inbred Lines

Breeder: Marcelo Carena



Four new very short-season (68RM to 74RM) corn inbred lines were released exclusively to a U.S. Foundation Seed Company. Hybrids including the new lines outyielded adapted commercial hybrids in marginal environments. In addition, they showed faster dry down, better stay green, cold and drought tolerance, excellent lodging resistance, and higher grain quality. These are new and unique to the North Dakota early maturity commercial market and will help expand corn north to Manitoba. **ND2044** is a unique Stiff Stalk heterotic group female line that was developed to be used as parent of 74RM short-season elite hybrids. **ND2048** is a unique non-Stiff Stalk heterotic group male line that was developed to be used as parent of 70RM short-season elite hybrids. **ND2049** is a unique non-Stiff Stalk heterotic group male line that was developed to be used as parent of 72RM short-season elite hybrids. **ND2051** is a unique non-Stiff Stalk heterotic group male line that was developed to be used as parent of 68RM short-season elite hybrids.

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Food Science Program Approved by Review Board

The North Dakota State University Food Science Program has been re-approved for five years by the Institute of Food Technologies (IFT) Higher Education Review Board (HERB). IFT/HERB approval means that the program offers courses and degree options that meet the IFT Undergraduate Education Standards for Degrees in Food Science, which include specific administrative and physical standards, and core and food science course offerings.

Sixty-four universities worldwide have approved undergraduate programs. NDSU has been approved since 2005, and has been re-approved every five years as required by the IFT.

The IFT education standards were developed to ensure students graduating with a B.S. degree in Food Science will be well prepared for professional development and scientific research in food industries worldwide. NDSU Food Science Program Coordinator Clifford Hall says, "The benefit of IFT/HERB approval is that those in the food industry looking to hire new graduates will know that NDSU students meet the same high level of education and experience as all approved schools."

New Loftsgard Laboratory Classroom

The remodeling of Room 116 in Loftsgard Hall is complete and the laboratory classroom has been busy since the first day of the fall 2016 semester. Classes taught in the room are required for Crop and Weed Sciences majors and are usually at capacity with students on wait lists.



Cliff Hall (right) works with a student in the lab.

Remodeling of the laboratory classroom began in early 2016. The first classes commenced in August 2016 with 532 students in 22 laboratory sections. The current spring semester has 547 students in 23 laboratory sections, which is a seven percent increase from the 2015 spring semester enrollment. The new classroom space allows for 36 students in each laboratory section.

The classroom has access to a state-of-the-art growth room, ample storage for laboratory equipment and educational materials such as dried plants and mounts, dual projection screens, convenient white boards, ceiling mounted extension cords, movable desks, easy clean floors and soil traps in sinks for easy cleanup.



Laboratory classes taking place in Room 116 in spring semester 2017 are World Food Crops (PLSC110) taught by Rebekah Oliver and Brenda Deckard; Weed Identification (PLSC215) taught by Greta Gramig; Principles of Crop Production (PLSC225) taught by Burton Johnson; Genetics (PLSC315) taught by Michael Christoffers; Principles of Forage Production (PLSC320) taught by Marisol Berti; and Principles of Weed Science (PLSC323) taught by Kirk Howatt.

Johnson says he really likes teaching in the new space. "Activities in the former classroom were crowded and class size had to be limited," he said. His class has increased by more than 20 students from 2015 because he can allow more students to register for lab sections.

Classroom activities during the second week of the spring semester included germination tests in Principles of Crop Production, microscopic examination of growing plant tissue in Genetics, crop identification in World Food Crops and weed identification in Principles of Weed Science.

Room 116 formerly housed research growth chambers, which are now located in the Agricultural Experiment Station Research Greenhouse.

Research Plot Produce Donated to Food Pantry

Students Jacob Kluza and Austin Espe are responsible for growing more than 4000 pounds of fresh produce that was donated to the Emergency Food Pantry in Fargo, ND during the 2016 growing season. The donated vegetables were grown in two research projects for the high value crops project led by Harlene Hatterman-Valenti. The donations were organized through the North Dakota Department of Agriculture Hunger Free North Dakota Garden Project.

Kluza is working on his M.S. degree in Plant Sciences, advised by Hatterman-Valenti and Esther McGinnis, Extension horticulturist and assistant professor. Espe is a senior majoring in Microbiology, advised by Janice Haggart.



Department News



Jacob Kluz

Kluz's project, which is part of his graduate research, involved comparing how well cut flowers, tomatoes, cucumbers and peppers grow inside and outside high tunnels.

High tunnels shelter plants from disease agents and extreme environments, significantly extending the growing season. For Kluz's project, high tunnels were constructed in three locations with funding provided by the North Dakota Department of Agriculture Specialty Crop Block Grant Program. Kluz said that the high tunnel helped extend the growing season in one location by more than six weeks, and protected plants from a catastrophic hail storm in August.



Austin Espe

Espe was awarded a Department of Plant Sciences Research Fellowship to work for Hatterman-Valenti during the summer. The purpose of his research was to study the effects of biostimulants on cucurbit production. Cucurbit crops included in his study were cucumbers, summer squash, cantaloupe, watermelon, pumpkin and winter squash. Espe presented his research as a poster during the 2016 NDSU EXPLORE Undergraduate Excellence in Research and Scholarly Activity event in November.

Classes Host National Arborist

Todd West's PLSC 386 Arboriculture Climbing and Rigging Operations and PLSC 485/685 Arboriculture Science courses welcomed a guest instructor for a day this fall. Rip Tompkins, internationally known arborist and co-founder of ArborMaster Training, Willington, Connecticut, taught and demonstrated



advanced climbing and rigging techniques and provided an industry perspective on the arborist career. Students who already have climbing training and experience were able to receive individual, hands-on instruction with Tompkins, as well. The PLSC 386 course is a path to becoming a Certified Arborist. Skills in tree climbing and rigging are necessary for this career field, as a bucket truck can't always get into a space to work on a tree. Individuals trained in tree climbing have the potential for a profitable career.

Students Recognized at Scholarship Luncheon

The annual NDSU College of Agriculture, Food Systems, and Natural Resources Scholarship Recognition Luncheon was held in November. Ninety-three scholarships ranging from \$100 to \$2,000 were awarded to 79 Crop and Weed Sciences, Horticulture, Plant Sciences, Food Science and Cereal Science students; 50 to undergraduates and 29 to graduate students. Donors also attended the recognition luncheon. The total scholarship dollars awarded for the 2016-17 academic year was \$67,792.

Study Tour in Vietnam

During spring break a team of research and Extension students and staff participated in a study tour of the research and Extension activities in Vietnam that support the development of a climate resilient agriculture. Participants were Ph.D. students Grant Mehring, Shana Forster, Aaron Hoppe and Lesley Lubenow; M.S. students Ben Cigelske and Calli Feland; and Research Specialist Chad Deplazes. Drs. Joel Ransom and Hans Kandel led the tour.

The group visited the Thai Nguyen University of Agriculture and Forestry, a Climate Smart Village (a project from the International Center for Tropical Agriculture), a World Agroforestry Centre project, and the Field Crops Research Institute, which included a focus on the work of the International Rice Research Institute. In addition, a number of local markets and water resource management sites were observed.



Vietnam was selected for the 2016 study tour because of the significant role agriculture plays in the country's economy, and the large proportion of the population involved in agriculture. Vietnam's agro-economy consists of intense small-scale agriculture coupled with local markets and growing demand for both commodity and specialty crops. With a growing off-farm economy, the need for innovations to meet the labor demands at the farm level is

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currently an interesting challenge being addressed by research and Extension. Furthermore, with climate change impacting traditional cropping systems, the challenge of mitigating the impacts of climate change is urgent given the important role of agriculture in the economy and the lives of the population.

Participants gained new insight into the importance of agriculture research in the lives of small-scale farmers, how innovative Extension and development approaches can bring new technology to farmers in very different circumstances than those encountered in North Dakota, and an increased understanding of how climate change is impacting agriculture in the tropics/subtropics and how those impacts might be mitigated.

Horticulture Programs Host Field Days

The NDSU Yard and Garden Open House was held on August 4 at the NDSU campus Research and Demonstration Gardens, with 130 people in attendance. The open house featured walking tours of the All-America Selections bedding plant display garden



and the NDSU Historic Daylily Garden, campus tree walks and a guided trailer tour of NDSU research plots that highlighted blackberry, grape and vegetable research. NDSU personnel taught sessions on lawn, flowers and vegetable topics, and activities were available for children.

The NDSU Horticulture Research Farm Field Day was held on August 17, with 125 people in attendance. The field day feature research project tours



that highlighted fruit, vegetable and flower research, as well as walking tours of the Dale E. Herman Research Arboretum. NDSU personnel gave talks on lawn, tree, vegetable and flower topics, and Don the Bug Man provided educational demonstrations for children.

In Memoriam

Dr. Shivcharan Singh Maan

passed away November 1, 2016 in

Davis, California. Dr. Maan worked in the Department of Plant Sciences in hybrid wheat research from 1964 to 2000. He was a Fellow of the Crop and Agronomy Societies of America and received the Crop Science Research award in 1980. He was the first recipient of NDSU's Distinguished Professorship. His funeral was held November 5 in Sacramento, California.

David Ervin Walsh received an M.A. and Ph.D. at NDSU and was an Associate Professor of Cereal Chemistry and Technology until 1974. He passed away in Hollywood, South Carolina on March 19, 2016.



2017 Event Calendar

Research Extension Center Field Days

- June 27** – Canola Field Day, North Central REC, Minot
- July 10** – Central Grasslands REC, Streeter
- July 11** – Hettinger REC
- July 12** – Dickinson REC
- July 13** – Williston REC
- July 14** – Nesson Valley – Irrigation, Williston
- July 17** – Agronomy Seed Farm, Casselton
- July 18** – Carrington REC
- July 19** – North Central REC, Minot
- July 20** – Langdon REC

Campus Research Field Days

- July 25** – Yard & Garden Open House, Horticulture Research & Demonstration Gardens, Main Campus
- August 9** – Horticulture Farm & Arboretum Field Day, Absaraka
- August 24** – NPPGA Potato Field Day, Larimore, Inkster, Hoople

Courses

- July 18-21** – Barley Field School, NDSU Main Campus
- October 2-5** – Barley & Malt Short Course, NDSU Main Campus

In Memory of Dr. James J. Hammond

Dr. James J. Hammond, NDSU flax breeder and professor in the Department of Plant Sciences, passed away on August 9, 2016. A memorial service celebrating his life was held August 15, 2016 in Fargo. He had served NDSU 47 years at the time of his death. His diverse contributions to the department and the university were invaluable.

Hammond was raised on a corn and soybean farm in southern Illinois. He attended the University of Illinois-Urbana, where he received his B.S. (1963) and M.S. (1965) degrees in Agronomy. He received his Ph.D. in Agronomy at the University of Nebraska-Lincoln in 1969.

In 1969, Hammond was hired by the Department of Agronomy (now Plant Sciences) at North Dakota State University as assistant professor and flax breeder. He was promoted to associate professor in 1975 and professor in 1981. Hammond's appointment was 90% research and 10% teaching. In addition, he supported information technology operations for the Department of Plant Sciences through the setup and maintenance of computers, software and local area network. He

also served on campus information technology committees.

Hammond's research appointment encompassed responsibilities for flax and crambe improvement. Under his direction, the flax project developed varieties that are higher yielding with disease resistance, high oil content, and high linolenic acid content. During Hammond's tenure as flax breeder, 12 flax varieties were released: Wishek (1979), Flor (1981), Linton (1985), Neche (1988), Omega (1989), Pembina (1998), Cathay (1998), York (2002), Nekoma (2002), Carter (2004), Westhope (2010), and Gold ND (2014).

Hammond taught PLSC 734 Field Design II and served on numerous graduate student committees. His statistical expertise was highly valued and he worked with hundreds of graduate students and faculty in the Department of Plant Sciences and the Agricultural Experiment Station as a consultant on experiment design and analysis.

Hammond actively served in professional organizations throughout his career. He took on the roles of President, Vice President and Webmaster for the Flax Institute of the United

States, an organization that originated at NDSU with the goal of bringing together national and international researchers with an interest in flax to share and learn about flax research. He was a member of the American Society of Agronomy and the Crop Science Society of America. He also served multiple terms as Associate Editor for Statistics for the *Agronomy Journal*, a peer-reviewed international journal of agriculture and natural resource sciences.

Hammond also was an avid NDSU Bison athletics fan.

A scholarship fund has been set up by Dr. Hammond's family. Contributions can be made through the NDSU Foundation and Alumni Association at www.ndsualumni.com/Netcommunity/contribute.



Graduate Student News

Three Minute Thesis

Kiran Ghising, Cassie Hillen, and Maneka Malalgoda represented Plant Sciences in the campus-wide Three Minute Thesis competition in February.



L to R: Ghising, Ibrahim, Bjerke, Hillen, Malalgoda

The three were nominated, along with three students from other NDSU College of Agriculture, Food Systems and Natural Resources departments, following faculty judging. **Somo Ibrahim** and **James Bjerke** also participated in the College of Ag competition.

Hogstad Awarded Sustainable Ag. Scholarship



Samantha Hogstad, Plant Sciences M.S. student from Frost, MN was awarded a scholarship by the Northern Plains Sustainable Agriculture Society (NPSAS).

The scholarship program is designed to support the training of the next generation of sustainable food systems workers. Candidates for the scholarship must be enrolled in or accepted to an accredited post-secondary education program in a curriculum related to sustainable agriculture or an approved mentorship program.

“As one of the few students pursuing a career in organic agriculture at NDSU, it is important for me to be an advocate for this niche market,” says Hogstad. “I believe sustainable management and production will be vital in the future.”

Hogstad earned her B.S. in Crop and Weed Sciences with Biotechnology focus at NDSU in December 2014. Her undergraduate adviser was Kevin McPhee, former Plant Sciences profes-

sor and pulse crop breeder.

Her graduate research focus is on weed control for organic production systems, and her studies are long-term organic tillage and sheep grazing, and strawberry mulch and biochar. Her graduate program adviser is Greta Gramig, associate professor and weed biology and ecology project leader.

Carter Honored at Weed Science Meeting



Travis Carter was awarded second place for his paper in the Student Paper and Poster Contest at the Western Society of Weed Science (WSWS) annual meeting held in Albuquerque, New Mexico in March.

Carter co-authored the paper, *Prairie Response to Canada Thistle Infestation*, with his adviser, Dr. Rodney Lym, professor and perennial weed control project leader.

The contest offers students an opportunity to improve their presentation skills and increase their visibility within the WSWS. Judging criteria included content and discussion of the research being presented, quality of visual aids, and speaking ability. The top students in each division received a plaque and a cash award to honor their achievement.

Carter, from Elk Point, SD, is pursuing his M.S. degree in Natural Resources Management.

Thilmony Wins Poster Competition

Blake Thilmony was the NDSU Ag Week Poster Competition winner in the graduate student category. Her poster title was *Native*



Prairie Response to Aminocyclopyrachlor in the Northern Great Plains. Her adviser was Rodney Lym.

NDSU Hosts Plant Science Graduate Symposium



The 32nd annual Plant Science Graduate Student Symposium was held at North Dakota State University in April, hosted by the **Plant Sciences Graduate Student Association**. Forty-six participants attended from the University of Manitoba, the University of Saskatchewan, and NDSU.

The symposium opened with a service learning outreach project at a local school. Symposium participants taught students at Carl Ben Eielson Middle School about agriculture around the world and about DNA.

Burton Johnson, professor in the Department of Plant Sciences and NDSU Plant Sciences Graduate Student Association adviser, gave the opening address. Sarah Lovas, NDSU alumna and agronomist with Lovas Consulting, Hillsboro, ND, gave the keynote presentation at the awards banquet.

Research presentations by graduate students from the participating universities were judged and scored by a panel of NDSU Plant Sciences faculty in the categories of Agronomy, Weed Science, and Ecology; Plant Breeding and Genetics; Plant Pathology and Physiology; and Research Proposals. First and second place awards in each category were presented at the closing banquet.

Graduate Student News

Winners from NDSU were: in Agronomy, Weed Science, and Ecology - first place, **Courtney Holdt** and second place, **Amy Scegura**; in Plant Breeding and Genetics - second place, **Leah Krabbenhoft**; in Plant Pathology and Physiology - first place, **Amanda Peters**; and in Research Proposals - second place, **Katelynn Walter**.

The Plant Science Graduate Student Symposium was initiated in an effort to bring graduate students from different universities together to exchange ideas, to introduce them to research work of fellow graduate students, and to provide an opportunity to polish public speaking skills. The location of the symposium rotates among the University of Manitoba, the University of Saskatchewan and NDSU.

Hillen Researches Pea Flour in Gluten Free Food



With increasing markets for gluten-free foods, pea flour is a possible substitute for wheat flour that could provide benefits for

consumers. However, pea flour has undesirable sensory characteristics in some food applications. The focus of one study in the Pulse End Quality Program is to remove some of the grassy, green or earthy flavors and aromas in pea flour. This research is being conducted by **Cassandra Hillen** as part of her M.S. degree in Cereal Science. Her adviser and the director of her research is Clifford Hall, who also directs the NDSU Pulse Quality program.

Peas are a high value food containing key nutrients such as folic acid, vitamins K and A, B vitamins, calcium, zinc and manganese, protein and soluble and insoluble fiber. Pea flour does

not contain gluten forming proteins, which trigger celiac disease. Pea flour can add nutritional value and improve baking properties of gluten-free foods, and also can be used as a substitute for soy ingredients, which is of interest to the food industry due to the need to label soy as an allergen on food products.

Hillen extracted pea flour samples through High Pressure Solvent Extraction (HPSE) and vacuum drying to remove undesirable flavors. She then used the treated and untreated flour samples to bake cookies and cake and conducted taste tests to determine differences between treatments. She concluded that the untreated pea flour samples tasted significantly different from those samples treated to remove flavors. She would suggest conducting further studies using other pulses and to try to conduct taste tests with consumers restricted to gluten free diets in order to determine if the taste of the end products is superior to current gluten-free products.

Khalid Wins International Poster Competition



Hazila Khalid, a Cereal Science Ph.D. candidate, won the Poster Presentation Competition Award for best poster at the 15th Inter-

national Cereal and Bread Congress (ICBC) held in Istanbul, Turkey, in April. The title of Khalid's poster was *Impact of Bran Components on the Quality of Whole Wheat Bread*.

More than 200 posters were presented by graduate students. Judges were appointed from among the professional and industry participants. The best three posters were awarded with a

monetary prize.

Khalid's project focused on whole-wheat milling and bread quality, bran components and genotype by environment effect on whole wheat bread quality. Her adviser is Senay Simsek, Bert L. D'Appolonia Cereal Science and Technology of Wheat Endowed Associate Professor.

The 15th ICBC was organized by the International Association for Cereal Science and Technology (ICC) and ICC's national representation in Turkey, Hacettepe University. The event hosted 440 participants from 50 countries, which included researchers and manufacturers, policy makers and representatives from regulatory bodies, representatives from industry and subject matter experts in the areas of food production, grain/crop breeding and growing, storage, milling, baking and food processing, as well as students and professionals. Held every four years, the ICBC is an opportunity for learning, networking and collaborating at the crossroads of different continents and cultures.

Malalgoda Receives Awards



Cereal Science graduate student **Maneka Malalgoda** won third place in the Elsevier poster competition at the 13th International Hydrocolloids Conference held in Guelph, Canada, in May. Her poster, titled *Gliadin Functionality in the Gluten Network: Role of Omega-gliadin Proteins*, was part of the work she completed during her M.S. research. Malalgoda's adviser is Senay Simsek.

Malalgoda's research looked at historical and modern hard red spring wheat released in North Dakota from 1910-

Graduate Student News

2013. The main objective of the study was to determine how protein chemistry in spring wheat changed over the last century.

In this study she determined that the improvements in dough quality which occurred over time could be related to the quantitative increase in glutenin and certain gliadin proteins. The functionality of the gliadin proteins and its individual components has long been debated, and Malalgoda's results suggested that a certain fraction called the omega-gliadins could be associated with favorable dough qualities.

Malalgoda also was awarded the Charles Becker Graduate Student Fellowship by the American Association of Cereal Chemists International (AACCI) for the 2016-2017 academic year. Recipients of the fellowship are selected based on their involvement and commitment to the AACCI, good academic standing, number of publications and presentations, quality of research, contributions toward the advancement of cereal science, and potential for having a successful career in cereal research.

The primary purpose of graduate student fellowships is to encourage research in the area of grain science. These fellowships are funded by the endowment funds of the AACCI Foundation, which include contributions by companies and various AACCI divisions.

Malalgoda completed her M.S. degree in Cereal Science and began work on her Ph.D. soon after her graduation, continuing to work under the guidance of Simsek. She hopes to conduct more research in the area of wheat proteins and carbohydrates.

Feland Receives Poster Award



Plant Sciences M.S. student **Calli Feland** was awarded first place for her poster presentation in the Marvin Stone Memorial Poster Com-

petition at the Nitrogen Use Efficiency annual conference held in August at the University of Idaho in Boise.

Feland co-authored the poster, titled *Impact of Nitrogen Type, Timing, and Additives on Grain Yield and Protein in Hard Red Spring Wheat*, with her adviser, professor and Extension agronomist Joel Ransom.

The Nitrogen Use Efficiency conference "brings together agronomists, biogeochemists, farmers, economists, sociologists, extension agents, educators, and policy experts from both public and private sectors to identify the major impediments to improved nutrient management and to make recommendations for overcoming those impediments."

Students Receive Poster Awards

Fifteen graduate students represented NDSU Plant Sciences in the graduate student poster competition during the 2016 Agricultural Bioscience International Conference held in Fargo in September. **Maneka Malalgoda** and **Ramnarain Ramakrishna**, Ph.D. students in the Cereal Science program, were selected as winners in the Plant Science and Food and Health poster competition categories, respectively.

Malalgoda presented her poster titled *Analysis of Historical and Modern Hard Red Spring Wheat Cultivars Based on Parentage and HPLC of Gluten Proteins Using Ward's Clustering*

Method. Her Ph.D. adviser is Senay Simsek, Bert L. D'Appolonia Cereal Science and Technology of Wheat Endowed Associate Professor in the Department of Plant Sciences.



Malalgoda (left) and President Bresciani

Ramakrishna presented his poster titled *Enhancing Phenolic Antioxidant Profile of Barley Sprouts Using Bioprocessed Elicitors for Improved Bioactive Functionality In Vitro*. His Ph.D. adviser is Kalidas Shetty, associate vice president for International Partnerships and Collaborations at NDSU and professor in the Department of Plant Sciences.



Ramakrishna (left) and President Bresciani

Graduate students from NDSU, South Dakota State University and Canada presented 34 posters describing their research in four categories: Plant Science, Animal Health, Innovations, and Food and Health. Posters were judged by members of academia and industry on overall quality, scientific merit, clarity of supporting graphics, and oral presentation. The winner in each category received a cash prize of \$500. NDSU President Dean Bresciani was on hand to congratulate the winners and present the awards.

This was the first time the Agricultural Bioscience International Conference was held in the United States. The theme of the 2016 conference was "Better Food, Better World" and featured speakers from Cargill, Monsanto, Bayer, and many international policy makers. It is the premier global meeting promoting innovation in bioscience to ensure sustainable food, feed, fiber and fuel security.

Graduate Student News

Anderson Honored at Cereal Chemists Conference



Cassie Anderson won second place in the Best Student Research Paper Competition at the annual meeting for the American Association of Cereal Chemists International held in Savannah, Georgia in October. She was one of six finalists from around the world competing for this distinguished award. Finalists were selected based on the scientific merit of their research.

Anderson, a Cereal Science M.S. candidate, is advised by Senay Simsek, Bert L. D'Appolonia Cereal Science and Technology of Wheat Endowed Associate Professor in the Department of Plant Sciences.

The title of Anderson's research is *Arabinoxylans from Cereal Processing Byproducts as a Basis for Biodegradable Food Packaging*. Her research analyzes the arabinoxylan, a form of die-

tary fiber, found in wheat bran, corn bran, and dried distillers' grains, as the main component in food packaging materials. According to Anderson, the results of her research show great promise for the food packaging industry.

Anderson expects to complete her M.S. degree in spring 2017 and publish her research shortly after. She will continue to contribute towards the advancement of cereal science through further research and work in the industry.

Scegur Honored at Pulse Research Workshop



Plant Sciences M.S. student **Amy Scegur** was awarded first place for her poster presentation at the 10th Canadian Pulse Research

Workshop held in Winnipeg, Manitoba, in October. The title of her research is *Marker Assisted Backcross Selection for Virus Resistance in Pea (*Pisum**

sativum L.).

Scegur's research is focused on developing a backcross population that is resistant to Pea seed-borne mosaic virus (PSbMV), which has significant impact on the industry, resulting in yield loss and reduced grain quality.

Scegur is from Avon, MN, and graduated with her B.S. in Crop and Weed Sciences in December 2015. She is working on her M.S. in Plant Sciences with an emphasis in Plant Breeding and Genetics under the advisement of Kevin McPhee, former Plant Sciences professor and pulse crop breeder.

The Canadian Pulse Research Workshop is the biennial meeting of pulse researchers in Canada. The meeting brings together researchers from different disciplines to present their latest results in the areas of agronomy and pathology, environment, genetics and plant breeding, and nutrition and food.

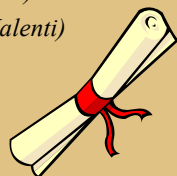
2016 Ph.D. & M.S. Graduates

Ph.D.

Alfredo Aponte (*Plant Sciences, Berti*)
Tsogtbayar Baasandorj (*Cereal Science, Simsek*)
Kiran Ghising (*Plant Sciences, Osorno*)
Ramon Huerta-Zurita (*Cereal Science, Schwarz*)
Mohamed Ibrahim (*Plant Sciences, Marais/Cai*)
Grant Mehring (*Plant Sciences, Ransom*)
Debjyoti Sen Gupta (*Cereal Science, McPhee*)
John Stenger (*Plant Sciences, Hatterman-Valenti*)
Jose Vasquez (*Plant Sciences, Osorno*)

M.S.

Bradley Bisek (*Plant Sciences, Marais*)
Amanda Crook (*Plant Sciences, Hatterman-Valenti*)
Abigail Debner (*Horticulture, Hatterman-Valenti*)
Morgan Hanson (*Plant Sciences, Howatt*)
Cassandra Hillen (*Cereal Science, Hall*)



Joseph Kallenbach (*Cereal Science, Hall*)
Leah Krabbenhoft (*Plant Sciences, Thompson*)
Ryan Lenz (*Plant Sciences, Dai*)
Amber Lindgren (*Cereal Science, Simsek*)
Oleksandr Maistrenko (*Genomics, Bergholz*)
Maneka Malalgoda (*Cereal Science, Simsek*)
Aurora Manley (*Plant Sciences, Marais*)
Nathan Maren (*Plant Sciences, Ransom*)
Lindsey Novak (*Plant Sciences, Ransom*)
Brittany Olson (*Plant Sciences, Hatterman-Valenti*)
Jordan Orwat (*Cereal Science, Shetty*)
Md. Mizanur Rahaman (*Plant Sciences, Rahman*)
Theresa Reinhardt (*Plant Sciences, Zollinger*)
Evan Salsman (*Plant Sciences, Elias*)
Catherine Schwebach (*Cereal Science, Simsek*)
Blake Thilmony (*Plant Sciences, Lym*)
Adam Winchester (*Plant Sciences, Robinson*)



Undergraduate Student News

Students Win Innovation Challenge

Cereal Science student **Joe Kallenbach** and Agriculture and Biosystems Engineering student **Bonnie Cobb** won the top award in the Agriculture Track at the 2016 NDSU Innovation Challenge. Kallenbach and Cobb worked together on a project similar to both of their thesis research projects with the guidance of Clifford Hall, professor of Cereal and Food Science.



Joe Kallenbach (left) and Bonnie Cobb

Their project, Clean the Cluck Up, proposed a method to decolor corn gluten meal, producing improved high protein animal feed and a highly valuable natural carotenoid for use as a natural food coloring. They were awarded \$5000.

The Innovation Challenge is presented by the NDSU Office of the Provost in partnership with the Research and Technology Park to showcase innovative ideas and entrepreneurial skills of NDSU students.

Syverson Named University Innovation Fellow



Food Science/Food Safety student **David Syverson** was named a University Innovation Fellow (UIF), joining 169 students from 49

institutions of higher education in four countries to be selected in the latest class of fellows. The program, run by Stanford University's Hasso Plattner Institute of Design, trains and supports student leaders to become agents of

change in their schools.

After being accepted, students go through six weeks of online training, which involves exercises and experiences intended to help fellows develop their design thinking, innovation, entrepreneurship, and communication skills.

Each student or group of students develops a main focus or priority for their UIF project. Syverson is leading a project called Stackable Credentials, which aims to place a credential on the transcript of students who have learned and been tested on relevant skills at a job level, quantifying the skill for potential employers.

In March 2017, Syverson will travel to Silicon Valley to participate in the UIF Meetup, where fellows will participate in experiential workshops and exercises focused on movement building, innovation spaces, design of learning experiences and new models for change in higher education.

Syverson is from Hastings, MN, double majoring in Food Science and Food Safety. His major adviser is Professor Clifford Hall. Plant Sciences Assistant Professor of Practice Anuradha Vegi provided a nomination letter and has advised Syverson for the UIF program. Syverson credits Hall and Vegi for being great supporters of the work he is doing at NDSU.

Syverson serves as vice president of the Food Science and Safety Club, secretary of the Innovation Corps, is participating in the 2017 NDSU Innovation Challenge competition, and works in the food science labs. He will intern at Dakota Growers Pasta Company in summer 2017. Syverson's future career goal is to go into research and development for a Fortune 500 company.

Syverson is interested in innovation, because, "I want to be a part of creating a food, something people use in their everyday lives, and to be able to say that I was a part of it. Everything starts with an idea and a little motivation."

Scheldorf Selected for Duncan Scholars Program



Horticulture student **Andrew Scheldorf** was selected by the College of Agriculture, Food Systems and Natural Resources (CAFSNR) to

participate in the 2016-17 Russell and Anna Duncan Undergraduate Research Scholars program. He is one of eight NDSU students selected to participate in the second year of the program.

Scheldorf is from Chokio, MN, and is studying under Harlene Hatterman-Valenti, professor and high value crops project leader. Scheldorf's research involves testing pre-germination treatments on raspberries, which includes fermenting the seeds and applying chemical treatments to improve germination.

In addition to being a Duncan Scholar, Scheldorf is the NDSU Horticulture and Forestry Club president, a CAFSNR Honors Commissioner, a member of The Real Food Challenge, a student representative on the Department of Plant Sciences undergraduate curriculum committee, a member of the Phi Eta Sigma national honor society, and the American Society of Horticulture Science Associated Collegiate Branches National reporter.

Students eligible to apply for the Duncan Scholars program are full-time CAFSNR undergraduate students who have been working with faculty members in their research programs and are

Undergraduate Student News

ready to take on significant responsibility in that research or propose their own research project. Students chosen for the program must be doing research that relates to production agriculture, and also that connects the academic perspective with the project's potential usefulness in industry.

Schoenfelder Attends National Turf Program



Sports and Urban Turfgrass Management student **Tanner Schoenfelder** was selected to attend the Jacobsen® Future Turf Managers

Seminar held in May in Charlotte, North Carolina. Nationally, about twelve students are selected each year for this prestigious opportunity.

Students are selected based on their status as a graduating senior in a turf-related program of study, adviser recommendation as a potential leader in their future turf career, academic performance, leadership skills, and work ethic.

The seminar gives participants an inside look at the industry through educational talks, hands-on experiences and tours, and an opportunity to network with peers and turf professionals. All expenses are paid by Jacobsen®, a turf equipment company.

Schoenfelder is from Moorhead, MN and interned during the summer with Bethpage State Park on Long Island, NY, host to The Barclays Championship 2016, a PGA Tour Playoff event. Schoenfelder's long-term career goal is to be a general manager at a golf and country club, or a golf course superintendent. His adviser is Deying Li, associate professor in Plant Sciences.

Berguis Represents NDSU as McNair Scholar



Brandt Berghuis has been involved in the NDSU TRIO program and entered the McNair Scholar program in fall 2015. In March, he trav-

eled to Washington D.C. to represent TRIO and the McNair Scholars program to North Dakota and Minnesota senators. Berghuis finished his Crop and Weed Sciences-Biotechnology degree in May and is pursuing a graduate degree in Plant Pathology. His Crop and Weed Sciences major adviser was Kirk Howatt, associate professor in Plant Sciences.

Kemper Awarded CropLife Scholarship



Taylor Kemper, a Crop and Weed Sciences student from Hastings, MN, was awarded the Mid America CropLife Association (MACA) Young Leader Scholarship.

The scholarship program is designed to expose future agriculturists to the crop protection industry and future career opportunities. Candidates for the scholarship must be enrolled in an agriculture-focused program at one of the 13 Land-Grant Universities, and have secured a summer internship within agriculture.

Kemper worked as a sales representative intern for Dow AgroSciences in the summer. She traveled with and assisted sales representatives in the Northern Plains district. In September, Kemper attended the MACA annual meeting in Bloomington, MN, where she spoke about her internship experience.

Patrie Receives Garden Club Scholarship



Horticulture student **Jillian Patrie** is the recipient of a scholarship sponsored by the Green Thumb Garden Club of Casselton, ND.

The scholarship was awarded during Pie Day at Casselwood Retirement Center in Casselton. For the last five years, the group has hosted a Pie Day to raise funds for the scholarship. The pie sale proceeds are donated to a horticulture student chosen by the NDSU Horticulture faculty.

Patrie is a senior from St. Cloud, MN, with an emphasis in the Production and Business option in the Horticulture program. She has been active in the NDSU Horticulture and Forestry Club and enjoys gardening at her home. Her career plans are to manage a garden center or greenhouse.

Horticulture Students Receive Scholarships



Connor Hagemeyer



Sarah Kickert

Horticulture students **Connor Hagemeyer** and **Sarah Kickert** were named 2016-2017 Minnesota Nursery and Landscape Association (MNLA) Foundation Academic Award Winners. Hagemeyer will receive a scholarship co-sponsored by Gertens Greenhouses and Garden Center. Kickert will receive a scholarship co-sponsored by the Robin D. Linder Memorial Scholarship. The scholarships were awarded during the Green Industry Awards Celebration held in Minneapolis in January 2017.

Undergraduate Student News

Hagemeyer, from Clara City, MN, is advised by Harlene Hatterman-Valenti. He serves as vice president of the NDSU Horticulture and Forestry Club. After college, Hagemeyer wants to become an ornamental plant breeder.

Kickert, from Shakopee, MN, is advised by Todd West. She works for West in the Woody Plant Improvement program and is a member of the NDSU Horticulture and Forestry Club. Her goals after graduation include working in residential landscape design and potentially pursuing a master's degree in landscape architecture at NDSU.

The goal of the MNLA Foundation Academic Awards Program is to honor the academic achievements of college students who have made horticulture or landscaping their career choice. Over 20 scholarships are awarded every year.

Student Athletes Awarded Scholarships



Zach Mayo

Crop and Weed Sciences students and athletes **Zach Mayo** and **Derrek Tuszka** were awarded scholarships during the 43rd annual

Harvest Bowl in November. Mayo, a baseball player from Mather, Manitoba, received the Red River Commodities Scholarship. Tuszka, a football player from Warner, SD, received the Scott and Ann Dau Family Scholarship.

Students Named in College of Ag Top Ten Seniors

Jodi Boe, **Cassie Hillen**, **Amy Scegur**a and **Justin Zahradka** were among the students honored as Top Ten Seniors by the College of Agriculture, Food Systems and Natural Resources at the NDSU Ag Week Ban-

quet. Selection for the award is based on the student's GPA, leadership, community service, awards and honors, and work, internship and scholarly activities. **Justin Zahradka** was chosen as the Outstanding Senior.



Jodi Boe



Cassie Hillen



Amy Scegur



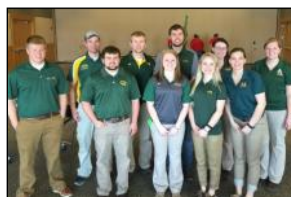
Justin Zahradka

Agronomy Club Receives Awards

The **Agronomy Club** placed third in the NACTA Regional Crop Judging Contest held at Kansas State University. They moved on to compete at the national contest in April at Crookston, MN, where they placed fourth. Team members in both contests were **Kyle Aasand**, **Jodi Boe**, **Brandon Breckheimer**, **Bethany Christensen**, **Andy Haugen**, and **Justin Zahradka**. **Boe** also placed fifth individual overall.

Bethany Erickson, **Megan Jones**, **Taylor Kemper**, **Nolan Rockstad**, and **Elizabeth Rongen** also competed in the national contest.

The Agronomy Club is advised by Kirk Howatt.

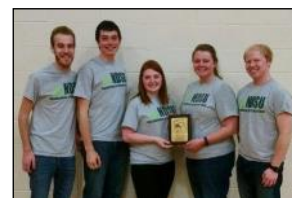


Agronomy Club

Horticulture and Forestry Club Receives Awards

The Horticulture and Forestry Club team competed for the first time at the National NACTA Judging Conference held in Crookston, MN in April and took second place overall in the Horticulture Contest. Team members were **Anne Gatzke**, **Connor Hagemeyer**, **Torie Jones**, **Nick Rajtar**, and **Andrew Scheldorf**.

In addition, **Hagemeyer** and **Scheldorf** each took home two individual awards. Hagemeyer placed second overall, and first in the tool and equipment competition. Scheldorf placed third overall and first in the general knowledge test.



L to R: Rajtar, Hagemeyer, Gatzke, Jones, Scheldorf

The club also won team and individual awards in an undergraduate competition held during the American Society for Horticultural Science (ASHS) annual conference in Atlanta, Georgia in August. The team earned third place overall. Team members were **Connor Hagemeyer**, **Anne Gatzke**, **Nick Rajtar**, **Andrew Scheldorf** and **Josie Schmitz**. **Scheldorf** and **Hagemeyer** also placed first and third, respectively, in the general knowledge exam.

In the Mid-America Collegiate Horticulture Society conference and compe-



L to R: Gatzke, Schmitz, Scheldorf, Hagemeyer, Rajtar

Undergraduate Student News

tition held at Northwest Missouri State University in Maryville in October, the club placed first overall and three students placed in individual events.

Connor Hagemeyer, from Clara City, MN, took first place in woody plant identification, second place in herbaceous plant identification and was



L to R: Scheldorf, Rajtar, Hagemeyer, Jones

the second place overall individual. **Torie Jones**, from Fessenden, ND placed third in woody plant identification. **Andrew Scheldorf**, from Chokio, MN, placed third in fruit, vegetable and plant judging.

Hagemeyer, Jones, Scheldorf and **Nick Rajtar**, from Blaine, MN, made up the first place overall team. All four students are Horticulture majors.

The Horticulture and Forestry Club is advised by Harlene Hatterman-Valenti and Todd West.

Summer Research Fellowship Interns

Austin Espe is from Fargo, ND and is a senior majoring in Microbiology. He worked in the high value crops project with Dr. Harlene Hatterman-Valenti.



Jonathan Vollmer is from Elk River, MN and is a senior majoring in Crop and Weed Sciences. He worked in the canola breeding project with Dr. Mukhlesur Rahman.



From the Department Head (continued)

(Continued from page 1)

than projected revenue for the state. Most agencies in the state, including Higher Education, the Agricultural Experiment Station, and the Extension Service had budget cuts of over 7% during the current biennium. This resulted in a hiring freeze of all positions supported with state General Fund dollars. At this time, we are unable to fill some of the positions that are vacant due to the retirements of Bob Baumann, Mark Ciernia, Pete Gregoire, Bob Nudell, and Ron Roach; the resignation of Dr. Kevin McPhee; and the passing of Dr. Hammond. The only way we are able to refill the research support positions is using non-state funding.

Dr. Jerry Miller, retired USDA-ARS sunflower breeder, has been helping to lead the flax program. Dr. Miller worked on flax genetics in addition to sunflower during the earlier part of his career, so the experience he brings to the flax breeding program is greatly valued. Dr. Miller made selections in the field last fall prior to harvest, developed the crossing block for this winter, and provided a breeding strategy for the future. Dr. Miller spends winters with his wife in the Phoenix area, but I know he is looking forward to assisting the flax program when he returns. I can't thank Dr. Miller enough for all he is doing. How we proceed with the flax breeding program will be decided in the upcoming months.

As I finish this update, it is March 19 and there is no snow on the ground. We have the barley seed back from our New Zealand and Puerto Rico winter nurseries and I will be headed down to Yuma, AZ in the first week of April to thresh the winter nursery there. It looks like it will be a quick turnaround from getting the seed back and getting it seeded. It wouldn't surprise me if we started planting our western research sites in the state before we get the seed back from our Arizona nursery, which will result in a second trip to the western sites to plant them with the seed from Arizona. To everyone with field activities, I hope you have a safe and successful season.



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Department History

Do you know...

- ◆ What year the NDSU Department of Plant Sciences began?
- ◆ Where the department was first housed?
- ◆ Who advised the first graduate student to earn a doctoral degree?
- ◆ Who the department chair was in 1979?
- ◆ When the name changed from Agronomy to Crop and Weed Sciences to Plant Sciences?
- ◆ When the Horticulture Research Farm near Absaraka was established?



Answers to these questions and more can be found on a new page of our department website titled "A Brief History of the Department of Plant Sciences" (www.ag.ndsu.edu/plantsciences/about/history). Check it out and try to find the answers to these questions!

Newsletter Archive

Take a stroll down memory lane with the newly posted *Blizzard Watch* newsletter online archive! Former department chair Dr. Jack F. Carter began the annual department newsletter in 1967, and the tradition has continued every year since. In 1989 the newsletter was named the *Blizzard Watch*. The archived issues contain all the significant happenings in the department over the years. We are missing only one issue - 1977. If you have saved past issues that far back, we would love to copy or scan it to complete our collection! Contact Kamie at 701-231-7123 or kamie.a.beeson@ndsu.edu.

The *Blizzard Watch* newsletter and archive is online!

www.ag.ndsu.edu/plantsciences/news/newsletter

Update Your Info

Don't miss out on the next issue! Use the form on the next page to update your contact information or complete the form on our website—be sure to include your e-mail address. When the next issue of the *Blizzard Watch* is published online, you will be notified by e-mail. If you know someone who would like to receive the *Blizzard Watch*, please forward this information to them. We appreciate your help and we look forward to keeping in touch!



Find more news on our website! www.ag.ndsu.edu/plantsciences/news

Plant Sciences: www.ag.ndsu.edu/plantsciences

Cereal Science: www.ag.ndsu.edu/cerealscience

Food Science: www.ag.ndsu.edu/foodscience

Let's Keep in Touch!

We would like to hear what you are up to now and update your contact info so we can keep in touch. Please take a moment to fill out and mail or fax this form to our office, or go to our website to complete the form. We look forward to hearing from you!

First Name _____ Last Name _____

Last Name used while at NDSU (if different from above) _____

Grad. Year _____ Degree _____ Discipline _____ Adviser _____

Email _____

Current Position/Title _____

Company/Organization _____

Department _____

Preferred mailing address _____

City/Locality _____ State/Province _____

Postal Code _____ Country _____

This is my Home Address Work Address (check one)

Preferred phone number (optional) _____

This is my Mobile Phone Home Phone Work Phone (check one)

Comments:

Please mail or fax this form to:

Dept. of Plant Sciences
NDSU Dept. 7670
PO Box 6050
Fargo, ND 58108-6050
Fax: (701) 231-8474

To submit this form online, go to:

www.ag.ndsu.edu/plantsciences/alumni

Plant Sciences Faculty

Richard D. Horsley	Dept. Head and Professor (6-rowed and 2-rowed barley breeding, genetics)
Marisol Berti	Professor (forages and biomass crop production)
Chris Boerboom	Director, NDSU Extension Service and Professor (weed science)
Xiwen Cai	Professor (wheat genetics and cytology, genetics teaching)
Marcelo J. Carena	Professor (corn breeding, genetics)
Bingcan Chen	Assistant Professor (food and cereal chemistry)
Michael J. Christoffers	Associate Professor (weed science, genetics teaching)
Wenhao (David) Dai	Associate Professor (woody plant physiology, biotechnology)
Edward L. Deckard	Professor (crop physiology)
Elias M. Elias	University Distinguished Professor, J.F. Carter Durum Wheat Breeding/Genetics Endowed Professor (durum wheat breeding)
Kenneth F. Grafton	VP for Ag. Affairs; Dean, College of AFSNR; Director, NDAES (dry bean breeding)
Greta Gramig	Associate Professor (weed science)
Andrew Green	Assistant Professor (hard spring wheat breeding)
Clifford Hall, III	Professor (flaxseed, antioxidants, phytochemical stability in food systems)
Harlene Hatterman-Valenti	Assistant Dept. Head and Professor (high value crop production)
Theodore C. Helms	Professor (soybean breeding, genetics)
Kirk A. Howatt	Associate Professor (weed science-annual weeds)
Burton L. Johnson	Professor (sunflower, minor and new crop production)
Thomas Kalb, II	Extension Horticulture Specialist (western ND)
Hans Kandel	Professor (Extension agronomist, broadleaf crop production)
Chiwon W. Lee	Professor (greenhouse production, vegetable culture and breeding)
Deying Li	Associate Professor (sports turf management)
Xuehui Li	Assistant Professor (statistical genomics)
Rodney G. Lym	Professor (perennial weed control)
Frank A. Manthey	Professor (durum and pasta quality)
G. Francois Marais	Associate Professor (hard red winter wheat breeding, genetics)
Phillip E. McClean	Professor (dry bean genetics, biotechnology)
Esther McGinnis	Assistant Professor (Extension horticulture)
Michael S. McMullen	Professor (oat breeding, genetics)
Kevin McPhee	Professor (pulse crop breeding)
Grant Mehring	Research Assistant Professor
Rebekah Oliver	Assistant Professor of Practice (genetics)
Juan M. Osorno	Associate Professor (dry edible bean breeding)
Tom Peters	Assistant Professor (Extension agronomist, sugarbeet/weed science)
Mukhlesur Rahman	Assistant Professor (canola breeding, genetics)
Joel K. Ransom	Professor (Extension agronomist, small grains and corn)
Jiajia Rao	Assistant Professor (food chemistry and ingredient technology)
Andrew Robinson	Assistant Professor (Extension agronomist, potato production)
Paul Schwarz	Professor (malting barley quality)
Kalidas Shetty	Assoc. VP for Internatl. Partnerships; Professor (plant metabolism, food security)
Senay Simsek	Bert L. D'Appolonia Endowed Associate Professor (wheat end quality)
Asunta (Susie) L. Thompson	Associate Professor (potato breeding)
Anuradha Vegi	Assistant Professor of Practice (food safety, processing, microbiology)
Todd West	Associate Professor (woody plants improvement)
M. Dale Williams	Foundation Seedstocks Director (seedstocks)
Qi (Chee) Zhang	Associate Professor (turfgrass stress physiology)
Richard K. Zollinger	Professor (Extension weed control)
Alan Zuk	Associate Professor (sports and urban turfgrass management)

Professors Emeriti

Cereal Science

Bert D'Appolonia
Dennis Gordon
Khalil Khan

Plant Sciences

Duane R. Berglund
Arthur A. Boe
Harold Z. Cross
Alan G. Dexter
Murray E. Duysen

Jerry D. Franckowiak
Richard C. Frohberg
Dale E. Herman
Neal S. Holland
H. Roald Lund
Calvin G. Messersmith

Dwain W. Meyer
Donald C. Nelson
Ronald C. Smith
LeRoy A. Spilde
Dean A. Whited

Adjunct Faculty (*USDA)

James V. Anderson* (plant biochemistry)

James Beaver (dry bean genetics)

Patrick M. Carr (sustainable agriculture)

Shiaoman Chao* (small grains genomics)

Wun S. Chao* (perennial weeds)

Linda Dykes* (food science and technology)

Justin Faris* (wheat molecular genetics)

Michael E. Foley* (weed biology)

Karen L. Fugate* (sugarbeet physiology)

Russell Gesch (physiology of oilseed crops)

Darrin Haagenen* (crop physiology and ecology)

David P. Horvath* (perennial weed physiology)

Brent Hulke* (flax and sunflower genetics)

Chao C. Jan* (sunflower cytogenetics)

Brian Jenks (integrated weed management)

Blaine Johnson (quantitative genetics)

Ed C. Lulai* (potato physiology)

Mohamed Mergoum (hard red spring wheat breeding)

Jae-Bom Ohm* (grain science)

Michael Ostlie (weed science)

Timothy Porch (dry bean breeding and genetics)

Lili Qi* (wheat genetics)

Susan Raatz* (human and clinical nutrition)

Gerald J. Seiler* (sunflower and sugarbeet germplasm)

Jochum Wiersma (small grains)

Steven Xu* (hard red spring wheat development)

Postdoctoral Research Fellows

Yadav Gyawali (wheat genetics and cytology)

Jawahar Jyoti (barley genetics)

Ajay Kumar (hard spring wheat breeding and genetics)

Zhao Liu (sunflower germplasm development)

Yunming Long (hard red spring wheat development)

Samira Mafi Moghaddam (legume genetics/genomics)

Seyed Pirseyedi (hard red winter wheat pre-breeding)

Dipayan Sarkar (plant metabolism, and food security)

Stephan Schroder (dry bean genetics)

Ali Soltani (dry bean breeding and genetics)

Zahirul Talukder (sunflower germplasm development)

Qijun Zhang (wheat stem rust resistance)

Research and Support Staff

Matthew Abdallah (hard red spring wheat breeding)
Jason Adams (Extension weed control)
Hiroshi Ando (durum and pasta quality)
Collin Auwarter (high value crop production)
John Barr (barley quality)
Bob Baumann (oat breeding)
Joyana Baumann (Foundation seedstocks)
Kaitlin Beck (wheat quality)
Brad Bisek (hard red winter wheat breeding)
Eric Brandvik (potato production)
Kathy Christianson (perennial weeds)
Mark Ciernia (weed control)
Ashley Cooper (soybean breeding)
Christopher Cossette (wheat quality)
Janet Davidson-Harrington (weed science)
Brenda Deckard (Director, Plant Sci. Student Services)
Chad Deplazes (Extension crop production)
Darin Eisinger (Extension crop production)
Brock Fagerstrom (soybean breeding)
Jason Fiedler (statistical genomics)
Jerry Gee (soybean breeding)
James Gillespie (barley quality)
Pete Gregoire (crop physiology)
John Grieger (barley breeding)
Dave Hanson (soybean breeding)
Justin Hegstad (statistical genomics)
Ana Heilman-Morales (large database breeding pipeline)
Karen Hertsgaard (information specialist)
Martin Hochhalter (barley breeding and genetics)
Peter Ihry (potato production)
Karen Jensen (wheat quality)
Kreg Kercher (flax breeding)
Michael Kloberdanz (dry bean breeding)
Barb Laschkewitsch (vegetables and perennials)
Rian Lee (dry bean genetics)
Yu Liu (durum and pasta quality)
Andrew Lueck (Extension sugarbeets)
Vicki Magnusson (woody plants)
Sally Mann (durum wheat breeding)
Sandra Mark (weed science)
Rachel McArthur (wheat genetics and cytology)
Kelly McMonagle (wheat quality)
Greg Morgenson (woody plants)
Toni Muffenbier (Foundation seedstocks)
Mary Niehaus (cereal and food science)
Richard Nilles (potato breeding)
Bob Nudell (forages)
DeLane Olsen (wheat quality)
Allen Peckrul (food and cereal chemistry)
James Perleberg (durum and pasta quality)
Paula Petersen (new crops)
Ron Roach (weed control)
Gonzalo Rojas-Cifuentes (Asst. Director, Seedstocks)
Andrew Ross (canola breeding)
Kevin Rue (turfgrass)
Robert Sabba (weed science)
Thor Selland (hard spring wheat breeding)
Megan Shawgo (durum wheat breeding)
Stan Stancyk (durum wheat breeding)
Jesse Underdahl (hard spring wheat breeding)
Jody VanderWal (dry bean breeding)
Tom Walk (large database breeding pipeline)
Adam Walz (hard spring wheat breeding)
Kristin Whitney (wheat quality)
Devin Wirth (Extension weed control)

Office Staff

Kamie Beeson, Information Processing Specialist
Eileen Buringrud, Administrative Assistant
Cora Crane, Grants Coordinator
Michelle Grant, Senior Accounting Specialist
Lisa Johnson, Administrative Secretary

Lorin Miller, Accountant
Starr Thies, Accounting Specialist
Shannon Ueker, Administrative Secretary
Jill Walkinshaw, Administrative Secretary

Graduate Students

Cereal Science	Deg.	Adviser	Courtney Holdt	MS	McPhee
Abdulrahman Alahmed	MS	Simsek	Aaron Hoppe	PhD	Kandel
Cassie Anderson	MS	Simsek	Mohamed Ibrahim PhD	Marais	
Tawakalit Asiyani-Hammed	PhD	Simsek	Razi Ibrahim	MS	Hatterman-Valenti
Tsogtbayar Baasandorj	PhD	Simsek	Emma Kaehler	MS	Marais
Lingzhu Deng	PhD	Manthey	Changhyeon Kim	MS	Lee
Supun Fernando	MS	Manthey	Brian Kisely	MS	Horsley
Natsuki Fjuiwara	PhD	Simsek	Jacob Kluza	MS	McGinnis
Cassandra Hillen	MS	Hall	Leah Krabbenhoft MS	Thompson	
Amber Kaiser	PhD	Hall	Codee Lee	MS	Howatt
Joseph Kallenbach MS	Hall		Yuan Liu	MS	X. Li
Eyada Khalaf	MS	Shetty	Elizabeth Lovering MS	Ransom	
Yang Lan PhD	Rao		Andrew Lueck	MS	Peters
Yingya Li	MS	Schwarz	Johanna Lukaschewsky	MS	Berti
Yu Liu	MS	Manthey	Lucy Lund	MS	McCLean
Maneka Malalgoda PhD	Simsek		Carlos Maldonado Mota	MS	Osorno
Sara Moayedi	PhD	Manthey	David Mettler	MS	Hatterman-Valenti
Md Mahfuzur Rahman	MS	Simsek	Sepehr Mohajeri Naraghi	PhD	Elias
Ramnarain Ramakrishna	PhD	Shetty	Luz Montejo Dominguez	MS	Osorno
Ebony Sampson	MS	Hall	Randy Nelson	MS	McGinnis
Delgersaikhan Shinezorigt	MS	Manthey	Atena Oladzad	PhD	Elias
Serap Vatansever	PhD	Hall	Brittany Olson	MS	Hatterman-Valenti
Jing Wan PhD	Rao		Suman Parajuli	PhD	Lee
Yujuan Wang	MS	Schwarz	Amanda Peters	MS	Faris
MInwei Xu	PhD	Chen	Alan Peterson	MS	Berti
Fengchao Zha	PhD	Chen	Kathryn Plotke	MS	West
			S. M. Hisam Al Rabbi	PhD	Elias
			Sanzida Rahman	MS	Thompson
Plant Sciences	Deg.	Adviser	Matthew Rellaforde MS	Ransom	
Kyle Aasand	MS	Johnson	Shuangfeng Ren	PhD	Cai
Jason Adams	PhD	Zollinger	Daniel Restrepo Montoya	PhD	Osorno
Naa Korkoi Ardayfio	PhD	McMullen	Jose Rivera	MS	Horsley
Muhammad Arif-Uz-Zaman MS	Rahman		Kevin Rue	MS	Zhang
Rahil Ashtari Mahini	PhD	McPhee	Jyoti Saini	PhD	Faris
Kenneth Beamer	MS	Gramig	Evan Salsman	PhD	X. Li
Alan Bingham	MS	Robinson	Dulan Samarappuli PhD	Berti	
Bradley Bisek	MS	Marais	Amy Scegura	MS	McPhee
James Bjerke	MS	Thompson	Michael Schaefer	MS	McPhee
Patricia Cabas Luhmann	MS	Manthey/Elias	Nicholas Schimek	MS	Ransom
Sergio Cabello Leiva	PhD	Berti	Megan Shawgo	MS	Elias
Matt Chaput	PhD	Ransom	Brian Smart	MS	Hulke
Benjamin Cigelske MS	Kandel		Kyla Splichal	MS	McGinnis
Abigail Debner	MS	Hatterman-Valenti	Jordan Stanley	MS	Kandel
Marina Dobrydina PhD	Elias		John Stenger	PhD	Hatterman-Valenti
Thomas Drietz	MS	Li	Alison Stone	MS	Hulke
Kelsie Egeland	MS	Kandel	Meredith Swanson MS	West	
Erin Endres	MS	Helms	Ethan Sweep	MS	Johnson
Steffen Falde	MS	Thompson	Hongbin Tao	PhD	Marais
Calli Feland	MS	Ransom	Oswaldo Teuber	PhD	Berti
Danielle Fiebelkorn Wrucke PhD	Rahman		Maria Tobar Pinon MS	McCLean	
Shana Forster	PhD	Ransom	Carlos Velasquez	MS	Osorno
Lindsey Forward	MS	Hatterman-Valenti	Katelynn Walter	PhD	Osorno
Nelson Geary	MS	Robinson	Tiffany Walter	MS	Howatt
Melissa Geiszler	MS	Ransom	Qi Wang	MS	Yan
Kiran Ghising	PhD	Osorno	Sudeshi Wasala Seneviratne PhD	Faris	
Baljeet Gill	PhD	Xu/McClean	Devin Wirth	MS	Zollinger
John Grieger	MS	Elias	Liqi Yang	MS	Zhang
Tracy Hillenbrand MS	Ransom		Mingyi Zhang	PhD	Cai
Jorden Hinrichsen MS	Hatterman-Valenti		Wei Zhang	PhD	Cai
Samantha Hogstad MS	Gramig				

NORTH DAKOTA STATE UNIVERSITY

Department of Plant Sciences
166 Loftsgard Hall
NDSU Dept. 7670
PO Box 6050
Fargo, ND 58108-6050

Phone: 701-231-7971
Fax: 701-231-8474
E-mail: nds.plantsciences@nds.edu
Web: www.ag.ndsu.edu/plantsciences

The Department of Plant Sciences at North Dakota State University is a diverse department with regional, national, and world-respected expertise. As part of the College of Agriculture, Food Systems, and Natural Resources, the department offers academic programs that prepare students for careers in expanding job markets. Undergraduate programs are Crop and Weed Sciences, Food Science, and Horticulture; graduate programs are the M.S. in Plant Sciences/Horticulture, Cereal Science, and the Ph.D. in Plant Sciences and Cereal Science.

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