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 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](http://www.ag.ndsu.edu/plantsciences), our Facebook page at NDSUPlantSciences, or our Twitter account at @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](http://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.

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

10 Years
- Kamie Beeson
- Sally Mann

15 Years
- Mary Niehaus

30 Years
- Jesse Underdahl

35 Years
- Kristin Whitney
- Allen Peckrul
- Albert “Jody” Vanderwal

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Seven Retire from Department of Plant Sciences

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 Frohberg 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
“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!
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.

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.

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.
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 Agriculture 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.

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
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.

**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 production 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/2f1ev39.

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.
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.


**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.
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

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.

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.
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 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.

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 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.
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, utilizing 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 Montejio Dominguez attended the joint Pan-African Grain Legume and 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.

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.
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*

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 and moderate SCN resistance.

**ND Palomino Pinto Bean**  
*Breeder: Juan Osorno*

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. Canning quality is within acceptable commercial ranges.

**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.
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 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

Kluza’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 Kluza’s project, high tunnels were constructed in three locations with funding provided by the North Dakota Department of Agriculture Specialty Crop Block Grant Program. Kluza 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.

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
current 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**

<table>
<thead>
<tr>
<th>Research Extension Center Field Days</th>
<th>Campus Research Field Days</th>
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<tr>
<td><strong>June 27</strong> – Canola Field Day, North Central REC, Minot</td>
<td><strong>July 25</strong> – Yard &amp; Garden Open House, Horticulture Research &amp; Demonstration Gardens, Main Campus</td>
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<td><strong>July 10</strong> – Central Grasslands REC, Streeter</td>
<td><strong>August 9</strong> – Horticulture Farm &amp; Arboretum Field Day, Absaraka</td>
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<td><strong>July 11</strong> – Hettinger REC</td>
<td><strong>August 24</strong> – NPPGA Potato Field Day, Larimore, Inkster, Hoople</td>
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<td><strong>July 12</strong> – Dickinson REC</td>
<td><strong>Courses</strong></td>
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<td><strong>July 13</strong> – Williston REC</td>
<td><strong>July 18-21</strong> – Barley Field School, NDSU Main Campus</td>
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<tr>
<td><strong>July 14</strong> – Nesson Valley – Irrigation, Williston</td>
<td><strong>October 2-5</strong> – Barley &amp; Malt Short Course, NDSU Main Campus</td>
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<tr>
<td><strong>July 17</strong> – Agronomy Seed Farm, Casselton</td>
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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 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.
Three Minute Thesis

Kiran Ghising, Cassie Hillen, and Maneka Malalgoda represented Plant Sciences in the campus-wide Three Minute Thesis competition in February. 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 professor 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 Scegum; 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 International 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 Glialdin 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 Competition 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 advisor, 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. advisor is Senay Simsek, Bert L. D’Appolonia Cereal Science and Technology of Wheat Endowed Associate Professor in the Department of Plant Sciences.

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

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 dietary 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.

Scegura Honored at Pulse Research Workshop

Plant Sciences M.S. student Amy Scegura 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.)*.

Scegura’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.

Scegura 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*)
Kirin 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*)
Joseph Kallenbach (*Cereal Science, Hall*)
Leah Krabbenhoft (*Plant Sciences, Thompson*)
Ryan Lenz (*Plant Sciences, Dai*)
Amber Lindgren (*Cereal Science, Simsek*)
Oleksandra 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 Thilmonty (*Plant Sciences, Lym*)
Adam Winchester (*Plant Sciences, Robinson*)

**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*)
Oleksandra Maistrenko (*Genomics, Bergholz*)
Maneka Malalgoda (*Cereal Science, Simsek*)
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Catherine Schwebach (*Cereal Science, Simsek*)
Blake Thilmonty (*Plant Sciences, Lym*)
Adam Winchester (*Plant Sciences, Robinson*)
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.

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...
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 traveled 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**

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

Crop and Weed Sciences students and athletes Zach Mayo and Derek Tuska were awarded scholarships during the 43rd annual Harvest Bowl in November. Mayo, a baseball player from Mather, Manitoba, received the Red River Commodities Scholarship. Tuska, 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 Scegura 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 Banquet. 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.

### 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 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.

### 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.

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-
Undergraduate Student News

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.

**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.

**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.

**“Follow” us on Twitter! twitter.com/NDSUPlantSci**

**“Like” us on Facebook! facebook.com/NDSUPlantSciences**

L to R: Scheldorf, Rajtar, Hagemeyer, Jones
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 named 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!

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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/plant sciences/alumni
# Plant Sciences Faculty

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

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<th>Cereal Science</th>
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<td>Harold Z. Cross</td>
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<td>Murray E. Duysen</td>
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**Adjunct Faculty (**USDA**)**

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<tr>
<th>James V. Anderson* (plant biochemistry)</th>
<th>Chao C. Jan* (sunflower cytogenetics)</th>
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<tr>
<td>James Beaver (dry bean genetics)</td>
<td>Brian Jenks (integrated weed management)</td>
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<tr>
<td>Patrick M. Carr (sustainable agriculture)</td>
<td>Blaine Johnson (quantitative genetics)</td>
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<tr>
<td>Shiaoman Chao* (small grains genomics)</td>
<td>Ed C. Lulai* (potato physiology)</td>
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<td>Wun S. Chao* (perennial weeds)</td>
<td>Mohamed Mergoum (hard red spring wheat breeding)</td>
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<tr>
<td>Linda Dykes* (food science and technology)</td>
<td>Jae-Bom Ohm* (grain science)</td>
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<tr>
<td>Justin Faris* (wheat molecular genetics)</td>
<td>Michael Ostlie (weed science)</td>
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<td>Michael E. Foley* (weed biology)</td>
<td>Timothy Porch (dry bean breeding and genetics)</td>
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<tr>
<td>Karen L. Fugate* (sugarbeet physiology)</td>
<td>Lili Qi* (wheat genetics)</td>
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<tr>
<td>Russell Gesch (physiology of oilseed crops)</td>
<td>Susan Raatz* (human and clinical nutrition)</td>
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<tr>
<td>Darrin Haagenson* (crop physiology and ecology)</td>
<td>Gerald J. Seiler* (sunflower and sugarbeet germplasm)</td>
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<td>David P. Horvath* (perennial weed physiology)</td>
<td>Jochum Wiersma (small grains)</td>
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<tr>
<td>Brent Hulke* (flax and sunflower genetics)</td>
<td>Steven Xu* (hard red spring wheat development)</td>
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**Postdoctoral Research Fellows**

<table>
<thead>
<tr>
<th>Yadav Gyawali (wheat genetics and cytology)</th>
<th>Seyed Piseyedi (hard red winter wheat pre-breeding)</th>
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<tr>
<td>Jawahar Jyoti (barley genetics)</td>
<td>Dipayan Sarkar (plant metabolism, and food security)</td>
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<td>Ajay Kumar (hard spring wheat breeding and genetics)</td>
<td>Stephan Schroder (dry bean genetics)</td>
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<tr>
<td>Zhao Liu (sunflower germplasm development)</td>
<td>Ali Soltani (dry bean breeding and genetics)</td>
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<tr>
<td>Yunming Long (hard red spring wheat development)</td>
<td>Zahirul Talukder (sunflower germplasm development)</td>
</tr>
<tr>
<td>Samira Mafi Moghaddam (legume genetics/genomics)</td>
<td>Qijun Zhang (wheat stem rust resistance)</td>
</tr>
</tbody>
</table>
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Matthew Abdallah (hard red spring wheat breeding)  Barb Laschkewitsch (vegetables and perennials)
Jason Adams (Extension weed control)  Rian Lee (dry bean genetics)
Hiroshi Ando (durum and pasta quality)  Yu Liu (durum and pasta quality)
Collin Auwarter (high value crop production)  Andrew Lueck (Extension sugar beets)
John Barr (barley quality)  Vicki Magnusson (woody plants)
Bob Baumann (oat breeding)  Sally Mann (durum wheat breeding)
Joyana Baumann (Foundation seedstocks)  Sandra Mark (weed science)
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Brad Bisek (hard red winter wheat breeding)  Kelly McMonagle (wheat quality)
Eric Brandvik (potato production)  Greg Morgenson (woody plants)
Kathy Christianson (perennial weeds)  Toni Muffenbier (Foundation seedstocks)
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Ashley Cooper (soybean breeding)  Richard Nilles (potato breeding)
Christopher Cossette (wheat quality)  Bob Nudell (forages)
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Martin Hochhalter (barley breeding and genetics)  Tom Walk (large database breeding pipeline)
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