



Dr. Gary J. Muehlbauer  
Department Head

Welcome to the fall edition of Plant Pages, the Department of Agronomy and Plant Genetics newsletter. A new school year is underway, and we're excited to welcome new students to campus and reconnect with returning ones. In this newsletter, we highlight some ongoing renovations to department facilities, catch up with alumni and showcase the impressive work of our students and faculty.

## Annual Corn Feed

The department held its annual Agronomy Corn Feed on August 9, with the usual spread of late-summer favorites: hot dogs, cucumbers, tomatoes, and, of course, plenty of tasty sweet corn provided by Candy Hirsch's lab.

There was an incredible turnout, and people enjoyed reconnecting with colleagues, seeing the newly-renovated conference room and kitchen, and taking a break from the hot summer sun! Thanks to **Jayanti Suresh**, who coordinated the cooking effort, **Gail Nelson** and **Elisabeth Vose** for providing food and drinks, and **everyone in Dr. Hirsch's lab** who helped plant and harvest the delicious sweet corn.



Stay connected with us!





Sithin Mathew, PhD  
(Sarangi)



Sarah Klingenberg, PhD  
(Heuschele, Stupar)

# WELCOME, NEW STUDENTS

The Department of Agronomy and Plant Genetics welcomed five new graduate students this fall. We're excited to have Sithin, Sarah, Isabella, Lovepreet, and Navjot in the graduate program.



Isabella Fiore, PhD  
(Stupar / Lorenz)



Navjot Singh, PhD  
(Sarangi)



Lovepreet Singh, PhD  
(Lorenz)



# FACULTY AWARD WINNERS

## Dr. Hirsch Receives Two University Awards



This summer, **Dr. Candice Hirsch** received two University awards: The University of Minnesota McKnight Presidential Professorship in Plant Genomics and the 2023 Award for Excellence in Academic Unit Service.

As a McKnight Professor, Dr. Hirsch exemplifies the qualities in teaching, research, and service that the University values most. This award recognizes the scholarly achievements and contributions that a faculty member will make in advancing the prominence of the University of Minnesota.

The 2023 Award for Excellence in Academic Unit Service honors Dr. Hirsch's outstanding contributions to her academic unit. This award recognizes exceptional service that has strengthened the functioning and climate of our unit. This is the award's inaugural year and is a collaborative initiative of the Provost's Office and the Faculty Consultative Committee.

Dr. Hirsch's research involves integrating big data, including high-throughput genome and transcriptome sequencing, high-throughput phenotyping, and environmental measurements, to improve corn as a crop plant.

## Dr. Stupar Receives the Richard Bernard Mid-Career Award

In August 2023, **Dr. Robert Stupar** was awarded the Richard Bernard Mid-Career Award.

The Soybean Genomics Executive Committee gives this award to recognize outstanding contributions from a mid-career scientist working in soybean genetics and genomics. It was presented at the 2023 Biennial Cellular and Molecular Biology of the Soybean Conference.

Dr. Stupar's research group works on crop legume genetics and genomics. They specialize in molecular aspects, including identifying gene function, genome variation, and biotechnology applications.



*Dr. Stupar (right) is pictured here with fellow award recipients Dr. Anna Locke (Early Career Award, left) and Dr. Ann Dorrance (Career Achievement Award, center)*



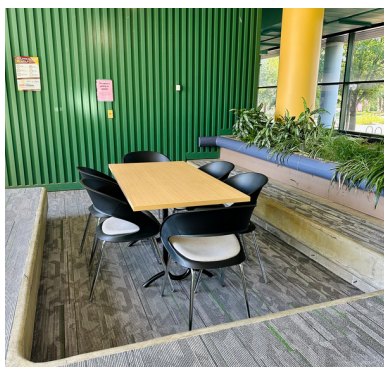
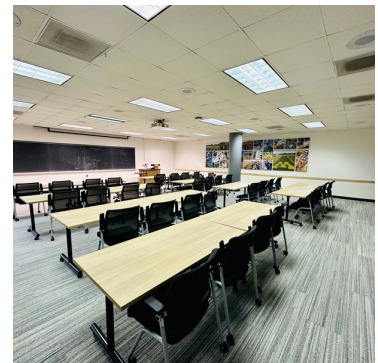
# New Year, New Spaces

This summer, our administrative team worked to update and improve several of our meeting, conference, atrium, and classroom spaces.

## 302 Borlaug Kitchen & 306

### Borlaug Class & Meeting Room

In July, a complete kitchen demo and renovation were completed in 302 Borlaug Hall. The newly updated facilities will serve as a clean and functional space to host departmental events, socials, and meetings for many years to come. This space improvement was made possible through generous gifts to the Agronomy and Plant Genetics Service Fund and Syngenta funds. Also updated was the adjacent 306 Borlaug Hall class and meeting room, complete with new chairs and tables (on wheels!), carpet, paint, and artwork that features the many people, places, and research our wonderful department encompasses.



## Borlaug Hall 3rd Floor Atrium

This space saw new carpet, updated and added furniture, improved wifi for student study spaces that will also reach the outdoor patios, UCard readers for building access from the north and south patios, and power along benches for charging and laptop use. These updates were done in partnership with CFANS Student Services; the Departments of Agronomy and Plant Genetics, Plant Pathology, and Soil, Water, and Climate; and University IT, OCM, and Facilities Management. We are excited to start the year with these new and functional spaces.

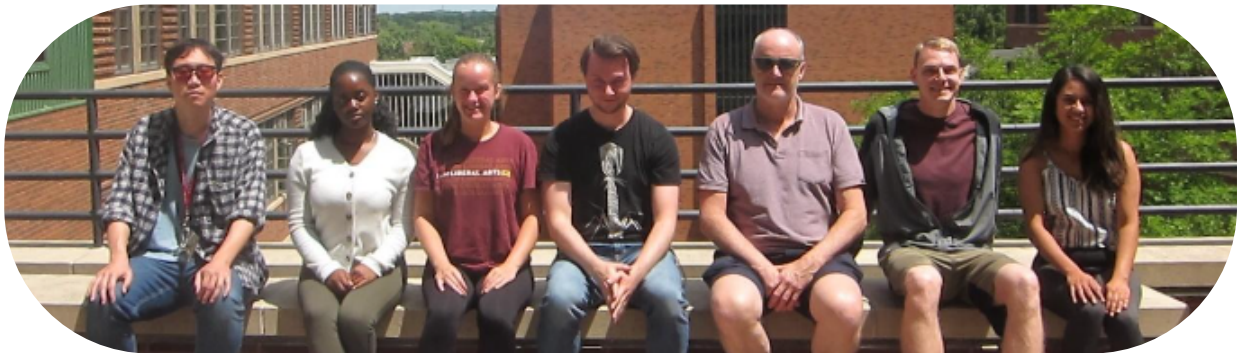
These renovations were made in part by generous department donors. Interested in donating? Click here:

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# USDA-ARS Legume and Cereal Genomics Research Group

**Dr. Shaun Curtin** is a lead scientist at the USDA-ARS Plant Science Research Unit. The lab's primary focus revolves around plant genome engineering and synthetic biology. Recently, the group's work has been dedicated to enhancing the efficiency of transforming often challenging legume and cereal genotypes, which can be elite, un-adapted, or wild varieties. Furthermore, the lab has a keen interest in advancing the tools used for editing legume and cereal crop genomes. This interest is particularly concentrated on techniques such as base editing, prime editing, and gene targeting strategies. The overarching objective of the lab's research is to eventually contribute to the understanding and manipulation of root architecture traits. By harnessing this knowledge, the group aims to engineer improved crop varieties that can optimize nutrient and water utilization. Such advancements will be vital for ensuring global food and nutritional security.



**Ezekiel Ahn** is a research associate at USDA-ARS, Plant Science Research Unit. He is working on a project that uses phloem mobile elements to rapidly gene edit soybean and *Medicago truncatula* without the need for tissue culture. He recently accepted a plant pathologist position at USDA-ARS, Beltsville Agricultural Research Center, where he will establish a lab to study plant-fungal pathogen interactions in chocolate and coffee plants.

**Kabita Poudel** (2nd-year Ph.D. student in Applied Plant Science) is working on a project that studies hyper-accumulation of phosphate in alfalfa. Her project also has a gene editing component that focuses on optimizing the transformation of elite alfalfa genotypes and improving gene editing reagent efficiency.

**Lauryn Jones** (USDA-ARS 1890 Scholar) is a food science undergraduate student from the University of Tennessee who interned with the lab over the summer. She worked on a project studying Verticillium wilt disease of alfalfa.

**Jacob Botkin** (3rd year Ph.D. student in Plant Pathology) is leading a project that uses omics technologies to explore host resistance to spring black stem and leaf spot disease of alfalfa and *Medicago truncatula*. He will use gene-editing technologies to generate mutant plants to validate candidate genes involved in host-pathogen interactions.

**John McFarlane** (USDA-ARS Biological Science Lab Technician) is primarily responsible for Agrobacterium-mediated transformation of soybean and other legumes. His work involves improving transformation efficiency, testing new genome-editing reagents and techniques, and producing desired soybean mutant plants.

**Sydney Winecke** (USDA-ARS Biological Science Lab Technician) was primarily responsible for optimizing an oat and barley leaf transformation protocol. She recently departed the lab to work on coronavirus research.

# Catching Up With

Dr. Jim Anderson, Wheat Breeding & Plant Genetics



**Dr. Jim Anderson**, Professor in the Department of Agronomy & Plant Genetics, leads the Wheat Breeding & Genetics project. In addition to developing new spring wheat varieties and improved germplasm adapted to Minnesota growing conditions, project research includes investigating breeding/genetic principles related to crop improvement and resilience. The team focuses on locating genes underlying economically important traits and implementing marker-assisted and genomic prediction for cultivar and germplasm development.

Project personnel includes Research Scientists **Susan Reynolds**, **Dr. Emily Conley** and **Nathan Stuart**; Postdoc **Dr. Charlotte Brault**; Ph.D. candidate **Max Fraser**; and 8-10 undergraduate students.



Dr. Anderson teaches Agro 5021, Principles of Plant Breeding,

coordinates Agro 5311, a one-credit survey course on Research Methods in Crop Improvement and Production and provides guidance and helps manage breeding programs on intermediate wheatgrass (Kernza®), pennycress, and camelina.



**Minnesota Agricultural  
Experiment Station  
Crookston, Minnesota**

# Catching Up With

Dr. Jim Anderson, Wheat Breeding & Plant Genetics



## Improving Wheat Digestibility

FODMAPs (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols) and ATI (amylase trypsin inhibitor) proteins are anti-nutrients in wheat grain that can contribute to poor digestibility. In collaboration with Dr. George Annor in the Department of Food Science & Nutrition, the team measured FODMAPs and ATIs across 220 ancient, heritage and modern spring wheat varieties curated by the University of Minnesota wheat breeding program, dating back to the late 1800s. The project team also evaluated fermentation as a potential processing technique to further reduce these anti-nutrients. Results showed:

- There is genetic variation for FODMAPs and ATIs, but their levels have not increased in modern varieties
- Genetic mapping revealed polygenic control of these traits and that they should be responsive to selective breeding
- Fermentation can significantly reduce FODMAPs and ATIs

The group is actively breeding and selecting for lower levels of FODMAPs and ATIs and is also increasing the fiber and resistant starch content of wheat by breeding for higher amylose content.

## Wheat Variety Development

The University of Minnesota developed spring wheat varieties that accounted for an estimated 34.5% of Minnesota's 1.25 million spring wheat acres in 2022. Recent wheat variety releases include 'Linkert' (2013), 'Bolles' (2015), 'Shelly' (2016), 'Lang-MN' (2017), 'MN-Washburn' (2019), 'MN-Torgy' (2020), and 'MN-Rothsay' (2022). MN-Torgy, was Minnesota's number-one wheat variety in 2022, grown on 21.7% of the state's wheat acres. Linkert, named after retired technician Gary Linkert, was the number-one variety in the state from 2016 to 2020 and is the current end-use quality standard in our region.

The wheat breeding program prioritizes grain yield, lodging resistance, high grain protein and bread-baking quality, along with several diseases, including Fusarium head blight (scab), bacterial leaf streak, and leaf, stripe, and stem rust, including pre-emptive breeding for highly virulent African stem rust races. Germplasm from the breeding program is being used as parents by private and public breeding programs in the region. The team also coordinates the testing of approximately 40 public and private released hard spring wheat varieties per year in statewide trials to assess and report their performance in yield nurseries, end-use quality, and reactions to important diseases. This information is critical to help growers make informed varietal choices.



PLANT  
BREEDING  
CENTER

# Maize Breeding Research Updates



**Rex Bernardo** is professor and endowed chair in corn breeding and genetics in the department. He currently serves as director of the Plant Breeding Center at UMN. Rex and his graduate students and postdocs discover new ways of breeding corn, particularly investigating how inexpensive and abundant DNA fingerprints can best be used to develop maize lines and hybrids.

This work involves theoretical studies, computer simulation, and analysis of large data sets from molecular marker assays and field experiments. Research of the UMN maize breeding group continues a body of investigations that have involved a series of firsts:

- Development, in 1994, of a prediction procedure that is now known as genomic best linear unbiased prediction or GBLUP;
- First wide-scale use of BLUP for hybrid prediction (1996);
- First study on the usefulness of genomewide prediction in plants (2007);
- First estimates of prediction accuracy via empirical cross-validations in plants (2009);
- First estimates of empirical gains from genomewide selection in plants (2013); and
- First study on the potential of targeted recombination for quantitative traits (2017).

Rex is currently studying maize breeding methods that differ fundamentally from the century-old inbred-hybrid system, which is the cornerstone of maize breeding. He supervises the research of two Ph.D. students (Inés and Isaias) and a postdoctoral scientist (John). See their bios on the following page.

Rex currently teaches three courses: Breeding for Quantitative Traits in Plants (AGRO 8202), Professional Skills for Scientists (CFAN 8101), and a new freshman seminar entitled Coffee from the Ground Up (AGRO 1921). In his leisure time, Rex enjoys swing dancing with his wife, Chona, and has started taking drum lessons this fall.



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PLANT  
BREEDING  
CENTER

# Maize Breeding Research Updates



**Inés Rebollo** obtained her B.S. and M.S. from the Universidad de la República of Uruguay. Her Ph.D. research focuses on chromosome and population-specific approaches for genome-wide prediction, as opposed to current approaches that treat different chromosomes and populations as homogeneous. Inés enjoys reading, cooking, and being around friends, family, and plants.



**Isaias Ariza-Hernandez** obtained his B.A. from Universidad Autonoma Chapingo and his M.S. from Colegio de Postgraduados in Mexico. His Ph.D. research is on genome-wide prediction of yield stability in maize and machine learning to mimic breeders' decisions in selecting lines. Beyond his academic pursuits, Isaias likes to spend time with his family and has developed a passion for kayaking since he arrived in Minnesota.



**John Cameron** obtained his B.S. in botany from The University of Wisconsin-Madison and his Ph.D. in plant breeding with a minor in statistics from Iowa State University. In his Ph.D. research, John used mathematical models and algorithms from operations research to design systematically optimized plant breeding projects. John is currently investigating how to optimize targeted recombination in the context of genome-wide prediction. In his free time, he enjoys roughhousing with his 6-year-old daughter, Emilia, playing the guitar, and doing yoga.



## GopherCorn

Late this summer, the maize breeding research group and the Plant Breeding Center hosted a series of U-pick events featuring *GopherCorn*, a new sweet corn hybrid cultivar that proudly features the UMN maroon and gold colors. More than 100 corn pickers, young and old, came to one of five hour-long events to learn about plant breeding at UMN, hear how *GopherCorn* was developed, and pick a dozen or more free ears to bring home. The plan is to use *GopherCorn* as a plant breeding mascot for public education and outreach, and similar U-pick events will be held each summer.



# Alumni Spotlight TABARE ABADIE

With more than 40 years of career in education and plant sciences, **Tabare Abadie** has worked on a variety of plant breeding, genetic resources and quantitative genetics topics. His current areas of interest are higher education, career development, mentoring, and especially the advancement of the IDE agenda.

Abadie has spent more than half his career as a professor, wheat breeder, and consultant in the public sector. Abadie's diverse experiences have allowed him to study and work in several countries (Uruguay, USA, Brazil, UK, etc.).

Mentoring has been a cornerstone of Abadie's career. His first mentoring opportunity was in 1972, and he's been involved in mentoring since. While it is impossible to mention all the people who influenced his career, **Bob Stucker** remains one of his greatest inspirations. Abadie remains committed to mentoring, dedicating many hours as a mentor and contributor to mentoring programs.

Abadie is excited that a young generation of scientists, better prepared than his generation, will drive the advancement of agriculture. "Many new technologies are available for developing a sustainable world. However, what most encourages me is that younger generations are more open-minded to scientific and social challenges. They are enthusiastic about building a more balanced future with an equitable place for all," says Abadie.

While retirement is on the horizon, Abadie intends to remain connected with the U of MN. "As my alma mater and second home, I want to continue my engagement with the university's community, working on the areas I have found so much inspiration and passion during the last few decades."



"Although I think my career was satisfactory before coming to the U.S. for graduate studies, the University of Minnesota Graduate School provided me with incredible opportunities for advancement. First, it trained me further in science, enabling me to take on professional challenges I had not dreamt of taking before. Second, it opened my mind to new ideas and encouraged me to take risks and boldly implement them. And last, but very importantly, my experiences at UMN helped me to develop a network of connections that are the foundation of my success. In a way, I have become a master of building connections, and honestly, I learned that from my professors and mentors at UMN."

*Tabare Abadie earned degrees in plant breeding from the U of MN (MSc 1992, Ph.D. 1994), where he received a Doctoral Dissertation Fellowship in 1993-94 and the CFANS Alumni Service Award in 2018. He is originally from Uruguay, where he obtained an Ing Agr degree from the UDELAR (1982). He worked as a wheat breeder and university professor for over 20 years before coming to Iowa to work for Pioneer/Corteva. He is currently a Senior Research Manager and Distinguished Laureate at Corteva Agrisciences, responsible for external scientific relations for Seed Product Development.*

*His best-known contribution is probably the ideation, development, and coordination of the Plant Sciences Symposia Series (2008-20), which became a global program with the participation of more than 60 organizations on five continents. Tabare provides leadership for several organizations, serving as a Trustee of the Agronomic Science Foundation and the Integrated Breeding Platform, and has elected positions in the Tri-Societies and NAPPN. He is a Fellow of the Crop Sciences Society of America and has received several awards within the Corteva organization, including the 2019 World-Wide Exemplary Leadership honor. Tabare is also a member of the Board of the CFANS Alumni Society.*



# The Quest for Kernza®

APG alum Lee DeHaan leads the Land Institute's indeterminate wheatgrass domestication and commercialization research.

**Lee DeHaan** obtained M.S. and Ph.D. degrees from the Department of Agronomy and Plant Genetics, graduating in 2001. DeHaan was one of the first students in the department to complete projects focused on developing new perennial crops for Minnesota. At UMN, he worked with kura clover and two native perennial legume species under **Craig Sheaffer** and **Nancy Ehlke**'s advisement.

After graduating from UMN, DeHaan began work at The Land Institute in Salina, Kansas, as the lead researcher for developing perennial wheat. Over the next decade, he would have the privilege of experimenting with various candidate perennial crops, including perennial rye, perennial barley, and various native perennial species.

One of the candidate perennial crops DeHaan evaluated was intermediate wheatgrass. After several breeding cycles, he concluded that the project could be successful with expanded effort. So, in 2010, he became the lead scientist for intermediate wheatgrass domestication at The Land Institute. At that point, he began to share germplasm with UMN researchers and co-authored a grant proposal to initiate work with intermediate wheatgrass domestication in Minnesota. Under Professor Jim Anderson's direction, this program has been strong and growing in years since, releasing the first food-grade variety, MN-Clearwater, in 2020. Production of grain from intermediate wheatgrass is steadily rising in Minnesota and other states, with food and beverage products now being produced and marketed under the trade name "Kernza®."

DeHaan has been actively working to build a research consortium capable of achieving dramatically improved yields from intermediate wheatgrass. An expanding network of researchers successfully obtained funding from the AFRI Sustainable Agricultural Systems Coordinated Agriculture Project (SAS-CAP) in 2020, with UMN as the lead institution. He has also worked to expand international collaborations, with projects in Australia, Canada, France, Sweden, Denmark, Germany, Russia, Kazakhstan, and more. DeHaan has also facilitated the work of an intermediate wheatgrass genome sequencing consortium. A quality genome assembly has been released with financial support from the DOE's Joint Genome Institute. The genome is being used to accelerate breeding through genomic selection, and a project is also underway to attempt rapid domestication of the species with genome editing.

# Where Are They Now?

## Dr. Kristin Mercer

**Kristin Mercer** grew up outside of Boston and graduated from Wesleyan University in Connecticut in 1996 as a biology major. She studied phenotypic plasticity with Dr. Sonia Sultan and developed an interest in sustainable agriculture while working on an organic farm. In 1997, she began her Master's work with Dr. Wyse and Dr. Nick Jordan at UMN, studying weed evolution with quackgrass. The team found that different farming systems (pastures vs. corn/soy rotations) selected on weed populations, differentiating them over time.



Kristin pursued a Ph.D. with Dr. Wyse and Dr. Ruth Shaw (in EEB) and developed a project in 2000 to inform the ongoing debate around environmental impacts of genetically modified crops. Working on crop-wild gene flow, she learned that crop alleles "escaping" cultivation might affect wild sunflower populations differently depending on variation among wild populations involved and local environmental conditions. Kristin also developed an interest in interdisciplinary research while in graduate school, working with a social scientist graduate student in geography, Joel Wainwright, who later became her husband and longtime collaborator.

After UMN, Kristin had two postdocs that laid the groundwork for her current work. As a Fulbright-Garcia Robles fellow in Chiapas, Mexico, in 2005, she initiated work with Dr. Hugo Perales at Ecosur (College of the Southern Border) on evolution in maize landraces (or traditional varieties). From there, Kristin took a postdoc at the Ohio State University (OSU) in 2006 with Dr. Allison Snow to extend her dissertation work by exploring the early life history implications of crop-wild gene flow in collaboration with Dr. Helen Alexander. Since 2008, Kristin has been on the Department of Horticulture and Crop Science faculty at OSU, where she has taught courses on statistical design for agricultural research and agroecology and led graduate seminars.

Kristin's lab at OSU has focused on evolutionary ecology in sunflower, maize, and chile pepper. Her team worked on sunflowers for years to understand how different generations of crop-wild hybrids differ in seed dormancy and fitness traits that can affect the potential for introgression of crop alleles. Studying maize landraces in Mexico for nearly two decades, they have found them to be locally adapted to their elevation and environment of origin — a result with implications for productivity under climate change. Kristin's lab continues to explore quantitative and molecular genetic signatures of local adaptation in maize. Since 2019, they have been investigating the capacity of diverse maize accessions to fix nitrogen in association with microbes they host on their aerial roots with a soil ecologist, Dr. Richard Dick. For the past decade, Kristin has worked with Drs. Leah McHale, Lev Jardón, Mikey Kantar (UMN grad!), and others to explore how adaptation to abiotic stresses has shaped quantitative and molecular genetic variation in chile pepper in Mexico. Kristin is currently on faculty professional leave at the University of Tokyo for the 2023-2024 school year with an interest in diving deeper into the ecological dimensions of chile pepper domestication.

Kristin has enjoyed mentoring students in her work at OSU. Graduate students and their research are the lifeblood of the lab, and many have worked internationally with Mexican collaborators. She has also advised the OSU Student Farm for the past six years. The farm is a student-led and -initiated project through which they can participate in creating sustainable food and farming systems and grow their leadership skills at the same time.

## GRAD STUDENT SPOTLIGHT

# Maicy Vossen



**Maicy Vossen** is from a small town in central Minnesota, where she enjoyed taking care of large vegetable and flower gardens with her family.

Even though her family didn't own a farm, she grew up in an ag-centric community. While she always loved plants, Maicy began her undergraduate degree at Gustavus Adolphus College as a pre-med student, hoping to become an oncologist.

A research project focusing on cell cycle checkpoint proteins and tumorigenesis sparked her curiosity in research and discovery. As Maicy progressed through her undergrad degree, she shifted her focus to plant science, where she found real joy in research. While earning a bachelor's degree in biology with an emphasis in plant science and a minor in public health, Maicy also completed research on art therapy for people with traumatic brain injuries.

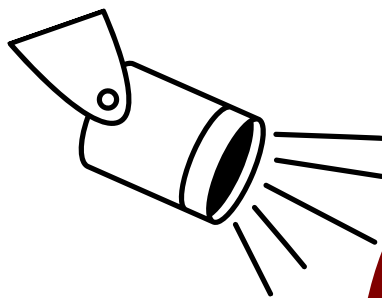
Maicy found her passion for plant physiology and systematics during an undergraduate experience and has enjoyed learning the intricate details of what makes plants function. She is also interested in climate science and learning how the changing climate is already impacting the planet and may change our world in the future. Maicy has combined these interests by studying plants in extreme environments. When searching for an advisor for graduate school, she found **Dr. Walid Sadok's** lab and was very interested in his physiology work.

Maicy's current research focuses on freeze tolerance in perennial ryegrass. Perennial ryegrass is one of the fastest turfgrass species to germinate and establish, making it appealing to turfgrass managers. But, it is also one of the least winter hardy species, which is not ideal for places like Minnesota that experience harsh winters. Identifying traits in perennial ryegrass that are indicative of resistance to freezing damage is the core of Maicy's research. For this project, she is co-advised by **Dr. Eric Watkins** and collaborates with researchers from Massachusetts and Norway. Maicy has enjoyed getting to know the members of both labs she works with here at UMN and collaborators in other parts of the world.

When Maicy is not busy with her research, she enjoys connecting with other grad students in the APS program. She is the president of the APS Graduate Student Association and enjoys planning and participating in the association's activities. Outside of graduate school, Maicy is a fitness instructor. There, she has amazing clients and coworkers from all stages of life who offer advice and inspiration. This job outside of grad school gives Maicy a productive outlet and balance to her busy lifestyle.

# UNDERGRAD STUDENT SPOTLIGHT

## Lara Pester



Last summer, undergraduate student **Lara Pester** had the incredible opportunity to work with the National Farmers Union in Washington D.C., as their legislative intern. She stayed busy monitoring legislative and regulatory activity in the federal government, attending daily hearings on Capitol Hill, creating written material for publications, planning educational and advocacy events and assisting in other efforts to support family farmers.

Lara will graduate from CFANS in December. After graduation, she will attend graduate school to earn a Master's Degree in Public Policy. Lara aspires to be a champion for Minnesota farmers and agricultural industries through policy and legislation.

# STAFF SPOTLIGHT

## Karen Beaubien

**Karen Beaubien** has worked in the Kevin Smith lab for all of her 21 years at the University of Minnesota. Formerly known as the "Barley Breeding Group," the Smith lab now has four breeding programs: spring barley, winter barley, oats, and silflower. Karen focuses on managing the genotyping pipeline and collecting trait data for all four breeding programs. These datasets are the basis for ongoing genomic selection cycles in barley and oats and future (fingers-crossed) genomic selection cycles in silflower.



The APG community has supported Karen in pursuing professional development opportunities in Diversity, Equity, and Inclusion (DEI) both within and outside the University of Minnesota. She completed the Office of Equity and Diversity Education Certification I in 2014 and Certification II in 2015 and appreciates ongoing education opportunities. Karen has served on the APG DEI committee since its inception in Fall 2020. This service to the community has been rewarding and educational. Karen looks forward to continuing her work with the APG DEI committee and department community to ensure that our department is a welcoming environment for all.



# Celebrating Success

Congratulations to APG summer graduates and award winners, and a special farewell to department veteran Bruna Bucciarelli.

## END OF AN ERA

**Bruna Bucciarelli** has been in the Agronomy and Plant Genetics department, in one form or another, since the early 1990's. She came here as a graduate student, earning her Ph.D. under advisor **Dr. Carroll Vance**. After completing her Ph.D. in plant physiology, Dr. Vance asked Bruna to work in his lab. She spent the next 20+ years in the Vance Lab until Dr. Vance's retirement in 2013. Her work spanned the areas of cell biology, gene expression localization, plant growth analysis, and phenotypic characterization of various legumes.

Bruna's specialized work included using in situ hybridization to localize various expressed genes associated with nitrogen fixation and assimilation in alfalfa root nodules. She worked on teams to localize several genes associated with phosphorus acquisition and root hair development in white lupin and phenotype and characterize a mutagenized soybean population. Bruna also helped develop a standardized method to describe the morphological development of the model legume, *M. truncatula*, under various stress conditions. Dr. Vance's foresightedness was the impetus that helped Bruna merge two distinctly diverse disciplines, the classical technique of histology and the modern technique of molecular biology, and use the ever-evolving and changing microscopy instruments.

Most recently, Bruna worked in the labs of **Dr. Deborah Samac** and **Dr. Robert Stupar**, navigating the needs and demands of new and emerging technologies.

Bruna retired from the University of Minnesota on August 31st. We thank her for her dedication to the Department of Agronomy and Plant Genetics and wish her the best in her retirement.



**"I will always be grateful for my time here in the department. I've had the opportunity to work and collaborate with some brilliant people and have made some close life-long friendships."  
-Bruna Bucciarelli**

## Summer award winners

Name	Award
Lovepreet Singh	National Association of Plant Breeders, George Washington Carver Scholar (2023)
Alina Smolskaya	Biennial Cellular and Molecular Biology of the Soybean Conference, 1st place poster (2023)

## Summer graduates

Name	Degree	Advisor	Co-Advisor	Thesis Title
James Bowden	MS	Jacob Jungers		Organically managed intermediate wheatgrass ( <i>Thinopyrum intermedium</i> ) as a dual-use grain and forage crop
Madison Moses	MS	Julie Grossman	Jacob Jungers	SINful consequences of cover cropping: Soil Inorganic Nitrogen (SIN) provision and petention from warm-season cover crops for northern US region vegetable production

# REMEMBERING RON

Ron Phillips earned his Ph.D. in 1966 under the guidance of Professor Charlie Burnham in the Department of Agronomy and Plant Genetics at the University of Minnesota. After a brief postdoctoral stint at Cornell University, the APG department recruited Ron in 1967, and he committed the following 42 years of his life to remarkable work at the University of Minnesota.

Ron enjoyed a prolific research career marked by groundbreaking discoveries and keen insights. Among his notable achievements:

- his lab was the first to successfully regenerate corn from tissue culture, a pivotal development that paved the way for genetically modified corn.
- initiating pioneering work in characterizing tissue-culture-induced variation.
- introducing an innovative approach to use tissue culture for selecting higher amino acid content in corn.
- isolating a flowering time gene in corn, demonstrating that an upstream, non-conserved genomic sequence regulated the gene.
- collaborating with his colleague and friend Howard Rines to develop oat-maize hybrids and radiation hybrids, which proved invaluable for genetic mapping in maize.



Ron possessed a terrific mentoring approach that revolved around two fundamental principles: nurturing the growth of his students within the scientific community and generously sharing his best ideas with them. Throughout his career, he mentored 55 graduate students, 23 postdoctoral scientists, and 29 visiting scientists, many of whom now hold leadership positions in academia, industry, or government.

Ron also served as the chief scientist for the United States Department of Agriculture competitive grants program from 1996 to 1998. Additionally, he chaired the White House Committee responsible for drafting a congressional proposal for the National Plant Genome Initiative, a crucial effort at a time when coordinated funding for plant genomics was scarce.

Furthermore, Ron was one of the founding figures behind the Plant Molecular Genetics Institute at the University of Minnesota. This pioneering institution brought molecular biology tools into the realm of plant research and improvement. He also served as the inaugural Director of the Microbial and Plant Genomics Institute at the University of Minnesota. Ron's leadership was instrumental in securing funding for the Cargill Building on campus, and he played a pivotal role in designing the building and all its amenities.

Ron received numerous prestigious awards for his research, including:

- the Wolf Prize in Agriculture, often regarded as the Nobel Prize in Agriculture
- elected membership to the National Academy of Sciences, a recognition reserved for individuals who have made distinguished and sustained contributions to original research.
- recognition as a Regents Professor, a distinction awarded to only a few out of thousands of faculty at the University of Minnesota.
- the first McKnight Presidential Chair in Genomics
- the Dekalb Genetics Crop Science of America Distinguished Career Award
- the Siehl Prize for Excellence in Agriculture at the UM
- the R. Emerson Lifetime Award, a testament to his enduring impact on the field

Ron's career was rich, distinguished, and marked by his unwavering commitment to the University of Minnesota. We are forever grateful for his contributions. While we will miss him greatly, his legacy lives on among the APG family.