

# The DPH Practitioner

*“Educating Leaders for Tomorrow’s Sustainable Plant Production Systems”*

## Congratulations to the New Department Heads

Doctor of Plant Health would like to welcome:



**Loren Giesler - Department Head of Plant Pathology.** For about the last 20 years, Dr. Loren Giesler has been the statewide leader for extension plant pathology programs in alfalfa, soybeans, ornamentals and trees, but his primary focus has been on developing improved management programs for numerous soybean diseases in Nebraska. Dr. Giesler began as Department Head in September 2018.

*“Students in the DPH program bring a breadth of diversity in experiences that enhance our learning environment that benefits all of us in Plant Pathology and the students in the DPH program benefit as well from interactions with students studying in our discipline.” -Dr. Giesler*



**Martha Mamo - Department Head of Agronomy and Horticulture.** Dr. Martha Mamo is a soil scientist who has been a mainstay in teaching soil science in the Department of Agronomy and Horticulture for nearly 20 years. Her research has focused on efforts to integrate soil processes, water conservation, and food security in Nebraska and internationally. Dr. Mamo began as Department Head on January 1, 2019.

*“DPH students and program enrich the Agronomy and Horticulture department and I look forward to strengthening our partnership and collaboration.” -Dr. Mamo*



**John Ruberson - Department Head of Entomology.** Dr. John Ruberson comes to UNL from Kansas State where he was Head of the Entomology Department for several years. Prior to his time at KSU, he was at the University of Georgia with appointments in research, teaching, and extension related to biological control and IPM. Dr. Ruberson started his position on January 1, 2019.

*“It’s a privilege to join the UNL Department of Entomology and IANR. The DPH program and students are and will continue to be valued and valuable parts of Entomology that transcend disciplines and help tie IANR together.” -Dr. Ruberson*

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@UNLDPH

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DOCTOR OF PLANT HEALTH

## DPH Faculty Steering Committee Members

Dr. Gerard Adams, Associate Professor of Practice, Plant Pathology

Dr. Roger Elmore, Professor, Agronomy/Horticulture

Dr. Richard Ferguson, Professor, Agronomy/Horticulture

Dr. Chuck Francis, Professor, Agronomy/Horticulture

Dr. Loren Giesler, Professor, Plant Pathology

Dr. John Lindquist, Professor, Agronomy/Horticulture

Dr. Lance Meinke, Professor, Entomology

Dr. Ellen Pappozzi, Professor, Agronomy/Horticulture

Dr. Anne Vidaver, Emeritus Professor, Plant Pathology

Dr. Brian Wardlow, Associate Professor, School of Natural Resources

Dr. Robert Wright, Professor, Entomology

Dr. Gary Yuen, Professor, Plant Pathology

Dr. Roch Gaussoin, Professor, Agronomy/Horticulture

## DPH Program Staff

Dr. Gary Hein, DPH Director

Kelly White, Administrative Associate

# Welcome to the Doctor of Plant Health newsletter

The Doctor of Plant Health program at the University of Nebraska–Lincoln is an innovative model for educating plant health practitioners. DPH is a professional degree parallel to a medical or veterinary degree, but instead, graduates are prepared to understand and diagnose plant health issues and manage the entire plant production system. Our program provides coursework and internship experiences that prepare you to make a difference in tomorrow's agriculture.

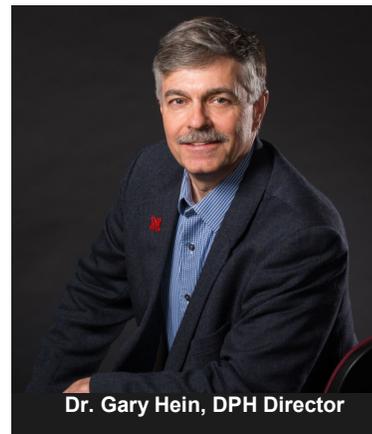
Graduates of the Doctor of Plant Health program are in demand worldwide for their comprehensive knowledge and experience, resulting in 100 percent job placement.

Interested in us? We're interested in you! Contact Dr. Gary Hein, DPH program director, at [ghein@unl.edu](mailto:ghein@unl.edu), or call 402-472-3365 for more information. We look forward to visiting with you.

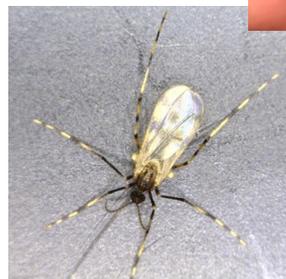
## Doctor of Plant Health Alumnus - Justin McMechan

In late June of 2018, researchers in Nebraska, Iowa, and South Dakota began receiving reports of soybean fields with dead or dying plants that were associated with an orange maggot feeding at the base of the stem. Justin McMechan, a 2016 graduate of the Doctor of Plant Health program along with taxonomists from the USDA-ARS and Kyushu University in Japan determined that the insect was a new species.

McMechan is currently leading a multi-state and multi-disciplinary team to address a range of research questions aimed at identifying management practices to mitigate losses from soybean gall midge.



Dr. Gary Hein, DPH Director



### THE MISSION OF THE DOCTOR OF PLANT HEALTH PROGRAM AT THE UNIVERSITY OF NEBRASKA–LINCOLN

is to produce plant practitioners with broad expertise and experience across the various disciplines that impact plant health and plant management. These plant practitioners (plant doctors) will integrate from across this expertise to diagnose and solve plant health problems and to develop integrated plant and pest management systems that maximize the system's economic, environmental, and social sustainability.

## Aaron Sedivy - Brazil Internship

“The DPH program can lead to incredible opportunities. An integral aspect of the program is the requirement of experiential learning, through which the student is to apply their wide knowledge basis built from coursework. With a special interest in tropical plants, I was fortunate enough to be able to travel with my family to the Federal University of Viçosa (UFV) in Minas Gerais, Brazil.



Aaron and his family on a beach in Rio de Janeiro.

While at the UFV, I worked in the department of plant pathology and nematology, with the goal of identifying a potential relationship between nematode populations and the spread of fusarium wilt of banana, *Fusarium oxysporum* f. sp. *ubense* 'tropical race 1' (Foc1). This work is to be mapped and overlaid atop of maps soil properties, slope, disease spread, weevil borer presence, and many other factors that may influence the spread of this fungal pathogen. Once this map is completed, we hope to be able to identify populations of nematodes that may have an influence, positive or negative, in the spread of Foc1 in two banana fields in the mountains of Minas Gerais.

Within tropical plants, my main passion is for the bromeliad family, Bromeliaceae. Some well-known members include pineapple, Spanish moss and airplants. The UFV houses an impressive collection of wild collected bromeliads at the Center for Bromeliad Research and Conservation (UPCB). Many of their plants have yet to be named or are now extinct from the wild, primarily due to habitat destruction from mining. I could not resist getting involved with this incredible group of people! I spent two mornings a week accessioning plants as well as updating and backing up records.

I did not anticipate using my background of collections management with the Denver Botanic Gardens when I was planning a research trip in a Brazilian banana field. This proves how influential every experience truly is, in a career or in life. Thank you to all who supported this adventure, we are forever grateful.”



A corpse of black banana weevil, *Cosmopolites sordidus*, after infection by the biological control agent *Beauveria bassiana*.



An image of a nematode, a microscopic roundworm, collected from a banana field soil sample.



A pseudostem of a banana plant showing classic purple-red symptoms of fusarium wilt; a healthy plant would be white.



An overview of one banana field from higher up the mountain.



A tree frog snoozing away the morning in a bromeliad tank at UPCB.



## DPH External Advisory Committee Members

Paul Carter - Sr. Agronomy Sciences Manager, DuPont Pioneer, Johnston, IA, retired

Glen Franzluebbbers - Director, Professional Ag Services, Central Valley Ag Cooperative, Oakland, NE

Thomas Hoegemeyer - Corn Breeder/Crop Professional Extraordinaire, retired

Billy McLawhorn - McLawhorn Crop Services, Inc., Cove City, NC

Bruce Monke - retired (formerly with Bayer), Kansas City, KS

Brian Olson - Learning Center Manager, Monsanto Company, Gothenburg, NE

Abby Stilwell - Supervisory Plant Protection and Quarantine Officer, USDA-APHIS-PPQ, Raleigh, NC

Tom Taylor - Twin Rivers Agronomics, Inc., Minden, NE



# DPH - May 2019 Graduates



## Chris Wynn

Chris spent the summer of 2018 working with fellow DPH student Lee Briese as a Crop Advisor at Centrol Crop Consulting in North Dakota. Chris and Lee worked side by side in scouting and providing recommendations for their growers. They scouted 65,000 acres every week! The crops they oversaw consisted of corn, soybeans, dry edible peas, wheat, oats, and barley.

This last year, Chris was also a recipient of the Earl S. Raun Fellowship. He is currently working on finishing his doctoral document and a few remaining courses so he can graduate in May.

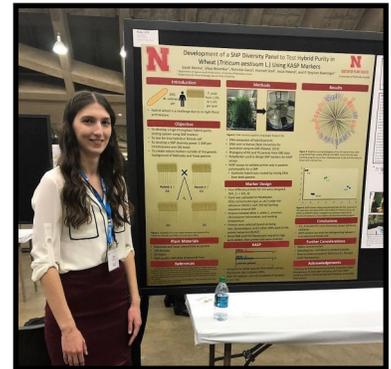


Chris has accepted a job offer with Verdesian Life Sciences. Verdesian Life Sciences specializes in Nutrient Use Efficiency. It offers farmers and growers the biological, nutritional, seed treatment and inoculant technologies that maximize performance on high-value row crops and specialty crops, as well as turf and ornamental plants. “The position I accepted will be a territory sales representative and agronomist. My Territory will cover Oregon and parts of Washington state. I'm extremely thrilled about this opportunity and location. I will be heading back to the Pacific Northwest and working in the state I grew up in. I'll be working alongside many growers to improve their Nutrient Use Efficiency as well as helping build a sustainable future.”

*“This fall I was given a gift that I've been waiting for over 15 years for. I successfully shot and harvested my first pair of wood ducks.”*

## Sarah Blecha

Sarah has won two awards this past year! She earned Third Place in the 2018 CSSA C-1 Division Poster Competition at the ASA & CSSA International Conference in Baltimore, MD. Her poster was titled: ‘Development of a SNP Diversity Panel to Test Hybrid Purity in Wheat (*Triticum Aestivum* L.) Using KASP Markers’. Sarah also received the 2019 ASA, CSSA, SSSA Future Leaders in Science Award and will be attending Congressional Visits Day in Washington, DC this March.



“This past summer was a continuation of my distributed internship working for Dr. Baenziger as his molecular lab technician. The small grains breeding program is busy during the growing season. I took flowering and plant height notes. I rated wheat for disease tolerance for line advancement. This summer was hot early on so stripe rust was not present. I saw stem rust, leaf rust, powdery mildew, barley yellow dwarf virus, and bacterial leaf streak. Throughout the summer, I helped other grad students collect data for their projects in the field. I also attended a couple of wheat field days where I met wheat growers, private industry representatives, and USDA employees. I helped during harvest time in July. After harvest, I coordinated the students on cleaning seed, organizing seed by projects, setting up for fall planting, and further data collection.”

In March and April of 2018, Sarah completed a 6-week internship at ICARDA in Morocco; she learned about the challenges an international wheat breeding center face and their efforts to address these challenges.



# DPH - May 2019 Graduates



## Salvador “Sal” Ramirez II

Upon completion of the DPH, Sal will continue his doctoral studies at UNL under the mentorship of Dr. Rhae Drijber and Dr. Virginia Jin. He plans to defend a PhD in agronomy in December of 2019. For his PhD, Sal has characterized soil microbial communities under 3 different agroecosystems. The first system is a USDA site in which corn stover is removed at three levels under no-till or disked tillage. The second site is also a USDA site in which nitrogen fertilizer is applied at three different levels under four crop rotations. That last site is a CERES trust funded organic site in which cover crops were used to suppress weed species. By extracting fatty acid methyl esters in addition to soil enzymes, Sal compares how those treatments influence soil microbial biomass and soil microbial activity.



Sal’s interest in soils influenced how he designed his second DPH internship. His second DPH internship was with the USDA Charles E. Kellogg Soil Survey Laboratory (KSSL) in Lincoln, NE. Sal spent time developing a procedural understanding of the several physical, chemical, and biological soil properties tests conducted at KSSL, with the goal of expanding his understanding of how to interpret those tests. Sal’s first DPH internship was a totality of his extensive teaching and undergraduate mentorship experience.

Sal was selected as the first Graduate Student Coordinator for Dr. Mamo’s NIFA funded Applied Plant Systems Experiential Learning Program (APS). Under the guidance of faculty members, Dr. Don Lee, Dr. Gina Matkin, and Dr. Martha Mamo, Sal created a set of diverse ‘Think Tank Sessions’ (TTS) with the purpose of enhancing the summer research experience of mentees in APS.

Upon completion of his PhD, Sal plans to return to his home state of California. He has expressed interest in working for the USDA after having thoroughly enjoyed his internship at KSSL, but has also expressed interest in industry opportunities. Either way, Sal is grateful for the training he received at UNL through the DPH, and is confident he can find a job that balances the interdisciplinary training of the DPH and his passion for soil resources.

## Lee Briese

Lee has been busy working with the North Dakota State University Soil Health team. He has given many presentations this winter and last summer about soil health and cover crop management. He has presented in: Lisbon, Havana, Fargo, Valley City, and Jamestown, North Dakota; Kingston and Guelph in Ontario, Canada; Charlottetown, Prince Edward Island, Canada; Hartford, Watertown, Redfield, Sisseton, and Mitchell, South Dakota. In March, Lee will be the Keynote speaker at the Midwest Cover Crops Council meeting in Springfield, IL.



Lee was also elected to the International Certified Crop Adviser (CCA) board last September. He began his three year commitment this January as the Vice Chair. Next year he will be a Chairperson and the final year he will serve as Past Chair. His duties with the CCA program consist of advocating for policy that supports CCA’s and their duties and making connections for the program within and outside of agriculture.



After graduation, Lee plans to continue to work as a crop consultant in Jamestown, ND. He hopes to provide a higher level of service and diagnostics to his growers. He will also be helping to provide continuing education training for his coworkers at Control Crop Consulting. Lee will continue to give presentations encouraging growers to improve how they manage their soils and utilize Integrated Pest Management and diversity in their cropping systems.

# What the DPH Staff & Students Have Been Up To



UNIVERSITY OF NE AT LINCOLN  
DOCTOR OF PLANT HEALTH

EXHIBITING at the AG PRO EXPO  
For 5+ YEARS  
2016 National Meeting  
National Alliance of Independent Crop Consultants  
1000 UNIVERSITY BLVD.  
LINCOLN, NE 68503  
January 14-16, 2016

## National Alliance of Independent Crop Consultants

Dr. Gary Hein attended the NAICC Conference in Savannah, Georgia to promote the DPH program and recruit students. The DPH program was recognized for exhibiting at the Ag Pro Expo for 5+ years!

### Callie Braley - DPH Student

- Participated in the Soybean Management Field Days and spoke about frogeye leaf spot and its resistance to QoI fungicides in soybeans.
- Attended the American Phytopathological Society North Central Division meeting in Fargo, North Dakota last June. While there, she got a chance to tour an apiary, a meadery, and a brewery!
- She has also been busy working in Sydney Everhart's lab learning basic laboratory techniques: making water agar, PDA, measuring fungi, transferring isolates, and making "plugs" to transfer fungal hyphae to a new dish so it can produce new growth.



Presenting at the Soybean Management Field Days.

### Lindsay Overmeyer - DPH Student

Last September, Lindsay attended the Bayer-Monsanto Diversity Student Summit in St. Louis, Missouri. The Diversity Student Summit provides ethnic/racial minority students an opportunity to attend a three-day leadership experience with a focus on networking with leaders, professional development, and an overview of Bayer-Monsanto and careers in agriculture.



### Adam Striegel - DPH Student

- Volunteered as a student worker at the North Central Weed Science Society Weeds Contest in Gothenburg, NE.
- Was recognized as a Milton E. Mohr fellowship recipient due to his involvement in teaching.
- Attended the University of Wisconsin-Madison Plant Science Symposium.
- Presented an oral presentation at the North Central Weed Science Society meeting in Milwaukee, WI - Control of Glyphosate/Glufosinate resistant volunteer corn with Enlist™ corn.
- Took 12 students to Hutchinson, KS for their first crops contest and received 2nd place overall.
- Presented his poster at WSSA in New Orleans and earned 1st place. Poster title: **"Comparison of Herbicide Programs in Conventional, Glufosinate, and Glyphosate/Dicamba-Resistant Soybeans Across Nebraska"**



## Chris Chen - DPH Student

Last summer, Chris was busy with Dr. Wortman's research team scouting pest and disease in the research plot, traveling to North Platte and Scottsbluff to help establish research and collecting samples, applying fungicide and pesticide, fertigation, planting, trellising, pruning, and soil lipid extraction to identify soil microbes in the lab.



Chris is also working towards his Master's degree. His research will address Dicamba and 2, 4-D drift in Specialty Crops. Because of the newly released Dicamba resistance corn and soybean, there will be a trend of increasing use of Dicamba. However, because of the high volatility of Dicamba and its sensitivity to weather conditions, it is expected unintended drift will occur. Many high-value specialty crops are very sensitive to Dicamba drift, and I am focusing mainly on squash, lettuce, oaks (seedling), grape and hops.

## DPH Students Teaching in the Classroom - by Salvador Ramirez II

DPH students have positively contributed to several college courses as teaching assistants (TAs), lab instructors, and course instructors at University of Nebraska-Lincoln (UNL). Naturally, these contributions have occurred across several disciplines within the Department of Agronomy and Horticulture at UNL. Courses that current DPH students have contributed to include plant physiology, plant genetics, soil science, weed science, and plant pathology. Sound familiar? That list should sound familiar, and it's evident that DPH students' interdisciplinary training has prepared them to undertake leadership roles in the instruction of various disciplines.



Of the current DPH students who have been involved in the instruction of a UNL college course, most have done so repeatedly. Both Jakob Nikodym and Lee Briese have been involved with Agronomy 426/826 (Invasive Species) twice. Amy Hauver and Sarah Blecha have been involved with Agronomy 215 (Genetic Principles) twice. Some DPH students have contributed to UNL college courses across disciplines. Callie Braley, for example, has contributed to Agronomy 132 (Agronomic Plant Science Laboratory), Agronomy 366 (Soil Nutrient Relationships), and Horticulture 354 (Fruit Production Laboratory). These dependably consistent and interdisciplinary

contributions to UNL courses have garnered attention from several UNL faculty. When asked about DPH students teaching, Dr. Sindelar said: *"The DPH students are the kind of dedicated and responsible students that make great teaching assistants. I really appreciate the contribution they make to the classroom due to their extensive experience with practical field Agronomy. I have had three DPH students assist me with my two courses. They make a great contribution across all the disciplines of the department."*

While DPH students' contributions to extant UNL courses are impressive, some DPH students have designed their own courses, a trend started by Josh Miller DPH Ph.D. Current DPH student Adam Striegel followed in Josh's footsteps, creating a spring and fall course for undergraduate students interested in representing UNL at regional and national crops judging competitions. As a co-curricular, competitively focused-course, Striegel focuses on teaching and reinforcing practical agronomic skillsets in plant and seed identification, field entomology, plant pathology and various agronomic technologies. Since the implementation of these courses, UNL's Intercollegiate Crops Judging team has placed in the top three places at nine of the last nine regional and national contests.



Post graduate leadership has always been expected of DPH students, and DPH students have consistently demonstrated their leadership capabilities as graduate students by taking on leadership roles in UNL lecture halls.

# Help us grow the Earle Raun Plant Health Fund



Dr. Earle S. Raun

The Earle S. Raun Doctor of Plant Health Fellowship Fund was created to honor Earle Raun's efforts in establishing UNL's Plant Health Program and his professional contributions to crop consulting and agricultural education.

In addition to his work at UNL, Dr. Raun created Pest Management Company-the first independent crop consulting firm in the Midwest specializing in research and advice on pest management and crop production, and was instrumental in founding the National Alliance of Independent Crop Consultants (NAICC) and its Nebraska affiliate, Nebraska Independent Crop Consultant Association (NICCA).

Contributions to this fund will enable UNL to offer fellowships for Doctor of Plant Health students. To give, go to [nufoundation.org/fundsearch](http://nufoundation.org/fundsearch) and enter Earle S. Raun into the search window.

For more information, contact Josh Egley at 402-458-1202 or Dr. Gary Hein at 402-472-3345.

**CAMPAIGN** for  
**NEBRASKA**  
UNIVERSITY of NEBRASKA FOUNDATION



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