Doctor of Plant Health

Volume 14, Issue 1

Winter 2025

The DPH Practitioner

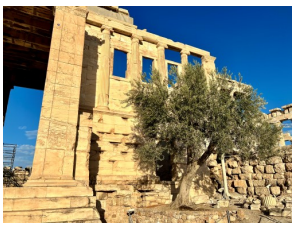
"Educating Leaders for Tomorrow's Sustainable Plant Production Systems"

Overlook of the ruins of the Oracle of Delphi.

I hope you all had a Happy New Year as we have now begun a new year in the DPH program and a new semester for our students is just around the corner! As you will read in the following pages, our students have had a *very* active summer and fall! From summer internships in Nebraska and California, international education in Brazil, to research presentations in Arizona – a very productive few months! We had a new student, Jae Horn, enroll in our program this fall! It has been exciting for me to be involved in onboarding new students into the DPH program this year. Look for some additional new student announcements in future issues in 2025! We also had a very active DPH Colloquium this fall with a visit to Midwest Research and networking conversations with people from many sectors of the plant health profession – from Federal government to private industry and, of course, DPH alumni. Speaking of DPH alumni, I want to give a heartfelt *thank you* to all of the alumni who have reached out, joined us at the DPH summer potluck, or just "checked in" with Kelly or myself. We truly appreciate hearing from you all! Thank you!

Cicada orni (the ash cicada) is commonly found on Fraxinus ornus, manna ash, where it lays its eggs. It is common throughout Europe, the Near East, and North Africa. There were hundreds of them calling in Delphi on July 10th!

Lastly, a very exciting opportunity was extended to the DPH program this past summer! I was invited (along with Dr. Amanda Hodges, Director of the Doctor of Plant Medicine Program, University of Florida) to speak about professional plant health programs as part of a "plant health – Phytiatry" symposium at the International Plant Protection Congress in Athens, Greece. In fact, due to some unexpected, last-minute circumstances, Amanda and I ended up co-moderating the entire symposium along with Amanda! I didn't mind this last-minute responsibility in the least as I truly value Amanda's friendship and comradery. In fact, Amanda and I took the opportunity to have some extended conversations about strategies for the future of our professional plant health practitioner programs. Based on our interactions during the symposium, both the DPH and DPM programs maintain a unique pathway for students in the world. Most "Phytiatry" or "Plant Protection" programs globally are very focused on producing researchers only and are especially interested in developing a pipeline for replacing university faculty. Amanda and I both remain dedicated to the vision of our programs to produce plant health practitioners that, "… make an impact anywhere that plants grow". We both feel that we need more programs like ours at more institutions. We envision a future where we might have national accreditation for plant health professional degree programs. If such strategic thinking interests you as well, I welcome input and your possible interest in serving on the DPH external advisory committee…



The Sacred Olive tree of Athens. Protected by the state, this olive is rumored to have been here since ancient times. During the invasion of Athens by Persia in 480 BC, it's said that a scion of the tree was saved and replanted.

An additional opportunity arose through a conversation with Dr. Nutan Kaushik, Director General for the Amity Food and Agriculture Foundation. Amity is a global university based in India. Dr. Kaushik and her colleagues at Amity were very impressed with the DPH program's vision and outcomes and we are currently in the process of developing a potential international pathway partnership with them. I hope to share more about these developments in the future! Lastly, my wife, Katie, also traveled with me as we celebrated my 50th birthday while visiting the ruins of the Oracle of Delphi.

DOCTOR OF PLANT HEALTH
University of Nebraska-Lincoln

Doctor of Plant Health at the
University of Nebraska - Lincoln
279E PLSH P.O. Box 830933 Lincoln, NE 68583-0933

@UNLDPH dph.unl.ed

DPH Faculty Members

Kyle Broderick, *Assoc. Ext. Educator, Plant Pathology*

Dr. Christian Elowsky, *Asst. Professor, Agronomy & Horticulture*

Dr. Katherine Frels, *Asst. Professor, Agronomy & Horticulture*

Dr. Loren Giesler, *Professor and Dept. Head, Plant Pathology*

Dr. Tiffany Heng-Moss, *CASNR Dean*

Dr. Tamra Jackson-Ziems, *Professor, Plant Pathology*

Dr. Amit J. Jhala, *Professor & Assoc. Dept. Head, Agronomy & Horticulture*

Dr. Kyle Koch, *Asst. Ext. Educator, Entomology*

Dr. Louise Lynch-O'Brien, *Asst. Professor, Entomology*

Dr. Martha Mamo, Professor & Dept. Head, Agronomy & Horticulture

Dr. Justin McMechan, Asst. Professor, Entomology

Dr. Jill Motschenbacher, *Assoc. Professor, School of Natural Resources*

Peter Mullin, *Lecturer, Plant Pathology*

Dr. John Ruberson, *Professor, & Dept. Head, Entomology*

Dr. Christian Stephenson, *Asst. Professor, Agronomy & Horticulture*

Dr. Anne Vidaver, *Emerita Professor, Plant Pathology*

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

Dr. Sam Wortman, *Assoc. Professor, Agronomy & Horticulture*

DPH Program Staff

Dr. Jeff Bradshaw, *DPH Director*

Kelly White, *Admin. Asst.*

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. Jeff Bradshaw, DPH program director, at jbradshaw2@unl.edu, or call 402-472-3365 for more information. We look forward to visiting with you.

Congratulations to the following students for receiving the following financial awards:

Garrett Kuss:
Raun Fellowship Award

Alex Angel:
David H. & Annie E. Larrick Memorial Travel Fund,
Raun Fellowship Award

Thomas Wilbur Davis:
Graduate Student Travel Award (*made possible by the University of Nebraska Foundation, through a generous donation from the family of Warren and Edith Day.)*

Lilly Buchholz is the recipient of the William J. Curtis Fellowship and was presented with a certificate from Deans Derek Mclean and Tiffany Heng-Moss at the Graduate Fellowship Luncheon on December 5th.

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.

New DPH Student - Jae Horn

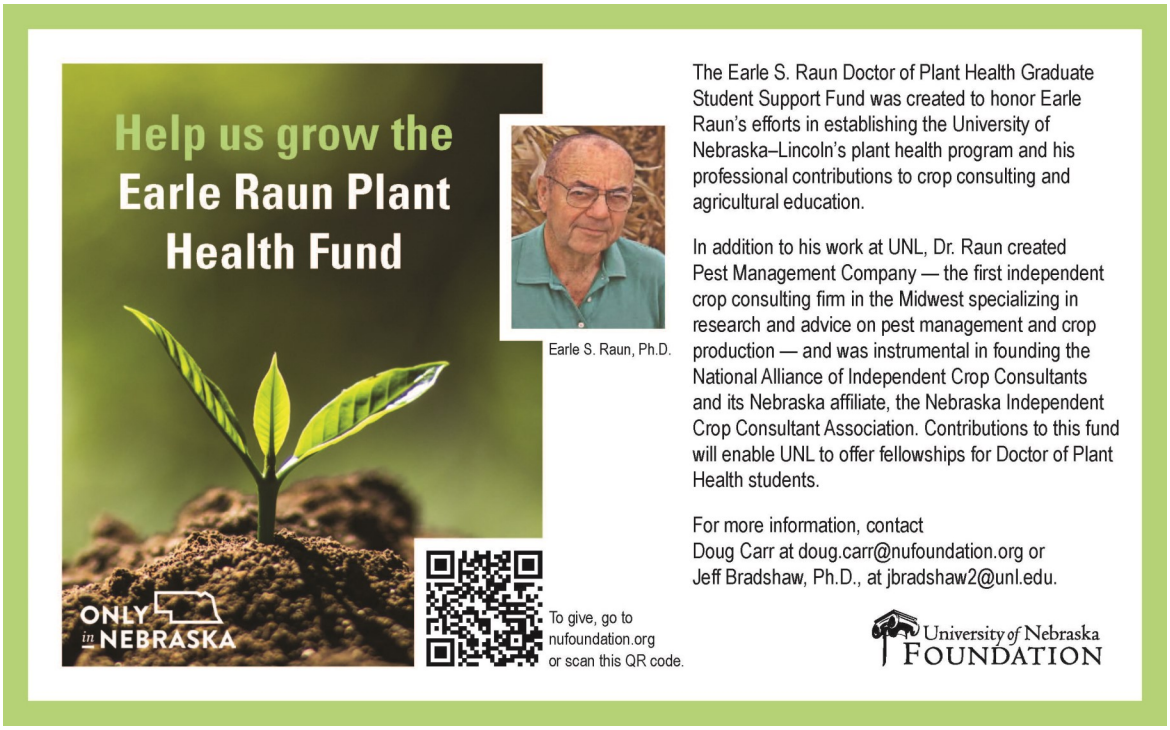
Jade "Jae" Horn is a passionate entomologist born in Emporia, Kansas. In 2023, Jae earned a Bachelor of Science from Emporia State University, focusing on research topics such as the alfalfa weevil (*Hypera postica*) and the honey bee (*Apis mellifera*). With a keen interest in integrated pest management (IPM) and conservation methods, Jae aspires to contribute to sustainable agricultural practices and the health of our ecosystems.

"I am a passionate individual pursuing my master's degree in Entomology at the University of Nebraska-Lincoln, focusing on the health and sustainability of honey bee populations. My thesis research examines various colony health measures in honey bees, focusing on the effects of pesticide exposure and innovative management practices for controlling varroa mites.

My academic journey began at Emporia State University where I spent two years in the microbiology lab, honing my skills in the production and management of lab materials, in addition to working alongside Dr. Joanna Gress, where I investigated the impacts of neonicotinoids on honey bee cognition and explored the potential benefits of hemp usage within colonies. This experience deepened my commitment to understanding and protecting these vital pollinators.

My goal is to become a well-rounded plant pathologist and entomologist, contributing to sustainable agricultural practices and the overall health of our ecosystems."

Jae, Welcome to the DPH Program at UNL!

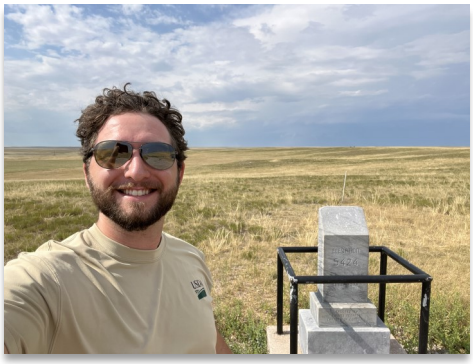


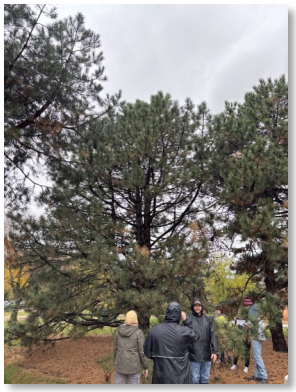
Because our students are self-supported, general student support is needed to assist students in pursuing opportunities to travel to professional meetings, inviting outside speakers or to enhance educational opportunities for students in the program.

Your donation truly goes a long way in supporting our students.

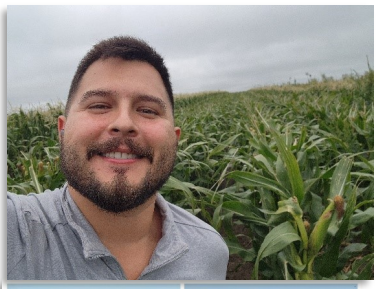
DPH Students - *Semester Wrap-up*

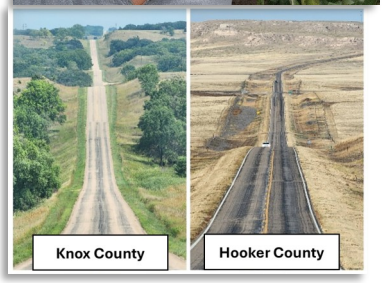
Tyler Prow: This past summer, Tyler worked as a field tech for USDA-APHIS-PPQ, primarily doing grasshopper surveys and monitoring for exotic tree pests. Although based out of the Lincoln field office, Tyler was responsible for the Panhandle region and spent most of his time driving around (or to and from) the beautiful Nebraska Sandhills. As he did last semester, Tyler served as TA and lab instructor for the undergraduate Dendrology course with Ann Powers. Class-wise, Tyler enjoyed learning about plant and insect diagnostics and furthering his knowledge of GIS systems. In personal news, Tyler married Amara, his partner of nine years, on October 12th at his grandparents' farm near Scotia, NE. Mr. & Mrs. Prow are looking forward to their honeymoon in January, and Tyler is excited for a more manageable course load come spring!

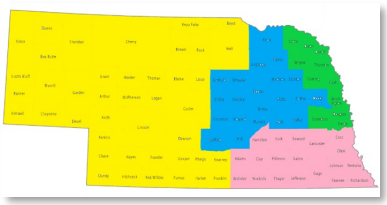




Josh Villazana: From the roads of East Nebraska to West Nebraska the remainder of the year has been a delight! Pictured to the left is Josh in a corn field conducting a growing season field inspection (GSFI) in the summer for Nebraska growers to identify disease symptoms. GSFIs are conducted at least once per year by the Nebraska Department of Agriculture (NDA) or the Nebraska Crop Improvement Association. Some reports may be submitted as part of the export application if needed and the reports are used for the basis of export certification. As an Agricultural Inspection Specialist, Josh is responsible for the Northeast territory of Nebraska (counties highlighted in blue) while three other inspectors are responsible for the remaining colored counties.







In July Josh participated in the Heartland Pride Festival at Omaha representing the DPH with the Nebraska Alumni Association led by the Assistant Director of Alumni Engagement Nathan Hé.

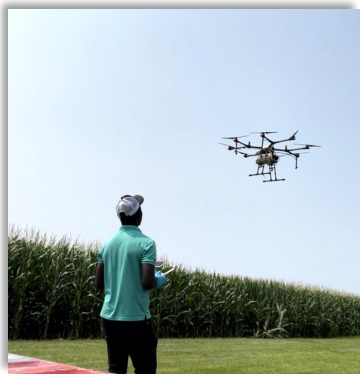
In September Josh was at Husker Harvest Days with NDA and the new Survey Coordinator John Bowley. This is the world's largest totally irrigated working farm show that offers a unique agricultural experience!

In November he sang with the All-Collegiate Choir directed by Dr. Pete Eklund and the Cornhusker Marching band honoring the 80th anniversary year of the D-Day Invasion performing the John Williams "Hymn To the Fallen" during half time of UCLA vs. UNL football game.

DPH Students - *Semester Wrap-up*

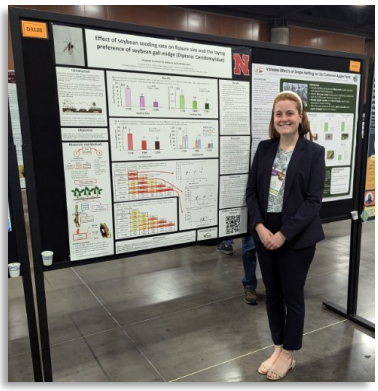
Garrett Kuss: This fall semester flew by! Most of my time was spent in diagnostic classes and teaching classes in freshman agronomy. In my spare time I started a fermentation science and brewing club here on campus with some friends from other grad programs. This semester was also exciting for my entire family as my youngest sister, Rachel, started her first semester at UNL and my other sister, Emma, graduated with her undergraduate degree this December. Having them both around on campus has been the highlight of the year!

Outside of school, this fall has been filled with time spent with family traveling up north to South Dakota for a reunion and traveling to the black hills for a family vacation over break. I look forward to starting the latter half of my program next semester as this finals season wrapped up the first two years and I hope to start on some of my doctoral projects soon!



Thomas Wilbur Davis started his DPH residency period this past summer at Midwest Research Inc., where his learning experience combined traditional agricultural research with cutting-edge technology. During his internship which lasted from May to August 2024, Thomas was exposed to many things including a system used to assess plant tissue in real-time and the operation of drones – mainly taking arial photos for plant health assessment and using spray drones for fungicide application. At Midwest Research Inc., Thomas was responsible for assisting in all aspects of conducting various types of agronomic research trials including pesticide, biological, and fertilizer efficacy tests; GMO trait assessment; pesticide residue analysis; and product demonstrations. He also assisted with the establishment and maintenance of research plots, collected data from established plots and performed other operations including the overall assessments of plant health for diseases and insects. Next summer (2025), Thomas plans to complete his second and final internship as required for obtaining the Doctor of Plant Health degree.

During the Fall Semester, he continued his work on *wheat streak mosaic* virus and collaboration with the Arthropod Vectors of Plant Pathogen Lab in the Department of Entomology.



Lilly Buchholz: In November I had the opportunity to attend my first conference to present a poster about the work I have been doing in Dr. Justin McMechan's Lab. The poster was entitled *Effect of seeding rate on fissure size and the laying preference of soybean gall midge*. It was very exciting to be able to present the work I have been doing as well as answering questions and discussing my work with others. I enjoyed being able to walk around and see what other work is being done by people like myself at different universities, in extension, and other positions. I was able to sit in on a few talks about different aspects of entomology that I have never even thought of.

As a plant pathologist, I often forget about how important insects are in the world of plant health and not just the microorganisms that cause damage and disease. As a special bonus, I was also able to reconnect with friends I attended school with in Hawaii and see the progress they have made on their research since I left last March.

Overall it was a wonderful experience and I learned so much!

DPH Students - *Semester Wrap-up*

Alex Angel: Visit to Brazil

This 4,000 acre cotton field was just a small part of a single family farm. I struggled to wrap my head around the scale of operations in Mato Grosso.

This summer, I had the amazing opportunity to travel to Brazil to learn what's "growing on" south of the equator. I was invited to attend the Tropical Biobased Production Systems course at the Escola Superior de Agricultura "Luis de Queiroz" (ESALQ). This course brought students from around the world to Brazil to learn about current practices in tropical agriculture. It featured lectures from ESALQ faculty, tours of research laboratories, and visits to local businesses.

Brazil is known for its production of large-scale commodity crops like soy, coffee, and sugar. As a participant in the course, I was taught about the disease and pest management issues facing each of the major commodities. A recurrent theme was the constant pressure that is placed on crops because of the continuous growing season. Some crops need more than 30 applications of fungicides and insecticides during a single season.

The researchers at ESALQ were working hard to find ways to limit the inputs needed to manage a successful crop. The SPARCBIO labs on campus work to identify novel biological control methods. Fungi and parasitic wasps were the organisms that showed the most promise during my visit. There were also lectures on nutrient management and how fertilizers interact with the tropical oxisols found in much of Brazil. Invited faculty from the Moroccan Mohammed VI Polytechnic University showed how potassic clays could be better used in large agronomic systems.

Despite the interesting tours and lectures, the favorite part of my trip was getting to interact with the other students outside of class. We had a great time learning about school, life, and agriculture from each other. Whether it was over a $0.40 lunch at the school cafeteria, or celebrating one of the group's 4 birthdays, all 30 of the course participants thoroughly enjoyed each other's company. We even had the chance to organize an international Futsal tournament, of which my team was victorious!

My victorious PC United, Futsal Champions of ESALQ.

When the ESALQ course wrapped up, I took the next week to travel deeper into Brazil's heartland. I had seen videos of 40-row planters rolling across massive Brazilian fields, and I had to witness the fields and farmers for myself.

I connected with a farming family that manages a 40,000-acre soy and cotton farm in Mato Grosso state. Lucas, one of the grandsons and the farm's agronomist, was gracious enough to have me sit shotgun in his pickup. I spent the better part of two days with Lucas, discussing the ongoing cotton harvest, production challenges during the season, infrastructure on farms and in the community, and plans for how the was going to manage the upcoming soy crop. I even got to see some of the mega planters that were sitting in the equipment shed!

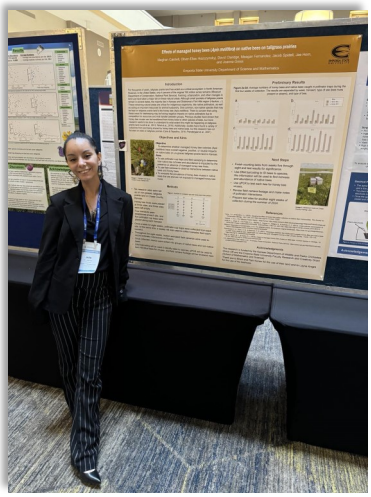
Brazilians don't mess around with their coffee breaks. Great food and even better drinks!

Because of their large size, Lucas' family farm and many of the neighbors do more of their processing on farm than many American operations. The farm had its own cotton gin, complete with two ginning units that could run in parallel and produce hundreds of bales of cotton per day. They captured more value from the cotton by feeding some of the leftovers from processing to their cows on the adjacent feedlot. The family also had its own Eucalyptus forests from which they could produce firewood for drying soybeans in the wet season.

This summer's trip to Brazil was an important inflection point. For the first time, I found a country outside of America that, while foreign, felt familiar. The pace of conversation, the entrepreneurial spirit, and the kind and helpful nature of many strangers (almost none of whom spoke English), made me feel right at home.

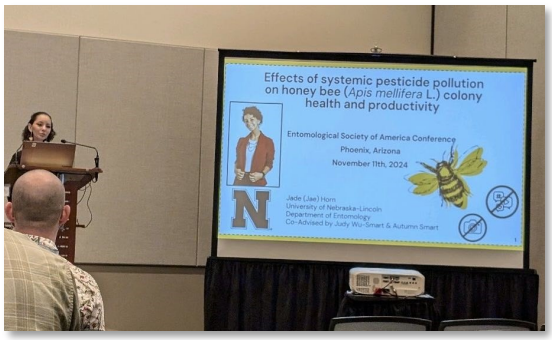
It's opportunities like these that inspire me to continue working towards a career in international agriculture. I believe that there are more kind people interested in feeding and clothing the world, and it's my mission to go and find them. I am excited to see what adventures lay ahead, and I'll be sure to share any updates as things progress.

DPH Students - *Semester Wrap-up*



Jae Horn: My master's thesis investigates the effects of common stressors and their interactions on honey bee colony health and productivity, with a particular focus on pest management practices for *Varroa destructor* mites. Across several chapters, I examine the colony-level impacts of prolonged pesticide exposure, assessing recovery rates during and after exposure. I also explore the individual-level consequences of varroa mite infestations and evaluate the effectiveness of drone trapping as a practical method for mite control. My thesis aims to understand honey bee stressor interactions and their effects on colonies, while providing beekeepers with insights on recognizing health indicators in their hives. Ultimately, the goal is to promote informed management practices that support healthy hives with minimal pesticide use.

I had the privilege of discussing my findings on colony-level impacts of long-term pesticide exposure at the National ESA Conference in Phoenix, AZ, last November. My talk, titled "*Effects of systemic pesticide pollution on honey bee (Apis mellifera L.) colony health and productivity,*" marked my first conference presentation, and it was a truly rewarding experience. Additionally, in December, I presented my thesis proposal at the University of Nebraska-Lincoln, titled "*The impacts of systemic pesticide pollution on colony development and pest management in honey bees (Apis mellifera L.).*"



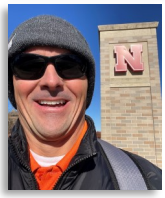
Although last semester was busy and "occasionally" stressful, I greatly enjoyed being part of a community of scientists who were eager to engage with and learn about my research journey.

DPH Colloquium - Fall 2024

Thank you to the following guests for taking time out of their busy schedules to meet with our students:

UNL CASNR Dean Tiffany Heng-Moss; Dr. Jorge P. Venegas, Director, Latin America Berry Operations, Pairwise; **Jeremy Quist**, Agronomist, Bayer CropScience; **Dr. Ana Maria Velez**, Associate Professor of Entomology, UNL; **Dr. Megan O'Rourke**, National Science Liaison, USDA-NIFA; **Dr. Nathan Fortner**, DPH Alumnus, Founder & Executive Director of East Gate Ext.; **Dr. Brett Lynn**, DPH Alumnus, Crop Protection Tech. Dev. Rep., Bayer CropScience; **Dr. David Coyle**, Associate Professor of Forest Health & Invasive Species, Clemson University; **Dr. Josh Miller**, DPH Alumnus, Linx Systems; **Dr. Christine Booth**, UNL Lecturer.

Jeff and the DPH students visited DPH alumnus, Zach Rystrom and colleague Jess Spotanski at Midwest Research in York, NE.



Dr. David Coyle discussed Invasive species, climate change, and their impacts on plant health and resilience; Out to eat with Jeff and Jody Green, Assoc. Extension Educator with UNL; David and Asst. Professor of SNR, Andy Little.

DOCTOR OF PLANT HEALTH

University of Nebraska–Lincoln
279E Plant Sciences Hall
PO Box 830933
Lincoln, NE 68583-0933

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