Ashley N. Hostetler (née Henderson), Ph.D.

Curriculum Vitae

Contact Information

Division of Plant Science and Technology and Bond Life Sciences Center
University of Missouri, Columbia, MO
ashleyhostetler@missouri.edu

Education

Doctor of Philosophy (Ph.D.) in Biology 2014 – 2020
West Virginia University, Morgantown, WV
Advisor: Dr. Jennifer S. Hawkins, PhD
Dissertation title: The morphological, physiological, and genetic underpinnings of intraspecific salinity tolerance in *Sorghum bicolor*

Bachelor of Science (B.S.) in Biology 2011 – 2014
West Virginia University, Morgantown, WV

Professional Appointments

Senior Scientist Computational Biologist, University of Missouri, Columbia MO 2025 – Present
Division of Plant Science and Technology and Bond Life Sciences Center

USDA NIFA Postdoctoral Fellow, University of Delaware, Newark DE 2022 – 2025
Department of Plant and Soil Sciences and the Delaware Biotechnology Institute
Project: Bracing for Sustainable Agriculture: Characterization of brace root development and function in two members of *Andropogoneae*
Faculty Mentor: Dr. Erin E. Sparks, PhD
Awarded $225,000

Visiting Scholar, West Virginia University, Morgantown WV 2022 – 2025
Department of Biology

Postdoctoral Research Scientist, University of Delaware, Newark DE 2020 – 2022
Department of Plant and Soil Sciences and the Delaware Biotechnology Institute
Faculty Mentor: Dr. Erin E. Sparks, PhD

Lecturer, West Virginia University, Morgantown WV 2020 – 2020
Department of Biology

Genomics Core Research Fellow, West Virginia University, Morgantown WV 2016 – 2020
Department of Biology

Undergraduate Research Assistant, West Virginia University, Morgantown WV 2013 – 2014
Department of Biology
Advisor: Dr. Jennifer S. Hawkins

Publications

**indicates undergraduate student mentored*

Submitted and Pre-Prints

1. **Hostetler, A.N.,** Kennebeck, E., Reneau, J.W., Birtell, Eva., Caldwell, D.L., Iyer-Pascuzzi A.S., Sparks, E.E., 2026. Ultra large-scale 2D clinostats uncover environmentally derived variation in tomato responses to simulated microgravity. bioRxiv 10.1101/2025.05.16.654566.

Accepted and Published

1. **Hostetler, A.N.**, Ikiriko, I. I., Sparks, E.E., 2025. Experimental Approaches for Assessing Root Mechanical Properties in Maize. *Cold Spring Harbor Protocols. (Invited)*
2. Pierce, E., **Hostetler, A.N.**, Sparks, E.E., 2025. Three-Point Bend Testing for Quantification of Maize Brace Roots Mechanics. *Cold Spring Harbor Protocols. (Invited)*
3. **Hostetler, A.N.,** Ikiriko, I. I., Reneau, J.W., Betts, A.K., Sparks, E.E., 2025. A biphasic trajectory for maize stalk mechanics shaped by genetic, environmental, and biotic factors. *The Plant Journal 123, e70342*.
4. **Hostetler, A.N.**, Reneau, J.W., Cristiano, J., Weldekidan T., Kermani, T., Kim, T., Sparks, E.E., 2025. A tool to measure maize root system stiffness that enables a comprehensive understanding of plant mechanics and lodging. *Journal of Experimental Botany erae465.*
5. **Hostetler, A.N.,** Morais de Sousa Tinoco, S., Sparks, E.E. 2023., Root responses to abiotic stress - a comparative look at root system architecture in maize and sorghum. *Journal of Experimental Botany erad390. (Invited Review).*
6. Hazelwood, O.S.*, **Hostetler, A.N.**, Ikiriko, I.I., Sparks, E.E., 2023. Characterization of mechanosensitive MSL gene family expression in *Zea mays* aerial and subterranean brace roots. *microPublication Biology*. 10.17912/micropub.biology.000759
7. **Hostetler, A. N.**, Erndwein, L., Ganji, E., Reneau, J.W., Killian, M.L., Sparks, E.E., 2022. Maize brace root mechanics vary by whorl, genotype, and reproductive stage. *Annals of Botany*.
8. **Hostetler, A. N.**, Erndwein, L., Reneau, J.W., Stager, A., Tanner, H.G., Cook, D., Sparks, E.E., 2022. Multiple brace root phenotypes promote anchorage and limit root lodging in maize. *Plant, Cell, and Environment* 45(5): 1573-1583.
9. **Hostetler, A.N.**, Khangura, R.S., Dilkes, B.P., Sparks, E.E., 2021. Bracing for sustainable agriculture: the development and function of brace roots in members of *Poaceae*. *Current Opinion in Plant Biology* 59: 101985. (*Invited Review*).
10. **Hostetler, A.N.**, Govindarajulu, R., Hawkins, J.S., 2021. QTL mapping in an interspecific sorghum population uncovers candidate regulators of salinity tolerance. *Plant Stress* 2: 100024.
11. Govindarajulu, R., **Hostetler A.N.**, Xiao, Y., Chaluvadi, S.R., Mauro-Herrera, M., Siddoway, M.L., Whipple, C., Bennetzen, J.L., Devos, K. M., Doust, A.N., Hawkins, J.S., 2021. Integration of high-density genetic mapping with transcriptome analysis uncovers numerous agronomic QTL and reveals candidate genes for the control of tillering in sorghum. *G3 Genes|Genomes|Genetics* 11.
12. Carrara, J.E., Walter, C.A., Freedman, Z.B., **Hostetler, A.N.**, Hawkins, J.S., Fernandez, I.J., Brzostek, E.R., 2021. Differences in microbial community response to nitrogen fertilization

result in unique enzyme shifts between arbuscular and ectomycorrhizal-dominated soils. *Global Change Biology* 27: 2049–2060.

13. **Henderson, A.N.**, Crim, P.M., Cumming, J.R., Hawkins, J.S., 2020. Phenotypic and physiological responses to salt exposure in *Sorghum* reveal diversity among domesticated landraces. *American Journal of Botany* 107: 983–992.
14. Hawkins, J.S., Ramachandran, D., **Henderson**, **A.,** Freeman, J., Carlise, M., Harris, A., Willison-Headley, Z., 2015. Phylogenetic reconstruction using four low-copy nuclear loci strongly supports a polyphyletic origin of the genus *Sorghum*. *Annals of Botany* 116: 291–299.

Research Grants, Honors, and Awards

Travel Award - Plant Biology 2023, ASPB-Early Career Plant Scientists ($450)	2023
USDA Agriculture and Food Research Initiative Postdoctoral Fellowship ($225,000)	2022
2nd prize poster competition, North American Plant Phenotyping Network (NAPPN) ($50)	2021
Graduate Student Productivity Award, WVU Eberly College of Arts and Sciences ($1000)	2020
Disciplinary Breadth Award, 62nd Maize Genetics Conference (funded travel & registration)	2020
Travel Grant, WVU Eberly College of Arts and Sciences ($700 per year)	2016, 2019, 2020
Doctoral Research Award, WVU Eberly College of Arts and Sciences ($800 per year)	2015, 2016, 2018, 2019
Core Research in Taxonomy of Vascular Plants Award, WVU Dept. of Biology ($2000 per year)	2015, 2016, 2017, 2018
Co-writer, WVU Research and Scholarship Advancement Grant ($25,000)	2016
Graduate Student Research Award, WVU Biology Graduate Student Association ($500)	2016

Presentations

Oral, Primary Presenter, Invited

1. “Bracing for Sustainable Agriculture: Multiple Brace Root Phenotypes Promote Anchorage and Limit Root Lodging in Maize.” Center for Bioinformatics & Computational Biology - Bioinformatic Seminar Series, February 14th, 2022.
2. “Utilizing high-throughput brace root phenotyping data to predict lodging susceptibility across 53 maize genotypes.” North American Plant Phenotyping Annual Conference. February 16th-19th, 2021.
3. “Phenotypic and physiological responses to salt exposure in *Sorghum* reveal diversity among domesticated landraces.” West Virginia University Annual Biology Retreat. November 13th, 2019. Morgantown, WV.
4. “The genetic, physiological, and morphological underpinnings of intraspecific salinity tolerance in *Sorghum bicolor*.” Genomics Group Meeting October 19th, 2018. Morgantown, WV.
5. “Physiological and morphological responses to salt exposure in Sorghum.” Genomics Group Meeting. October 18th, 2016. Morgantown, WV.
6. “Comparative expression analysis of domesticated grasses and their wild relatives when exposed to saline conditions.” Genomics Group Meeting. April 4th, 2016. Morgantown, WV.

Poster

*Indicates trainee supervised

1. Hostetler, Ashley N.; Khangura, Rajdeep S.; Dilkes, Brian P.; Sparks Erin E. "Decoupling brace root development from phase change in sorghum: candidate genes revealed by GWAS" 67th Annual Maize Genetics Conference. March 6-9, 2025.
2. Ikiriko, Irene I.; Hostetler, Ashley N.; Sparks Erin E. "Uncovering the genes regulating lifespan stalk flexural stiffness" 67th Annual Maize Genetics Conference. March 6-9, 2025.
3. Jensen, Austin*; Hostetler, Ashley N.; Sparks, Erin E. "Characterization of brace root development in *Sorghum bicolor* x *Sorghum propinquum* RIL population" Symposium for Undergraduate Research and Creativity. August 10, 2023.
4. Hostetler, Ashley N.; Reneau, Jonathan W.; Sparks, Erin E. "A tool to non-destructively measure root torsional stiffness for understanding root lodging-resistance" ASPB Plant Biology Meeting. August 5-9, 2023.
5. Hazelwood, Olivia*; Hostetler, Ashley N.; Ikiriko, Irene I.; Sparks Erin E. "Characterization of mechanosensitive MSL gene family expression in Zea mays aerial and ground brace roots." 65th Annual Maize Genetics Conference. March 16-19, 2023.
6. Ikiriko, Irene I.; Hostetler, Ashley N.; Sparks Erin E. "Does stalk flexural stiffness require cellular-scale mechanosensing?" 65th Annual Maize Genetics Conference. March 16-19, 2023.
7. Hostetler, Ashley N.; Reneau, Jonathan W.; Sparks Erin E. "SMURF: A new tool to measure root torsional stiffness for understanding root lodging- resistance" 65th Annual Maize Genetics Conference. March 16-19, 2023.
8. Hostetler, Ashley N.; Sparks Erin E. "Utilizing high-throughput brace root phenotyping data to predict lodging susceptibility across 53 maize genotypes." 63rd Annual Maize Genetics Conference. March 8-12, 2021.
9. Hostetler, Ashley N.; Sparks Erin E. "Utilizing high-throughput brace root phenotyping data to predict lodging susceptibility across 53 maize genotypes." North American Plant Phenotyping Annual Conference. February 16-19, 2021.
10. Henderson, Ashley N.; Govindarajulu, Rajanikanth; Cumming, Jonathan; Hawkins, Jennifer S. "Use it or Lose it: Diversity in salt response following domestication of sorghum landraces." 62nd Annual Maize Genetics Conference. March 12-15, 2020. Kailua-Kona, Hawai′i.
11. Govindarajulu, Rajanikanth; Henderson, Ashley N.; Xiao, Yuguo; Chaluvadi, Srinivasa R.; Mauro-Herrera, Margarita; Siddoway, Muriel L.; Whipple, Clinton J.; Bennetzen, Jeffrey L.; Doust, Andrew N.; Hawkins, Jennifer S. "Integration of high density genetic mapping with transcriptome analysis reveals candidate genes for tillering in sorghum." 62nd Annual Maize Genetics Conference. March 12-15, 2020. Kailua-Kona, Hawai′i.
12. Henderson, Ashley N.; Hawkins, Jennifer S. "The variation in spatial and temporal sensing and signaling of salinity stress between a salt tolerant and salt sensitive accession of *Sorghum bicolor*." West Virginia University Annual Biology Retreat. September 15th, 2018. Morgantown, WV.
13. Delaney, Katelyn E.*; Henderson, Ashley N.; and Hawkins, Jennifer S. "SOS1 and NHX2 expression changes after NaCl exposure in two genotypes of *Sorghum bicolor*." 10th Annual Summer Undergraduate Research Symposium. July 2018. Biological Sciences Category. WVU. Morgantown, WV.
14. Calvert, Clinton*; Henderson, Ashley N.; Carrara, Joe.; Govindarajulu, Rajanikanth.; Brzostek, Edward.; Hawkins, Jennifer S. "Effects of long-term nitrogen deposition on the composition

and function of soil microbial communities." The second annual undergraduate spring symposium. April 2018. Environmental Sciences Category, WVU. Morgantown, WV.
15. Rosiello, Abby*; Henderson, Ashley N.; Carrara, Joe; Govindarajulu, Rajanikanth; Brzostek, Edward; Hawkins, Jennifer S. "Elevated nitrogen shifts microbial community structure and function in forest soils." 9th Annual Summer Undergraduate Research Symposium. July 2018. Environmental Sciences Category, WVU. Morgantown, WV.
16. Henderson, Ashley N.; Hawkins, Jennifer S. "Physiological and morphological comparative analysis of overall plant health and resource allocation in domesticated grasses when exposed to saline conditions." West Virginia University Annual Biology Retreat. October 2017. Morgantown, WV.
17. Govindarajulu, Rajanikanth; Henderson, Ashley N.; Ramachandran, Dhanushya; Chaluvadi, Srinivasa R; Bennetzen, Jeffery; Hawkins, Jennifer S. "High density bin mapping in a sorghum RIL population [*S. propinquum x S. bicolor* (Tx7000)] for comparative analyses with foxtail millet and maize to determine the genetic architecture of tillering." 59th Annual Maize Genetics Conference. March 9-12, 2017. St. Louis, Missouri.
18. Henderson, Ashley N.; Hawkins, Jennifer S. "Comparisons of physiological responses to salinity stress in salt tolerant and salt sensitive lines of Sorghum and Setaria." West Virginia University Annual Biology Retreat. October 15th, 2016. Morgantown, WV.
19. Henderson, Ashley N.; Hawkins, Jennifer S. "Comparative expression analysis of domesticated grasses and their wild relatives when exposed to saline conditions." 58th Annual Maize Genetics Conference. March 17-20, 2016. Jacksonville, FL.
20. Govindarajulu, Rajanikanth.; Henderson, Ashley N.; Harris, Alex; Bennetzen, Jeffery; Hawkins, Jennifer S. "Dissecting the genetic underpinnings of tillering in a sorghum RIL population [*S. bicolor* (Tx7000) x *S. propinquum*]*:* a preliminary report." 58th Annual Maize Genetics Conference. March 17-20, 2016. Jacksonville, FL.
21. Henderson, Ashley N.; Hawkins, Jennifer S. "The Genetic Underpinnings of Salt Tolerance in Panicoid Grasses." West Virginia University Annual Biology Retreat. October 17th, 2015. Morgantown, WV.

Teaching Experience

Instructor of Record

1. Co-Instructor for PLSC435: Plant Developmental Biology (Fall 2022)
2. Workshop development and instruction: Introduction to R and Data Science (Fall 2022)
3. Co-Instructor for PLSC366: Independent Study - Characterization of maize mechanosensors (Spring 2022)
4. Instructor for BIOL420: Genomics (Fall 2020)
5. Instructor for lab component of BIOL420: Genomics (Fall 2017)
6. Instructor for BIOL320: The Total Science Experience: Genomics (Spring 2016)

Graduate Teaching Experiences

1. Graduate teaching assistant for BIOL386: Undergraduate Research (Spring 2019, Fall 2017, Spring 2017, Fall 2016, Spring 2016)
2. Graduate teaching assistant for BIOL411: Introduction to Recombinant DNA (Spring 2015)

3. Graduate teaching assistant for BIOL115: Introduction to Biology Laboratory (Fall 2014)

Professional Service and Academic Activities

Editorial Advisor - *Plants People Planet* 2024 – Present
Journal Reviewer 2019 – Present
European Journal of Agronomy, Journal of Applied Genetics, G3, Sustainability, Frontiers in Plant Science, Annals of Botany, Journal of Experimental Botany, Plant Direct, Plant Methods, Planta, Rhizosphere, Science, The Plant Journal, Plant and Soil, The Plant Phenome Journal, New Phytologist
Member and Seminar Committee – UD Plant and Soil Sciences JEDI Committee 2021 – 2025
UD Diversity LEAD Ally Certification – UD 2022
Panelist for International Society of Root Research – Root Phenotyping Workshop 2021
Poster Judge for Undergraduate Research Symposium – WVU 2020
Seminar Host – Dr. Erin Sparks (UDel) – WVU 2019
Seminar Host – Dr. Andrew Doust (OKState) – WVU 2018
Seminar Host – Dr. Clint Whipple (BYU) – WVU 2018
Social Coordinator – Department of Biology Graduate Student Association – WVU 2017 – 2018
Committee Member – Department of Biology Retreat Organizing Committee – WVU 2015 – 2016

Mentorship and Leadership Experience

Undergraduate Mentorship

1. Aine Grubb, University of Delaware 2024
    - University of Delaware Plant and Soil Science, Internship in Plant Science and Bioinformatics
2. Lee Bowman, University of Delaware 2024
    - University of Delaware Plant and Soil Science, Internship in Plant Biology
3. Austin Jensen, University of Delaware 2023
    - University of Delaware Biology, UD Unique Strengths Scholar
    - Poster presentation at the UD Symposium for Undergraduate Research and Creative Activity
4. Miranda Farnum, University of Delaware 2022
    - University of Delaware Plant and Science, Internship in Plant Biology
5. Anthony Jiang, University of Delaware 2022
    - University of Delaware Mechanical Engineering, Internship in Agriculture Robotics
6. Olivia Hazelwood, University of Delaware 2021 – 2023
    - First author on manuscript published in *microPublication Biology,* 2023
    - Poster presentation at the Maize Genetics Meeting, 2023
    - CANR Unique Strengths Undergraduate Research Internship, 2022
    - Independent Study (PLSC366), 2022
    - Center for Food Systems & Sustainability Research Scholar, 2021
7. Lloyd Gilfillian, Cheyney University 2021
    - UD ENVISION Summer Research Scholar

8. John David Bodner, West Virginia University 2019
    - West Virginia University Undergraduate Research Experience (WVU BIOL386)
9. Katelyn Delaney, West Virginia University 2018
    - West Virginia University Summer Undergraduate Research Experience (SURE) program
    - Co-author on publication in prep
10. Clinton Calvert, West Virginia University 2017 – 2018
    - West Virginia University Undergraduate Research Experience (WVU BIOL386)
11. Abby Rosiello, West Virginia University 2017
    - West Virginia University Summer Undergraduate Research Experience (SURE) program
12. Margo Folwick, West Virginia University 2016 – 2017
    - West Virginia University Undergraduate Research Experience (WVU BIOL386)
13. Rachel Bainbridge, West Virginia University 2016 – 2017
    - West Virginia University Undergraduate Research Experience (WVU BIOL386)
14. Natalie Needley, West Virginia University 2016
    - West Virginia University Undergraduate Research Experience (WVU BIOL386)

Graduate Mentorship

1. Eva Birtell, University of Delaware 2022 – Present
    - PhD Student, University of Delaware Department of Plant and Soil Sciences
2. Irene Ikiriko, University of Delaware 2022 – Present
    - PhD Student, University of Delaware Department of Plant and Soil Sciences
3. K. Thanduanlung, University of Delaware 2022 – Present
    - PhD Student, University of Delaware Department of Plant and Soil Sciences
4. Lindsay Erndwein (PhD), University of Delaware 2020 – 2021
    - PhD Student, University of Delaware Department of Plant and Soil Sciences
5. Melissa Lehrer (PhD), West Virginia University 2015
    - PhD Student, West Virginia University Department of Biology

Professional Memberships

National Postdoctoral Association – Member 2023 – 2025
Advancing Research Impact in Society (ARIS) – Member 2022 – Present
American Society of Plant Biologists (ASPB) – Member 2021 – Present
North American Plant Phenotyping Network (NAPPN) – Member 2021 – Present
Plant Postdocs – Member 2020 – 2025
Maize Genetics Cooperation (MGC) – Member 2014 – Present
Association for Women in Science (AWIS) – Member 2016 – 2018

In the News

SORGHUMBASE "Rooting for Resilience: Genetic Insights for Transforming Sorghum and Maize for Climate Challenges" 2024
The Delmarva Farmer "Hostetler identifies traits to address crop lodging issues" 2022
Morning AgClips *America's #1 Daily Ag News Source* "Bracing Our Crops" 2022

UDaily "Bracing Our Crops" 2022
No Time To Read Podcast – Embracing brace roots (S1E7) 2022