

# Melissa A. Draves

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## Education

### **University of Missouri: Columbia, MO**

*Ph.D. in Plant, Insect, and Microbial Sciences*

*Advisors: Sherry Flint-Garcia and David Braun*

August 2022-present

### **Iowa State University: Ames, IA**

*Bachelor of Science in Genetics- Minors in Agronomy and Biology*

May 2022

Magna Cum Laude

## Research Experience

### **University of Missouri Division of Plant Science and Technology**

Columbia, MO

*Graduate Research Assistant- Flint-Garcia Lab*

August 2022-present

- Characterizing 990 heirloom maize populations from the United States and Canada in order to create comprehensive phenotypic and genotypic data sets describing heirloom morphology and population relationships.
- Responsible for coordinating and training five undergraduate students each summer in controlled pollinations and manual phenotyping techniques for 1,280 experiment rows.
- Collaborating with a team of principal investigators, students, and researchers at multiple institutions across the country to expand understanding of heirloom maize populations in various environments.

### **Iowa State Department of Genetics, Development, and Cell Biology**

Ames, IA

*Undergraduate Research Assistant-Kelley Lab*

January 2020-May 2022

*Laboratory Technician-Kelley Lab*

May 2022-August 2022

- Executed research and published work related to investigating the role of auxin response factors in maize seedling root development with Dr. Dior Kelley.
- Efficient in performing laboratory projects including molecular biology bench skills, hormone growth assays, large scale phenotyping assays, and statistical tests based on data collection.
- Collaborated with a diverse team to develop essential interpersonal skills through data presentations and weekly meetings.

## Publications and Preprints

**Draves, M.A.**, Traylor, Z.B., Salazar-Vidal, M.N., Oliver, S.L., Flint-Garcia, S. (2025, accepted). Field Preparation and Planting Corn (*Zea mays*). Cold Spring Harbor Protocols.

Salazar-Vidal, M.N., **Draves, M.A.**, Fitzsimmons, S.L., Traylor, Z.B., Flint-Garcia, S. (2025, accepted). How to Harvest and Store Corn (*Zea mays*). Cold Spring Harbor Protocols.

Traylor, Z.B., Fitzsimmons, S.L., **Draves, M.A.**, Salazar-Vidal, M.N., Tracy, W.F., Flint-Garcia, S. (2025, accepted). Planting, Pollinating, Monitoring Growth, and Harvesting Maize (*Zea mays*) for Research. Cold Spring Harbor Protocols.

Salazar-Vidal, M.N., Traylor, Z.B., **Draves, M.A.**, Fitzsimmons, S.L., Tracy, W.F., Flint-Garcia, S. (2025, accepted). How to Monitor Growth and Identify Developmental Stages of Maize (*Zea mays*). Cold Spring Harbor Protocols.

Fitzsimmons, S.L., Salazar-Vidal, M.N., Traylor, Z.B., **Draves, M.A.**, Flint-Garcia, S. (2025, accepted). How to Pollinate Corn (*Zea mays*). Cold Spring Harbor Protocols.

- Callwood, J.B., Townsend, E.G., Malik, S., **Draves, M.A.**, Khor, J., Marshall, J.P., Sweers, H., Cowling, C.L., Walley, J.W., Kelley, D.R. (2025). Identification of phenotypic and transcriptomic signatures underpinning maize crown root systems. *Plant Phenomics*.  
<https://doi.org/10.1016/j.plaphe.2025.100008>
- Dash, L., McReynolds, M.R., **Draves, M.A.**, Khangura, R.S., Muench, R.L., Khor, J., Callwood, J.B., Cowling, C.L., Mejia, L., Lang, M.G., Dilkes, B.P., Walley, J.W., Kelley, D.R. (2023, submitted). The Auxin Response Factor ARF27 is required for maize root morphogenesis.  
<https://doi.org/10.1101/2023.08.15.553439>.
- Cowling, C.L., Homayouni, A., Callwood, J.B., McReynolds, M.R., Khor, J., Ke, H., **Draves, M.A.**, Dehesh, K., Walley, J.W., Strader, L.C., Kelley, D.R. (2023). ZmPILS6 is an auxin efflux carrier required for maize root morphogenesis. *Proceedings of the National Academy of Science*.  
<https://doi.org/10.1073/pnas.2313216121>.
- Draves, M.A.** and Muench, R., Lang M.G., Kelley, D.R. (2022). Maize seedling growth and hormone response assays using the rolled towel method. *Current Protocols*. <https://doi.org/10.1002/cpz1.562>.
- McReynolds, M.R., Dash, L., Montes, C., **Draves, M.A.**, Lang, M., Walley, J.W., Kelley, D.R. (2022). Temporal and spatial auxin responsive networks in maize primary roots. *Quantitative Plant Biology*. 3, E21. [10.1017/qpb.2022.17](https://doi.org/10.1017/qpb.2022.17).

## Relevant Work Experience

### **Research and Development Intern**

*Wyffels Hybrids*

Geneseo, Illinois

May 2021-August 2021

- Directed a team of 15 students in hand pollination techniques and general nursery management for hybrid production.
- Evaluated hybrid plot locations throughout the Western corn belt to provide valuable data on potential products.

### **Precision Agronomy Intern**

*Advanced Agrilytics and Ag Ingenuity Partners*

Champaign, Illinois

May 2020-August 2020

- Coordinated scouting and yield based improvement data for over 3,000 acres of corn and soybeans throughout East Central Illinois.
- Provided GPS coordinates, data, and plant collections in over 20 corn and soybean trials in support of the Research and Development department.
- Developed a streamlined reporting system for communicating field status with growers.

### **Field Corn Breeding Undergraduate Research Assistant**

*University of Wisconsin-Madison*

Madison, Wisconsin

June 2019-August 2019

- Collaborated closely with Bridget McFarland, Ph.D. and the UW Field Corn Breeding Program, to assess physiological effects of planting density on plant performance using genotypic, phenotypic, and weather data.
- Gained proficiency in planting, pollinating, collecting phenotypic data, and conducting data analysis in R.

## Campus Involvement and Service

### **Department of Plant Science and Technology Graduate Student Association**

January 2023-present

- Serving on the Graduate Student Association (GSA) committee to foster a welcoming and supportive community among DPST graduate students.

## **Maize Genetics Meeting Steering Committee**

February 2024-March 2025

### *Graduate Student Representative*

- Served as the graduate student representative for the committee planning the 2025 Maize Meeting in St. Louis, MO.

## **MU Plant Research Symposium Committee**

October 2022- March 2023

### *Co-Chair*

- Worked with a team of seven graduate students and post-docs to organize the MU Plant Research Symposium with 150 attendees and five speakers.

## **Teaching and Mentorship**

### **B4U Mentoring Program**

February 2025-present

#### *Graduate Mentee*

- Participating in a yearlong mentorship program, sponsored by Bayer Agriscience, with a primary focus on professional development opportunities.

## **Maximizing Access to Research Careers (MARC)**

August 2024-present

### *Undergraduate Mentor*

- Responsible for mentoring two senior undergraduate students during their graduate school application process including editing personal statements and providing general support.

## **University of Missouri Division of Plant Science and Technology**

August 2023-December 2023

### *Teaching Assistant for Plant Breeding and Genetics*

- Responsible for grading assignments for 25 students in the undergraduate plant breeding and genetics course and delivering multiple lectures related to plant breeding objectives and plant polyploidy.

## **Presentations**

- Research Presentation-Corn Breeding Meeting-St. Louis, MO March 2025
- Poster presentation-Interdisciplinary Plant Group Symposium-Columbia, MO May 2023, 2024, 2025
- Poster presentation-Bayer Agriscience-Chesterfield, MO March 2024
- Poster presentation- MU Plant Research Symposium-Columbia, MO March 2024, April 2025
- Poster presentation- Maize Genetics Meeting-Raleigh, NC February 2024
- Outreach presentation- Career Exploration Day-Columbia, MO August 2023, 2024
- Outreach presentation- Nursery Demonstration Plot-Columbia, MO August 2023, 2024
- Virtual Panel Discussion-American Society of Plant Biologists April 2023
- Poster presentation- Maize Genetics Meeting- St. Louis, MO March 2022, 2023, 2025

## **Honors and Awards**

- Third Place Poster Presentation-Interdisciplinary Plant Group Symposium May 2025
- Third Place Poster Presentation-MU Plant Research Symposium April 2025
- First Place Short Talk- Corn Breeding Meeting March 2025
- Graduate Research Fellowship Honorable Mention-National Science Foundation March 2024
- Life Sciences Fellowship August 2022-present
- Genetics, Development, and Cell Biology Departmental Award May 2022

## **Certifications**

- Mentoring at Mizzou March 2024
- Remote Pilot Certification- Federal Aviation Administration June 2023