HARTWIG

ENDOWED CHAIR IN SOYBEAN AGRONOMY

BIENNIAL REPORT
2024 – 2025

MISSISSIPPI STATE UNIVERSITY™

COLLEGE OF AGRICULTURE AND LIFE SCIENCES
MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION
MSU EXTENSION SERVICE

EDGAR E. & WINIFRED B. HARTWIG ENDOWED CHAIR IN SOYBEAN AGRONOMY

In 2013, the Mississippi Soybean Promotion Board invested in the creation of an endowed chair in soybean agronomy. The investment allowed Mississippi State University to leverage funds from industry partners Monsanto and Syngenta, and the Hartwig family, to create the **Edgar E. and Winifred B. Hartwig Endowed Chair in Soybean Agronomy.**

Hartwig spent 47 years with the U.S. Department of Agriculture's Agricultural Research Service in Stoneville. He was responsible for developing many of the soybean varieties grown both in the Southern U.S. and regions around the world with similar climates.

A 2007 contribution from Hartwig's wife, Winifred, established the endowment and provided support for graduate student research at Mississippi State. Investments from the Soybean Promotion Board and its industry partners were added to the original fund.

Visit our website for more information:
www.soybean.msstate.edu

By The Numbers

2024 – 2025 • **AT A GLANCE**

$2.4M
External funding
$11M in collaborative external funding

15
Peer-reviewed publications

17
Extension Events

36
Conference presentations & abstracts

LETTER FROM THE CHAIR

It is a great honor to serve as the Hartwig Endowed Chair for Soybean Agronomy. Over the past two years, our program has achieved significant milestones: we published 15 peer-reviewed articles, secured $2,385,016 in funding specifically for the Hartwig program ($11,860,908 in total awards), hosted 17 Extension events and field days, published six Extension publications, and delivered 36 conference presentations. We also graduated two master's students in Plant and Soil Sciences—one now managing a farm in Tennessee, and the other pursuing a Ph.D. at the MSU Delta Research and Extension Center.

Dr. Hartwig spent much of his career developing soybean varieties suited for early planting in Mississippi, dramatically increasing yields. We continue his legacy by using modern technologies to optimize early planting windows. Variety and planting date remain two of the most critical factors for yield. While Dr. Hartwig focused on developing varieties, our work emphasizes ensuring these early-maturing varieties are planted on time. Several students are exploring the limitations of high-speed planting using machine learning combined with traditional agronomic field trials.

Our success is made possible by the generous support of our sponsors, including the Mississippi Soybean Promotion Board, the Multiregional Soybean Board, the United Soybean Board, and the Science for Success initiative. This funding supports research informing the Soybean Sustainability Initiative—a 15-state collaboration investigating nitrogen credits for crops following soybean. Additional USDA-funded projects quantify greenhouse gas emissions from improved agronomic practices, providing data that encourages producers to adopt climate-smart agriculture.

My goal is to enhance efficiency for Mississippi soybean producers by optimizing inputs, labor, and time. None of this work is possible without collaboration. Our program benefits from partnerships within Plant and Soil Sciences, Agricultural and Biological Engineering, Agricultural Economics, the Mississippi Agricultural and Forestry Experiment Station, and MSU Extension, as well as with other land-grant universities nationwide, all working to remove constraints to soybean production.

Beyond applied research and extension, I am honored to serve as Executive Director of the Mississippi Certified Crop Advisor program. This role led to my election to the American Society of Agronomy Board of Directors, allowing me to contribute nationally to the direction of our industry. Additionally, after serving as Technical Editor for Agronomy Journal, I will begin as Administratrive Editor in 2026—a role that helps promote the interests of Mississippi soybean producers on a national stage.

As always, I welcome new ideas from stakeholders. Please reach out if you see issues not currently being addressed—those are the projects I enjoy most.

Dr. Michael J. Mulvaney, CCA
Hartwig Endowed Chair
for Soybean Agronomy
Mississippi State University

Meet the team

John Wallace and Mike Mulvaney inspect soybean quality at the Mississippi Agricultural and Forestry Experiment Station's R.R. Foil Plant Science Research Unit (North Farm).

Samuel English
Undergraduate student

Karl Grebner
Undergraduate student

Tucker Hilyer
M.S. student

Aayushi Jain
Research Associate I
Master's student

Oluwaseyi E. Olomitutu
Ph.D. student

Oluwafemi Oyedele
Ph.D. student

John Wallace
Research Associate II
Master's student

Meet the team

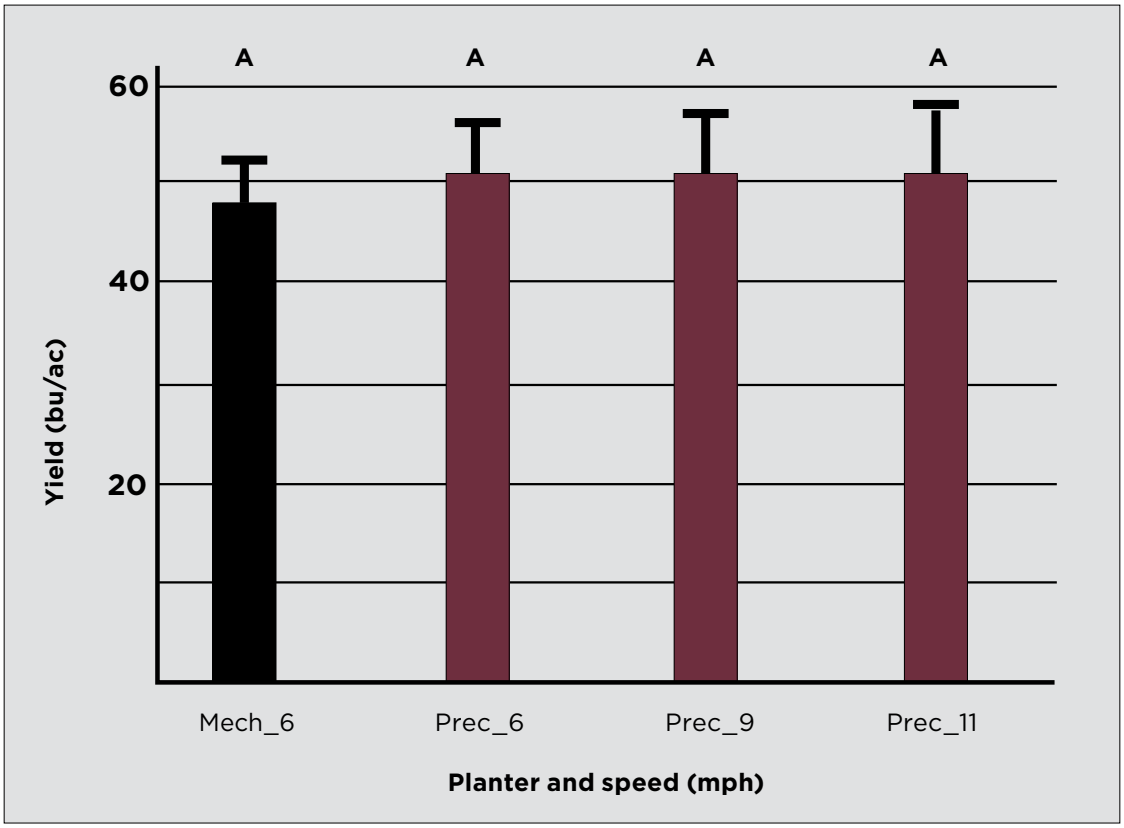
OLUWASEYI EMMANUEL OLOMITUTU

Ph.D. student - Agronomy

GROWING UP IN A SMALL farming community in Nigeria, Oluwaseyi Emmanuel Olomitutu was inspired early to develop agricultural solutions for the future. After earning his master's degree in plant breeding at the University of Ibadan, he spent four years as a research fellow at the International Institute of Tropical Agriculture, focusing on the genetic improvement of under-utilized legumes. This international experience in crop improvement led him to Mississippi State University, where he joined as a Ph.D. student in agronomy in January 2023. His research now focuses on advanced planting technologies, testing whether precision planters can help farmers plant faster during critical planting windows.

Timely planting is essential to maximize crop yields, yet weather and poorly drained soils in Mississippi often limit the acreage that can be planted during optimal periods. High-speed planting offers an opportunity to expand coverage during these windows. Over multiple years and locations, Olomitutu has compared traditional mechanical planters (5–6 mph) with advanced precision planters at higher speeds, measuring seed placement uniformity and final crop yields. His results show that farmers can plant up to 11 mph using precision planters without sacrificing yield, although plant population decreases slightly at higher speeds.

This research provides farmers with greater flexibility during planting season. By planting nearly twice as fast, producers can cover more acres during optimal windows, potentially increasing overall production and profitability while reducing the stress and labor demands of planting.



Soybean yield using mechanical and precision planters at various planting speeds across various MS locations. Mech_6 is the mechanical planter at 6 mph, where Prec_6, Prec_9, and Prec_11 are the precision planter at 6, 9, and 11 mph, respectively.

Meet the team

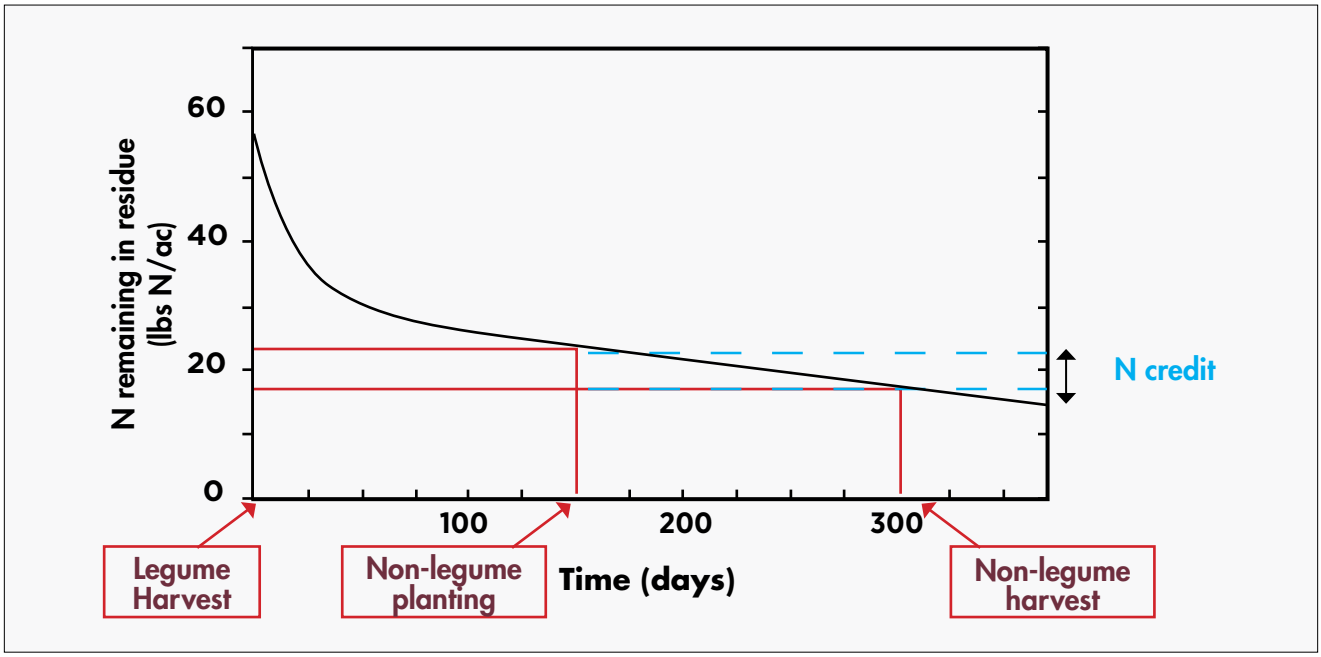
OLUWAFEMI (FEMI) OYEDELE

Ph.D. Student - Agronomy

OLUWAFEMI OYEDELE IS passionate about helping farmers grow healthier crops while protecting the environment. He earned a master's degree in crop and soil science from the University of Ibadan, Nigeria, in 2021. During his studies, he developed a strong interest in sustainable farming practices while working as a research fellow on the CocoaSoils project at the International Institute of Tropical Agriculture (IITA). This project, funded by the Norwegian Agency for Development Cooperation and led in collaboration with IITA and Wageningen University & Research, promotes an Integrated Soil Fertility Management approach to cocoa intensification.

Oyedele is currently pursuing a Ph.D. in agronomy in the Mississippi State Department of Plant and Soil Sciences, under the supervision of Dr. Michael Mulvaney. His graduate research focuses on quantifying nitrogen (N) credits from soybean to subsequent non-legume crops. This work involves collaboration with fifteen land-grant universities across the United States, with Mississippi State leading the project.

Extension offices across soybean-growing regions—ranging from South Dakota and Nebraska to Wisconsin and Georgia—recommend reducing N fertilization for crops following soybean by 18 to 63 lbs N per acre. By accurately quantifying N credits from modern soybean cultivars and improved management practices, Oyedele's research demonstrates that an average N credit of 20 lbs per acre can save farmers approximately $14.41 per acre at current urea prices. Across millions of soybean acres, this provides substantial cost savings while reducing nitrogen losses to the environment, offering a practical framework for sustainable crop management nationwide.



Schematic representation of N credits from soybean to a subsequent non-legume crop.

Meet the team

JOHN WALLACE

Research Associate II / Master's student

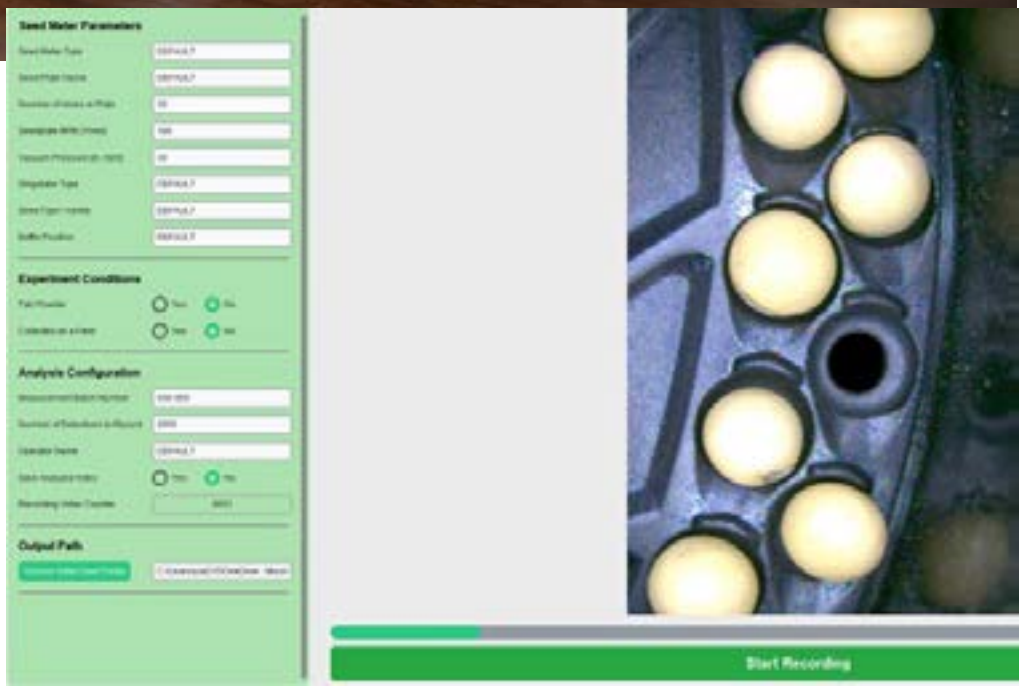
JOHN WALLACE GREW UP in north Georgia and began his career in the automotive industry. In 2007, he moved to Starkville to pursue a bachelor's degree in Agricultural Engineering Technology and Business at Mississippi State University. After earning his degree, John worked as a research associate under Dr. Erick Larson before relocating to Hernando in north Mississippi. There, he helped manage a 7,500-acre row crop farm near Robinsonville, producing corn, cotton, soybeans, and peanuts.

Following several years in production agriculture, Wallace joined John Deere as a field technician, specializing in agricultural tractors, combines, and scraper tractors. He later returned to Starkville to serve as service manager for John Deere in Columbus, Mississippi.

Today, John is back at Mississippi State as a research associate with Dr. Mike Mulvaney while pursuing a master's degree in agronomy.

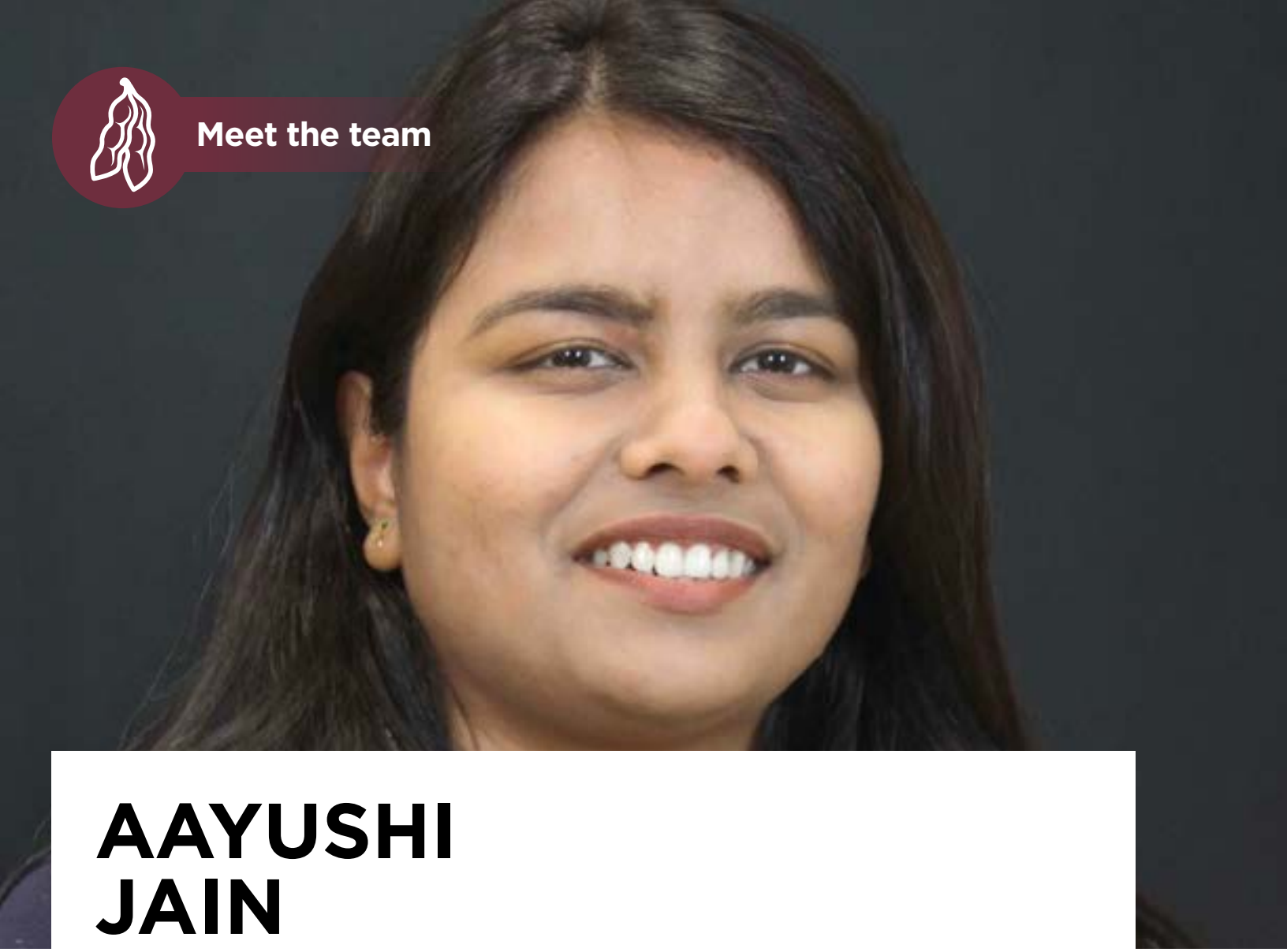
His graduate research investigates the effects of high-speed soybean planting. Previous studies by Dr. Mulvaney found that higher planting speeds can reduce plant populations, but the cause of this reduction remains unclear—it may involve seed metering performance, planter vibration, mechanical limits, depth control, or closing system issues.

In collaboration with Dr. Wes Lowe in the Department of Agricultural and Biological Engineering, Wallace's project evaluates whether precision seed meters maintain performance at higher speeds. A high-speed camera installed in the seed meter housing captures footage across planting speeds ranging from 3 to 13 mph under different vacuum settings. These videos are analyzed to measure seed plate rotation, quantify skips and doubles, and compare actual versus expected seed output. Additionally, vibration data loggers mounted on the planter units record vibration levels at each ground speed to help identify how vibration affects planting performance.



A high-speed camera mounted on a precision seed meter (top) uses machine learning algorithms (right) to detect seed skips.

Planting at higher speeds often reduces plant stands. This study investigates whether vibration from high-speed planting causes seeds to be shaken off the meter plate—and whether increasing vacuum pressure can mitigate this stand loss.



Meet the team

AAYUSHI JAIN

Research Associate II / Master's student

AAYUSHI JAIN IS A research associate with the MSU-USDA National Center for Alluvial Aquifer Research. A native of Rajasthan, India, she earned her master's in plant and soil science from Arkansas State University, where she researched soil biochemical properties, greenhouse gas emissions, and nutrient cycling. Before joining her current project, she worked at the University of Kentucky using trace gas analyzers to measure greenhouse gas emissions from agricultural fields.

In her role at MSU, Jain manages on-farm research sites across the Mississippi Delta, measuring CO_2, N_2O, and CH_4 fluxes using LI-COR smart chambers. She conducts soil and crop laboratory analyses and builds data-processing tools for flux modeling. Her work supports ongoing efforts to improve soil health, enhance nutrient-use efficiency, and advance climate-smart agricultural practices to reduce the carbon intensity score for U.S. soybean as a sustainable commodity.

TUCKER HILYER

Master's student

TUCKER HILYER GREW UP on a small cow-calf operation in Clanton, Alabama. While an undergraduate, Hilyer competed on the 2022 Mississippi State Livestock Judging Team, and competitively judged livestock across the U.S. at major competitions. Hilyer had an interest in agriculture from his childhood but discovered his passion for soybean research during his internship at GDM Seed, a soybean breeding and research facility in Jonesboro, Arkansas. Hilyer earned his bachelor's degree from Mississippi State University in agronomy and is now pursuing a master's.

Hilyer's research examines the effects of biological products—living organisms that improve plant health, control pathogens, or increase immune response—on soybean. His research examines soybean agronomic, physiological, and plant health response to biologicals. Hilyer's research is conducted at three different sites: Delta Research and Extension Center in Stoneville, North Mississippi Research and Extension Center in Verona, and the MAFES R.R. Foil Plant Science Research Center in Starkville. The effects of biologicals are important to understand so producers can make informed decisions with unbiased information on how to use the products to benefit soybean production systems.

Hilyer is also responsible for the United Soybean Board's (USB) national biological trial as well. The USB biological trial is in cooperation with 25 collaborators from 22 universities with Ohio State leading the project. The trial seeks to understand the effects of seed treatment biological products and how they affect soybean under various environments.

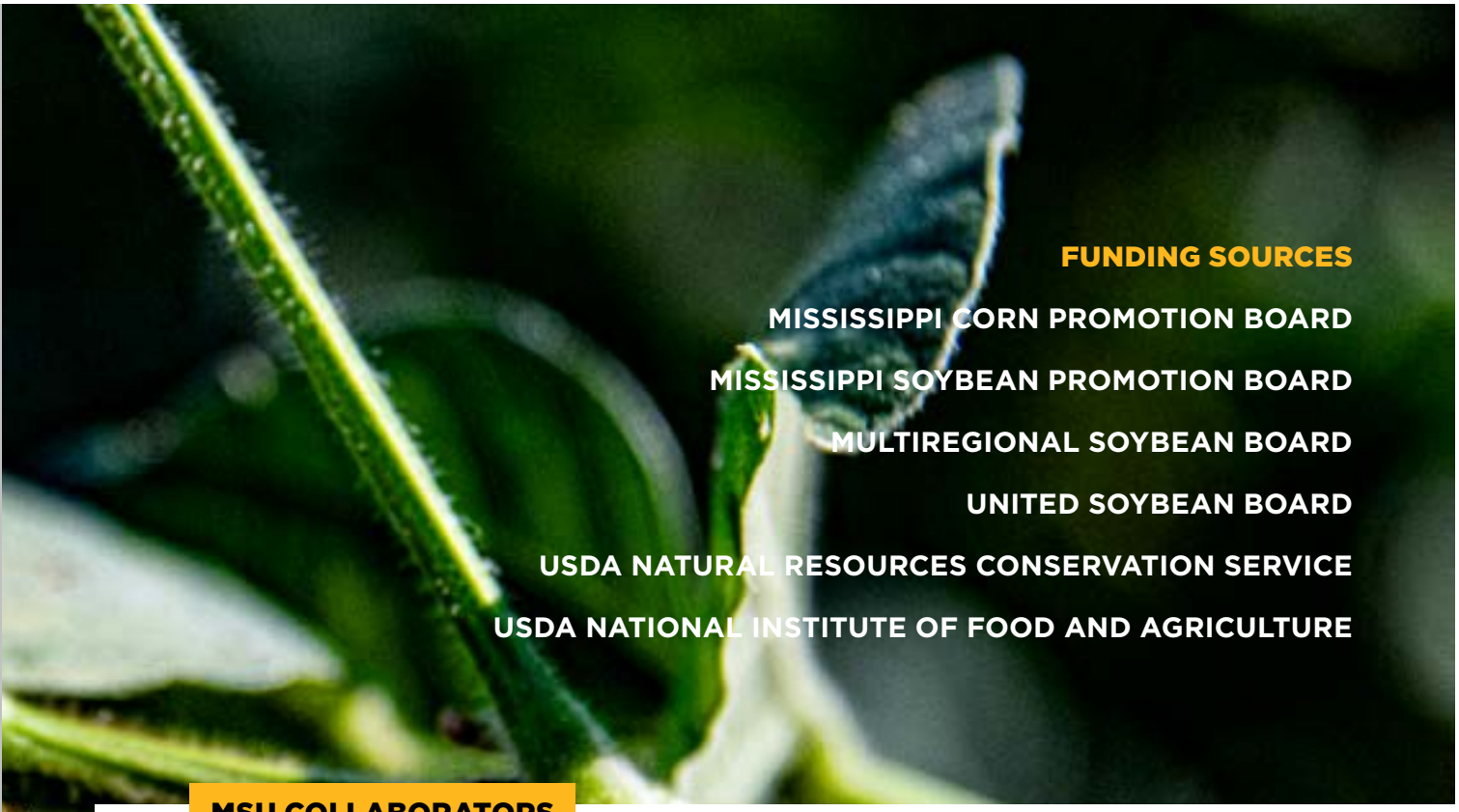
SAMUEL ENGLISH

GROWING UP IN NORTH ALABAMA, SAMUEL English gained hands-on experience in agriculture by helping with his family's cow-calf operation. His passion for the industry inspired him to start his own herd of registered Hereford cattle. English is currently pursuing a degree in Agricultural Science at Mississippi State University, with a focus on Precision Agriculture and Integrated Crop Management. In 2025, he joined Dr. Mulvaney's research team as a student worker, contributing to projects that enhance efficiency and sustainability in soybean production.

Through his studies and practical experience, English is preparing for a career dedicated to advancing agricultural practices and supporting the future of production agriculture.

KARL GREBNER

KARL GREBNER, A STARKVILLE NATIVE, comes from a family rooted in forestry education and industry. He graduated from Mississippi State University in 2024 with a degree in mechanical engineering and a minor in physics. That summer, he began working intermittently with Dr. Mulvaney, where he discovered a growing passion for agronomy. Karl's background in machine design and computational modeling gives him a unique lens for understanding the many challenges farmers face in soybean production—from emerging technologies to shifting environmental conditions. Recognizing the critical role of quality soybean research, he is committed to advancing the field. In spring 2026, he will continue his education at Pennsylvania State University, pursuing a master's degree in mechanical engineering.



FUNDING SOURCES

MISSISSIPPI CORN PROMOTION BOARD

MISSISSIPPI SOYBEAN PROMOTION BOARD

MULTIREGIONAL SOYBEAN BOARD

UNITED SOYBEAN BOARD

USDA NATURAL RESOURCES CONSERVATION SERVICE

USDA NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

MSU COLLABORATORS

Tom Allen, Agricultural Science and Plant Protection

Beth Baker, Wildlife, Fisheries and Aquaculture

Corey Bryant, Plant and Soil Sciences

Bill Burdine, Plant and Soil Sciences

Justin Calhoun, Plant and Soil Sciences

Daniel Chesser, Agricultural and Biological Engineering

Joby Czarnecki, Geosystems Research Institute

Jagmandeep Dhillon, Plant and Soil Sciences

Jessica Drewry, Agricultural and Biological Engineering

Drew Gholson, Plant and Soil Sciences

Trent Irby, Plant and Soil Sciences

Erick Larson, Plant and Soil Sciences

Wes Lowe, Agricultural and Biological Engineering

Will Maples, Agricultural Economics

Brian Mills, Agricultural Economics

Brian Pieralisi, Plant and Soil Sciences

Raju Rangappa, Plant and Soil Sciences

Vaughn Reed, Plant and Soil Sciences

Brian Smith, Industrial and Systems Engineering

Mary Love Tagert, Agricultural and Biological Engineering

Jim Weinstein, Athlete Engineering Institute

Jialin Zhang, Statistics

THE HARTWIG PROGRAM

The Hartwig program tackles today's most urgent issues in soybean research using strategic and investigative themes. Strategic research seeks solutions to the problems faced by Mississippi soybean producers today, and investigative research determines whether a problem exists before engineering a solution.

While we maintain additional research efforts, such as those coordinated at the national level or led by other principal investigators, the following themes represent the current, overarching research strategy of the Hartwig program.

Strategic/Investigative Research

STRATEGIC RESEARCH THEME 1:

Planting speed (funded by Mississippi Soybean Promotion Board)

- On-farm evaluations (Wes Lowe, Emmanuel Olomitutu)
- Effects of planting speed on soybean and rotational crops (Emmanuel Olomitutu, John Wallace)
- Planting speed effects on vibrational forces across the planter (Emmanuel Olomitutu)
- Mitigation of stand loss with planting speed using dynamic downforce (Emmanuel Olomitutu, Jagman Dhillon)
- Identification of stand loss in the meter using machine learning (John Wallace)
- Speed planting into cover crops (Emmanuel Olomitutu)

STRATEGIC RESEARCH THEME 2:

Nitrogen credits from soybean (funded by Multiregional Soybean Checkoff/United Soybean Board, USDA NRCS)

- Quantification of N credits from soybean to rotational crops across 15 states (Oluwafemi Oyedele, Science for Success)
- Mineralization dynamics of soybean residue across 5 states (Oluwafemi Oyedele, Science for Success)
- Determination of optimal N rates for crops following soybean (Oluwafemi Oyedele, Science for Success)
- Quantification of greenhouse gas emissions from soybean compared to corn and fallow (Oluwafemi Oyedele)
- Greenhouse gas mitigation using improved agronomic practices (Aayushi Jain – DREC)

STRATEGIC RESEARCH THEME 3:

Soybean agronomy (funded by Mississippi Soybean Promotion Board and United Soybean Board)

- Determine optimal harvest timing for soybean maturity groups and planting dates
- Minimize soybean grain quality dockages by optimizing harvest strategies
- Optimize planting configurations and planting dates for new soybean genetics
- Cover crop establishment strategies on raised bed systems
- Fertilizer application timing effects on soybean

INVESTIGATIVE RESEARCH THEME 1:
Irrigation water quality (not funded)

- Use of in-furrow acids to mitigate high bicarbonate irrigation water
- Compare soybean response to high and low bicarbonate irrigation water

INVESTIGATIVE RESEARCH THEME 2:
Soybean agronomy (not funded)

- Deer repellent effects on soybean
- Soybean response to biological product application timing
- Soybean response to biological product application method
- Breaking apical dominance in soybean to increase branching and yield

PEER-REVIEWED PUBLICATIONS IN 2024–2025

(p=postdoc; g=graduate student; G=Dr. Mulvaney's graduate student; Underline=lead author)

1. Colet, F. (p), S. Mourtzinis, R.A. Vann, S. Naeve, S.P. Conley, E.G. Matcham, A.B. Reis, H. Kandel, D. Moseley, M. Plumblee, E. Francisco, G.P. Fontes, D.R. Carrijo, T. Irby, M.J. Mulvaney, J. Kleinjan, J. Ross, C.D. Lee, S. Casteel, M.A. Licht, M. Singh, N. Cafaro La Menza, N. Fiorellino, D. Holshouser, A.J. Lindsey, H.D. Lopez-Nicora, O. Ortez, L.E. Lindsey. 2025. Commercial biostimulant seed treatments showed minimal impact on soybean seed yield across the United States. Field Crops Research 334:110170. https://doi.org/10.1016/j.fcr.2025.110170.

2. Kendall, M., S. Mourtzinis, L. Lindsey, N. Menza, M. Licht, E. Matcham, J. McNeal, D. Moseley, M. Mulvaney, S. Naeve, M. Plumblee, G.P. Fontes, W.J. Ross, R. Vann, S. Conley. 2025. Harvest aid applied at soybean growth stage R7 rarely impacted seed, protein, or oil yield. Agronomy Journal. http://dx.doi.org/10.1002/agj2.70109.

3. Moseley, D., A.F. Reis, R. Parvej, T. Watson, P. Price, B. Padgett, N. DeWitt, T. Setiyono, M. Kongchum, E. Francisco, M. Singh, R. Vann, E. Matcham, G.P. Fontes, C. Ortel, S. Thomas-Sharma, M. Mulvaney, J. Carleo, R. Heiniger, K. Fic, C.C. Vieira. 2025. Using variety testing data to select soybean varieties: Guidelines for practitioners. Crop, Forage, & Turfgrass Management 11(2):e70077. https://doi.org/10.1002/cft2.70077

4. Olomitutu, O. (G), M. Mulvaney, J.W. Lowe, C. Bryant, J. Wallace (G), N. Harper, E. Larson, G. Shavers (G), T. Hilyer (G), J. Dhillon. 2024. Soybean response to high-speed planting in Mississippi. Agronomy Journal 116(6):2817-2826. https://doi.org/10.1002/agj2.21665.

5. Clavijo-Herrera, J. (g), M. Thetford, J. Williamson, M. Mulvaney, L. Rossi, A. Sarkhosh. 2025. Adaptation and early establishment of olive trees (*Olea europaea* L.) under the humid subtropical climate of the Southeastern United States. HortScience 60(8):1379-1388. https://doi.org/10.21273/HORTSCI18660-25.

6. Dar, E.A. (g), P. Omara (p), J.E. Iboyi (G), M.J. Mulvaney, E. Carter, W. Wood, L. Sharma, H. Singh. 2025. Optimizing nitrogen rates for rainfed cotton on sandy loam soils of Florida. Agronomy Journal 117:e70046. https://doi.org/10.1002/agj2.70046.

7. Hopf, A. (g), K. Boote, Y. Upadhyaya (G), H. Singh, M. Mulvaney, N. Kaur, L. Sharma, Z. Brym, J. Watson, G. Hoogenboom. 2025. Adaptation of the process-based CSM-CROPGRO model to simulate the growth and development of industrial hemp for seed and fiber production. Agrosystems, Geosciences & Environment 8(2):e70145. https://doi.org/10.1002/agg2.70145

8. Huddell, A., R. Thapa, G. Marcillo, L. Abendroth, V. Ackroyd, S. Armstrong, G. Asmita, M. Bagavathiannan, K. Balkcom, A. Basche, S. Beam, K. Bradley, L. Canisares, H. Darby, A. Davis, P. Devkota, W. Dick, J. Evans, W. Everman, T. Ferreira de Almeida, M. Flessner, L. Fultz, S. Gailans, M. Hashemi, J. Haymaker, M. Helmers, N. Jordan, T. Kaspar, Q. M. Ketterings, E. J. Kladivko, A. Kravchenko, E. Law, L. Lazaro, R. Leon, J. Liebert, J. Lindquist, K. Loria, J. McVane, J. Miller, M. Mulvaney, N. Nkongolo, J. Norsworthy, B. Parajuli, C. Pelzer, C. Peterson, H. Poffenbarger, P. Poudel, M. Reiter, M. Ruark, M. Ryan, S. Samuelson, J. Sawyer, S. Seehaver, L. Shergill, Y. Upadhyaya (G), M. VanGessel, A. Waggoner, J. Wallace, S. Wells, C. White, B. Wolters, A. Woodley, R. Ye, E.

Youngerman, B. Needelman, S. Mirsky. 2024. U.S. cereal rye winter cover crop growth database. Scientific Data 11(1): 200. https://doi.org/10.1038/s41597-024-02996-9.

9. Koebernick, J.C., A.K. Hagan, M. Zaccaron, C. Escalante, A.L. Jacobson, K.L. Bowen, A. Strayer-Scherer, B. Heilsnis, S. Brown, E.J. Sikora, T.W. Allen, T.R. Faske, J.K. Greene, A. Huseth, H. Kelly, R.C. Kemerait, D. Kerns, M.J. Mulvaney, P.P. Price, I. Small, S. Taylor, H. Wang, K. Conner. 2024. Monitoring the distribution, incidence, and symptom expression associated with cotton leafroll dwarf virus using a sentinel plot system in the southern United States. PhytoFrontiers. https://doi.org/10.1094/PHYTOFR-02-24-0008-R.

10. Lunga, D.D. (p), K.R. Brye, M.J. Mulvaney, M. Daniels, T. de Oliveira, B. Baker, T. Bradford Jr., M.A. Chandler. 2025. Cover crop effects on greenhouse gas emissions and global warming potential in furrow-irrigated corn in the Lower Mississippi River Valley. Atmosphere 16(5):498. https://doi.org/10.3390/atmos16050498.

11. Lunga, D.D. (p), K. Brye, M. Mulvaney, M. Daniels, T. de Oliveira, B. Baker, T. Bradford, C. Arel. 2025. Time-series analysis of soil respiration in furrow-irrigated corn with and without cover crop in the Lower Mississippi River Basin. Climate 13(11):232. https://doi.org/10.3390/cli13110232.

12. Müller, I. (g), J. Czarnecki, B. Baker, B. Smith, M. Mulvaney, X. Li, V. Reed, M. Li. 2025. A random forest model for predicting soil properties using Landsat 9 bare soil images. Agrosystems, Geosciences & Environment 8: e70239. https://doi.org/10.1002/agg2.70239.

13. Mulvaney, M.J., J. Iboyi (G), K. Balkcom, D. Jordan, B. Zurweller, A. Jani (G). 2024. Nitrogen credits after peanut (*Arachis hypogaea* L.). Agronomy Journal 116(6):3344-3353. https://doi.org/10.1002/agj2.21669.

14. Olomitutu, O.E. (G), J.S. Dhillon, J.W. Lowe, C.J. Bryant, E. Larson, J. Zhang, J. Wallace (G), J. Meadows (g), G. Shavers (G), T. Hilyer (G), O. Oyedele (G), M. Mulvaney. 2025. Planting corn at high-speed increased stand variability but did not affect yield. Agronomy Journal, 116(6), 2817-2826. https://doi.org/10.1002/agj2.21665.

15. Singh, H., M. Mulvaney, M. Bashyal (G), K. Singh. 2024. Prohexadione calcium applications increase peanut peg strength. 2024. Agronomy Journal 116(6):3108-3116. https://doi.org/10.1002/agj2.21682.

AWARDED GRANTS IN 2024–25

(Lifetime total $44,447,823; Dr. Mulvaney's lifetime allocation total $6,904,815)

ROLE	AGENCY	GRANT TITLE	DATES	TOTAL REWARD	MY ALLOCATION
PI	MS Soybean Promotion Board	Improving agronomic efficiency for Mississippi soybean producers	4/1/25-3/31/26	$138,323	$138,323
PI	Multiregional Soybean Board	Quantifying nitrogen credits from soybean	1/1/25-12/31/25	$402,610	$402,610
PI	MS Soybean Promotion Board	Improving agronomic efficiency for Mississippi soybean producers	4/1/24-3/30/25	$152,034	$152,034
CO-PI	MS Soybean Promotion Board	Optimizing soybean plant architecture for higher yield and seed quality in newly developed isolines for stem termination in Mississippi	4/1/25-3/30/26	$89,664	$21,030
PI	Multiregional Soybean Board	Quantifying nitrogen credits from soybean	1/1/24-12/31/24	$358,799	$358,799
CO-PI	United Soybean Board	Sprouting soybeans: Management strategies that reduce late-season yield loss and protect seed quality	10/1/2023-9/30/24	$405,512	$41,000
CO-PI	USDA NRCS	Developing climate-smart grain markets in the mid-south through diverse partnerships and a farming-systems approach to practice integration to reduce greenhouse gas emissions	4/30/23-5/1/27	$10,000,000	$1,148,620
PI	MS Soybean Promotion Board	Improving agronomic efficiency for Mississippi soybean producers	4/1/23-3/30/24	$143,630	$143,630
CO-PI	USDA FAS	Equipping, educating, and empowering (E^3) African fellows to advance animal feed and fertilizer practices	10/1/23-9/30/25	$260,000	$-
			2024-25 TOTAL:	$11,950,572	$2,406,046

EXTENSION PRESENTATIONS

(since 2024)

1. High Speed Planting Research. 2025. Ag & Seed Technology Short Course, Starkville, MS, Aug. 5-6, 2025.
2. Soybean Planting Date x Maturity Group x Desiccation Timing. 2025. Hosted by Ayres-Delta Implement, Greenwood, MS. Feb. 18, 2025. Attendance 27.
3. Advanced Planting Technologies Field Day. 2024. Hosted by M. Mulvaney and W. Lowe. Mid-South Ag Equipment, Tunica, MS. July 19, 2024. Attendance 20.
4. Advanced Planting Technologies Field Day. 2024. Hosted by M. Mulvaney and W. Lowe. Delta Research and Extension Center, Stoneville, MS. July 18, 2024. Attendance 20.
5. Advanced Planting Technologies Field Day and In-Service Training. 2024. Hosted by M. Mulvaney and W. Lowe. MAFES Black Belt Branch Station, Brooksville, MS. June 5, 2024. Attendance 100.
6. T. Hilyer, C. Bryant, M. Mulvaney, T. Allen, T. Irby, J. Wallace, G. Shavers, O. Olomitutu. 2024. Biological product effects on soybean architecture and yield components in Mississippi. North Mississippi Producer Advisory Council, Verona, MS. Feb. 15, 2024.
7. O.E. Olomitutu, M.J. Mulvaney, J.W. Lowe, C.J. Bryant, J. Wallace, N. Harper, J. Dhillon, G. Shavers, T. Hilyer. 2024. Advanced planting technology for soybean production in Mississippi. North Mississippi Producer Advisory Council, Verona, MS. Feb. 15, 2024.
8. E.O. Oluwaseyi (G), J. Dhillon, J.W. Lowe, B. Mills, C.J. Bryant, E.J. Larson, J. Zhang, J. Wallace (G), J. Calhoun, M.J. Mulvaney. 2025. High-speed soybean planting in Mississippi. Mississippi State University Extension, Starkville, MS.
9. M. Uddin, J.L. Drewry, J.W. Lowe, C. Bryant, M. Mulvaney. 2024. Collecting and post-processing yield data. North Mississippi Producer Advisory Council, Verona, MS. Feb. 15, 2024.

EXTENSION FIELD DAYS AND EVENTS

(since 2024)

1. How Fast Can You Plant Soybean? Science for Success, United Soybean Board. Feb. 25, 2025. https://www.youtube.com/watch?v=jmbNz0mZAOw&t=57s
2. High Speed Planting for Soybeans. Field Advisor, Illinois Soybean Association Checkoff Program. Mar. 5, 2024. https://fieldadvisor.org/high-speed-planting-for-soybeans/
3. Advanced Planting Technologies Field Day. 2024. Hosted by M. Mulvaney and W. Lowe. Mid-South Ag Equipment, Tunica, MS. July 19, 2024. Attendance 20.
4. Advanced Planting Technologies Field Day. 2024. Hosted by M. Mulvaney and W. Lowe. Delta Research and Extension Center, Stoneville, MS. July 18, 2024. Attendance 20.
5. Advanced Planting Technologies Field Day and In-Service Training. 2024. Hosted by M. Mulvaney and W. Lowe. MAFES Blackbelt Research and Extension Center, Brooksville, MS. June 5, 2024. Attendance 100.
6. T. Hilyer (G), C. Bryant, M. Mulvaney, T. Allen, T. Irby, J. Wallace (G), G. Shavers (G), O. Olomitutu (G). 2024. Biological product effects on soybean architecture and yield components in Mississippi. North Mississippi Producer Advisory Council, Verona, MS. Feb. 15, 2024.
7. O.E. Olomitutu (G), M.J. Mulvaney, J.W. Lowe, C.J. Bryant, J. Wallace (G), N. Harper (g), J. Dhillon, G. Shavers (G), T. Hilyer (G). 2024. Advanced planting technology for soybean production in Mississippi. North Mississippi Producer Advisory Council, Verona, MS. Feb. 15, 2024.
8. M. Uddin, J.L. Drewry, J.W. Lowe, C. Bryant, M. Mulvaney. 2024. Collecting and post-processing yield data. North Mississippi Producer Advisory Council, Verona, MS. Feb. 15, 2024

NON-REFERRED PUBLICATIONS

(since 2024)

1. Trials Test Soybean Planting Speed Limits. 2025. Soybean Research and Information Network (SRIN). Sept. 22, 2025. https://soybeanresearchinfo.com/research-highlight/trials-test-soybean-planting-speed-limits/

2. Field Day Highlights: MSU Extension Shares Research on High-Speed Planting. 2024. Cotton Farming Magazine. July 1, 2024. https://www.cottonfarming.com/feature-story/field-day-highlights/

3. Speed Planting. 2024. FarmWeek. June 13, 2024. http://extension.msstate.edu/farmweek/video/2024/season-47-show-49

4. B.E. Mills, M.J. Mulvaney, J.W. Lowe, O. Olomitutu (G). Planting Date: The Need for Speed. Southern Ag Today. March 20, 2024. https://southernagtoday.org/2024/03/20/planting-date-the-need-for-speed/.

5. High Speed Planting for Soybeans. Illinois Soy Advisor. March 5, 2024. https://www.ilsoyadvisor.com/high-speed-planting-for-soybeans/

CONFERENCE PRESENTATIONS

(since 2024)

1. M. Cihal (G), J. L. Drewry, J.W. Lowe, C. Bryant, M. Mulvaney, Analyzing the Spatial Accuracy of Yield Monitoring Technology. Ag and Seed Tech Short Course, Starkville, MS, Aug. 5-6, 2025. Poster.

2. T. Hilyer (G), C.J. Bryant, M.J. Mulvaney, T.W. Allen, J.T. Irby, J. Wallace, O.E. Olomitutu (G), and G.M. Shavers (G). Biological Product Effects on Soybean in Mississippi. ASA-CSSA-SSSA International Annual Meeting, Westin Irving Convention Center, TX, Feb. 01- Feb. 04, 2025.

3. T. Hilyer (G), C.J. Bryant, M.J. Mulvaney, T.W. Allen, J.T. Irby, J. Wallace, O.E. Olomitutu (G), and G.M. Shavers (G). Biological Effects on Soybean Plant Architecture and Yield Components in Mississippi. ASA-CSSA-SSSA International Annual Meeting, Westin Irving Convention Center, TX, Feb. 01- Feb. 04, 2025.

4. T. Hilyer (G), C.J. Bryant, M.J. Mulvaney, T.W. Allen, J.T. Irby, J. Wallace (G), O.E. Olomitutu (G), and G.M. Shavers (G). Soybean Response to Biological Products in Mississippi. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, Nov. 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/158481

5. T. Hilyer (G), C.J. Bryant, M.J. Mulvaney, T.W. Allen, J.T. Irby, J. Wallace (G), O.E. Olomitutu (G), and G.M. Shavers (G). Biological Product Effects on Soybean Plant Architecture and Yield Components in Mississippi. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, Nov. 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/160278

6. T. Hilyer (G), C.J. Bryant, M.J. Mulvaney, T.W. Allen, J.T. Irby, J. Wallace (G), G.M. Shavers (G), O.E. Olomitutu (G). Biological Product Effects on Soybean in Mississippi. 2024 Spring Mississippi State Graduate Research Symposium. Feb 24, 2024.

7. T. Hilyer (G), C.J. Bryant, M.J. Mulvaney, T. Allen, J.T. Irby, J. Wallace (G), G.M. Shavers (G), O.E. Olomitutu (G). Biological Product Effects on Soybean Plant Architecture and Yield Components in Mississippi. Southern Branch American Society of Agronomy Meeting, Atlanta, GA, Feb. 3-5, 2024. Poster.

8. T. Hilyer (G), C.J. Bryant, M.J. Mulvaney, T. Allen, J.T. Irby, J. Wallace (G), G.M. Shavers (G), O.E. Olomitutu (G). Biological Product Effects on Soybean Plant Architecture and Yield Components in Mississippi. Southern Branch American Society of Agronomy Meeting, Atlanta, GA, Feb. 3-5, 2024.

9. H.V. Lowrey (U), M.J. Mulvaney, J. Wallace, T. Hilyer, O.E. Olomitutu (G), G.M. Shavers (G), O. Oyedele (G). Planting Date by Maturity Group Effects on Soybean Architecture and Yield Components in Mississippi. ASA-CSSA-SSSA International Annual Meeting, Westin Irving Convention Center, TX, Feb. 01- Feb. 04, 2025.

10. D.D. Lunga (p), K.R. Brye, M.J. Mulvaney, M. Daniels. Cover Crop Effects on Greenhouse Gas Emissions and Global Warming Potential in Furrow-Irrigated Corn in the Lower Mississippi River Valley. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov. 9-12, 2025.

11. A. Madapakula (g), M.J. Mulvaney, D.M. Gholson, R. Bheemanahalli, P.K. Jha. Integrating Satellite-Based ET and Crop Models for Precision Irrigation Scheduling in Mississippi Soybean Fields. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov. 9-12, 2025.

12. A. Madapakula (g), M.J. Mulvaney, D.M. Gholson, R. Bheemanahalli, P.K. Jha. Calibration and Validation of CSM-Cropgro Soybean Model for Phenology and Yield Prediction in Mississippi, Poster #1122. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov. 9-12, 2025.

13. M.J. Mulvaney, E. Olomitutu (G), W. Lowe, J. Jagman, J. Wallace (G), T. Hilyer (G), G. Shavers (G), and J. Meadows (g). Advanced Planting Technologies Allow High-Speed Planting in Row Crop Production. CSABE/ASABE Annual International Meeting, Toronto, Canada, July 13-16, 2025.

14. O.E. Olomitutu (G), J.S. Dhillon, J.W. Lowe, C.J. Bryant, E.J. Larson, J. Zhang, J. Wallace (G), J. Meadows, G.M. Shavers (G), T. Hilyer (G), O. Oyedele (G), M. J. Mulvaney. Managing the Trade-Off between Planting Speed and Seed Placement Accuracy. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov. 9-12, 2025.

15. O.E. Olomitutu (G), J. Dhillon, M.J. Mulvaney, J.W. Lowe, C.J. Bryant, E.J. Larson, J. Zhang, J. Wallace, J. Meadows (G), G.M. Shavers (G), T. Hilyer (G), and O. Oyedele (G). Impact of Planting Speed and Downforce on Corn Seeding. ASA-CSSA-SSSA International Annual Meeting, Westin Irving Convention Center, TX, Feb. 01- Feb. 04, 2025.

16. O.E. Olomitutu (G), M.J. Mulvaney, J.W. Lowe, J. Wallace, C.J. Bryant, G.M. Shavers (G), T. Hilyer (G), J. Meadows (G), J. Dhillon, E.J. Larson, J. Zhang, and O. Oyedele (G). Row Cleaner Configurations to Facilitate High-Speed Soybean Planting into Residue. ASA-CSSA-SSSA International Annual Meeting, Westin Irving Convention Center, TX, Feb. 01- Feb. 04, 2025.

17. O.E. Olomitutu (G), J. Dhillon, M.J. Mulvaney, J.W. Lowe, C.J. Bryant, J. Wallace (G), N. Harper (g), G. Shavers (G), T. Hilyer (G). Corn Response to Planting Speed in Mississippi. Southern Branch American Society of Agronomy Annual Meeting, Atlanta, Georgia, Feb. 2-6, 2024.

18. O.E. Olomitutu (G), M. J. Mulvaney, J. Dhillon, J.W. Lowe, C.J. Bryant, J. Wallace (G), N. Harper (g), G. Shavers (G), T. Hilyer (G). How fast can we plant soybean in Mississippi? Southern Branch American Society of Agronomy Annual Meeting, Atlanta, Ga, Feb. 2-6, 2024. Poster.

19. O.E. Olomitutu (G), M.J. Mulvaney, J.W. Lowe, J. Wallace, C.J. Bryant, G.M. Shavers (G), T. Hilyer (G), J. Meadows (g), J. Dhillon, E.J. Larson, J. Zhang, and O. Oyedele (G). High-Speed Soybean Planting into Heavy Residue. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, Nov. 10- Nov. 13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/158

20. O.E. Olomitutu (G), J. Dhillon, M.J. Mulvaney, J.W. Lowe, C.J. Bryant, E.J. Larson, J. Zhang, J. Wallace (G), J. Meadows (G), G.M. Shavers (G), T. Hilyer (G), and O. Oyedele (G). Impact of Planting Speed and Downforce on Corn Seeding. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, Nov. 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/158406

21. O.E. Olomitutu (G), J. Dhillon, M.J. Mulvaney, J.W. Lowe, C.J. Bryant, J. Wallace (G), N. Harper (g), G. Shavers (G), T. Hilyer (G). Corn Response to Planting Speed in Mississippi. 2024 Spring Mississippi State Graduate Research Symposium. Feb 24, 2024. Awarded 3rd place.

CONFERENCE PRESENTATIONS

(since 2024)

22. O. Oyedele (G), M.J. Mulvaney, D.G. Hougni, S. Hauser, A.G.T. Schut, L.S. Woittiez, L. Rusinamhodzi, M.O. Ogunlade, and K. Giller. Macrofauna Accelerates Nutrient Cycling of Cocoa (*Theobroma cacao* L.) Litterfall. ASA-CSSA-SSSA International Annual Meeting, Westin Irving Convention Center, TX, Feb. 01-Feb. 04, 2025.

23. O. Oyedele (G), M.J. Mulvaney, D.G. Hougni, S. Hauser, A.G.T. Schut, L.S. Woittiez, L. Rusinamhodzi, M.O. Ogunlade, and K. Giller. Macrofauna Accelerates Nutrient Cycling of Cocoa (*Theobroma cacao* L.) Litterfall. ASA-CSSA-SSSA International Annual Meeting, Westin Irving Convention Center, TX, Feb. 01-Feb. 04, 2025.

24. O. Oyedele (G), M.J. Mulvaney, O.E. Olomitutu (G), J. Wallace, G.M. Shavers (G), and T. Hilyer (G). Nitrogen Credit after Soybean: A Review. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, Nov. 10-13, 2024.https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/158389

25. O. Oyedele (G), M.J. Mulvaney, J. Wallace (G), O.E. Olomitutu (G). Greenhouse Gas Emissions from Crops Should be Indexed to a Control. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov. 9-12, 2025.

26. O. Oyedele (G), M.J. Mulvaney, J. Wallace (G), O.E. Olomitutu (G). The Science behind Nitrogen Credits from Soybean. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov. 9-12, 2025.

27. O. Oyedele (G), M.J. Mulvaney, J. Wallace (G), O.E. Olomitutu (G). Greenhouse Gas Emissions from Crops Should be Compared to a Control, Poster #1468. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov. 9-12, 2025.

28. O. Oyedele (G), M.J. Mulvaney, M. Giweta (P), O.E. Olomitutu (G), J. Wallace, G.M. Shavers (G), and T. Hilyer (G). Nitrogen Credit after Soybean: A Review. ASA-CSSA-SSSA International Annual Meeting, Westin Irving Convention Center, TX, Feb. 01- Feb. 04, 2025.

29. O. Oyedele (G), M.J. Mulvaney, D.G. Hougni, S. Hauser, A.G.T. Schut, L.S. Woittiez, L. Rusinamhodzi, M.O. Ogunlade, and K. Giller. Macrofauna Accelerates Nutrient Cycling through Litterfall in Cocoa. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, Nov. 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/158439

30. G.M. Shavers (G), M.J. Mulvaney, J. Wallace (G), T. Hilyer (G), O.E. Olomitutu (G), O. Oyedele (G), C.J. Bryant, V. Reed, and J.W. Lowe. Establishing Cover Crops in a Bedded Cropping System. Southern Branch ASA Annual Meeting, Irving, TX, Jan. 2-4, 2025.

31. G.M. Shavers (G), M.J. Mulvaney, J. Wallace (G), T. Hilyer (G), O.E. Olomitutu (G), O. Oyedele (G), C.J. Bryant, V. Reed, and J.W. Lowe. Impact of Fertility Timing in Soybean. Southern Branch ASA Annual Meeting, Irving, TX, Jan. 2-4, 2025.

32. G.M. Shavers (G), M.J. Mulvaney, J. Wallace (G), T. Hilyer (G), O.E. Olomitutu (G), O. Oyedele (G), C.J. Bryant, V. Reed, and J.W. Lowe. Determining Effective Cover Crop Establishment Methods in Bedded Systems. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, Nov. 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/161616

33. G.M. Shavers (G), M.J. Mulvaney, O.E. Olomitutu (G), T. Hilyer (G), J. Wallace (G), V. Reed, C. Bryant. How do soybean react to fertility timing in Mississippi? Southern Branch American Society of Agronomy Annual Meeting, Atlanta, GA, Feb. 3-5, 2024.

34. G.M. Shavers (G), M.J. Mulvaney, O.E. Olomitutu (G), T. Hilyer (G), J. Wallace (G), V. Reed, C. Bryant. Methods for establishing cover crops in bedded systems. Southern Branch American Society of Agronomy Annual Meeting, Atlanta, GA, Feb. 3-5, 2024. Poster.

35. G.M. Shavers (G), O.E. Olomitutu (G), T. Hilyer (G), C.J. Bryant, M.J. Mulvaney, V. Reed, O. Oyedele (G), and J.W. Lowe. Soybean Response to Fertility Timing in Mississippi. ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, Nov. 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/160801

36. S. Virk, J. Beasley, S. Singh, J. Sizemore, J. Wallace (G), M.J. Mulvaney. Investigating the Benefits of Advanced Planting Technologies in Southeastern Row Crops. ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, UT, Nov. 9-12, 2025.

COURSES TAUGHT

PSS 4133/6133 Fiber and Oilseed Crops.

Dr. Mulvaney overhauled the split-level (graduate and undergraduate) course Fiber and Oilseed Crops in the Department of Plant and Soil Sciences, which had focused mainly on cotton. Since cotton is no longer king in the region, Dr. Mulvaney restarted the course from scratch, to include soybean, peanut, and cotton production. After reinventing the course his first year, he then added asynchronous online sections for both graduate and undergraduate students to make content available to students at research stations or those who work while attending school. Given Dr. Mulvaney's extension experience, the course now focuses on practical agronomic management of soybean (*Glycine max*), cotton (*Gossypium hirsutum*), and peanut (*Arachis hypogaea*).

PSS 4133/6133 FIBER & OILSEED CROPS ENROLLMENT				
YEAR	UNDERGRADUATE		GRADUATE	
	IN-PERSON	ONLINE	IN-PERSON	ONLINE
2023	33	N/A	11	1
2024	33	0	3	1
2025	28	5	2	4

GRADUATE STUDENT MENTORING

	Ph.D.		M.S.	
	MAJOR/ CO-MAJOR	COMMITTEE MEMBER	MAJOR/ CO-MAJOR	COMMITTEE MEMBER
CURRENT	3	2	1	2
GRADUATED	3	1	3	12

AWARDS & SCHOLARSHIPS

T. Hilyer, 3rd place poster presentation, Biological Product Effects on Soybean Plant Architecture and Yield Components in Mississippi. 2024 Spring Mississippi State Graduate Research Symposium. Feb 24, 2024.

O. E. Olimitutu, 2025 Marc Curtis – MS Soybean Promotion Board Doctoral Fellowship. $4000 stipend plus $6000 in research expenses.

MISSISSIPPI STATE UNIVERSITY™

COLLEGE OF AGRICULTURE AND LIFE SCIENCES
MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION
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Produced by the Mississippi Agricultural and Forestry Experiment Station (MAFES), Mississippi State University. Scott Willard, Director