

Curriculum Vitae
Michael P. Natrass

Office Address:
715 Quadrangle, Box 5034
Cookeville, TN 38505
Email: mnatrass@tntech.edu
Office: (931) 372-3218

Home Address:
212 Durant Street
Cookeville, TN 38506
Cell: (662) 312-1769

Education

Doctor of Philosophy
Plant and Soil Sciences
GPA: 3.57

Mississippi State University (Starkville, MS) May 2020

Dissertation: Evaluation of constructed wetland phytoremediation of selenium-impacted runoff

Master of Science
Agronomy
GPA: 3.55

Mississippi State University (Starkville, MS) December 2016

Thesis: Stabilized urea fertilizer effects on corn nitrogen use efficiency and soil nitrogen transformations

Bachelor of Science
Agricultural Science
GPA: 3.76

Mississippi State University (Starkville, MS) May 2012

Professional Experience

Tennessee Technological University - Assistant Professor, Agronomy and Soils (Aug 2020-present)

- Engage undergraduate students through face-to-face classroom and laboratory instruction aimed at developing critical thinking skills and hands-on practical application regarding fundamental concepts essential to successful soil and nutrient management in agricultural production systems
- Create visual materials that showcase agriculture degree programs to increase student recruitment and retention within the School of Agriculture and the College of Agriculture and Human Ecology
- Intra- and interdepartmental faculty collaboration to secure external funding aimed at upholding the reputation of Tennessee Tech University as an institute of higher education and providing service to its community through research that improves the production efficiency of rural agriculture systems and promotes economic stability
- Actively serve on departmental, college, and university committees that serve the Upper Cumberland region of Tennessee

United States Army - Ft. Hood, TX; Ft. Carson, CO. (1997-2001)

Deployment to Bosnia-Herzegovina, March-September 1999

Awards and Medals

- Expert Infantryman Badge
- Army Commendation Medal
- Army Achievement Medal
- Army Good Conduct Medal
- Army Overseas Service Ribbon
- National Defense Service Medal
- Army Service Ribbon

Professional Leadership and Volunteerism

Professional Societies

Gamma Sigma Delta, 2016-2020
American Society of Agronomy, 2013 – present
Crop Science Society of America, 2013 – present
Soil Science Society of America, 2013 – present
American Society of Mining and Reclamation, 2017- 2020

Leadership and Volunteerism

2019-2020 MSU Eagle Aces President
2019-2020 Graduate Student Association Vice-President
2018-2019 Graduate Student Associate Departmental Representative
2018-2019 Mississippi FFA State Competition Judge

Honors and Recognition

2022 Outstanding Agriculture Research Award Tennessee Tech College of Agriculture and Human Ecology
2020 Mississippi Agriculture and Forestry Experiment Station Outstanding Graduate Research Award
2019 American Society of Mining and Reclamation Memorial Scholarship
2019 Graduate Research Assistant of the Year Finalist
2018 Mississippi State University 3-Minute Thesis Grand Champion
2018 American Society of Mining and Reclamation Student Travel Grant
2017 Congressional Visits Day, Future Leaders in Science Award
2017 Donald Zacharias Graduate Teaching Assistant of the Year Award Finalist
2016 Donald Zacharias Graduate Teaching Assistant of the Year Award Finalist

Certifications

Online Learning Consortium Online Teaching Certificate, Dec 2023
Preparing Future Faculty Certification, Apr. 2019
FAA Small UAS Remote Pilot Certification, CFR 107, Apr. 2019
CITI, Responsible Conduct of Research, Oct. 2016
Mine Safety and Health Administration Hazard Training, Aug. 2016
Certified Pesticide Applicator's Certificate Cat. III, X, Feb. 2012

Professional Presentations

1. **Nattrass, M.P.** 2024. Smart co-ops and decision support systems for small and mid-scale production systems. Southern Assoc. of Agric Scientists Atlanta, GA. 3-5 Feb.
2. **Nattrass, M.P.** 2023. Key factors for maintaining soil health. UT - Extension (Putnam County)
3. **Nattrass, M.P.** 2022. Drone applications in agricultural production systems. UT – Extension (Jackson County) Beef Cattle Field Day. 17 Oct.
4. **Nattrass, M.P.** 2021. Developing decision support systems for improving rural agricultural production systems. Smart Farm Workshop. IEEE International Conference on Big Data. Atlanta, GA. 10-12 Dec.
5. **Nattrass, M.P.** 2020. Developing smart farm systems for small-scale agricultural production: Opportunities and challenges. Smart Farm Workshop keynote speaker. IEEE International Conference on Big Data. Atlanta, GA. 10-12 Dec.
6. **Nattrass, M.P.**, J.I. Morrison, and B.S. Baldwin. 2019. Seasonal influence on constructed wetland phytoremediation of selenium-impacted runoff. Annual meeting of Am. Soc. of Agron. San Antonio, TX. 9-13 Nov.
7. **Nattrass, M.P.**, J.I. Morrison, and B.S. Baldwin. 2019. Temperature effects on selenium cycling in simulated constructed wetland microcosms. 36th Annual meeting of Am. Soc. of Mining and Rec. Bozeman, MT. 4-6 June.
8. **Nattrass, M.P.**, J.I. Morrison, and B.S. Baldwin. 2019. Seasonal influence on selenium removal in simulated constructed wetlands. 83rd Annual MS Academy of Sciences Meeting. Hattiesburg, MS. 21-22 Feb. ***1st place** PhD oral competition.
9. **Nattrass, M.P.** Phytoremediation: Plants improving water quality. 2019. Three Minute Thesis, Conference of Southeastern Graduate Schools. Knoxville, TN. 15-17 Feb.
10. **Nattrass, M.P.**, J.I. Morrison, and B.S. Baldwin. 2019. Seasonal impact on selenium removal in simulated constructed wetland microcosms. Southern Assoc. of Agric. Scientists. Birmingham, AL. 3-5 Feb. ***2nd place** PhD oral

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competition.

11. **Nattrass, M.P.** Phytoremediation: Plants improving water quality. 2018. Three Minute Thesis, Mississippi State University. 15-16 Nov. ***Grand Champion**.
12. **Nattrass, M.P.**, N.R. McGrew, J.I. Morrison, and B.S. Baldwin. 2018. Phytoremediation of storm water by aquatic macrophytes. 35th Annual meeting Am. Soc. of Mining and Rec. St. Louis, MO. 3-7 June ***3rd place**.
13. **Nattrass, M.P.**, N.R. McGrew, J.I. Morrison, and B.S. Baldwin. 2018. Phytoremediation of selenium- impacted stormwater runoff in constructed wetland microcosms. Southern Assoc. of Agric. Scientists. Jacksonville, FL. 4-6 Feb. ***3rd place** PhD. oral competition.

Undergraduate Research Posters/Presentations

1. Bledsoe, A.B., & **Nattrass, M.P.** 2024. Blending stabilized and control released fertilizer N sources for optimizing TN hay production. Southern Assoc. of Agric Scientists Atlanta, GA. 3-5 Feb.
2. Bledsoe, A.B., & **Nattrass, M.P.** 2023. Evaluation of blending stabilized and controlled release fertilizer N for optimizing TN hay production TN Tech Creative Inquiry Summer Experience.
3. Beck, G.G., **Nattrass, M.P.**, & Bowhay, C.M. 2023. Can arbuscular mycorrhizal fungi inoculation increase plant biomass? TN Tech Research Symposium. Agriculture Division - Poster
4. Johnson, E., **Nattrass, M.P.**, & Bowhay, C.M. 2023. Potential use of wood chips as a low-cost method to reduce the environmental impact of agricultural runoff. TN Tech Research Symposium. Agriculture Division - Poster
5. Jones, M.A., **Nattrass, M.P.**, & Bowhay, C.M. 2023. The potential for use of wood chips as bioreactors to reduce the amount of nitrogen from agriculture runoff. TN Tech Research Symposium. **1st place** Agriculture Division - Poster
6. Thomas, W.K., **Nattrass, M.P.**, & Bowhay, C.M. 2023. Effects of fertilizer nitrogen stabilizers on N transformations. TN Tech Research Symposium. Agriculture Division - Poster

Graduate Research Posters/Presentations

1. Garner, M.E., & **Nattrass, M.P.** 2024. Evaluation of enhanced efficiency fertilizers in TN hay production systems. Southern Assoc. of Agric Scientists Atlanta, GA. 3-5 Feb. MS oral competition
2. Dunn, R.J., & **Nattrass, M.P.** 2023. Tomato Production Efficiency in Hydroponic Systems and Impacts on Nutrient Discharge and Profitability. TN Agricultural Products Association Paris landing, TN 18-20 Jul - **2nd place** PhD oral competition.
3. Pierce, K.W., & Nattrass, M.P. 2023. Rapid screening bioassay assessing potential allelopathic influence on spinach by aqueous extract from fresh whole plant sorghum sudangrass tissue - **1st place** Agriculture Division – Poster
4. Dunn, R.J., & Nattrass, M.P. 2023. Preliminary study of temperature and nutrient concentration effects on seedling emergence and quality. TN Tech Research Symposium. Agriculture Division - Poster

Graduate Committees

1. **Chair, Doctoral** – (Current) Dunn, R.J. Optimizing and modeling nutrient use in a drip hydroponic system for tomato production.
2. Member, Doctoral (Nov 2023) – Duwadi, S. Factors effecting nutrient recovery and greenhouse gas emissions in restored agricultural floodplain wetlands.
3. Member, Doctoral (July 2023) – Koehler, E. Insect resistance and horticultural traits of acylsugar tomato breeding lines.
4. Member, Doctoral. (June 2023) - Mahan, M. Multiple assessments of critical thinking by introducing a case study.
5. **Chair, Doctoral** – (May 2023) Pierce, K.W. A rapid-screening bioassay for predicting allelopathic interactions between cultivars of *Spinacia oleracea* L. and cultivars of *Sorghum bicolor* (L.) Moench.

Publications

1. Pierce, K.W., & **Nattrass, M.P.** 2023. Rapid bioassay assessing potential allelopathic influence on spinach by aqueous extract from fresh, whole-plant sorghum-sudangrass tissue. HortScience 58(10). <https://doi.org/10.21273/HORTSCI17158-23>

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2. **Nattrass, M.P.**, J.I. Morrison, & B.S. Baldwin. 2022. Aqueous selenium removal and distribution in cattail (*Typha angustifolia*) and duckweed (*Lemna minor*) in constructed wetland microcosms. Agrosystems, Geosciences & Environment., (5)1 <https://doi.org/10.1002/agg2.20241>
3. **Nattrass, M.P.**, J.I. Morrison, & B.S. Baldwin. 2020. Influence of temperature and vegetation on selenium removal in constructed wetlands. J. Am. Soc. Mining and Rec. Vol. 9, Issue 3. <http://dx.doi.org/10.21000/JASMR20030044>
4. **Nattrass, M.P.**, N.R. McGrew, J.I. Morrison, & B.S. Baldwin. 2019. Phytoremediation of selenium-impacted water by aquatic macrophytes. J. Am. Soc. Mining and Rec. Vol. 8, Issue 1. <http://dx.doi.org/10.21000/JASMR19010069>

Grantsmanship

In-Review – \$642,000

Machine Learning Based Decision Support System For Predicting Nutrient Concentration In Hydroponic Tomato Discharge Solution - PI (2023)
 3-yr funding opportunity for \$642,000
Funding Agency: USDA DS-FAS

Funded - \$320,058

1. Corn yield assessment using low-cost spatial technologies to increase production efficiency and profitability. (2024) - Co - PI
 1-yr funding opportunity for **\$29,920**
Funding Agency: TN Corn Promotion Board
2. Evaluation of blending stabilized and controlled release fertilizer N for optimizing TN hay production. (2023) - PI
 Internal award supporting undergraduate research for fertilizer management in hay production.
 1-yr funding opportunity for **\$5,000**
Funding Agency: TN Tech Creative Inquiry Summer Experience
3. Integrating virtual reality technologies in the classroom. (2023) - PI
 Internal award for creating an immersive learning environment through virtual reality.
 1-time funding opportunity for **\$10,000**
Funding Agency: TN Tech Center for Advancing Faculty Excellence
4. Assessing agricultural data collection and processing to train machine learning models. (2023) - PI
 Internal award for research aimed collecting and processing data from soil moisture sensors.
 1-yr funding opportunity for **\$5,000**
Funding Agency: Tennessee Tech University Faculty Research Grant
5. Unmanned aerial systems for optimizing TN forage production management strategies. (2022) - PI
 Internal award for research aimed at using unmanned aerial systems to estimate biomass and predict forage nutritive value using multispectral imagery.
 1-yr funding opportunity for **\$5,000**
Funding Agency: Tennessee Tech University Faculty Research Grant
6. Promoting creative inquiry and critical thinking through developing undergraduate research skills and conducting undergraduate research (2022) - Co-PI
 1-yr funding opportunity for **\$15,138**
Funding Agency: Tennessee Tech EDGE Course and Curriculum Grant
7. TBR Open Educational Resources and Low Costs/no Costs Educational Support Materials (2021) Co-PI
 “Virtual Lab Activity Vignettes, Agriculture”
 Funding opportunity for **\$100,000** to Tennessee Tech University
Funding agency: Horticulture Science Foundation
8. Soil, Animal, Food, and Economic (SAFE) Research, Education, and Outreach (2021)
 Collaborative effort among MTSU, UT-Martin, and Tennessee Tech faculty evaluating best management practices to safeguard soil health and enhance nutritional quality of feed and food commodities.
 3-yr funding opportunity for **\$150,000** to Tennessee Tech University

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Funding Agency: USDA NIFA Capacity Building for Non-Land-Grant Colleges of Agriculture Program

Not Funded – \$619,000

7. Establishing an experiment station for conducting smart farm and precision agriculture – PI (2023)
*Multi-year funding opportunity for **\$20,000***
Funding Agency: Rural Reimagined
8. Soybean yield assessment using low-cost spatial technologies (2023) Co-PI
*1-yr funding for **\$5,000***
Funding Agency: Tennessee Tech Faculty Research Grant
9. Cost benefit analysis of fertilizer management strategies in TN corn production (2022) - PI
*1-yr funding for **\$19,000***
Funding Agency: Tennessee Corn Promotion Board
10. Evaluating prior management effects on soil health (2022) - Co-PI
*1-yr funding for **\$20,000***
Funding Agency: Tennessee Tech Faculty Research Grant
11. Developing Science Identity in Agriculture Undergraduates through Research (2022) - Co-PI
*1-yr funding for **\$5,000***
Funding Agency: Tennessee Tech Faculty Research Grant
12. Procuring self-sustainable energy-efficient smart farming infrastructures for economically distressed rural communities (2021) - Co-PI
*1-yr funding for **\$100,000** as a planning grant*
Funding Agency: National Science Foundation
13. Machine learning based decision support system for mixed species hay production using UAS images (2021) - Co-PI
*3-yr funding for **\$450,000** to Tennessee Tech University*
Funding Agency: USDA Data Science for Food and Agricultural Systems

Service

TN Tech University

- Faculty Senate (2023-present)
- Environmental Sciences Curriculum Committee (2021-present)
- Stormwater Committee (2021-present)

TN Tech College of Agriculture and Human Ecology

- Events Committee (2020-present)
- Recruitment Committee (2020-present)

TN Tech School of Agriculture

- Agriculture Foundation Representative (2023-present)
- Events Committee (2020-present)
- Recruitment Committee (2020-present)