Summary of the minutes of the 2025 SERA 6 meeting (mini meeting during the 2025 ISSPA Conference in Durham, NC):

12:00 –1:00 PM Registration and Lunch

1:00 PM Dr. Franta Majs: “When Extractable P Becomes Law”

1:20 PM Dr. Rishi Prasad "PSR as a tool for P management for Alabama soils"

1:50 PM Break

2:00 PM Dr. Jessica Davis: “Building a Usable and Sustainable Customer Application”

2:20 PM Dr. Nathan Slaton: “Summary of the terminology and basis used for soil-test-based crop fertilizer recommendations in the South“

https://aesl.ces.uga.edu/sera6/?minutes.html

2:30- 5:00 PM Business Meeting and State Reports

- Multistate project discussion- Nathan Slaton (AR) provided presentation with suggestions for universal terms for soil test levels in the Southern region; Vaughn Reed (MS) agreed to spearhead the project
- Other business discussion
- Length of term for officers- decision for 2 year terms, as has been followed in recent years
- SERA6 website and listserv- currently hosted by UGA, offer from TN to update and host
- Register on NIMSS (scan QR code); updates coming to NIMSS site
- Passed around sign up for email listserv
- 2026 meeting site: Decided on West Virginia
- State Reports: AL, AR, FL, GA, KY, LA, MS, NC, OK, PR, SC, TN, TX, VA, WV
- Group photo

Auburn University
Dr. Jessic Davis

Annual Report of Soil Testing Activities to SERA-6

June 2025
Durham, NC

Sample numbers and services:

Example samples:

Soils 14695

Non-Routine Soils 446

Plant tissue 146

Potting Media 114

Manure 16

Forages 913

Water 272

Chicken Litter/Lime 18

Impacts made by the program:

Lab personnel numbers or changes: We have added a QA analyst position and agricultural support admin.

Equipment/supply notes or upgrades: A new Elga DI water system.

Software notes or upgrades: Purchased and working on a new customer database/application.

Number of Extension /Research employees working on soil testing/soil fertility: N/A

Publications from 2024: N/A

Other notes:

University of Arkansas Division of Agriculture
Nathan Slaton. Bronc Finch, Gerson Drescher, Cheri Villines, Cindy Herron, & Ashley Morris

Annual Report of Soil Testing Activities to SERA-6

June 2025
Durham, NC

Sample numbers and services:

- The number of total samples analyzed for pH and Mehlich-3 nutrients by the Marianna Soil Test Laboratory in 2024 was 172,548 (158,132 client samples & 14,414 QC samples) a 22% decrease in client samples compared to 2023. Grid samples accounted for 74% of the client samples in 2024.
- The turnaround time (sample residence time at the lab for soil analysis including days on the weekend and holidays) was ≤4 days for 36% of samples, ≤6 days for 72% of samples, ≤8 days for 98% of the samples, and ≤16 days for 100% of samples. These values do not include time spent at the Extension office, post office, or in transit to the laboratory.
- Organic matter by Weight Loss on Ignition was performed on 1,120 soil samples.
- Electrical conductivity was performed on 368 soil samples in 2024.
- Nitrate-N was determined on 1,510 soil samples in 2024.
- The fall months continue to be the peak times for sample submission (Fig. 1)
- Sample submission to the Fayetteville Agricultural Diagnostic Lab from July 1 2023 - June 30, 2024, increased 46% compared to the prior fiscal year (Table 1).
- Funding in excess of $400,000 was allocated to 9 soil fertility-related research projects and reports published in the 2024 Arkansas Soil Fertility Series (https://scholarworks.uark.edu/aaesser/232/) which includes a summary of the 2024 soil test results.

Fig. 1. Samples analyzed by Month for selected years.

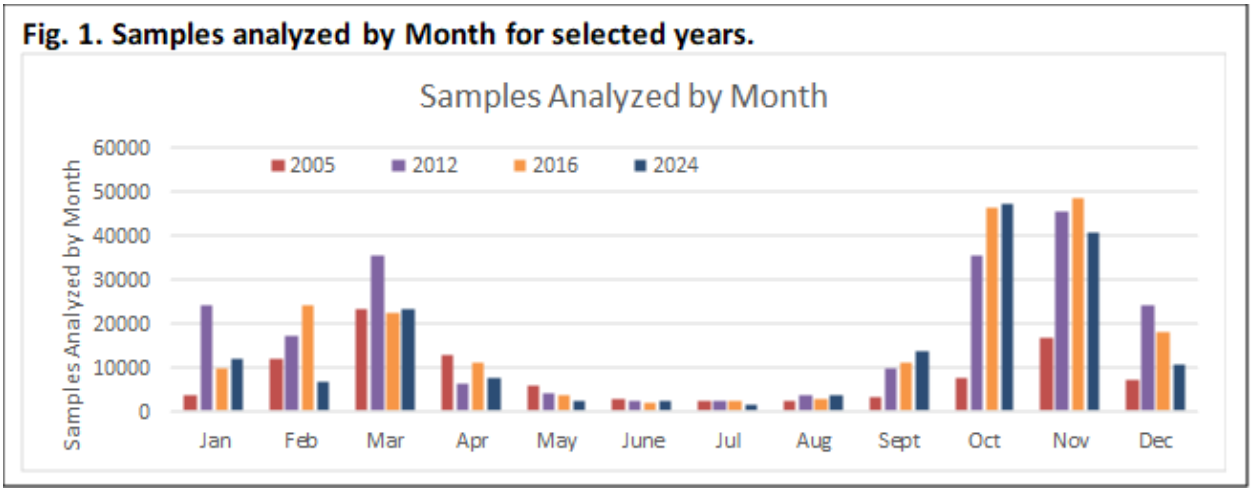

Table 1. Specific and total samples analyzed by fiscal year - July 1 through June 30 by the Fayetteville Agriculture Diagnostic Laboratory.

Category	Number of Samples Analyzed (by Year)					
	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024
Forage/Feed	1,764	1,765	1,333	1,504	2,223	2,276
Diagnostic Plant	483	315	448	600	756	461
Diagnostic Soil	267	131	165	158	151	248
Manures-Total	1,003	877	1,006	795	917	831
Strawberry Monitoring	224	242	196	134	183	306
Orchard Monitoring	0	0	0	0	0	0
Growing Media	57	95	122	253	75	760
Research Plant	5,263	7,278	8,377	6,824	7,536	15,232
Research Soil	2,698	3,989	5,097	3,270	5,135	5,644
Prepared Samples	3,692	4,995	2,881	1,916	2,282	2,482
Totals	15,451	19,687	19,625	15,454	19,258	28,140

Impacts made by the program:

- Provided low or no-cost routine soil analysis and/or recommendations on 1.12 million acres across the Arkansas landscape and more than 800 manure samples were analyzed for nutrient management. Analytical services support both stakeholders and public and private research interests.
- The program contributed matching funding for the FRST NRCS-funded umbrella Project, provides funding for a post-doctoral fellow (Dr. Raj Singh) and assistantships for 2 graduate students, and is contributing soil analysis, research space, and labor for the NRSP11 lime calibration project.
- Added to the overall knowledge of manure properties by publishing the 2005-20224 manure database in Ag Data Commons and provided the data to the University of Minnesota Manure dB project.

Lab personnel numbers or changes:

- No major changes to full-time permanent staff since last year.
- Dr. Rajveer Singh joined staff as a post-doctoral fellow in April 2025

Equipment/supply notes or upgrades:

- We plan to replace 2 Spectro Arcos I ICAPs (one in each lab) in FY2026. Current estimates show tariffs are increasing the price by ~$12,000 per instrument with an estimated cost of ~$140,000/instrument.
- Preventative maintenance on new Arcos 3 instruments will likely require contracts with the manufacturer rather than our typical 3rd party vendor.
- J-Kem pH robots for pH were added (or are in the process) to each lab.
- Solid-state generator was replaced at a cost of ~$30,000 in one Arcos II (Marianna lab, purchased in 2016) in March 2024

Software notes or upgrades:

- An unsolved glitch in the sample login system caused problems and is yet to be corrected.
- Maintenance and improvement of the LIMS system typically costs more than $30,000 annually. The LIMS provider has been slow to provide the requested improvements.

Number of Extension /Research employees working on soil testing/soil fertility:

- The Marianna lab employs 14 full-time staff
- The Fayetteville lab employs 4 full-time staff
- Faculty positions working mainly in soil fertility include Bronc Finch (Extension), Gerson Drescher (Experiment Station), Trenton Roberts (Split appointment), and Nathan Slaton (Administration) totaling 3.5 FTEs.
- An Extension soil fertility position is vacant and set to be advertised at the new Northeast Rice Research and Extension Center.

Publications from 2024-2025:

- Slaton, N.A., Ahmad, U., Villines, C., DeLong, R., & Robinson, O. (2024). University of Arkansas Division of Agriculture database of dairy, poultry, and swine manure/litter chemical and physical properties *Ag Data Commons. (Published dataset)* https://doi.org/10.15482/USDA.ADC/25209035.v2
- Slaton, N. A., & Uthman, Q. (2024). Bermudagrass forage response to phosphorus and potassium fertilization. *Ag Data Commons. (Published dataset)* https://doi.org/10.15482/USDA.ADC/24978027.v1
- Slaton, N.A., Singh, R., Ahmad, U., Villines, C., DeLong, R., & Robinson, O. (2024). University of Arkansas Division of Agriculture database of dairy, poultry, and swine manure/litter chemical and physical properties [2025 release]. Ag Data Commons. (Published dataset) https://doi.org/10.15482/USDA.ADC/25209035.v3

- Drescher§, G. A., Slaton, N. A., Roberts, T. L., & Smartt, A.D. (2024). Soil texture and organic matter prediction using Mehlich-3 extractable nutrients. Agrosystems, Geosciences & Environment, 7(1), e20461. https://doi.org/10.1002/agg2.20461
- Drescher§, G.L., Slaton., N. A., Ahmad, U., Roberts, T. L., & Smartt, A. D. (2024). Soil moisture and probe characteristics affect core integrity and soil test results. Soil Science Society of America Journal, 88(4), 1216-1233, https://doi.org/10.1002/saj2.20696
- Slaton, N. A., Pearce, A. W., Gatiboni, L., Osmond, D. L., Bolster, C., Clark, J., Dhillon, J., Farmaha, B., Kaiser, Lyons, S., Margenot, A., Miguez, F., Moore, A., Ruiz Diaz, D., Sotomayor, D., Spackman, J., Spargo, J., & Yost, M. (2024). Models and sufficiency interpretation for estimating critical soil test values for the Fertilizer Recommendation Support Tool. Soil Science Society of America, 88, 1419-143. https://doi.org/10.1002/saj2.20704
- Lyons, S.E., Arnall, D.B., Ashford-Kornburger, D., Brouder, S.M., Christian, E., Dobermann, A., Haefele, S.M., Haegee, J., Helmers, M.J., Jin, V.L., Margenot, A.J., McGrath, J.M., Morgan, K.T., Murrell, S.T., Osmond, D.L. Pelster, D.E., Slaton, N.A., Vadas, P.A., Ventera, R.T., Volenec, J.J., Wagner-Riddle, C. (2025). Field trial guidelines for evaluating enhanced efficiency fertilizers. Soil Science Society of America Journal, 89, e20787. https://doi.org/10.1002/saj2.20787
- Tang, Q., Duckworth, O.W., Obenour, D.R., Kulesza, S.B., Slaton, N.A., Whitaker, A.H., & Nelson, N.G. (2024). Relationships between soil test phosphorus and county-level agricultural surplus phosphorus. Journal of Environmental Quality, 53(6), 1127-1139. https://doi.org/10.1002/jeq2.20622
- Arkansas Department of Agriculture Plant Industries Division (2024). Arkansas Distribution of Fertilizer Sales by County. MP580. University of Arkansas System Division of Agriculture https://www.uaex.uada.edu/publications/pdf/MP580.pdf

Other notes:

University of Florida (UF)
Institute of Food and Agricultural Sciences (IFAS)
Analytical Services (ANSERV) Laboratories
In attendance: Franta Majs

Annual Report of Soil Testing Activities to SERA-6

June 2025
Durham, NC

Sample numbers and services: *This report is for Fiscal Year 2025 (7/1/2024–5/31/2025)*

	FY25	Year to Year Trend	FY24
Soils	*36,234*	*12% ↑ from FY24*	*32,378*
Plant Tissue	*9,145*	*2% ↓ from FY24*	*9,379*
Potting Media	*100*	*48% ↓ from FY24*	*194*
Manure & Compost	*85*	*24% ↓ from FY24*	*112*
Forages	*NA*		
Other samples:			
Irrigation Water	*285*	*1% ↓ from FY24*	*289*
Non-Potable Water, certified	*3,115*	*68% ↑ from FY24*	*1,854*
Solutions	*22,103*	*13% ↑ from FY24*	*19,620*

In addition to the ANSERV Labs in Gainesville, UF/IFAS also operates the Everglades Soil Testing Lab, located at the Everglades Research and Education Center (EREC) in Belle Glade, Florida. This lab analyzes approximately 7,000 soil samples annually. The goal is to bring that lab into SERA-IEG-6 reporting structure in the next report for the current FY26.

Impacts made by the program:

An impact statement will be provided at a later date.

Lab personnel numbers or changes:

	Occupied at the end of FY25	*Occupied at the end of FY24*
Director & Quality manager (FTE)	*2*	*1*
Administrative support (FTE)	*2*	*2*
Chemist (FTE)	3	*3*
Lab technician (FTE)	4	*3*
Temporary employees	4	*1*
Student workers	3	*4*

Nancy Wilkinson, the long-serving Quality Manager for the ANSERV Labs, announced her intention to retire for a second time. As a result, the search for her replacement is currently underway.
At the beginning of FY25, the laboratories filled the Director position that had been vacated by Dr. Tom Obreza upon his retirement at the end of FY24. A new Lab Technician II position was also created, and Ms. Rebekah Warrick was hired to fill the role. In addition, two new student workers and one temporary employee joined the team. Continuing a well-established tradition, three student workers remained with the laboratories as temporary employees following their graduation.

Equipment/supply notes or upgrades:

Flash Isotope Ratio Mass Spectrometer (Thermo Scientific, Bremen, Germany) installed and finally made functional after rounds and rounds of repairs. The instrument is composed of two main parts:

- *EA IsoLink CN flash unit*
- *Delta Q IRMS spectrometer*

Software notes or upgrades:

Since FY16, the UF/IFAS ANSERV Labs in Gainesville have utilized a web-based Laboratory Information Management System (LIMS). In contrast, the soil testing lab at the Everglades Research and Education Center (EREC) in Belle Glade does not have access to this system and instead relies on a combination of Microsoft Office applications. This setup requires manual adjustments whenever Microsoft Office is updated, which can disrupt workflow. To address this disparity, a statewide LIMS is currently being developed to serve both laboratory locations—Gainesville and Belle Glade—ensuring consistency, efficiency, and improved data management across the program.

Number of Extension /Research employees working on soil testing/soil fertility:

The UF/IFAS Nutrient Management Program received an additional $4 million at the end of FY25 to support ongoing research on Best Management Practices (BMPs) for selected crops. This funding also supports efforts to refine site-specific phosphorus fertilization recommendations and to evaluate the suitability of extraction solutions for measuring plant-available phosphorus in Florida soils. With this latest allocation, the total funding provided by the State of Florida now amounts to $24 million.
An updated headcount will be provided at a later date.

Publications from 2024:

Other notes:

The search for a mid-career faculty in soil fertility and plant nutrient management at UF / IFAS had commenced and the final hire should be announced soon.

Annual Report of Soil Testing Activities to SERA-6
June 2025
Durham, NC

University of Georgia

Sample numbers and services:

Total: 109,319 *(84,802 in 2020 which is a 28.9% increase in 5 years)*

- Soils: 75,834
- Manures: 905
- Plant tissue: 7,087
- Water: 10,712
- Microbiology: 3412
- Feed & Forages: 7,869
- Other: 3,500

Sample Type	2020	2021	2022	2023	2024
Soils	58990	63946	64900	71090	75834
Manures	1171	1297	1270	1045	905
Waters	10162	10405	10238	11441	10712
Plants	4964	6926	6392	10327	7087
Feed &Forage	5299	5159	6154	6288	7869
Microbiology	2973	3466	3395	3602	3412
Other	1243	3641	6499	3246	3500
TOTAL	84,802	94,840	98,848	107,039	109,319

Lab Personnel:

25 Full-time employees
- 3 faculty positions

3 part-time employees

4 student worker positions

Newly filled positions

- Accountant
- Crop quality lab manager
- Administrative Associate
- Business Manager
- Administrative assistant

Number of Extension /Research employees working on soil testing/soil fertility:

One – Soil fertility
One vacant (currently advertised – row crops)

Equipment/supply notes or upgrades:

- Agilent 5900 dual view ICP-OES
- FIALYZER-1000 - One-channel flow injection analyzer

University of Kentucky
Solomon Kariuki and Frank Sikora

Annual Report of Soil Testing Activities to SERA-6

June 2025
Durham, NC

Sample numbers and services:

Soils: 35054 in Lexington, 1741 in Princeton
Plant tissue: 0
Potting Media: 71 in Lexington
Manure: 212 in Lexington
Forages: 0
Nutrient Solutions: 61 in Lexington

Impacts made by the program:

Lab personnel numbers or changes:

Both labs have experienced significant personnel changes.

Frank Sikora is retiring Jul 7 2025 as Director of Laboratories and Soils Program. Solomon Kariuki was hired as the new Director Apr 2025. Solomon was employed as the Laboratory Manager for the Feed and Fertilizer laboratory in the Division.

In Lexington, lab manager (Diane Hunter) resigned Jan 2025, new lab manager (TJ Evans) was hired Feb 2025, ICP technician retired Feb 2025, new ICP technician (Pedro Herrera) hired Mar 2025, lab technician (Robert Reed) resigned Apr 2025, new lab technician (Rachael Frederick) hired Jun 2025.
Current employees in Lexington are 1 lab manager, 3 technicians, and a vacant technician position.

In Princeton, lab technician (Debbie Morgan) retired Jul 2023, lab manager (Michael Coons) was hired Oct 2024, lab technician (Angela Hall) was hired Feb, 2025, temporary lab manager (Paula Hill) retired Mar 2025.
Current employees in Princeton are 1 lab manager and 2 technicians.

Equipment/supply notes or upgrades:

Still working on recovery efforts to rebuild soil testing capabilities in Princeton after the December 2021 tornado. The lab began testing samples in a temporary trailer lab in August, 2024. Current schedule for occupying lab in new building is late 2025/early 2026. New capability for Princeton lab will be testing C and N with an Elementar combustion instrument.

Princeton lab purchased a Mantech instrument for pH and buffer pH testing. They have good tech support but feedback on using the instrument from technicians have not be positive. Mantech does not appear to have broad experience with pH testing in soil. There main specialty so far has been with solutions. One deficiency noticed that had to be resolved was a blade on the stirrer that was too small to adequately mix soil and solution.

Software notes or upgrades:
All 120 counties were transitioned to a web-based program for entering sample information and disseminating reports. A procedure for reviewing agents' comments is currently under discussion.

Number of Extension /Research employees working on soil testing/soil fertility:
Edwin Ritchey and John Grove are soil fertility extension specialists working in western Kentucky in Princeton. A new hire will be in a soil fertility extension specialist position in Lexington to serve eastern Kentucky in August. His name is Ricardo Ribeiro. He received his Ph.D. in Brazil and is currently a postdoctoral researcher at The Ohio State University. His specialty is in forage systems. He will fill the position vacated by Josh McGrath.

Publications from 2024:

Other notes:
Routine soil test (P, K, Ca, Mg, Zn, pH and buffer pH) fee increases from $6 to $8 on July 1, 2025. Also increasing charges for soil organic matter ($5 to $10), soil total N ($4 to $8), soil electrical conductivity ($4 to $6), boron ($4 to $6), water holding capacity ($4 to $6), CEC ($19 to $40), animal waste ($25 to $30), water ($15 to $20), and soilless media ($15 to $20).

LSU AgCenter
Soil Testing and Plant Analysis Laboratory (STPAL)
In attendance: Dr. Ted Gauthier, Dr. Leandro Vieira

Annual Report of Soil Testing Activities to SERA-6

June 2025
Durham, NC

Sample numbers and services (2024): *This report is for the calendar year 2024.*

Soils	*27078*	55% up from 2023
Plant tissue	*2127*	*48% down from 2022*
Soilless/Potting Media	*365*	*5% down from 2022*
Solutions	*4600*	*NA*
Water	*195*	*NA*

Impacts made by the program:

Lab personnel numbers or changes:

At the end of the calendar year 2024, the STPAL had two student workers and five full-time employees. This represents an increase of two employees from the previous year, a lab technician and an administrative assistant (responsible for accounting services, sample login, and reporting). The Soil Testing and Plant Analysis Soil Lab Director, Dr. Franta Majs, accepted a similar position with the University of Florida and left in June 2024. Dr. Ted Gauthier is currently serving as the Interim Director. In September 2024, Dr. Leandro Vieira was hired as Assistant Professor and Soil Fertility Specialist and is currently serving as the Soil Lab Technical Advisor.

Equipment/supply notes or upgrades:

The STPAL received significant funding to purchase new equipment. The lab purchased the following: oven to dry soil samples, pH robot, C/N analyzer, plant digestion block, grinder for soil samples, discreet water analyzer, and muffle furnace. The lab is switching its organic matter analysis method to LOI.

Software notes or upgrades:

The lab is upgrading the software on one of its ICP instruments as well as an existing CN analyzer. We are also in the process of retiring the old in-house LIMS system and working with Labworks to customize its LIMS for use by the lab.

Number of Extension /Research employees working on soil testing/soil fertility:

A copy of each test report is delivered to LSU AgCenter extension agents or regional extension offices. Agents use the analysis results for their extension programs. Therefore, approximately 70 agents are directly or indirectly involved in the soil lab services. Five researchers are working in soil fertility, and one research faculty is working on the forage testing.

Dr. Leandro Vieira accepted the position for Soil Fertility Specialist with primary emphasis on specialty crops such as vegetables, fruits, home gardens, turf, pasture, and ornamentals, and a minor emphasis on field crops. However, since the Field Crops Soil Fertility Specialist (Dr. Rasel Parvej) left in November 2023, Dr. Vieira has been serving as the interim Field Crops Soil Fertility Specialist.

Publications from 2024:

N/A.

Other notes:

N/A.

Annual Report of Soil Testing Activities to SERA-6
June 2025

Mississippi State University
Keri Jones

Sample numbers and services:

Soil – 14,126 samples tested (0.5% increase over last fiscal year)

Plant tissue- 5459 samples tested (3% decrease over last fiscal year)

Potting Media – N/A

Manure – N/A

Forages – N/A

Lab Personnel numbers or changes:

None

Equipment/supply notes or upgrades:

None

University represented
Oklahoma State University

Annual Report of Soil Testing Activities to SERA-6
June 2025
Durham, NC

Sample numbers and services:

Soils	*35,303*
Plant tissue	*737*
Potting Media	*603*
Manure	*1,027*
Forages	*7,567*
Water	*4,983*
Research	*7,472*
Total	***58, 560***

Impacts made by the program:

In 2024, the Soil, Water, and Forage Analytical Laboratory (SWFAL) processed over 58,560 samples from agricultural producers, homeowners, researchers, and Extension educators across Oklahoma and 35 other states. The program directly supported:

- ✓ Cost savings and yield optimization by helping producers apply fertilizers more efficiently
- ✓ Expansion of outreach tools including factsheets, training sessions, and client guides
- ✓ Launch of Near-Infrared Reflectance Spectroscopy (NIRS) forage testing to complement wet chemistry starting May 15, 2025.

Lab personnel numbers or changes:

- ✓ Full-time Staff: 7 technicians
- ✓ Student Workers: 9 undergraduate assistants, 4 of whom graduated in Spring 2025; 2 of whom quit in Spring 2025.
- ✓ New Hires: 2 undergraduate assistants hired for summer 2025
- ✓ No major staff turnover reported in 2024

Equipment/supply notes or upgrades:

- ✓ Acquired Near-Infrared Reflectance (NIR) for forage testing

Software notes or upgrades:

- ✓ Continuing development and improvement of online portal and database management system
- ✓ Developed NIR feature to database/online portal

Number of Extension /Research employees working on soil testing/soil fertility:

- ✓ Faculty (Plant and Soil Science): 5 involved in soil fertility or soil testing research
- ✓ Extension specialists actively engaged in nutrient management outreach: 3
- ✓ Graduate students working on soil fertility-related research: 12

Publications from 2024: **(bold are faculty and students from Department of PSS – working on soil fertility and nutrient management)**

- ✓ Antonangelo, J.A., S. Culman, and **H. Zhang**. 2024. Comparative Analysis and prediction of cation exchange capacity via summation: influence of biochar type and nutrient ratios. Front. Soil Sci. doi:10.3389/fsoil.2024.1371777
- ✓ Hillock, D., **H. Zhang**, L. Brandeberger, et al. 2024. Master Gardener's manual. https://hdl.handle.net/20.500.14446/343694
- ✓ Che, Y., B. Zhang, B. Liu, J. Wang, and **H. Zhang**. Effects of straw return rate on soil physicochemical properties and yield in paddy fields. Agron, 14(8), 1668. doi: 10.3390/agronomy14081668
- ✓ Antonangelo, J.A., and **H. Zhang**. 2024. Assessment of portable x-ray fluorescence (pXRF) for plant-available nutrient prediction in biochar-amended soils. Sci. Reports 13, 20377. doi: 10.1038/s41598-024-71381-8
- ✓ Singh, R., S. Sawatzky, M. Thomas, S. Akin, **W.R. Raun**, **H. Zhang**, **D.B. Arnall**. 2024. Micronutrients concentration and content in corn as affected by nitrogen, phosphorus, and potassium fertilization. Agrosyst. Geosci. & Environ. 7: e20568. Doi:10.1002/agg2.20568.
- ✓ **D.B. Arnall**. 2024. Cause and effects of soil acidity. Oklahoma Coop. Exten. Serv. PSS-2239. https://openresearch.okstate.edu/server/api/core/bitstreams/2d955205-444c-4d7c-ae72-70e7e28d61c0/content
- ✓ **D.B. Arnall**. 2024. Warm season perennial forage and hay quality result summary (2019-2024). Oklahoma Coop. Exten. Serv.PSS-2610. https://openresearch.okstate.edu/server/api/core/bitstreams/79060612-c21e-4337-9fc2-4e81a245fa6b/content
- ✓ **Ballagh, A., E.K. Cox, J. Lofton,** and **D.B. Arnall.** 2024. Impacts of soil pH and extractable aluminum on winter canola production in the southern Great Plains. J. Plant Nutri. 47(2):257–267. Doi:10.1080/01904167.2023.2275074.
- ✓ **J. Lofton,** and **D.B. Arnall.** 2024. Understanding soybean nodulation and inoculation. Oklahoma Coop. Exten. Serv. PSS-2169. https://openresearch.okstate.edu/server/api/core/bitstreams/e1ecbba4-1657-4dc6-aad0-1fdf63ac4e94/content
- ✓ **Cho, W., B.W. Brorsen, D.B. Arnall**. 2024. When should wheat phosphorus recommendations be based on build-maintenance rather than sufficiency? An economic analysis. Agrosyst. Geosci. & Environ. 7(4): e70013. Doi:10.1002/agg2.70013.
- ✓ **Abiola, S.O., J. Lacasa, B.F. Carver, D.B. Arnall,** I.A. Ciampitti, **A.d.O. Silva.** 2024. Nitrogen uptake dynamics of high and low protein wheat genotypes. Front. Plant Sci. 15:1493901. Doi:10.3389/fpls.2024.1493901.
- ✓ Lyons, S.E., **D.B. Arnall**, D. Ashford-Kornburger, S.M. Brouder, et al. 2024. Field trial guidelines for evaluating enhanced efficiency fertilizers. Soil Sci Ame. J. 89:e20787. Doi: 10.1002/saj2.20787.

Other notes:

- ✓ ***Certifications:*** 2025 Certified Manure Analysis Proficiency; 2025 Certified Manure Testing Program; 2025 Certified Soil Testing Program; 2025 NFTA Chemistry.
- ✓ Participated in multi-state efforts under SERA-6 including calibration/correlation data sharing
- ✓ Hosted lab tours for 4-H, master gardeners, and undergrad to promote soil science careers
- ✓ Increased social media (Facebook, Instagram and TikTok) visibility and client education
- ✓ USDA-NIFA Director visited the soil testing lab in April 2025

Clemson University
Shannon Alford- Laboratory Director; Michael Atkins- Laboratory Manager

Annual Report of Soil Testing Activities to SERA-6

June 2025
Durham, NC

Sample numbers and services for calendar year 2024:

Soils 45,775

Plant tissue 535

Manure 1363

Animal Feed & Forages 1225

Compost 108

Irrigation Water 317

Research & Commercial (non-ag) 4321

Impacts made by the program:

11,983 clientele served in 2024 for agricultural samples.
2,297 samples received from 42 US states other than SC, primarily soil, feed, and waste samples. This does not include research sample clientele or research samples from US states.

Lab personnel numbers or changes

Personnel Changes: Three lab staff departures (Nov 2024; March 2025; May 2025) for higher paying positions within the university. One was replaced with a part-time staff member in December 2024. A hiring freeze was implemented in Spring 2025, and we will not be allowed to fill these positions with full-time staff in the foreseeable future.
Current Personnel: 9 total staff (8 full-time, 1 part-time); 2 student workers per semester and 1-3 intermittent volunteers in the spring from other laboratory staff and Master Gardeners

Equipment/supply notes or upgrades:
Non-recurring funding for equipment and facility renovation from state allocated for 2022-2023 fiscal year has become available.
Buchi Proximate NIR and CEM microwave digestion unit delivered, not yet installed. LabFit pH Analyzer ordered.
The renovation project has begun with many changes occurring for compliance and safety due to the age of the building (1980).

Software notes or upgrades:
Development of a new sample check-in system for internal use in progress

Number of Extension/Research employees working on soil testing/soil fertility:
1 Extension/Faculty employee working on soil fertility

Publications from 2024: none; one submitted in 2025

Other notes: none

University of Tennessee
Robert Florence and Fafa Adotey

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June 2025
Durham, NC

Sample numbers and services:

Soil Lab analyzed 14,234 samples from 4,303 clients, spread out over all 95 TN counties

In coordination with the Beef Center, analyzed 1,784 forage samples for 677 clients from 89 TN counties and 33 other states. The out of state samples came from the Master Horse Online Program.

Plant Diagnostic Lab, with support from Entomology, and Plant Pathology Dept. we analyzed 626 physical samples, and 149 distance samples submitted by agents. Samples were submitted from 62 TN counties.

Responded to at least 506 individual one on one interactions with agents or producers, homeowners, and professional landscapers, accumulating to 81 hours of calls, emails, or walk-ins.

Lab personnel numbers or changes:

Hired a new Admin Assistant, financial associate, and lab analyst. Fully staffed for first time in many years.

Equipment/supply notes or upgrades:

No new equipment or supply notes. Looking for new ICP.

Air compressor for ICP has been giving trouble lately.

Currently have a 5300 and 7300 Perkin Elmer ICP and a LabFit pH robot.

We changed pH probes for the lab fir to gel filled TPS probes and have been happy with them compared to Thermo Ross Refillable probes. It is nice not having to buy the filling expensive filling solution for those probes now.

Software notes or upgrades:

Working to build a new LIMS system in house that will be used by Tennessee and Virginia Tech.

Number of Extension /Research employees working on soil testing/soil fertility:
UT Extension has specialists working on soil/crop nutrition (Dr. Fafa Adotey), corn/soybean production (Dr. Jake McNeal), cotton production (Dr. Tyson Raper), tobacco/hemp production (Dr. Mitchell Richmond), and forage specialist (Dr. Bruno Pediro), urban gardens (Dr Natalie Bumgarner), turf (Dr. Becky Bowling), Poultry litter and manure applications (Dr. Shawn Hawkins).

Publications from 2024:

Adotey, N., Logwood, Sydney, F. R. Walker, S. A. Hawkins, L. A. Duncan, R. Florence, X. Yin, T. B. Raper, and J. McNeal. 2024. Converting Between Mehlich 1 and 3 Soil Test Values for West Tennessee Soils. UT Extension, W1223.

Other notes:

Stephen F. Austin State University

Annual Report of Soil Testing Activities to SERA-6

June 2025
Durham, NC

Sample numbers and services: For Calendar Year 2024

Soil Analysis – 2,633 Routine soil tests for fertilization recommendations, Metals, SAR, Textures, Organic Matter, Hot Water Boron, Nitrates and Ammonia

Potting Media – 21 water soluble extractions

Manure / **Lagoon** – 310 Nitric Digest and Carbon/Nitrogen analysis

Forage / Plant Tissue – 65 Routine Forage quality, Mineral Analysis, Prussic Acid, Nitrates, Crude Protein

Lime – 10 Lime quality analysis

Water – 45 routine water analysis for irrigation and livestock purposes

Lab personnel numbers or changes:

Dr. Aakriti Sharma Director, Wayne Weatherford – Lab Associate

Equipment/supply notes or upgrades:

CEM MARS Microwave Digestor, YSI Dissolved Oxygen Meter, Thermolyne Oscillator Table

Software notes or upgrades:

Updates and additions to soil lab website. This includes online store/marketplace for prepaying of analysis. Updated soil fertility, manure, water, lime quality and forage reports with additional information with a new database that includes county, area code, and GPS coordinates based upon zip codes.

Number of Extension /Research employees working on soil testing/soil fertility:

Collaborated on graduate research work with five faculty members (Dr. Mindy Faulkner, Dr. Michael Mauer, Dr. David Creech, Dr. Erin Brown, Dr. Kefa Onchoke) at Stephen F Austin State University. Research collaboration with Dr. Lance Williams at University of Texas at Tyler. Research collaboration with Dr. Nancy Bormann at University of Minnesota – Twin Cities