VIRGINIA AGRICULTURAL EXPERIMENT STATION
SOUTHERN PIEDMONT AGRICULTURAL RESEARCH AND EXTENSION CENTER
VIRGINIA TECH

SOUTHERN PIEDMONT AREC NEWSLETTER

December 2023

Arash Rashed,
Director and Entomologist

Greetings from Southern Piedmont AREC!

2023 has been an exciting year for us. In this issue, we share the latest about our achievements, facility, technological and equipment upgrades, events, and more!

With our innovative Tobacco Agronomy, Plant Pathology, Forage Agronomy, Specialty Crop Production, and Entomology programs, we proudly continue our commitment to supporting resilient, profitable, and sustainable agriculture by promoting research and outreach efforts in diversified and integrated production systems with regional, national, and global relevance. As we move ahead to address our stakeholder-prioritized initiatives, we also invest substantially in training and preparing next-generation specialists, educators, and professionals.

And finally, we look forward to all of the opportunities ahead in the upcoming year**!**

Arash

Connect with us!

Technology and Equipment Upgrades Lead to Increased Efficiency at Southern Piedmont AREC





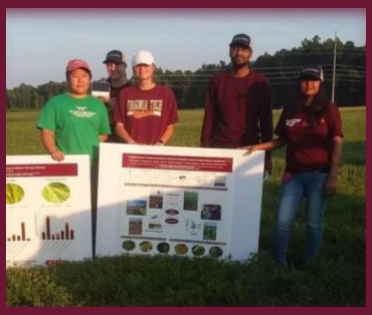

The Southern Piedmont AREC has had many exciting additions and upgrades over the last year. From building and structure renovations to new equipment additions, we improved not only our efficiency in the field but also the comfort and convenience of our employees and visitors. Renovating restrooms in our main office and field crew's facilities buildings, repaving our parking areas and main travel fairways, and gravel road repairs are just a few examples.

Thanks to the hard work of several of our field crew employees, we are boasting new cooling systems in our greenhouses and digital controllers are also being installed to continuously monitor and maintain glasshouse conditions.

We have also acquired a new John Deere GPS tractor, Zurn plot harvester combine, Zurn plot seeder, and cattle shade structures. We are excited about the benefits these new additions will bring to our programs, including increased efficiency in planting and harvesting a wider range of crops. Two plant growth chambers, a high-performance liquid chromatography, molecular equipment, and a field truck are other examples of our other newly acquired equipment that will facilitate our research and help us to better serve our community.

These would not have been possible without support from the Commonwealth of Virginia, Virginia Tech's College of Agriculture and Life Sciences, and the Virginia Agricultural Experiment Station.

Public Outreach and Events Help to Bring SPAREC and the Community Closer Together

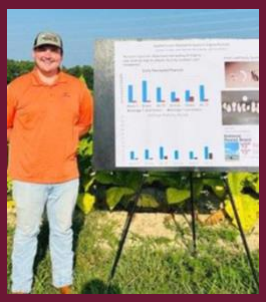


We pride ourselves on our dedication to educational outreach and a positive community impact. It is vital that we are open, transparent, and informative in our work and the work of others in the scientific community. We are fortunate to have the support of Virginia Agricultural Experiment Station, Virginia Cooperative Extension offices, cattlemen associations, farmers and consumers in our quest to inform and educate as many people as possible. We have had extraordinary attendances in all the educational outreach events that we hosted, including 3rd and 5th grade Ag Awareness, Field Day tours, pesticide application classes, and livestock handling classes. Our biggest event of the year, Family and Farm Day, was attended by 1,047 people this year.

We are also proud to partner with the Amelia Cattlemen's Association to host events such as our Bull Breeding Soundness Exam. We have farmers from all over Southside Virginia bringing in their breeding bulls for examination and assessment to ensure they are at peak production. Additionally, we host a herd of yearling heifers every year for our Heifer Development Program. Our local cattle farmers can enroll their young livestock to be brought in and fed out to their finishing weight while also being bred with top-of-the-line artificial insemination practices. This year we have 6 farmers and 65 head of cattle participating.

None of this would have been possible without the support from the college, our community, leadership council, faculty, staff, students, and other stakeholders.

Meet the Graduate Students and Scholars



Eli Hoar came to us after completing undergraduate studies at Virginia Tech. He is currently working on his master's degree in entomology, with a focus on chlorpyrifos alternatives to be used in Virginia type peanuts. This is his second field season in the Tidewater region.

Shirin Parizad came to Virginia Tech after receiving her first Ph.D. in plant pathology from the University of Tehran, Iran. That Ph.D. study was focused on plant-virus interactions. She is currently a research assistant/ Ph.D. student in entomology at Virginia Tech, studying insect-plant-virus interactions focusing on wheat and natural vegetation, cereal aphids, endophytes, and the cereal aphid- born barley yellow dwarf virus (BYDV) epidemiology.

Md Mostafa Masud was born in a small village in the southeastern part of Bangladesh, named Charkhagaria. He completed a B.S. in agriculture at Bangladesh Agricultural University, Mymensingh, majoring in agricultural science. Afterward, he completed a M.S. in plant pathology from the same university. In Summer 2023, he joined Virginia Tech as a Ph.D. student with a focus on plant pathology in the School of Plant and Environmental Sciences. He will be studying tobacco-*Phytophthora nicotianae* interactions.

Usha Panta is a Ph.D. student in Entomology who joined us after completing her undergraduate studies at the Institute of Agriculture and Animal Science College in Nepal. Currently, her research project focuses on examining the impact of biofumigation on springtails, as well as their recovery time following biofumigation. Additionally, she is investigating the effects of biofumigation on the reproduction and survival of above-ground herbivores, specifically aphids, when the plants (wheat and tobacco) are grown in biofumigated soil. She is also the winner of the 2023 Entomological Society of America's best poster award!

Atoosa Nikoukar came to Virginia Tech in August 2022 to finish her Ph.D. in entomology after receiving her M.S. in entomology from the University of Idaho, Moscow. Her research project focuses on integrated management approaches against wireworms, the larval stage of click beetles (Coleoptera: Elateridae), which damage a wide range of cash crops including tobacco, cereals, and vegetables.

Carter Phillips grew up in Rustburg, Virginia on a farm raising Angus cattle. His project focuses on establishing legumes in native warm season grasses to improve their nutritive value and the distribution of forage throughout the season. He graduates in December with an M.S. and then plans to work in the industry.

Priyanka Gangwar joined Virginia Tech's Southern Piedmont AREC as a postdoctoral researcher in the plant pathology program in April 2023. She received her Ph.D. in plant biotechnology from Amity University in India and served as an Assistant Professor in the Department of Biotechnology at Kanpur Institute of Technology between Aug 2022 to Feb 2023. Gangwar aims to elucidate synergisms between *Fusarium oxysporum*, *Phytophthora nicotianae*, and *Ralstonia solanacearum* in cultivated tobacco and its wild relatives.

Hadi Farrokhzadeh came to Virginia Tech in November 2022 after receiving his master's in agriculture entomology from Ferdowsi University of Mashhad, Iran. His research focused on endophytes fungi. He is currently a Ph.D. student/ visiting research scholar in entomology at Virginia Tech, researching on application of entomophatogenic fungi (Beauveria bassiana) as endophytes to protect cotton against corn earworm and fall armyworm, and evaluation of cotton immune gene expression.

Recent Publications

Books and Book Chapters:

Eigenbrode S. and **Rashed, A.** 2023. Advances in understanding insect pests affecting wheat and other cereals. P. 487. Burleigh Dodds Science Publishing, Cambridge, UK.

Rashed, A. and E.J. Wenninger. 2023. Advances in managing wireworms in cereal crops: challenges and future directions. Pp. 311-37. In Advances in understanding insect pests affecting wheat and other cereals (eds. S. Eigenberod and A. Rashed). P. 487. Burleigh Dodds Science Publishing, Cambridge, UK.

Research Publications (selected):

Alaryan, M.M., **Zeng, Y.**, Fulladolsa, A.C. and Charkowski, A.O. 2023. Brassica cover crops and natural Spongospora subterranea infestation of peat-based potting mix may increase powdery scab risk on potato. Plant Disease, 107:2769-2777.

Pollok, J.R., **Johnson, C.S.,** Eisenback, J.D., **Reed, T.D.** and **Adamo, N.** 2023. Effect of Soil Temperature on Reproduction of Root-knot Nematodes in Flue-cured Tobacco with Homozygous Rk1 and/or Rk2 Resistance Genes. Journal of Nematology, vol. 55, DOI: 10.2478/jofnem-2023-0032

Yari, S., Hajiqanbar, H., Farazmand, A., **Rashed, A.** and Fathipour, Y. 2023. Efficacy assessment of Neoseiulus cucumeris at different release rates in control of Frankliniella occidentalis on rose plants under laboratory and microcosm conditions. Systematic & Applied Acarology, 28: 607-618.

Yuan, J., Zhao, K., Tan, X., Xue, R., **Zeng, Y.**, Ratti, C. and Trivedi, P. 2023. Perspective on the development of synthetic microbial community (SynCom) biosensors. Trends in Biotechnology, 41: 1227-1236.

Extension Publications and Reports (selected):

Rashed, A., Clements, J. Saeed, A. 2023. Alfalfa Leafcutting Bee. University of Idaho Extension. BUL 1050.

Reed, T.D., Rashed, A., Zeng, Y., Barts, S. 2023 Flue-Cured tobacco Production Guide. Virginia Tech Cooperative Extension 436-048.

Zeng, Y., Wilkinson, C.A. 2023. Evaluation of frog eye leaf spot and Cercospora leaf blight severities and yield performance of maturity group IV soybean cultivars in Nottoway County, Virginia, 2022. Plant Disease Management Reports 17, CF0059.

Grant Awards

During 2023, the Southern Piedmont AREC's Applied Forages, Crop Production, Entomology, Plant Pathology, and Tobacco Agronomy programs have secured funding from federal, State (including commodity board funds, and private industry totaling upwards of $1,034,000 to support their research on various aspects of tobacco, forages, soybean, corn, wheat, mung bean, and hazelnut production.

Staff Spotlight

PJ Shepherd was nominated for the President's Award this year. She has dedicated her time, attention, and expertise to making Southern Piedmont activities and events the best that they can possibly be. Shepherd is the sole organizer of our 3rd and 5th Grade Ag Days, as well as our yearly Family and Farm Day! This year, she introduced new attractions to our Family and Farm Day event, such as rock wall climbing, the Keystone Truck and Tractor Museum, Fire Safety and First Aid, and more. Thanks to her, our Ag Awareness Days have become an award-winning affair!

Shepherd works closely with External Project Leaders to ensure that their research quality is paramount, while also assisting the field crew and other faculty as necessary. Whether she is called on to pull tobacco, collect seed, paint offices, direct and organize events, or take part in data collection, she always gives her greatest effort in every aspect of the job and always with a smile.

In honor of Staff Appreciation Week, SPAREC faculty, staff, and students enjoyed a group trip on May 17, 2023.

The Powers Memorial Scholarship was awarded to Robert Hite (left) by Dick Powers (right) at the Virginia Tech Southern Piedmont Agricultural Research and Extension Center (AREC) during our Tobacco Field Day on July 27, 2023. The scholarship was established in memory and honor of the contributions made by Danny Powers to agricultural research at the Southern Piedmont AREC.

Congratulations to Jimmy Morris on receiving the CALS Employee of the Month Award in December 2022. Morris has been a member of our field crew since 2007. He serves in many key roles at SPAREC, including overseeing our cattle operations, silage studies, small grain variety studies as well as the planting of our soybeans, sorghum, and corn studies.

New and Upcoming Programs

This year, we launched a program testing new and old organic vegetable production practices. The organic vegetable garden was planted and tended to in a way that represents organic growing practices for local producers to follow. Many crops that are traditionally grown in the area were represented in the test, including tomatoes, many varieties of hot peppers, eggplant, okra, squash, zucchini, white potatoes, and sweet potatoes. Each vegetable planted was represented by several different varieties in each category. This was a small-scale start-up test that we are hoping to expand on in the future. The organic vegetable market in Virginia is expanding, and we hope to not just keep up but to spearhead the production of these crops and help our producers be successful in their endeavors.

Here at the Southern Piedmont AREC, we are looking to improve and diversify our cover crop rotation and conventional crop rotation. We are exploring many new possibilities in the cover crop realm, including less commonly used cover crops such as tillage turnips/radishes for soil aeration and easier field preparation, arugula for fields that have a high bacteria or fungus pressure, legumes such as vetch, Austrian winter peas, and crimson clover in fields that need a nitrogen boost, and many others such as cereal rye, oats, rye grass and barley for bailage for our cattle program.

We are also looking to expand our range of harvestable crops/cover crops to become more self-sustainable and bring in beneficial revenue. This could be in the form of soybeans, corn, canola/rape seed, or sorghum. We are excited to see what is successful for our location and the markets that we will be working with.

www.arec.vaes.vt.edu/arec/southern-piedmont.html

Did You Know ?

The Southern Piedmont AREC:

- is one of the 11 off-campus research stations in the College of Agriculture and Life Sciences, with nearly 1200 acres of timber, research fields, ponds and grazing land.
- was opened in 1974 to address the agricultural needs of 23 counties in the Southern Piedmont Region of Virginia.
- has the only tobacco research program in the State and one of the largest in the country.

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