

Agricultural Research Service
Small Farm Research Agri-news

**Dale Bumpers Small Farms
 Research Center Newsletter
 Booneville, Arkansas**

**Greetings from the Acting Research Leader,
 Dr. Joan Burke**



Dr. Joan Burke

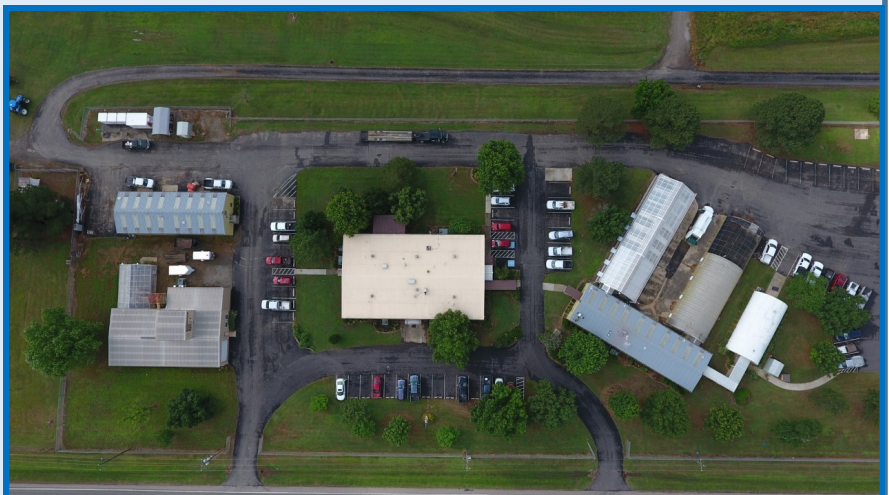
The new year is starting out busier than ever! Dr. Joan Burke was appointed as Acting Research Leader for a 90-day detail while Dr. Owens serves on an Area Detail (see on page 2). USDA remains on maximized telework due to the pandemic. This means that only essential personnel (primarily those caring for livestock and the grounds/property) and those conducting mission critical research tasks can be at the Center. There are several mission critical projects which can be found on our website here:

[Research Programs and Projects at this Location : USDA ARS](#), and the main project, “Sustainable small farm and organic grass and forage production systems for livestock and agroforestry” uses appropriated congressional funds. Grant-funded and collaborative research

support the objectives in the main project. Currently, we have three scientists (four upon the return of Dr. Owens) and a postdoc along with support staff responsible for research, writing and publishing manuscripts (technical and farmer-friendly), and disseminating research results. Soon, we will begin the writing of the next five-year research project. USDA ARS National Programs will be gathering input from stakeholders like you on researchable questions through listening sessions that will be announced this spring. Please reach out to our scientists regarding any new research ideas that you have that fit within our Center mission.

Current research by Dr. Burke includes measurements of phenotypes of sheep for genetic selection for more robust production, (continue on page 2)

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Arial photo of headquarters

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(continued from page 1) economic and practical use of *Duddingtonia flagrans*, a nematode trapping fungus, to control gastrointestinal parasites on pasture for small ruminants, organic and conventional sheep production, and benefits of out-of-season breeding in sheep. Collaborations are with the University of Nebraska, USDA ARS in Clay Center, NE and Dubois, ID, University of Idaho, Louisiana State University, University of Rhode Island, and others.

Current research by Dr. Christine Nieman, Dr. Zamir Libohova, and Dr. Phillip Owens includes forage establishment and management in Arkansas' silvopasture for small beef producers; innovative nutrient management options for sustainable pastureland intensification; improving productivity, sustainability, and resilience of Eastern grasslands utilizing native grasses; evaluating nutrient transformations over time following subsurface banding litter; inclusion of quebracho tannin as a silage additive in tall fescue silage; and effects of poultry litter on baleage nutritive value and pathogen contamination.

Collaborators include universities: University of Arkansas, University of Tennessee, University of Missouri. Collaborators also include Winrock International and USDA ARS locations in Madison, WI; Fayetteville, AR; Marshfield, WI and Lexington, KY. Dr. Nieman focuses on forages and how they affect livestock; Dr. Libohova focuses on introducing new tools such as remote and proximal sensing, in combination with in situ field sensors and spatial analysis to improve farm management practices such as grazing, raw crops and soil health. Dr. Owens focuses on soil mapping and looking through machine learning at how water and other factors such as soil, climate, and management affect the functionality of agricultural landscapes and improve the efficiency of farm operations.



2021 calf and cow



Seed bed preparation in pine tree plots

Dr. Phillip Owens accepts New Temporary Detail



Dr. Phillip Owens

On January 3, 2022, Dr. Phillip Owens began a 90-day detail as Southeast Area's Acting Associate Area Director located in Stoneville, Mississippi. The Southeast Area is comprised of 10 states and 2 US territories, which includes 66 USDA-ARS research units. In this leadership role, Dr. Owens will be focused on operational management of the research units within the Southeast Area. He will return as Research Leader on April 1 and will continue the Center's mission to utilize tools and strategies to improve small farm systems.

Dr. Christine Nieman's Cattle Research Spotlight



Dr. Christine Nieman

This spring we will start a new cattle grazing project at the center. This project will evaluate three grazing systems, a conventional tall fescue (KY31) system, and two “complementary systems”. Complementary systems composed of a cool season species which grows best in spring and fall, and a warm-season species which grows in the summer months. The different growth rates are illustrated in Figure 1. In these complementary systems, cattle will graze tall fescue in the spring, and in summer, cattle in the one complementary system will graze Eastern gamagrass and the other complementary system will graze a mixture of big bluestem and Indiangrass.

Cattle from both complementary systems will return to tall fescue in the fall (Figure 2). Cattle on the conventional tall fescue system will stay on tall fescue for the whole grazing season. The systems comparisons will have two major goals; 1) to evaluate the temporal distribution of forage biomass among systems and effects on cow and calf performance and 2) to evaluate any implications of reduced exposure to toxic endophyte on the complementary systems and subsequent effects on pregnancy rate and cow and calf body weight gain. We hypothesize that cow and calf body weight and pregnancy rate will be greater on complementary systems. This project is funded by NIFA and has collaborators from the University of Tennessee and the University of Missouri. Both collaborators have replicates with similar grazing systems at their university research centers. This project will start this year and will continue for 3 years.

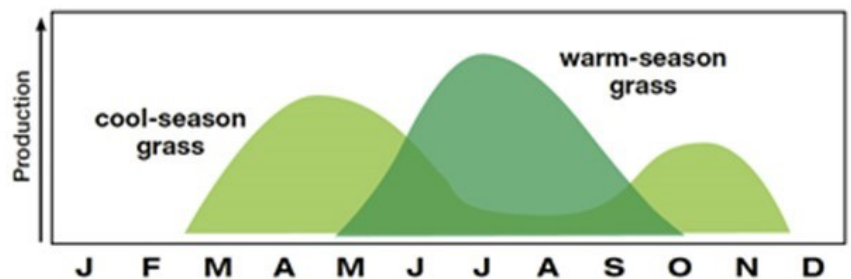


Figure 1. Warm and cool season growth patterns. Figure from USDA NRCS Native grasses for livestock 2015.

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	Spring	Summer	Fall
System 1	Tall Fescue	Tall Fescue	Tall Fescue
System 2	Tall Fescue	Eastern Gamagrass	Tall Fescue
System 3	Tall Fescue	Big bluestem & Indiangrass	Tall Fescue

Figure 2. Grazing schematic for the project “Back to the Future: Improving Productivity, Sustainability, and Resilience of Eastern Grasslands”. System 1: Conventional tall fescue system (KY31), cattle remain on this system for the entire growing season; System 2: Tall fescue grazing in spring, eastern gamagrass in summer, and back to tall fescue in fall; System 3: Tall fescue grazing in spring, big bluestem and Indiangrass in summer, and back to tall fescue in fall.

Dr. Joan Burke's Small Ruminant Research Spotlight



Dr. Joan Burke

Rollout of Genomic Enhanced Estimated Breeding Values in NSI

One of the greatest health challenges to small ruminants in warm, humid climates is gastrointestinal nematode parasites. Dewormers are no longer effective at controlling parasites due to worm resistance to the dewormers. An effective approach to manage these parasites is genetic resistance by the animal. It turns out that it is a moderately heritable trait, and through fecal egg count data submission to the National Sheep Improvement Program (www.nsip.org), producers can receive estimated breeding values (EBVs)

on individual sheep as an estimate of how resistant the animal is to worm parasites. ARS funds and a grant from USDA NIFA, Organic Research and Education Initiative led to a collaboration with 22 sheep farms that collected phenotypic data and DNA samples for genomic evaluation which led to building a reference population of more than 5,000 animals. Collaboration with Dr. Ron Lewis from the University of Nebraska yielded the rollout of genomic-enhanced EBVs (GEBV) in October 2021. The GEBV will lead to greater accuracy of parasite resistance, as well as, other economically important traits. The farmers have continued to build upon this by collecting a subsample of their flocks for genotyping after the grant project ended. Many producers are excited about the science and technology behind the GEBV. For more information see the article by Dr. Andrew Weaver and producers (and farm collaborators) Lisa Week and Kathy Bielek: [Overview-GEBV-Article.pdf](#) (nsip.org) found on the NSIP website. We will have several sheep for sale with GEBVs who have been genotyped in April and July this year. Check our website for information of the online sales!

Winter lambing is underway at the Dale Bumpers Small Farms Research Center.

Winter lambing occurs in January/February and consists of yearling ewes lambing for the first time and mature ewes that did not breed out of season for fall lambing. Winter lambing has many difficulties including potential for extreme weather, poor forage, and recently and most difficult the potential of Cache Valley virus (CVV). Cache Valley virus is a mosquito or midge transmitted disease that can cause infertility, abortion, stillbirth, dystocia and mild to severe deformities in lambs. The virus affects ewes within the first 60 days of pregnancy. Ewes infected early in that period are likely to abort, whereas ewes that are infected later in that period are likely to produce lambs with deformities. During breeding season for our winter 2022 lambing season, we took a few extra precautions to lessen the prevalence of the virus. Working with our attending veterinarian, Python Insecticide cattle ear tags were attached to sheep collars and placed around the ewe's neck for this period (active ingredients Zeta-cypermethrin 10%, Piperonyl Butoxide - Technical 20%). The breeding group was kept small and housed in a pasture with no low-lying, damp areas to reduce the ewe's exposure to mosquitoes during this vulnerable time. While this is considered an observational study, we will keep you updated on minimizing CVV.



Ewe with new lamb

Staff Spotlight– New Hires



Dr. Edwin Winzeler received a bachelor's degree in Natural Resources and Environmental Sciences from the University of Illinois and a M.S. and PhD from Purdue University in Soil Science, Agronomy. As an undergraduate he studied soil variability and fertility of the 140+ year-old Morrow Plots at the University of Illinois research farm. His PhD involved the development of a mapping application of the soil climate classification system of the USDA to examine soil climate changes over time. Dr. Winzeler also conducted research on soil potassium availability in a suite of agricultural soils in southern Indiana. Additionally, he helped in the development of soil mapping tools for the Terrain Attribute Soil Mapping (TASM) effort of the USDA.

Prior to joining the Dale Bumpers Small Farms Research Center, he worked for Pennsylvania State University at the Fruit Research Extension Center on challenges in fruit tree horticulture and entomology. His research interests involve the use of geographical information systems (GIS) to model the variability of agricultural systems, with particular emphasis on soil moisture, terrain indices, and the development of dynamic soil information systems within artificial intelligence (AI) frameworks. Through his research Dr. Winzeler aims to increase the performance efficiency of small farms with limited resources by incorporating geospatial tools and AI in day-to-day operations.



Warren Robertson is excited to start his journey with the USDA as a Agricultural Science Research Tech. His goal is to learn as much as possible and be an asset to the Dale Bumpers Small Farms Research Center. Warren is currently a Senior at the University of Arkansas in pursuit of a degree in Plant, Soil, and Environmental Sciences and has a passion for agriculture.

He is from Little Rock, Arkansas and has been around the farming industry his whole life. He worked on the family farm, 20 miles east of Little Rock, since he was young and hopes to bring practical experience to the center. Warren will be working for Dr. Phillip Owens and Dr. Amanda Ashworth focusing on a precision agriculture and looks forward to learning from such distinguished scientists in the field. Warren enjoys deer, duck, and especially turkey hunting and loves being outdoors in any capacity. He also enjoys watching football and baseball and is a lifelong Razorback.



Elora Pierce is a Biological Science Technician for at the Dale Bumpers Small Farm Research Center. She works for Dr. Burke in the field and laboratory assisting with small ruminant research trials and analyzing animal samples. Elora is from Bay Saint Louis, MS and graduated from the University of Southern Mississippi in 2021 with a bachelors degree in marine biology and a minor in chemistry.

Cattle Program Update



Winter is here and the cattle crew is staying busy with the usual hay and feed routine as well as preparing for a few upcoming re-search projects involving the farm's cattle. Winter also means calving season is close! The crew is gathering the supplies and ensuring facilities are ready to go for the 2-3 month calving season.



USDA, Natural Resources Conservation Service
Booneville, Arkansas Plant Materials Center

The [NRCS PMC 2021 Review of Activities](#) was published.

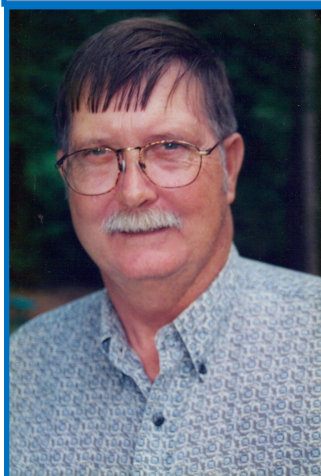
Other PMC Information is available online at: <http://www.plant-materials.nrcs.usda.gov/arpmc/>

To view archived newsletters or to find publications, please visit our website at :



<https://www.ars.usda.gov/southeast-area/booneville-ar/dale-bumpers-small-farms-research-center/>

In Remembrance...



Billy Moore, age 79, passed away Sunday, January 9, 2022 in Lincoln, Arkansas. He was born August 1, 1942 in Potter, Arkansas. Billy held a Masters Degree in Agriculture from the University of Arkansas. He worked for the University of Arkansas Plant Pathology Department for 18 years, and 19 years for the Cooperative Extension Service. He was stationed at the Dale Bumpers Small Farms Research Center as a State Alternative Farm Specialist.

He was active in 4-H, Cattlemen's Association, various Garden Clubs, judged many county fairs and was on the Board of Directors for Sebastian County Farm Bureau.

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