May 2021

Agricultural Research Service

Small Farm Research Agri-news

Dale Bumpers Small Farms Research Center Newsletter

Greetings from the Research Leader, Dr. Phillip Owens

The weather is improving and so is the activity at the Dale Bumpers Small Farms Research Center. As you drive by the Center, you will see a lot of activity on the east end of the farm. We have renovated the research paddocks through the leadership of the Stations Operations Manager Larry Huddleston and his team. They have built fence, cleared pastures, planted forage and are utilizing the patented "Subsurfer" to prepare for cattle grazing research. Dr. Christine Nieman is leading a project evaluating different forage and nutrient management options with stocker cattle.

While organizing that research, we have built several barns to replace structures damaged from the 100 mph wind that hit us almost 2 years ago. The amount of work on research and farm improvement has been tremendous over the last few years and all of these improvements are due to the dedicated employees we have at the Dale Bumpers Small Farms Research Center. Our research center has focused on animal operations improvement as well. Within the last year, we have joined the Natural State Preconditioned Calf "Go Green" program coordinated by the University of Arkansas Extension Program. This program allows producers to get credit for outstanding practices for animal health and assures buyers of healthy animals. Additionally, we have initiated an online records keeping software that allows us to track each animal to make management decisions regarding growth and productivity. These improvements are employee led initiatives that improve quality and efficiency of operations. (continued page 2)

In this issue:

The sheep crew are making national and international impact. Recently, Dr. Joan Burke had requests from Australia for information on biologic control of internal parasites. Annually, our herd of sheep grows to a point where we must sell animals to maintain numbers. This year we had sheep sale to local area producers as well as producers from throughout the US. The genetics developed on our farm are desired due to the parasite resistance which benefits the farmer's bottom line. Having our Center in Booneville make impacts and improvements for farmers in Arkansas and around the world which is a great source of pride for our employees. We are looking forward to the day when we can invite you join us at the research center to see more of our activities. Please stay in touch with us because we are here to use research to find economic solutions for small-holder farmers.

Earth Day 2021

Purple Martin and Bat Houses

April 22, 2021 was Earth Day. Every year employees of the Dale Bumpers Research Center celebrate Earth day with a presentation, wonderful lunch and fun activities with a special project. This year was a little different. We had an online meeting with videos featuring bats and Purple Martins, where we learned of their ecological importance. We purchased 3 bat houses and 4 Purple Martin birdhouses. The houses were erected close to animal pastures for help with insect control. We believe these new houses will encourage both bats and Purple Martins to make their home at the center. Below are some facts we learned on Earth Day 2021.

Purple Martins are native songbirds in the swallow family and almost always nest in human-supplied housing. They are dependent on humans for their survival, but also benefit humans greatly by eating insects The most important step in attracting Purple Martins is choosing the location for the martin houses. Martin's housing needs to be placed in open areas with clear flyways about 120 feet from human housing and at least 30 feet from trees in the south. Purple Martins only use housing during the breeding season, so, having housing ready at breeding time is critical. Purple Martins are vulnerable to predators such as hawks, owls, raccoons, snakes, and squirrels.

There are over 1,400 species of bats world wide. The world's smallest mammal is the Kitti's hog-nosed bat which weighs less than a penny. The largest bats are the flying foxes, which can have a wingspan of up to 6 feet. Over 300 species of fruit depend on bats for pollination. Bats help spread seeds for nuts, figs, bananas, avocados and cacao. Without bats, we also wouldn't have plants like agave or the iconic saguaro cactus. The U.S. and Canada are home to about 45 species of bats. Each night, insect-eating bats can eat their body weight or more in insects. They can greatly reduce the need for pesticides.

Dr. Christine Neiman Research Spotlight

Dr. Christine Neiman

With the start of the growing season, we are back in the forest evaluating forage growth in both the thinned hardwood forest plots and the loblolly pine plantation plots.

In the previous newsletter, we described the forage establishment study in the hardwood forest, in which we thinned an oak forest to allow light penetration for forage growth and future development of a silvopasture. Planting of orchardgrass and novel endophyte tall fescue occurred late fall of 2020. Photos were taken the week of April 11. Both forages have emerged and are proving to be very productive, covering the forest floor in the planted areas. We are very impressed and a bit surprised on how successful establishment has been in this experimental area. We will allow the forages to continue to grow, expand their root systems, and produce seed. After they reach the reproductive stage, we will take our first harvest and start monitoring production. So far, it looks like they are off to a good start.

Forage production in the pine plantations has started early and we have already completed the first harvest. The 8 forage species in the pines are novel endophyte tall fescue, orchardgrass, alfalfa, white clover, Italian ryegrass, annual ryegrass, crimson clover, and arrowleaf clover. At this time last year, all plots were dominated by annual ryegrass, as seed from previous years germinated and outcompeted the other species. However, this year the plots look much different. All species can be found in their respective plots. The expected spring standouts were the Italian ryegrass, annual ryegrass, and orchardgrass, which are all strong forages in shaded areas. However, what was surprising this year was the boom in white clover production, sometimes resulting in the takeover of adjacent perennial species plots that are less competitive in the shade such as alfalfa and tall fescue. Figures 3 and 4 show the vigorous white clover plots that are “moving” into other plots. White clover is considered a somewhat “mobile” forage species because it can reproduce via stolons which allow them to expand into bordering plots. The success of white clover in these plots is very promising, as many producers know, legumes are notoriously difficult to maintain in open pastures. Therefore, in Arkansas, silvopasture may be a means for maintaining highly digestible forage species and could be strategically incorporated into grazing systems, either to increase nutritive value when livestock nutrient requirements are high or as a reprieve from toxic tall fescue. It has been interesting to see how the botanical composition of the plots have changed over the past year, we will continue to keep you updated on interesting changes in future newsletters.

Figure 1 and Figure 2. Orchardgrass and novel endophyte tall fescue plots in the thinned hardwoods. The hardwood forest was thinned in summer and early fall in 2020, and forages were planted with a Brillion seeder in late fall 2020.

Figure 3. A healthy white clover plot planted in a 25-year-old loblolly pine plantation. Planting occurred in fall 2019.

Figure 4. Vigorous white clover expanding into neighboring plots. Plots are outlined with the orange flags. White clover has taken over three plots in this alley!

New GoGreen Cattle Program

Despite the pandemic and other obstacles, the Dale Bumpers Small Farm Research Center made some impactful changes to their cattle program this year. With implementing the GoGreen calf program as well as enlisting the farm in the national BQA (Beef Quality Assurance) program, the DBSFRC is committed to improving the health and well-being of the cattle while also demonstrating the effectiveness and profitability of these programs.

GoGreen is a program developed by the University of Arkansas-Cooperative Extension Service (www.uaex.edu/farm-ranch/animals-forages/beef-cattle/precon.aspx) to recognize calves that have experienced the best management practices up to the date of sell. To qualify for the green tag a calf must be weaned 45 days prior to sell and received its last vaccination 14 days prior to sell. The vaccines required for this program include IBR/PI3/BVD/BRSV, Clostridia, and Mannheimia Haemolytica with boosters if indicated on label. They must be past all withdrawal dates for any antibiotics and treated for internal parasites. All heifers must be open and bull calves must be castrated and completely healed by time of sell. Horns must be removed and healed, and all calves must be exposed to feed from a trough and water from a tank. Calves in this program yield higher profits because these qualifications ensure buyers will receive the healthiest calves with the best odds of success.

Alongside GoGreen is the Beef Quality Assurance program. The BQA is a nationally coordinated program that is implemented to ensure consumers that all aspects of the beef they are buying is top quality from farm to table. All individuals that care for the cattle must go through a 4–5-hour training and pass a test to qualify for the program. To certify a farm, a veterinarian from BQA must monitor the facility working the cattle through a chute and giving vaccines to determine all methods used are humane and shots are given with correct placement. With BQA knowledge, the DBSFRC is further improving the health and quality of the beef cattle herd.

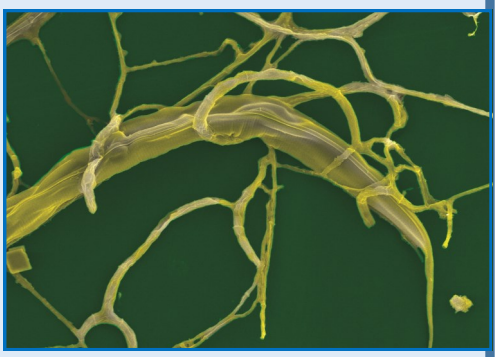
The center is wrapping up calving season with over 80% of the calves on the ground and only 3 weeks left to go with a 55% heifer percentage. The cattle crew is preparing for spring vaccinations that will begin in the upcoming weeks. In the meantime, the crew is working with Dr. Christine Nieman on a group of 112 cooperator steers that will soon go on a grazing study. The DBSFRC also just recently bought 3 new Stabilizer bulls from a cattle company based in Colorado. All 3 bulls should provide low birth weight and easy calving with optimal performance ratings. Raising cattle requires continuing education and practices that benefit the bottom line and we continue to explore options for our local producers.

Small Ruminant Research Spotlight

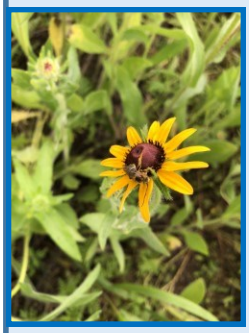
Dr. Joan Burke

Worm-trapping Fungus Fact Sheet

A new fact sheet, authored by Dr. Joan Burke (ARS) and Dr. James Miller (Louisiana State University) can be found on the American Consortium for Small Ruminant Parasite Control website (www.wormx.info) and was revised for the Australian equivalent worm program Wormboss. The fact sheets reach hundreds of farmers who represent as many as millions of sheep from the U.S. and Australia. Researchers from both sides of the globe often collaborate on issues of worm control in sheep and goats. In fact, the worm-trapping fungus provided as BioWorma® is a collaboration with Animal Health Products from Australia who provide product for a research project underway in Booneville (a 3-year project on economic and effective use of BioWorma). The worm-trapping fungus is the only gastrointestinal parasite control method that works on pasture by stopping infective larvae before they re-infect sheep and goats (and other livestock). More on this can be found in the fact sheet.



Color of trap influences sampling of bees and other insects in livestock pasture ecosystem



Decline of insect pollinators which wholly support our plant food production has increased the importance of accurately monitoring pollinator diversity and abundance over time. Collaborators from the USDA Agricultural Research Service, University of Arkansas, Long Island University and University of Maine determined that blue pan traps attracted the highest rates of bees and enabled scientists to understand species richness, but yellow and green traps captured more insects in general than blue and purple. These results can be used to guide research to understand relative abundance, richness, similarity and community assemblage patterns of insects in native grass and forb (non-grass) pastures which is important to entomologists, food scientists, environmentalists and ecologists. (Submitted for publication in Biology Journal)

Spring Katahdin Sheep Sale

The Small Ruminant crew held their Spring Katahdin sale online this year on the Willoughby Livestock Sales website. The sale included ewe and ram lambs born in Fall 2020 and a few mature ewes. Animals selected for this sale are enrolled in the National Sheep Improvement Program (NSIP) and are in the top of the Katahdin breed with parasite resistance and other traits. The sale was open for bidding from 7am-7pm April 14th and utilized racehorse style closing which extends the auction for 5 minutes each time a bid is placed after original close time. The sale finally ended at 8pm with total sales of $18,392 for 55 sheep. (page 6 continued)

This platform made for an exciting sale as the bids were viewed in real time. There were 280 bids placed by 19 bidders, but over 60 bidders were registered and watching the sale. The sheep will be going to 6 different states, with several staying locally in Arkansas.

The next DBSFRC sale will be held on July 28th using the same platform which will include lambs born in Jan 2021 and more mature animals than the previous sale. These animals will likely have higher EBVs and make for another exciting sale! Sale info will be available on our website by late June: Dale Bumpers Small Farms Research Center : USDA ARS. Look for lambs sired by one of the highest parasite resistant rams in NSIP. The NSIP is a program that allows farmers to record and enter traits on pedigreed animals (those with known parentage history). It benefits not only seedstock producers (farms that focus on producing replacement animals) but the commercial industry as well in that commercial farmers can purchase animals of known genetic traits to accelerate their farm goals. Most notably, commercial farmers can easily incorporate parasite resistant sires to make offspring more resistant to gastrointestinal parasites which can cause problems around weaning time. For more information on NSIP visit www.nsip.org.

Staff Spotlight

Retirement Announcement

Long-time ARS employee, Jacquelyn “Jackie” Cherry retired from the DBSFRC on March 31st. Jackie started working at the Center on June 28, 1992, as a Biological Technician for Dr. Mike Brown working with both cattle and sheep. In 1999, she transitioned to Dr. Joan Burke’s research team on projects that included sheep and goats. Over the years Jackie has served a vital role in regards to research support, purchases, property control, environmental management, and safety. She always excelled at the many roles that she was tasked with over the years. She organized and participated with many animal projects and facility events. Jackie was an intricate leader in outreach by organizing school tours, teacher programs, and representing the station at conferences and events, particularly with the station mascot at the time, Ivory. We will miss having Jackie at the station, but we are comforted in knowing that she will remain our friend due to the great bonds that she developed with her coworkers. Congratulations to Jackie on her retirement and we all hope you enjoy the next phase of life and happiness.

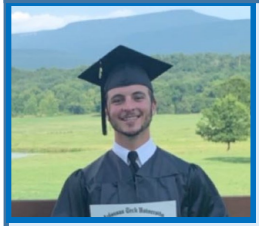
Transferred to NRCS

Steve Haller has taken a new position with USDA-NRCS at the Booneville Plant Materials Center. During his 25-year career at ARS, he worked as a Biological Science Technician for Dr. Dan Pote, Research Soil Scientist (retired) at the Dale Bumpers Small Farms Research Center. Steve worked for several years developing ways for farmers to make better use of fertilizer nutrients applied to pastures and cropland. He is co-inventor of a patented farm implement called "Subsurfer". The Subsurfer utilizes a no-till system to apply dry poultry litter or inorganic fertilizers under the soil surface, reducing nutrient losses to runoff and volatilization. Thus, conserving nutrients for plants to use and providing better water quality downstream. Steve joins the USDA-NRCS Plant Materials Program as an Agronomist / Soil Conservationist. The program develops plants and plant technology that helps to solve conservation needs. Information obtained at the Plant Materials Center is passed on to the public and NRCS field staff to better assist landowners on working farms and ranches.

New Hires

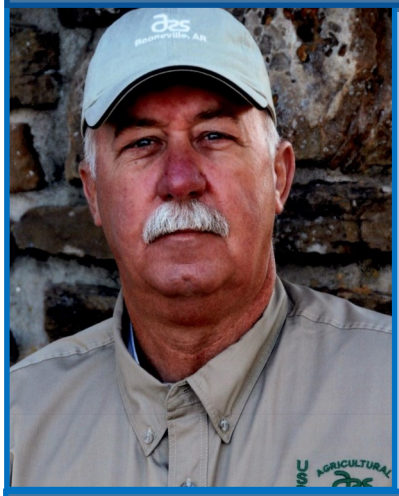
Harrison Smith is a data scientist who specializes in the use of Geographic Information Systems (GIS) and remote sensing to study issues in sustainable food systems and biodiversity conservation. He earned a Bachelor's degree in Biological Sciences from the University of Arkansas in 2016, with particular emphasis on ecology, conservation, and Spanish language. In 2019, he graduated with a Master of Science from the University of Michigan School for Environment and Sustainability. Currently he is working with Drs. Amanda Ashworth and Phillip Owens on various projects, including monitoring post-mining land reclamation efforts at the Tar Creek superfund site, and applications of Ground Penetrating Radar for soil characterization in an experimental agroforestry plot.

Jacob Nichols is an Agricultural Research Technician here at Dale Bumpers, working on the cattle crew. Jacob grew up in Booneville and pursued a bachelors degree in Recreation and Park Administration with an emphasis in Natural Resources from Arkansas Tech University In Russellville, graduating in 2015. He interned and worked seasonally for the US Army Corps of Engineers and the National Park service. Jacob grew up on a family farm and have always taken great interest in farming.



Ethan Fairbanks is a Biological Science Technician at the Dale Bumpers Small Farm research station. He was born and raised in Magazine, Arkansas. He graduated from Arkansas Tech University with a Bachelors of Science degree in Agriculture Business with an emphasis in Animal Science in 2020.

Danny Henson Remembered...



On Wednesday February 24, 2021, Danny Henson passed away at the age of 65. Danny was a retired Engineering Tractor Operator at the Dale Bumpers Small Farms Research Center. Danny was actively involved in the development of the research pastures and facilities during the 1980's. Danny was a true professional in the operation of all kinds of equipment, and was meticulous with the care of the tractors that he used to bale thousands of bales of hay. Danny contributed to the completion and success of many research projects in his thirty year plus career at the center. He was an avid Razorback fan, enjoyed golfing and spending time with his family.

Roy Vincent Remembered…

On Friday January 15, 2021, Roy Vincent passed away at the age of 76. Roy was a retired Auto Diesel Mechanic at the Dale Bumpers Small Farms Research Center. Roy worked on the farm crew and was tasked with keeping the location's vehicles and equipment moving for many years. Roy knew the old school farm equipment in and out and never minded lending a helping hand with whatever needing doing. Roy was a hard worker, a good friend, colleague in which no one ever wondered where he stood. Roy made many contributions to the development of the location and his expertise has been missed by the ones that worked with him since the day he retired. Roy enjoyed gardening and it was told a few scientists were envious of the strawberries he grew. In his personal time, Roy enjoyed hunting and fishing and spending time with his big extended family and he treasured each of those moments.

James Earl Hardin Remembered…

James Earl Hardin, who resided in Booneville, died Friday, April 23, 2021 in Booneville. He was 76 years old. Earl was retired from the USDA-ARS Dale Bumpers Small Farm Research Center, a veteran of the U.S. Army and National Guard serving for 32 years, part of which time was in the Vietnam War. He was known as the "HoneyMan" to his customers, having been a beekeeper for over 30 years and has always credited the bees and the hobby for giving him a new purpose in life.