

SMALL FARM RESEARCH AGRI-NEWS

Agricultural Research Service

Dale Bumpers Small Farms Research Center Newsletter



Greetings from the Research Leader, Dr. Phillip Owens

The USDA,ARS, Dale Bumpers Small Farms Research Center's mission is to develop scientific principles and technologies to enhance the profitability of small scale farms. Around 88% of the farms in the USA are categorized as "small farms" and these farms are very diverse. In the past, we have primarily focused on the management of forages for cattle and sheep production. We are continuing a strong research program in forage and animal research in the future and we are adding new topics to address future needs. The Center is determining the economic and environmental impacts of GPS guided auto-steer tractors. Tractors equipped with this technology provide an accurate location to within 1 inch of precision in the field. For example, a producer can have a sprayer that is within an inch of the edge of the pass previously taken. That precision will minimize gaps and overspraying within your field which may lead to 10-30% economic gains.

Additionally, minimizing the overlaps can minimize nutrient runoff which is beneficial for the environment. We developed an online tool with Dr. Mike Popp at the University of Arkansas and Dr. Amanda Ashworth at the USDA-ARS Poultry Production and Product Safety Unit in Fayetteville to evaluate the potential economic benefits of tractor guidance (see tool at: <https://agribusiness.uark.edu/decision-support-software.php>). Incorporating such technology is crucial for future farming practices in order to optimize farm operations, reduce labor, cut input costs, and increase profits.

In addition to optimizing farm operations, the scientists at the Center are working with scientists across the nation to increase agricultural markets. One example is working with the World Wildlife Fund on the "Next California Project" (see report at: <https://www.worldwildlife.org/publications/the-next-california-phase-1-investigating-potential-in-the-mid-mississippi-delta-river-region>). The project goals are to locate areas within the US that have good soil and water resources to build an economic base to grow specialty crops traditionally grown in California. Arkansas is fortunate to have ample water, good soils, and hardworking people. The Dale Bumpers Small Farms Research Center is promoting the River Valley for this economic development opportunity. This project just completed Phase 1 to identify optimum areas and we will continue to work on Phase 2 to assess potential for markets. I will provide updates as the project moves forward through communication in this newsletter.

Our team at the Dale Bumpers Small Farms Research Center is dedicated to improving the viability of small farms. We would like to hear from you and get your input, so feel free to contact us.

Good luck with your spring farming activities and stay safe!

In this issue:

- Greetings (page 1)
- Dr. Franco Award (page 2)
- Dr. Franco Research Spotlight (page 2)
- Dr. Burke Sheep Spotlight (page 3)
- Sheep Update and Sale (page 4)
- Cattle Spotlight (page 4)

2019 Editor's Citation for Excellence as Associate Editor



Dr. Jose Franco was selected as a 2019 Outstanding Associate Editor for "excellent work in the performance of duties as an Associate Editor". This recognition was awarded by the editorial board of Agronomy Journal for outstanding professional contributions in the oversight of manuscript reviews in 2019.

The AJ Editorial Board stated "Associate Editors are the foundation of the AJ Editorial Board, playing a critical role in overseeing manuscript reviews. Because of the extra effort by Associate Editor's like you, AJ is one of the premier agronomy journals in the world. The time that you have dedicated to AJ and your professional conduct, knowledge, and expertise are immensely appreciated."

Agroecology and Sustainable Farming Systems Research Spotlight



With the purchase of a roller-crimper last fall, a demonstration project aimed at evaluating different ways of terminating an okra cover crop was started. This work is part of Dr. Jose Franco's research on the feasibility of growing organic crops in the Arkansas River Valley and finding ways of reducing tillage while managing weeds in organic systems.

Dr. Jose Franco

Dr. Franco's multi-state Kernza intermediate wheat-grass (IWG) research continues with data collection set to begin later this spring. Kernza IWG is a cool-season, dual-use perennial grass that can produce a harvestable grain and produce high-quality forage for livestock. More knowledge is needed about how productive it will be in a hot, humid climate like we have in Arkansas, which this research will help address.



In related research, *Silphium integrifolium* (rosinweed), a native plant to the Midwest and mid-South U.S., will be evaluated for its nutritive value and ability to regrow after grazing. Like Kernza IWG, this species is being developed by [The Land Institute](#) as a dual-use crop and forage. We planted close to 1,000 *Silphium* seeds in the greenhouse this winter. A preliminary greenhouse evaluation will inform a subsequent field trial to evaluate *Silphium's* nutritive value and its regrowth potential after grazing.

Dr. Franco's research on specialty crops includes an initial greenhouse trial that is currently in progress to evaluate Saffron production in Arkansas. Saffron is considered the most expensive spice in the world and has the potential to increase income for small-scale farmers. However, it is typically grown in semi-arid to arid environments with low humidity, with much of the U.S. supply coming from Spain. High demand for the spice in the U.S. has led to increased interest in growing it domestically. With collaborators from the University of the Ozarks and the University of Arkansas, we will determine the feasibility of growing saffron in Arkansas. These evaluations are all aimed at providing other agricultural opportunities for Arkansas small farmers.



Small Ruminant Research Spotlight



Dr. Joan Burke

Lambing and Sheep Research

Winter lambing of mostly yearling ewes (first time lambers) yielded 76 lambs. In very early lambing, a ewe tested positive for Cache Valley Fever or Virus (CVV) prompted by birth of normal sized grossly deformed twin lambs. CVV is a virus transmitted by mosquitos to sheep. If infected during very early pregnancy, it can lead to dramatic neurological and muscular damage to unborn lambs.

CVV is not spread from animal to animal and an infected ewe will carry antibodies potentially avoiding future infections. The virus is a bunyavirus and the original mosquito, *Culiseta inornata*, was isolated in 1956 in Utah's

Cache Valley. Following the birth of those lambs and at least two more sets of deformed lambs, it appeared that black vultures stole two newborn lambs along with four other lambs from the fall lambing group. Black vultures are much more aggressive than turkey vultures and have

been known to attack cows during calving and their calves. We are evaluating multiple means to address predatory birds that can impact farmer profitability. Efforts are under way to address bird predators in the future by creating effigies (look-alike dead black vultures) and a laser effigy (thanks to Caleb Hopper's expertise in technology).



The winter lambs are under study to examine the effect of dietary Quebracho tree on coccidiosis. Coccidiosis or an acute infection of *Eimeria* spp., a protozoan parasite, causes diarrhea, dehydration, inappetence, weight loss, and death in young livestock (lambs, goat kids, calves – mostly dairy, and chicks). Coccidiostats are

often recommended to prevent coccidiosis in young livestock during times of stress. Once an *Eimeria* infection is present, treatment or cure is difficult. In the U.S., there are no USDA Food and Drug Administration approved products to treat *Eimeria* infection in sheep and goats. However, sulfa drugs and amprolium (Corid®) are sometimes used off-label for treatment through a prescription by a veterinarian. Resistance to anticoccidials has been documented in the poultry industry. Thus, alternatives to these pharmaceuticals is critical. Plants rich in condensed tannins, including sericea lespedeza, have been associated with a reduction in coccidiosis. There are no reports on the effects of Quebracho, a purified condensed tannin extract from a hardwood tree (*Schinopsis* spp.) typically of South or Latin American origin, on coccidiosis in lambs. This product is also used to tan leather. One group of lambs with their dams was fed Quebracho starting before weaning (about 60 days of age) and will continue for 21 days post-weaning. Lambs have been reluctant to consume the Quebracho which is spread over the top of their feed supplement. We have been collecting data and samples to quantify the incidence and signs of coccidiosis in this group and a control group. Our goal is to reduce the incidences of coccidiosis in lambs and thus enhance the wellbeing of the animal and profitability of the farmer.

Collaborative Sheep Research at West Virginia University

In January, colleagues from West Virginia University (A. Weaver, K.L. Bentley, S. Greiner, S. Bowdridge), Virginia Tech (D.L. Wright), and Katahdin International (J. Morgan) reported that lambs with greater estimated breeding values for parasite resistance had a lower lamb death loss. A possible outbreak of *Clostridium perfringens* Type-A occurred in the WVU lambs resulting in high death loss in parasite susceptible lambs (30% in 2018 and 15% in 2019) compared with ~10% in resistant lambs. Scientists discovered more circulating IgG antibodies in the resistant lambs ($P < 0.001$), thus possibly indicating an improved immune response. We have nearly 20 years of lamb records to investigate and will collaborate with the above scientists and ARS scientists at Clay Center. We will examine lamb death loss and estimated breeding values from the National Sheep Improvement Program. The value of NSIP breeding values will increase if parasite resistant sheep are found to be resistant to other diseases, and selection for this trait will increase flock profitability.

Sheep Sale

The next sealed bid sale is expected to occur this fall and will feature quality replacement lambs and breeding rams. Information and sale catalog will be available on our website in the future: <https://www.ars.usda.gov/southeast-area/booneville-ar/dale-bumpers-small-farms-research-center/>

Cattle Spotlight

We are almost finished with our spring calving season. Considering we had 80 heifers calving along with the normal cow herd we are at a 95% survivability rate. As of today, there are 125 calves tagged and the bull calves have been banded. Grass is here and the cows are beginning to leave the hay for the grass. In the next couple weeks, the cows and calves will be brought in, dewormed and given their yearly vaccinations before breeding season. There are 7 bulls with plans to purchase 3 more for our expanding herd. We will soon be giving breeding soundness exams to each of the bulls before turning them in with the cows next month. We have 6 yearlings on the continuously grazed plots on the watershed, and another 38 yearlings used for rotating on the research plots. We plan to keep around 14 of the yearlings for replacement heifers and will send the other 30 to market as preconditioned yearlings. We have received 74 steers from a local cooperator and will soon receive an additional 76 more for the upcoming study. This means we will have over 500 head of cattle on the station used for production and research projects. We have started construction on a new hay barn and we are in the process of getting 350 tons of poultry litter for upcoming research projects.



Reference to any commercial product or service is made with the understanding that no discrimination is intended and no endorsement by USDA is implied.

The USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.