



**UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
DALE BUMPERS SMALL FARMS RESEARCH CENTER
BOONEVILLE, ARKANSAS**



Innovations in Ag 2022 Field Day

The mission of the Dale Bumpers Small Farms Research Center is to develop scientific principles and technologies to enhance the profitability and sustainability of small-scale farms.

Dale Bumpers Small Farms Research Center
6883 South State Highway 23
Booneville Arkansas 72927

Precision Management for Small Scale Farms

Phillip R. Owens: phillip.owens@usda.gov

Zamir Libohova: zamir.libohova@usda.gov

Problem

- Precision management practices have been increasing at a rapid pace on large row crop farms across the USA. Of the farms in the USA, small scale farms are represented by 88%, yet small farms have been slow to adopt technology. This research evaluates different technologies and focuses on the potential investment related to economic gains.

GPS Guided Auto-Steer Tractor - Digital Soil Mapping – Applications

Example: Field 19, Fertilizer

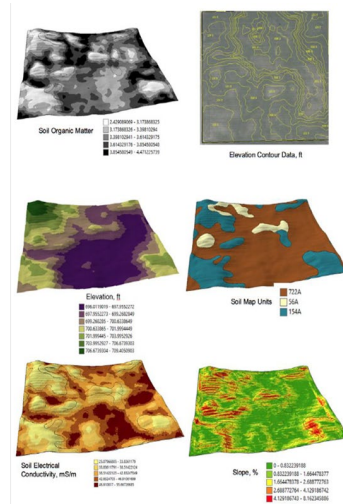
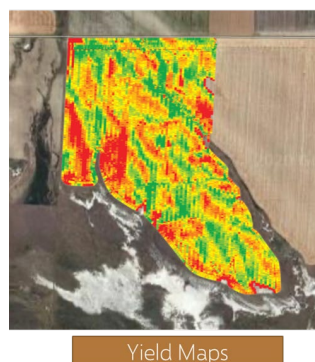
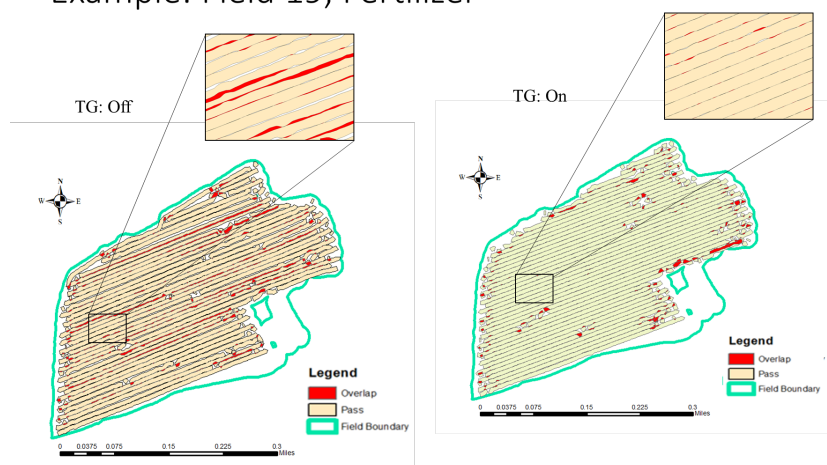


Figure 2. Maps of field characteristics data

Accomplishments and Impact

- GPS guided auto-steer tractors increased efficiency – 20-30% decrease in gaps and overlaps
- Having precise understanding of soil function allows optimization of nutrient applications which decreases costs of fertilization. This saves fertilizer costs and increases profits.

Utilizing Alternative Forages for More Productive Beef Systems

Christine Nieman, christine.c.nieman@usda.gov



Agricultural Research Service
U.S. DEPARTMENT OF AGRICULTURE

Problem

- Cow-calf and stocker cattle operations often face shortages of high-quality grazable forage on pastures during summer, early fall, and winter.
- High quality forages are available for hay making in spring, but frequent rains prevent adequate time for dry down.

Summer annual grasses and legumes



Native warm season grasses



Silvopasture



Baleage



Accomplishments

- Increased forage production in mid-summer and fall with summer annuals
Improved summer and fall weight gains for stocker cattle grazing summer annuals compared to bermudagrass
- Greater production and persistence of high-quality cool season forages and legumes, such as orchardgrass and white clover, in silvopasture systems
- Baleage from winter annual species increases the quality of stored forage

Producing More Efficient and Healthy Sheep

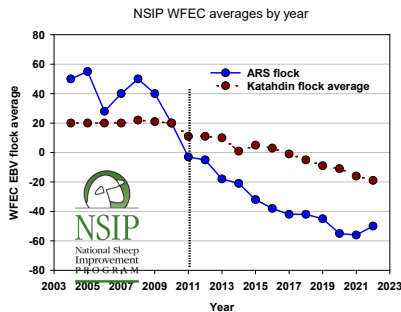
Joan Burke, joan.burke@usda.gov

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Problem

- Worm parasites cost the livestock industry billions of dollars each year due to dewormer resistance. Alternative control is essential. A holistic approach improves health and efficiency of grazing livestock and ensures healthy meat products for consumers.

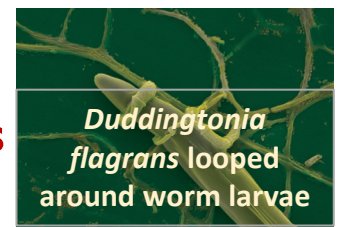
Genetic selection for parasite resistance



Copper oxide wire particles



Nematode-trapping fungus



Accomplishments and Impact

- Increased parasite resistance in ARS and farm sheep flocks in NSIP (see plot). Selection included other economically important traits (growth and dam milk production).
- Genomic enhanced estimated breeding values by the National Sheep Improvement Program (nsip.org) were introduced last fall to increase accuracy of breeding values and selection responses. There are > 10,000 sheep genotyped for a reference population in collaboration with > 21 farms, University of Nebraska, University of Idaho, and others; funded by USDA, NIFA, OREI.
- Alternatives including COWP and fungus markedly improves worm control, efficiency of production, and health and well-being of animals.



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The Dale Bumpers Small Farms Research Center is located in Booneville, AR
and is part of the Southeast Area.

The Research Leader is Phillip Owens.

www.ars.usda.gov/southeast-area/booneville-ar

Email: Phillip.Owens@usda.gov

Phone: (479) 675-3834

Fax: 479-675-2940

For general inquiries, contact

Jennifer.Keatts@usda.gov