

# Dale Bumpers Small Farms Research Center Booneville, AR

## Agroforestry Scientists

- *Dave Burner*, PhD  
Research Agronomist (AA and BS Forestry)  
Lead NP216 with UMCA, Columbia, MO
- *Dan Pote*, PhD  
Soil Scientist
- *Randy Raper*, PhD, PE, RL  
Ag Engineer

# Resources & Equipment

- **Land area**, 2300A (500A meadow/idle), leased
- **Plantations**
  - Hardwood (EBW, pecan, oaks)  $\leq$  10 yr old, 10A
  - Pine (mainly loblolly)  $\leq$  17 yr old, 65A
- **Forest**
  - Unimproved hardwood, various ages, 70A
- **Pasture**, improved bermudagrass/tall fescue, 1600A
- **Livestock** (Drs. Joan Burke & Mike Looper)
  - Cattle, angus/brahman and romo: 300 cows, 50 stockers, 15 bulls
  - Sheep, hair: 200 ewes
  - Goats, meat: 60
- **NRCS-PMC** co-located for native grasses, 285A (sub-lease 45A)
- **Farm equipment and implements**
  - Tractors, spreaders, seeders, sprayer, tillage (not row cropping)
  - Heavy equip: bulldozers, trucks, dump trucks, backhoe



# Location-Specific Accomplishments

## Pine Agroforestry

- Alley spacing affects herbage yield and quality, diurnal quality, ice damage, orchardgrass vs. tall fescue
- Forage grass production in alley cropping, pine root pruning, shade vs. soil water constraints
- N recovery,  $\text{NO}_3\text{-N}$  in pine alley cropping and pine straw
- Loblolly dbh-height relationships, biomass partitioning
- Minimizing soil and water loss with pine straw harvesting
- Modeling pine growth and profitability with pine straw
- ID tall fescue genotypes with enhanced shade tolerance

# Location-Specific Accomplishments

## Hardwood Agroforestry

- Pecan growth affected by understory grass, profitability
- EBW: predicting nut yield, rootstock-scion effects
- Management effects on watershed runoff
- Substrate effects on shiitake production, HMWP,  $\beta$ -glucan
- Black locust, thornless honey locust, and mimosa: allometry of leaf yield, yield and quality, soil responses, goat FEC
- Bristly locust, a 'novel' species for goat browse

# Location-Specific Accomplishments

## Bioenergy Feedstocks

- ID two sugarcane clones with stubble cold tolerance
- SCA, Bical, for clones of *Miscanthus x giganteus* and *M. sacchariflorus*

*In progress:*

- Biomass yields of giant reed, giant miscanthus, and sugarcane
- Stubble cold tolerance and forage quality of sugarcane, napiergrass, *Erianthus (ARS-Houma)*
- Family segregation for stubble cold tolerance (*ARS-Houma*)
- Establishment, cold tolerance of bamboo (*Phyllostachys* sp.)
- Maturity effects on stem carbohydrates of gamagrass and switchgrass

# Complementary Resources Needed

- Farm-scale bio-electric generation
- Harvesting technology/device for high-fiber energy grasses
- Row cropping equipment for biofuels