

## Mid-South Soybean Board – 2018 Proposal

**Title:** Arkansas Soybean Yield Gap Survey

**Investigators:** Jeremy Ross, Julie Robinson, Gene Stevens, Angela McClure, Todd Spivey, and Trent Irby.

**Status:** New, Year 1 of 2

**Stated Goal:** To combine Mid-South U.S. soybean producer survey data with a biophysical spatial framework for identifying cause of yield gaps over agricultural areas in Arkansas.

### Specific Objectives:

1. Benchmark producer soybean yields in relation to yield potential of their fields.
2. Identify key management practices that explain yield gaps.
3. Explain the drivers for some of the observed management by environment interactions.

### Approach:

1. Develop an Mid-South U.S. specific producer survey to capture data on soybean yield and management practices for Mid-South soybean producers.
2. Collect data on field location, average field yield, crop management (e.g., planting date, seeding rate, row spacing, cultivar, and tillage method), applied inputs (e.g., irrigation, fertilizer, lime, manure, and pesticides), and incidence of biotic and abiotic factors (e.g., insect pests, diseases, weeds, hail, and waterlogging).

### Planned Milestones:

1. Develop survey to capture producer data. This will consist of hardcopies and electronic versions of the survey.
2. Assess yield gap and its causes using spatial framework and producer self-reported data.
3. Develop Extension publication and present data and results at State and Regional soybean meetings.

### Value to the Soybean Industry:

There has been little data collected in the Mid-south U.S. to identify the cause of the soybean yield gap (difference between maximum yield potential and measured yield in producer yields). A study conducted in 10 states in the North Central U.S. region used a novel approach that combined producer-reported data and a spatial framework to identify explanatory causes of soybean yield gap over large geographic regions with diversity of climate, soils, and water regimes (rainfed and irrigated). This study identified several production practices that contribute to the yield variation. The most consistent factor explaining yield variation was planting date. A similar study will be conducted with soybean producers in the Mid-South U.S. Additional, we hope to utilize this cost-effective approach to identify causes of yield gap in the Mid-South U.S., and in turn use this data for impact assessment to support policy and investment prioritization and for monitoring the impact of research and Extension programs.

Budget:  
Instructional Design Specialist

BUDGET FOR 2019 MSSB RESEARCH PROJECT		
CATEGORY (see below for guidelines)	ORIGINAL	
A.	Personnel (No Permanent Salaries)	
	1. Salaries (See Addendum B)	\$13,300
	2. Wages (hourly workers)	
	3. GRA (include tuition)	
B.	Fringe Benefits (% used to calculate)	\$4,130 (31.05%)
C.	Travel	
D.	Contractual Services	
E.	Subcontracts	
F.	Commodities	
G.	Publication Costs	\$3,000
H.	Other Costs (Define)	\$2,150
TOTAL COST		\$22,580
(MSSB does not allow indirect costs/overhead charges)		
<p><b>Personnel:</b> Show number of hours x hourly rate for each category. GRA cost to include tuition and books. MSSB does not pay salaries of principal investigators or cooperating scientists (USB Compliance Manual, Sect. 17, Part 2-D).</p> <p><b>Fringe Benefits:</b> Amount and rate for indicated salaries, wages, and GRAs must be shown.</p> <p><b>Travel:</b> Out-of-pocket and per diem expenses (hotel and meals) for site visits, travel to and from meetings (e.g. airfare, vehicle mileage not to exceed the IRS rate), etc.</p> <p><b>Contractual Services:</b> External lab fees, consultants, etc.</p> <p><b>Commodities:</b> Expenses related to the conduct of the project (e.g., seed, fertilizers, pesticides, lab supplies).</p> <p><b>Additional Details:</b> Provide for each budget category in addendum if necessary.</p> <p><b>Reminder:</b> All payments for project activities are on a reimbursable basis based on an itemized invoice submitted to MSSB each quarter along with a progress report.</p> <p><b>Budget Transfers:</b> The MSSB follows USB guidelines, which state "The PI may transfer funds amongst budget categories <u>only with MSSB's prior written consent if</u> (i) the amount transferred <u>exceeds 10%</u> of any one general budget category (per annual period) or (ii) the funds transferred are <u>travel related</u>. <u>PI shall request permission from MSSB for all budget reallocations and account for them in his/her financial report.</u>"</p> <p><b>Additional Instructions:</b> See Addendum B.</p>		

**Explanation/justification of budget categories where needed for clarification or detail.**

**Salaries:** Program and Staff Development staff member will help with survey development, sending surveys, data collection, and data analysis (35% of this person's time).

**B. Fringe Benefits:** 31.05% of salary for Program and Staff Development staff member.

**G. Publication Costs:** Printing for 1000 paper surveys, reminders, and postcards - \$3,000 (\$3.00/survey participant contacted)

**H. Other Cost:** Yearly cost for SPSS statistical software (\$150/year). Postage for sending introductory letter ( $\$0.50 \times 1000 = \$500$ ), surveys twice ( $\$0.50 \times 1000 = \$500$ ;  $\$0.50 \times 1000 = \$500$ ), and postcard reminders once ( $\$0.50 \times 1000 = \$500$ ).