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| Project Title | Spatial and temporal variation of soil sampling affect phosphorus and potassium recommendations for soybean |
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| Research Locations (and states involved) | LSU AgCenter – Macon Ridge Research Station, located in Winnsboro, Louisiana. UofA System Division of Ag – Pine Tree Research Station, located in Colt, Arkansas. Mississippi State University – Delta Research & Ext. Center, located in Stoneville, Mississippi. |
| **Timeline:** **Current Year - FY23** | **Multi-Year Project Information** (if applicable) |
| Year 1 | Year 2 | Year 3 |
| Start Date |  | **31 March 2023** | **31 March 2024** | **31 March 2025** |
| End Date |  | **31 March 2024** | **31 March 2025** | **31 March 2026** |
| Funds Requested | $ | $ 30,000 | $ 40,000 | $ 40,000 |
| **Program Area (e.g., breeding, mngt.):** Fertility needs (especially P and K) for optimum and economical yield |
| Objectives | Conduct a detailed survey regarding the current soil sampling practices used by farm-service reps across Mid-South states and characterize the effects of sampling time and position, rotational crop, and soil management practices on soil P and K concentrations and fertilizer recommendations for soybean. |
| Justification | Since soil-test P and K concentrations fluctuate spatially and temporally, surveying the current soil sampling practices and investigating the effects of soil sampling time and method across different crop rotations and soil management practices will help develop better soil-test-based P and K fertilizer recommendations that optimize soybean yield and profit across Mid-South states. |
| Exp Setup | A detailed survey to identify the current soil sampling practices used by farm-service reps will be conducted in 2023 in Arkansas, Louisiana, and Mississippi. Research trials to evaluate spatial and temporal effects of soil sampling on soil-test P and K concentrations will be conducted at the LSU AgCenter from 2023 to 2025 across different crop rotations, soil type, and soil management practices with the additional research sites in Arkansas and Mississippi during 2024 and 2025. |
| Summary  | Multi-state survey will help us identify whether the current soil sampling practices used by farm-service reps negatively influence soil-test-based P and K recommendations. The multi-year/state research trials will help us develop the best time and way of soil sampling across crop rotation and soil management practices for maximize soybean yield with optimum fertilizer usage.  |
| Key Metrics | Measurements include soil nutrient concentrations and summer crop yield. Results from each year's trials will be presented in extension and professional meetings to improve knowledge and awareness of ag personnel regarding the best soil sampling strategies for maximum soybean yield and profitability. The final results will be published in a peer-reviewed journal.  |
| Expected Deliverables | We expect to develop research-based soil sampling guidelines for optimum fertilizer rates that maximize soybean yield, minimize fertilizer inputs and costs, and reduce fertilizer losses.  |
| Benefit to midsouth farmers | The development of the best soil sampling strategies for optimum fertilizer rates that maximize soybean yield will directly benefit approximately 5.6 million acres of Mid-South soybean that receive fertilization, with the possibility of another 4.3 million acres that will likely require fertilization within a short period. The expected outcomes will also help reduce fertilizer amounts and costs.  |
| Progress Made | The project will start on 31 March 2023. We are brainstorming about the survey questionnaires. |
| Signature of Principle Investigator | Date: 08/07/2022 |