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| Project Title | **Development of climate-smart high yield practices associated with high-end biological treatments and soybean related microbiome resiliency** |
| PI’s Name | Woo-Suk Chang | E-mail | wschang@uta.edu |
| PI’s Title | Professor | Institution: | University of Texas at Arlington |
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| Additional PIsFor this project | Dr. James Grichar-Texas A&M; Dr. Paul (Trey) Price-LSU AG; Shawn Clark-Univ. of AR; Dr. Tessie Wilkerson- Miss. State Univ.; Dr. Feng Lin-Univ. of MO. |
| Research locations (states involved) | Colt, AR; Winnsboro, LA; Stoneville, MS; Portageville, MO; Corpus Christi, TX. |
| **Timeline:** **Current Year - FY23** | **Multi-Year Project Information** (if applicable) |
| Year 1 | Year 2 | Year 3 |
| Start Date | 4/1/2023 | 4/1/2023 | 4/1/2024 | **4/1/2025** |
| End Date | 3/31/2026 | 3/30/2024 | 3/31/2025 | **3/31/2026** |
| Funds Requested | $180,000 | $60,000 | $60,000 | **$60,000** |
| **Program Area:** |
| Other related funding: | USB project titled “Development of a drought-tolerant dual-action inoculant with nitrogen fixation and phosphorus solubilization activities and potassium solubilizing inoculant.” |
| Objectives: | To develop climate-smart high yield practices associates with high end biological treatments using microbiome analysis and determine its effects on soybean cultivation with or without a tillage system. |
| Justification: | Based on previous work in our lab, the soybean rhizosphere under inoculant (i.e., biofertilizer) application shows more resilience than untreated plots, especially in non-irrigated conditions. Establishing climate-smart microbiome repositories will help us identify the key to verifying crucial species for high yield soybean production. |
| Exp Setup: | RCBD plot design. Soil physiochemical analysis and soybean yield. Greenhouse gas (GHG) measurements. Microbiome analysis of rhizosphere soils. Tillage and no-tillage systems will be set up to examine rhizosphere microbiomes and soybean yield.  |
| Summary:  | Collection of rhizosphere soils from no-till and conventional tillage fields. Field study will be conducted to measure GHG emissions and capture snapshots of microbial communities between tillage and no-tillage systems. A repository of soybean rhizosphere microbiome data will be created to identify key players. |
| Benefit to midsouth farmers: | Soil health and resiliency. Reduction of GHG emissions. Carbon credit by adopting a climate-smart practice involved in high-end biological treatments. More sustainable soybean production. |
| Progress Made: | The 1st year yield data and soil physicochemical analysis. DNA extraction from rhizosphere soils to analyze microbiomes. |
| Signature of Principle Investigator | Date: |
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