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| Project Title | Soybean yield components and seed nutrient concentration responses among nodes to phosphorus fertility |
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| PI’s Title | Associate VP Arkansas Ag Exp Stn | Institution: | University of Arkansas Division of Ag |
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| Research Locations (and states involved) | UARK Rice Research and Extension Center, Stuttgart, Arkansas. LSU AgCenter Macon Ridge Research Station, Winnsboro, Louisiana. |
| **Timeline:** **Current Year - FY23** | **Multi-Year Project Information** (if applicable) |
| Year 1 | Year 2 | Year 3 |
| Start Date | March 2023 | **March 2021** | **March 2022** | **March 2023** |
| End Date | March 2024 | **March 2022** | **March 2023** | **March 2024** |
| Funds Requested | $35,736 | $35,355 | $35,266 | $35,736 |
| **Program Area (e.g., breeding, mngt.): Cultural Practices (plant nutrition)** |
| Objectives | Evaluate the effects of P fertility on soybean seed yield, yield components, seed nutrient concentration among nodes, and the pattern of tissue-P concentration across time. |
| Justification | Soybean is widely cultivated on soils with limited P availability. Investigating how P availability affects soybean tissue-P concentration and yield components is paramount to developing better fertilizer-P recommendations and preventing yield loss.  |
| Exp Setup | Replicated fertilizer-P rate trials will be carried out from 2021 to 2023 in a long-term site varying in soil P availability (low to high) in Arkansas and in a P-deficient site in Louisiana.  |
| Summary  | Preliminary results are showing that sub-optimum P availability affects leaf-P concentrations, soybean growth, canopy coverage, and the distribution of yield components and seed-P concentrations among nodes. |
| Key Metrics | Results will be published in a peer-reviewed journal, included in the Arkansas Soybean Production Handbook, and shared via presentations at professional meetings.  |
| Expected Deliverables | The information from this project will improve soybean P nutrition diagnosis and fertilizer-P management, and can eventually be used to develop a decision support tool. |
| Benefit to midsouth farmers | First, understanding how P deficiency influences individual yield components on specific nodes will indicate whether post-emergence P applications could rescue P-deficient plants. Second, an improved understanding of and the ability to accurately diagnose P deficiency will positively impact production economics and the environment. |
| Progress Made | P fertility trials were conducted in 2021 and are being repeated in 2022. Additional site-year information from 2023 will allow us to have more conclusive information about the influence of P availability on soybean plant nutrition and yield responses. |
| Signature of Principle Investigator | Date: |
|  | 07/22/2022 |

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