

Please use this form to clearly and concisely report on project progress. The information included should reflect quantifiable results that can be used to evaluate and measure project success. Comments should be limited to the designated boxes. Technical reports, no longer than 4 pages, may be attached to this summary report.

<b>Project Title:</b>	Soybean yield components and seed nutrient concentration responses among nodes to phosphorus fertility
<b>Organization:</b>	University of Arkansas & Louisiana State University
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<b>Report Period:</b>	2 <sup>nd</sup> Quarter, 2022

**Project Status:** On-going (year 2)

**Objectives:** The project's objectives are to evaluate the effects of phosphorus (P) fertility on soybean seed yield, selected yield components (individual seed weight, pod and seed numbers, and seed abortion among nodes), the patterns of tissue-P concentration across time, and seed nutrient concentration among nodes. Specifically, we seek to identify whether seed yield, individual yield components, leaf-P concentration, and seed nutrient concentration are affected differently by P deficiency.

**2022 Q2 Project Update**

Two field trials with five fertilizer-P rates (0, 40, 80, 120, and 160 lb P<sub>2</sub>O<sub>5</sub>/acre) applied as triple superphosphate (TSP, 0-46-0) were established in Louisiana and Arkansas to address the study objectives. The Arkansas trial is being conducted within a long-term trial established in 2007 at the Rice Research Extension Center (RREC) in Stuttgart, AR on a Dewitt silt loam with mean soil-test P varying from Very Low to Above Optimum among fertilizer-P rate treatments. The Pioneer 52A14SE soybean variety was planted on June 6, 2022, and plants emerged on June 11. Plant growth was different among fertilizer-P rate treatments at V6/7 growth stage, with unfertilized plots presenting significantly smaller leaves and lower canopy coverage. Soybean leaf samples were collected at V6/7 and thereafter from R1 through R6 at one-week intervals to assess leaf-P concentrations. Soybean is currently at R6, and leaf samples are being processed for nutrient analysis. Preliminary results are showing that sub-optimal P availability in the control plot is significantly ( $P < 0.01$ ) affecting leaf-P concentrations at the V6/7 and R1 development stages (0.28 and 0.32 ppm P, respectively) in relation to the fertilized treatments (mean values of 0.33 and 0.41 ppm P, respectively). Soybean will be harvested and selected yield components and seed-P concentration among node sections (two nodes and two internodes/node section) will be evaluated at maturity (R8).

A P fertilization trial was established in 2022 on a Gigger-Gilbert silt loam soil with Low soil-test P at the LSU AgCenter – Macon Ridge Research Station (MRRS), Winnsboro, LA. The Progeny 4806 XFS soybean variety was planted on May 10, 2022, and soybean emerged 6 days after planting. Soybean leaf samples were collected from R1 through R6 at one-week intervals to assess leaf-P concentrations. Unfortunately, the trial was irrigated with groundwater rich in salts (*i.e.*, 2,131 ppm), which caused severe plant injury and compromised the trial. Therefore, the investigators decided to abandon the trial and not analyze the leaf samples that were collected.