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| 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. |
| Project Number: | 2223R0036 |
| Project Title:  | How does cover crops impact soil water dynamics and soybean production in Louisiana? |
| Organization:  | Louisiana State University-Agricultural Center |
| Principal Investigator Name: | Xi Zhang |
| Report Period: | Jul. 2024 – Sep. 2024 |
| Project Status - What key activities were undertaken and what were the key accomplishments during this quarter? Please use this field to clearly and concisely report on project progress. Limit 5,000 characters. |
| The project started on April 1, 2023. In the past quarter (07/2024-09/2024):With intact soil samples taken from control and treatment before the termination of cover crops, we measured soil porosity and saturated hydraulic conductivity. We measured soil porosity with core method and saturated hydraulic conductivity with falling head method based on Darcy’s Law. Soil moisture and temperature data are continuously collected at 15 minutes interval to analyze soil water and thermal status as influenced by cover cropping.With collected data from control and winter rye treatments, the analysis showed that cover crop effects on soil processes were influenced by soil texture. Winter rye had minimum effects on soil porosity and subsurface water flux in coarse texture sandy loam soil, while can significantly increase soil porosity and water flux in fine texture silty clay loam soil surface layer. In both soils, winter rye depleted soil moisture during its growth period due to transpiration. However, with winter rye residue left on soil surface, soil can conserve more water for subsequent soybean due to mulching effect.We are continuing soil moisture and temperature monitoring during soybean growth and measuring soybean performance (e.g., NDVI, grain yield) to evaluate if the mulching effects of cover cropping could improve soil water storage and soybean production. |