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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: | Apr. 2024 – Jun. 2024 |
| Project Status: Active, 2nd year |
| The project started on April 1, 2023. In the past quarter (04/2024-06/2024):Intact soil samples were taken from control and treatment before the termination of cover crops to measure soil bulk density, saturated hydraulic conductivity, and water retention properties. We are measuring soil bulk density with core method, saturated hydraulic conductivity with falling head method based on Darcy’s Law, and water retention curve with slow evaporation method. Winter rye was collected to measure biomass and nutrient content. 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 preliminary analysis showed that cover crop growth was influenced by soil texture. Winter rye in soil with higher clay content had higher biomass, which in turn impacted soil water and thermal dynamics. In silty clay loam soil, soil had lower surface temperature in winter rye plots than plots without cover crop, which might be caused by the reduced evaporation through covering soil with cover crop. However, in sandy loam soil, winter rye was not well developed. Winter rye and control plots didn’t have significant difference in soil temperature dynamics. Although soil temperature showed different behaviors under different soils, soil moisture dynamics behaved similarly. For both soils, cover cropping plots had lower moisture in surface soil, which means cover cropping can reduce soil moisture during growth. We continued soil moisture and temperature monitoring after the termination of cover crops to investigate if the mulching effects of cover cropping could improve soil water storage for soybean growth.In the next steps, we will measure soil water and thermal dynamics in soybean growth period to quantify cover cropping effects on soil water and thermal status during cash crop growth, and investigate if the subsequent soybean production is affected by cover cropping. |