



# MSSB Research Summary Page

Project Title	Evaluation of residual weed control with common soil-applied soybean herbicides		
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PI's Title	Extension/Research Professor	Institution:	Mississippi State University
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Additional PIs For this project	Justin McCoy, Trent Irby		
Research Locations (and states involved)	Stoneville, MS Verona, MS Brooksville, MS		
<b>Timeline:</b>	<b>Multi-Year Project Information (if applicable)</b>		
<b>Current Year - FY22</b>	Year 1	Year 2	Year 3
Start Date	<b>April 1, 2022</b>		
End Date	<b>March 31, 2023</b>		
Funds Requested	\$13,187	\$13,187	\$
<b>Program Area (e.g., breeding, mngt.): Weed management</b>			
Objectives	<ol style="list-style-type: none"> <li>1. Evaluate weed control and correlate with rainfall quantities across multiple planting dates to determine length of residual weed control with nine common soybean herbicides.</li> <li>2. Evaluate residual weed control from common soybean herbicides following application of a known quantity of simulated rainfall.</li> </ol>		
Justification	<p>Residual herbicides are a staple in soybean production to minimize interference to crop from problematic weeds. Recently, interest in determining the length of residual weed control provided by these herbicides following different quantities of rainfall has increased. Herbicide water solubility can vary based on chemical composition; therefore, it is important for producers to know through multiple years of research the level of residual weed control that can be expected under different environmental conditions. Therefore, studies will be conducted through Mississippi State University to determine the length of residual weed control from common herbicides in Mississippi soybean production.</p>		



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<p><b>Exp Setup</b></p>	<p>Studies to evaluate Objective 1 will include treatments arranged as a two-factor factorial within a randomized complete block design. All studies will include a nontreated for comparison. Factor A will consist of three soybean planting dates (130,000 seed/A) targeting April 15, May 1, and May 15 depending on environmental conditions. Factor B will consist of residual herbicide treatments to include fomesafen (Reflex) at 1.5 pt/A, S-metolachlor (Dual Magnum) at 1.3 pt/A, pyroxasulfone (Zidua) at 3 oz/A, metribuzin (Tricor 75 DF) at 5.33 oz/A, dimethamid-P (Outlook) at 12.8 oz/A, dicamba (XtendiMax) at 22 oz/A, flumioxazin (Valor 51WDG) at 2.5 oz/A, sulfentrazone (Spartan) at 12 oz/A, and acetochlor (Warrant) at 1.5 qt/A.</p> <p>Studies for Objective 2 will be conducted in a greenhouse to evaluate residual weed control from selected herbicides under a rainfall simulator applying a known quantity of water. A soil texture commonly utilized for soybean production will be greenhouse air dried at 118/72 (<math>\pm</math> 5 F) for 4 wk and homogenized prior to potting. Soil will be potted to approximately 3.5 lb in 6.5- x 9-inch trays. Treatments will be arranged as a two-factor factorial within a randomized complete block design. Factor A will consist of rainfall quantities in increments of 0.0, 0.25, 0.5, 0.75, 1.0, 1.25, and 1.5 inches applied through a rainfall simulator at the Mississippi State University Delta Research and Extension Center. Factor B will consist of herbicide treatments to include S-metolachlor (Dual Magnum) at 1.3 pt/A and pyroxasulfone (Zidua) at 3 oz/A. Palmer amaranth will be sown in respective pots as an indicator weed at a rate of 500 seed/pot.</p>		
<p><b>Summary</b></p>	<p>Studies evaluating weed control correlation with rainfall quantities across multiple planting dates to determine length of residual weed control were initiated at multiple sites in Mississippi in 2021. Four runs of the experiment were initiated in Stoneville on 22-April, 17-May, 25-May, and 01-June. Four runs of the experiment were initiated in Brooksville on 21-April, 28-April, 14-May, and 20-May. One run of the experiment was established in Verona on 26-May. Poor weather has prevented additional runs of the experiment in Verona, but plans are in place to plant one or two additional replicates. All treatments have been applied, and incorporating rainfalls events varied from two to 10 days after application at the Stoneville site. All studies will be irrigated as needed and managed intensively for insect and disease control for the remainder of the season.</p>		
<p><b>Key Metrics</b></p>	<p>Weed control, length of residual weed control, rainfall quantity at different sites.</p>		
<p><b>Expected Deliverables</b></p>	<p>End products of data collected will be presented at county extension meetings, profession society meetings (SWSS, ASA, WSSA, etc.), short course, grower meetings, etc. Additionally, appropriate data will be published in referred journals, Extension publications, popular press, and online articles.</p>		
<p><b>Benefit to midsouth farmers</b></p>	<p>Potential outputs from these data sets could impact hundreds of thousands soybean acres. The current reliance on soil-applied residual herbicides for GR weed control impacts thousands of acres; therefore, the most current and up to date information regarding these herbicides is crucial to maintain soybean production.</p>		
<p><b>Progress Made</b></p>	<p>Weed control data have been collected. Soybean at the different research sites are in varying levels of maturation and will be harvested at season's end.</p>		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 5px;"> <p>Signature of Principle Investigator  <b>Jason A. Bond</b>  <small>Digitally signed by Jason A. Bond  Date: 2021.08.12 16:14:08 -05'00'</small></p> </td> <td style="width: 40%; padding: 5px;"> <p>Date:</p> </td> </tr> </table>		<p>Signature of Principle Investigator  <b>Jason A. Bond</b>  <small>Digitally signed by Jason A. Bond  Date: 2021.08.12 16:14:08 -05'00'</small></p>	<p>Date:</p>
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