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| Project Number: | 2022-47 |
| Project Title: | Exploitation of weed species extracts as an effective and environmental friendly strategy to control insects and deer in soybean |
| Organization: | Mississippi State University |
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| The primary objective of this study was to evaluate whether liposome encapsulation of sicklepod extracts enhances the rainfastness period, thereby improving deer repellent efficacy when applied to soybean plants. Treatments including liposome encapsulated extracts and extracts without encapsulation were compared to assess their retention and rainfast properties. Visual analysis indicated that while both treatments showed some degree of leaf damage, the key finding was the improved retention of the extracts encapsulated in liposomes. The presence of Emodim and Chrysophanol, primary active forms of anthraquinone, in treated leaves following simulated rainfall demonstrated successful retention and reduced wash-off of the liposomal formulation compared to the non-encapsulated extract (Figure 4). Although no statistically significant differences were found between treatments, the mean comparison highlighted a trend towards increased retention of Emodim with liposome encapsulation. Our previous studies have demonstrated that although foliage may exhibit visible damage following sicklepod extract applications, these symptoms do not correlate with reductions in soybean yield. Therefore, minor phytotoxicity observed in the current study is not considered a primary concern.These results support the potential for liposome encapsulation to significantly enhance the rainfast period of sicklepod extracts, thereby likely improving their long-term deer repellent efficacy in practical agricultural settings. We will conduct additional studies with increased liposome concentrations to confirm these promising findings and validate the results. Additionally, we are exploring the use of PLGA-coated extracts to determine if this alternative encapsulation method can provide even greater retention and rainfastness compared to liposomes. | |