|  |  |
| --- | --- |
| Project Title | SPRAY APPLICATION OF DOUBLE STRANDED RNA FOR SIMULTANEOUS MANAGEMENT OF MULTIPLE SOYBEAN FUNGAL AND INSECT DISEASES |
| PI’s Name | Zhi-Yuan Chen | E-mail | zchen@agcenter.lsu.edu |
| PI’s Title | Professor | Institution: | Louisiana State University AgCenter |
| Mailing Address | Dept of Plant Pathology and Crop Physiology, 302 Life Sciences Building, LSU |
| City/State/Zip  | Baton Rouge, LA 70803 |
| Phone number | 225-578-7850 (office) |
| Additional PIsFor this project | None |
| Research Locations (and states involved) | Baton Rouge, Louisiana |
| **Timeline:** **Current Year - FY22** | **Multi-Year Project Information** (if applicable) |
| Year 1 | Year 2 | Year 3 |
| Start Date | 03/01/2022 |  |  |  |
| End Date | 02/28/2023 |  |  |  |
| Funds Requested | $41,040 | $ | $ | $ |
| **Program Area (e.g., breeding, mngt.):** |
| Objectives | 1) produce dsRNAs of 3-4 candidate genes selected from Cercospora species using a bacterial expression system; 2) identify the most effective method for applying dsRNA onto soybean plants, and 3) examine the efficacy of these dsRNAs in suppressing CLB, PSS, and FLS disease development under greenhouse and field conditions |
| Justification | Double stranded RNAs (dsRNA) have been shown to travel between host and pathogen/pests and can suppress the expression of its target genes by binding and initiating a sequence specific degradation, and thus achieve the disease control. |
| Exp Setup | 1) Produce dsRNA in bacteria; 2) Determine the effectiveness of different methods for delivering dsRNA to plants; 3) Identify the most potent dsRNAs in reducing soybean losses caused by CLB, FLS, and PSS under greenhouse and field conditions. |
| Summary  | This is a very novel research with great potential that has not been attempted by any other lab in US to manage soybean fungal and possibly insect and nematode diseases.  |
| Key Metrics | dsRNA production, growth chamber demonstration of successful delivery of dsRNA using PDS gene, reduced CLB/FLS/PSS disease development under greenhouse and field |
| Expected Deliverables | 1. Optimized method for delivering dsRNA; 2) Identification of key fungal genes to suppress to manage CLB/FLS/PSS; 3) New funding support from USB/USDA/NSF.
 |
| Benefit to midsouth farmers | Reduced soybean losses due to fungal pathogens/pests, reduced dependence on fungicides/pesticides, reduced operation cost, reduced environmental pollution, and enhanced sustainability. |
| Progress Made | We have cloned 4 genes into bacterial expression system and are producing dsRNAs in small scale and performing initial testing with PDS gene in growth chamber conditions. |
| Signature of Principle Investigator:  | Date: 08/02/2021 |
|  |  |