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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:  | 2020-172-0148 |
| Project Title:  | Enhanced Pest Control Systems for Mid-South Soybean Production |
| Organization:  | LSU AgCenter |
| Principal Investigator Name: | Paul P. Price, III (Trey) |
| Report Date: | 06/15/2020 |
| **National Soybean Checkoff Research Database** [**https://www.soybeanresearchdata.com/**](https://www.soybeanresearchdata.com/) **(visible to public)****Please choose only one option (if no option is selected, this report will be posted to the website):**[x]  I agree to allow the information contained in this report to be published in its entirety.[ ]  I have included, at the end of this report, a brief non-technical report that can be posted to the website.[ ]  I DO NOT agree to allow the information contained in this report to be published. |
| Project Status: |
| Seed was shipped to all cooperators (15 locations, 56 entries) for the CLB variety trial. Most of the locations have been planted, and no problems have been reported other than germination and vigor issues with a couple of entries as observed in three Louisiana locations. Soybeans are just planted to V stages. We decided to increase seed of susceptible PIs to compare with resistant PIs during the 2021 field season. The PIs have been planted in Louisiana and Missouri, will be hand-harvested at the end of the season, and sent to a winter nursery for further increase. We are in the process of resubmission of a manuscript to JCI after revisions mentioned by the reviewers, including some statistical analysis. With the help of PCR-RFLP and LAMP assays, we have screened *Cercospora* isolates from three locations for their fungicide sensitivity. We are continuing screening of remaining isolates from other locations using both assays. This will likely result in first reports for QoI resistance in the CLB pathogen population for 6 southern states. Additional studies have been initiated genetically characterizing the isolates. Experiments using leaf disks and cercosporin have been initiated with twenty-five varieties that are part of the official variety trials (OVT). The correlation between the leaf disk assay and field screening of these varieties in classifying varieties will be measured. Procedures for growing soybeans hydroponically and setting up experiments with iron deficient, sufficient, and excesses has been identified. A trial has been initiated grow soybeans hydroponically and then test the four IDC varieties. Seeds for the four varieties (A11 and Traill, resistant to IDC, and Glacier and Stine0480, susceptible to IDC) to be tested have been obtained. **Stink bug update:** We had enough seed for six lines to be planted in five stink bug trials this year. Seed was shipped to cooperators on May 11, 2020. These are Dr. Shane Zhou at Texas A&M, Dr. Nick Bateman at University of Arkansas, Dr. Don Cook at Mississippi State, and Dr. Katelyn Kesheimer at Auburn. Stink bug numbers are high throughout the Midsouth and Southeast and should result in an excellent test. Dr. Chen has successfully crossed his breeding lines with the stink bug resistant lines to create five populations that each had 150 plants; Twenty to 30 seed of each line was sent to Dr. Davis for evaluation. Dr. Chen will plant out these populations and evaluate for agronomic qualities this year, selecting the next set of lines for future stink bug evaluation. **MO breeding update: W**e will have 56 populations (~5000 progeny rows) in our 2020 progeny row nursery that have CLB resistant parental lines from our 2018 crossing block. We made 19 successful crosses in 2019 with the following CLB resistant lines: S14-9017R, S15-3772RY, S11-20242. S11-16653, S13-10592C, and S14-15138R. Using these lines allows us to incorporate conventional, RR1, R2Y and STS herbicide tolerances into our breeding program along with CLB resistance. We were able to make 5 new crosses in 2019 between lines with stink bug resistance and high yielding conventional breeding lines. The F1 hybrids have been sent to our winter nursery for generation advancement last fall and will be planted in our 2021 progeny row nursery for line selection. We plan on making 10-12 new crosses between lines with stink bug resistance and high yielding conventional, RR1 and R2Y lines in 2020 for next cycle of breeding.  |