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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: |  |
| Project Title:  | Screening and Selecting Non-Extend Soybeans for Dicamba Tolerance |
| Organization:  | University of Missouri - Fisher Delta Research Center |
| Principal Investigator Name: | Dr. Pengyin Chen |
| Other investigators: | Caio Canella Vieira |
| Report Period: |  |
| Project Status: On-going(What key activities were undertaken and what were the key accomplishments during this quarter? Please use this field to clearly and concisely report on project progress).  |
| For the 2020 growing season, we have designed 13 field trials to study the impact of off-target Dicamba damage on soybean yield and select genotypes with superior tolerance. These will be grown in Portageville-MO (strong off-target Dicamba exposure) and three additional locations free of Dicamba exposure (Arkansas, Central MO, and Louisiana). Additionally, we partnered with weed scientists and breeders from Purdue University and the University of Illinois to screen and characterize extreme lines using digital phenotyping tools in the field and greenhouse (Table 1).**Table 1**. Summary of field trials planned for the 2020 growing season

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test Name** | **# Entries** | **Source** | **# Loc** | **# Reps** | **Total Plots** | **Plot layout** | **Data recorded** |
| Screening | 10 | AYT | 2 | - | - | - | Drone imaging; GH digital screening |
| DIC-4YT | 24 | AYT | 2 | 3 | 72 | 4-row plots, 12 ft. long | Drone imaging, Dicamba damage, Yield, Plant Height |
| DIC-5YT | 24 | AYT | 2 | 3 | 72 | 4-row plots, 12 ft. long | Drone imaging, Dicamba damage, Yield, Plant Height |
| DIC-4YT - MO | 24 | AYT | 1 | 2 | 48 | - | Yield |
| DIC-4YT - LA | 24 | AYT | 1 | 2 | 48 | - | Yield |
| DIC-5YT - LA | 24 | AYT | 1 | 2 | 48 | - | Yield |
| DIC-5YT - AR | 24 | AYT | 1 | 2 | 48 | - | Yield |
| DPS-Screening: | - | - | - | - | - | - | - |
| DPS-1 | 160 | Nursery | 2 | 2 | 320 | 1-row plot, 7 ft. long | Drone imaging, Dicamba damage |
| DPS-2 | 160 | Nursery | 2 | 2 | 320 | 1-row plot, 7 ft. long | Drone imaging, Dicamba damage |
| DPS-3 | 160 | Nursery | 2 | 2 | 320 | 1-row plot, 7 ft. long | Drone imaging, Dicamba damage |
| DPS-4 | 120 | Nursery | 2 | 2 | 240 | 1-row plot, 7 ft. long | Drone imaging, Dicamba damage |
| DPS-5 | 120 | Nursery | 2 | 2 | 240 | 1-row plot, 7 ft. long | Drone imaging, Dicamba damage |
| DIC-Contrast 1 | 40 | Nursery | 2 | 2 | 80 | 2-row plots, 7 ft. long | Drone imaging, Dicamba damage, Yield, Plant Height |
| DIC-Contrast 2 | 40 | Nursery | 2 | 2 | 80 | 2-row plots, 7 ft. long | Drone imaging, Dicamba damage, Yield, Plant Height |

The tests DIC-4YT and DIC-5YT are selections of extreme lines (tolerant and susceptible) from our 2019 advanced yield trials (AYT). These tests will be grown at our research site in Portageville, MO (presence of Dicamba), and three other locations free of Dicamba exposure (AR, LA, and central MO). The DPS-screening trials consist of 5 populations derived from tolerant and susceptible parents. Our goal with this trial is to collect Dicamba injury data for mapping of dicamba tolerance gene(s) or QTL. The DIC-Contrast trials are extreme selections from the 5 genetic populations, and will be used for yield comparison as well as mapping studies.All trials have been planted with good field emergence. Off-target Dicamba injuries are showing up early in the vegetative stage, and different responses among genotypes are starting to become evident. We will soon start to take the first round of notes on off-target Dicamba symptoms (late vegetative stage), as well as prepare to fly drones in all plots to help to characterize the symptoms. |