SEA FY21 OTHER IMPORTANT RESEARCH

Employee Acknowledgement Statement & Approval

Date: 02/18/21

Location: USDA-ARS Greenhouse 3127 Ligon Street Raleigh, NC 27607

Project Title: Evaluation of Soybean Breeding Lines for Response to Saturated Soil Conditions at Germination and Flooding at the V2 Growth Stage

Objective: To finalize data collection needed to release N11-352 and N10-792. These two lines have been evaluated extensively under flooded and non-flooded field conditions over the past several years. Determining how these lines preform under saturated soils conditions during germination and at the V2 growth stage will be the final step before these two lines can be released. No prior data exists for evaluation at these stages. Soybean lines with better emergence under saturated soil conditions and flooding during early plant growth will greatly improve the profitability of soybean production.

Project Activities: from 03/22/21-03/31/21 (daily measurements, 2 hours/day, are required to maintain % water holding capacity)

Determining line performance under saturated soils conditions during germination

LB or EF or JG: In the greenhouse pots will be filled with potting soil and watered to saturation. Then, the pots will be left to drain overnight, and weighed to obtain weight at 100% water holding capacity. To get pots at 80%, optimal water holding capacity, pots will be left to drop to a weight below that of the intended water holding capacity and rehydrated to the required weight. Three seeds of each line will be sown to a depth of 2.5 cm in four pots (replications) per each moisture level. At sowing, plastic covers will be placed over the pots in order to minimize evaporative loss of water **(total time: 8 hours)**. Seven days after sowing, the emerged seedlings in each pot will be counted to estimate emergence. An emerged seedling will be counted when at least both cotyledons are above the soil surface **(total time: 4 hours)**. After recording emergence, seedlings were carefully pulled from the potting soil without damage to the primary roots. Primary root length will be measured by stretching the primary root and measuring the distance between the cotyledonary node and the tip of the primary root **(total time: 8 hours)**. Pots will be weighed daily during the whole experiment and watered according to pot weight to maintain them at the required moisture level **(total time: 2 hours/day for 7 days)**.

- Workers will be unaccompanied in the greenhouse, which does not have an air circulation unit (air comes in from the outside) and wearing appropriate PPE (mask, gloves) at all times.

Project Activities: on 04/05/21-04/06/21, 04/12/21-04/14/21, 04/19/21, 04/26/21-04/27/21, 05/08/21-05/09/21, 05/18/21-05/25/21

Determining line performance under flooded soils conditions at the V2 growth stage

LB or EF or JG: For this greenhouse experiment two treatments will be imposed: flooded and non-flooded, to serve as the control. At planting 3 seeds of each line will be sown to a depth of 2.5 cm for each replicate and treatment, a total 16 pots per line **(total time: 8 hours)**. At emergence each pot will be thinned to one plant. Pots will then be placed in their respective treatment tanks **(total time: 4 hours)**. Once plants are at V2, pots will be flooded to ~ 1 inch above soil level for 7 days, then drained, non-flooded pots will be watered as needed **(total time: 4 hours)**. After 7 days flooding and chlorophyll measurements will be recorded **(total time: 8 hours)**. After ~2 weeks or at the V5 stage, shoot and root samples will be collected. The root and shoot samples will be allowed to dry at 60°C, for ~10 days **(total time: 8 hours)**. Then visual ratings, biomass, root architecture and chlorophyll data will be collected and analyzed **(total time: 8 hours/day for 3 days)**.

- Workers will be unaccompanied in the greenhouse, which does not have an air circulation unit (air comes in from the outside) and wearing appropriate PPE (mask, gloves) at all times.
- Before and after each procedure, the lab/greenhouse benches and equipment surfaces will be cleaned with 70% ethanol.

All of these tasks will be performed by an employee working alone in the greenhouse or lab and the employee will wear masks at all times in public spaces. The lab is stocked with gloves, 70% ethanol, and hand sanitizer to ensure the cleanliness of surfaces. To carry out these tasks, we request that Laleh Bagherzadi, Elizabeth Fletcher and Jay Gillenwater be allowed to work as much as 20 hours on-site per week. Tasks will be rotated as needed. This work will require no more than 20 total person-hours on site per week. Work schedules will be staggered to avoid higher traffic time periods in the greenhouse or lab. A majority of the experiment will be conducted in the greenhouse, with just a few days needed in the lab for analysis. The greenhouse does not have an HVAC system, it is an open environment. The greenhouse can be accessed, through a locked door, without entering the main building. Everyone in the main building is required to wear a mask at all times and all bathrooms are single occupancy, with 70% ethanol available to clean surfaces upon leaving.

Employee Acknowledgement Statement:

By digitally signing below, "I acknowledge that I am willing, have no concerns with my safety and health, in performing this specific project work as titled above and described on associated Employee Work Tracking Sheet.

Ben Fallen Digitally signed by Ben Fallen Date: 2021.03.03 08:53:51 -05'00'

Employee Digital Signature	Employee Signature
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SEA Pandemic Approval Process for "FY21 Other Important Research" Projects

By digitally signing below, **"I acknowledge that this document was written with the safety and health of our employees as priority one."** Together, we are ensuring our employees mentioned in this project are working/driving as allowed; Location has all required PPE, sanitation supplies, Hygiene Plans (proper hand washing, sanitizing surfaces/areas); and employees informed about social distancing and face covering rules. Therefore, my evaluation of the project and associated documents, to the best of my ability, will be implemented as written. I approve this project and will ensure the safety and health of our employees.

Research Leaders Digital Signature	Location Pandemic Coordinator Digital Signature	Location Senior Management Official Digital Signature
Area Pandemic Coordinator Digital Signature	Associate Area Director Digital Signature	Area Director Digital Signature (If Required)