

2022 Report of Activities for project titled ‘Reimagining the Ultra-late Soybean Production System with Long Juvenile varieties to increase yield’

Principal Investigator

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Project Summary

This year’s project, still in progress, has made strides towards increasing our data set of long juvenile soybeans to determine potential varieties that are best adapted to production in the Deep South in ultra-late plantings. The project is still in progress, as the planted soybean varieties are not to maturity at the time of this report, excepting two commercial varieties included in the study.

The generous funding by the Georgia Soybean Commission was leveraged to develop teaching demonstration plots alongside the research plots for use in several courses taught this fall at ABAC.

One undergraduate student was supported through this grant. This student managed the plots, collected in-season data, and led the harvest and yield analysis.

Preliminary results of the year’s progress are outlined below.

1. Ultra-late planted soybean study

The study was planted on August 16th, at the J.G. Woodruff Farm on the ABAC campus. Ten varieties of long juvenile soybean varieties and two commercial varieties were randomized in three replications. Plots were each 30 ft. long, in 3 ft. row spacing, with 4 rows per plot planted at 200,000 seeds per acre.

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Figure 1. 2022 field design for the Ultra-late planted soybeans and variety list included in the study. Each plot dimension is 30 ft. x 12 ft. Each replication includes 10 long juvenile soybeans varieties and two commercial varieties.

Figure 2. Aerial Remote image from Sept. 9th (24 DAP) over the research study area.



Weekly height and development stage were measured to track the comparison among the long juvenile varieties and between the long juvenile and the commercial varieties. As of this writing, the two commercial varieties were at R8 through natural maturity and senescence (Figure 3A), while all the 10 long juvenile varieties are still at various reproductive stages. A light frost on Nov. 18th caused damage to the soybeans (Figure 3B), but the plants can continue through grain fill. The danger of an early killing frost is a risk of the long juvenile varieties, even in South Georgia.

Figure 3A. (Left) Maturity Group 2.1 at R8 on Nov. 30th; Figure 3B. (Right) Long Juvenile variety SC10-406 at R5 on Nov. 30th



This fall or winter at R7 the long juvenile varieties will be chemically desiccated, unless killed by a frost first. Then hand samples will be collected to measure grain yield in 14.5 ft. row lengths. Additionally, three representative plants from each plot will be hand-selected and diagrammed for number of nodes, number of pods, number of seeds per pod, total seeds, and total seed weight per plant.

Furthermore, this year's grain samples, along with previous years' grain, will be ground and analyzed for nitrogen concentration.

2. Soybean Teaching Demonstration Plots

Summer and Fall-planted soybean plots were planted on June 21st and August 17th, respectively. These plots provided side-by-side maturity group and planting date comparisons for discussion the fall semester Field Crop Production course. Additionally, students in the Insect Pest Management, Plant Disease Management, and Fundamentals of Plant Protection courses used the plots for learning pest scouting and identification. Total students which benefited from the plots totaled approximately 150 students through the summer and fall semesters.

The June planting included a range of commercial soybean maturity groups of 0.0, 2.1, 4.6, 5.6, 6.6, and 7.1, planted under center pivot irrigation at 140,000 seeds per acre in 3 ft row spacing. As of August 5th, all of the soybean maturity groups were in reproductive stages, with MG 0.0 at R5, MG 2.1 at R3, and MG 4.6 at R3.

The August planting included a broad range of soybean maturity groups similar to the summer planting demonstration. Two seeding rates (140,000 and 200,000 seeds per acre) were included side-by-side as well. In the 140,000 seeding rate the following maturity groups were included: 0.0, 2.1, 4.6, 5.6, and 6.6. In the 200,000 seeding rate the following maturity groups were included: 0.0, 2.1, 4.6, 6.6.