

# SCSB Quarterly Report

## **General Information**

**Principal Investigator(s) Name(s):** C. Nathan Hancock (USCA) and Kendall Kirk (Clemson)

**Organization:** University of South Carolina Aiken

**Date:** 31 July, 2020

**Quarter:** Second

## **Proposal Information**

**Title:** Strategies for identification and rescue of poorly nodulated soybeans

**Amount Expended to Date:** \$200

## **Progress Assessment**

*Report the progress toward the situation described in the proposal summary. Include progress against budget, timeline and scope.*

The research plot was planted on Tuesday, 16 June 2020, as described in the proposal. Twelve treatments (10 Nod- mutants and 2 controls, with three levels of nitrogen treatment) were arranged in 6 complete randomized replicates. Germination was better than what we had last year, so we expect it will give us better data.

At the R1 stage (20 July) we measured height by hand and NDVI with a handheld Greenseeker (Figure 1). These results showed that the addition of nitrogen resulted in taller and greener plants as expected. The control (Williams 82) plants benefited from the nitrogen treatment, suggesting that we may not have had good nodulation. We also collected leaf samples that will be analyzed for nitrogen content in the next few weeks. Aerial images were also captured at the R1 stage, producing a single low resolution image of the field (Figure 2) and a mosaic of images captured from lower altitudes. In the coming months, leaf color will be analyzed from these images.

A rescue application of fertilizer was applied to a subset of the plants with low nitrogen content. This will allow us to determine if the yield of poorly nodulated soybeans can be rescued by nitrogen application at R1.

In addition to the plot described in our proposal, we were able to identify three chlorotic regions in SC growers' fields to perform nitrogen rescue tests. In each field, we produced 4 replicates of three treatments (0, 120, and 240 lbs/acre N). We measured height, collected leaf tissue, and took aerial images as a reference for the response.

## **Key Performance Indicators**

*What KPI(s) are being used to measure project success? How are KPI(s) being measured? Will KPI(s) not be met? Are KPI(s) on track? Will KPI(s) be exceeded? Explain the key circumstances that are impacting achieving or not achieving KPI(s).*

We are currently on track with all of the aims of the project.

### **Next Steps**

*Explain the next steps of the projects and what you hope to achieve during the next quarter.*

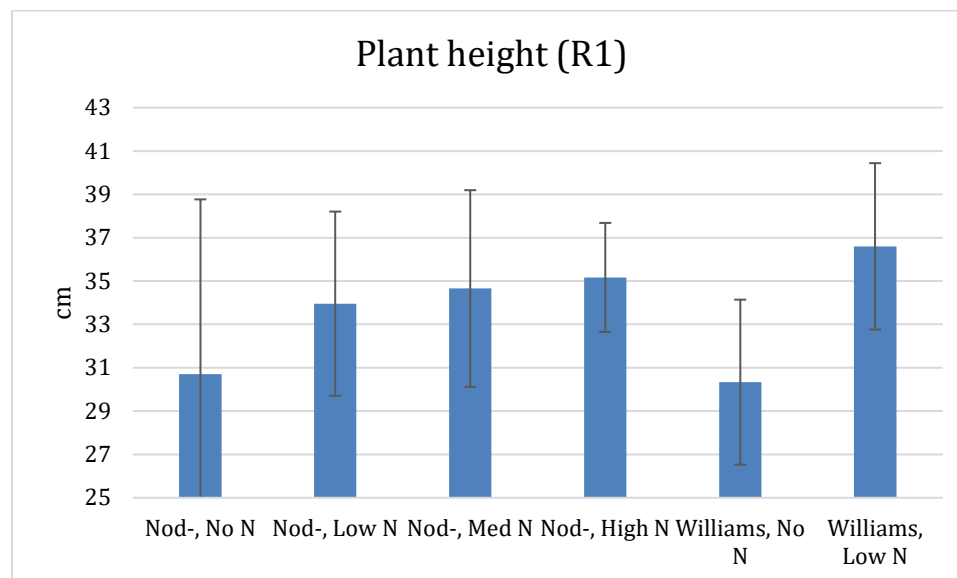
Data from the R1 stage will be analyzed and a regression model will be created describing the relationship between leaf color and nitrogen content. Harvest will be performed by hand using a single plant thresher and yield will be determined in comparison to the control lines. This will allow us to determine how much nitrogen is required to rescue poorly nodulated soybeans.

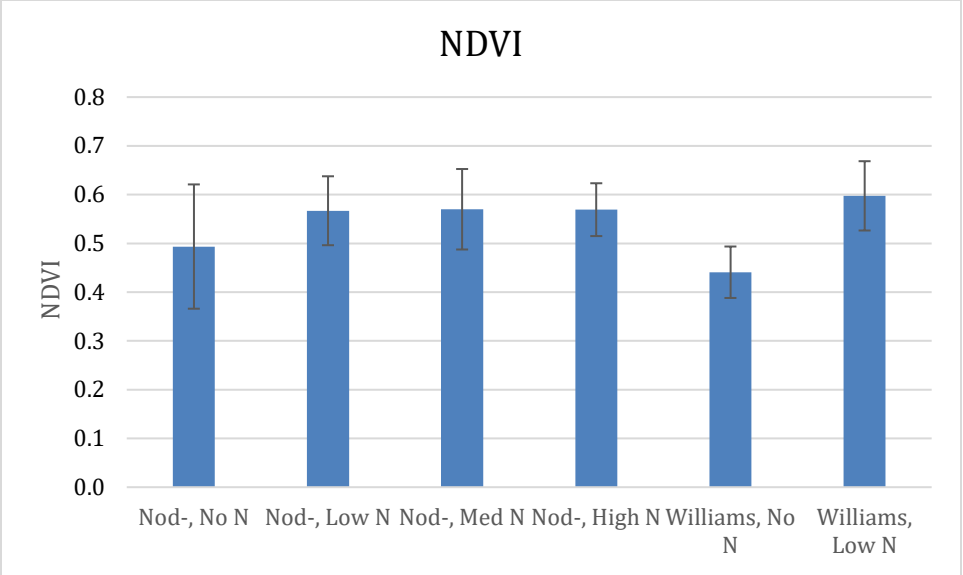
In the SC grower's fields, we will measure height, collect leaf tissue, and take aerial images later in the season to determine what effect the nitrogen application had. The yield in these plots will be measured to determine what effect N application had on productivity. We will then calculate the economic feasibility of nitrogen application.

### **Additional Information**

*Provide all additional supporting information, facts or figures here.*

**Figure 1 – Height and NDVI Results**





**Figure 2 - Aerial Image of the 2020 experimental plot**



Prior to submission, reports should be saved as a pdf document using the following naming convention; 2018Date(yrmoday)\_(PI Last Name)\_(Abbreviated Proposal Title)\_Qtr1.