PROGRESS REPORT OF PROPOSAL ENTITLED:

Evaluations of 15 advanced blueberry selections and cultivars under irrigated conditions in Sandhills Research Station (NC)

Funding # 2023-R-24

Summary:

This project aims to evaluate the NC State blueberry breeding program's advanced selection under irrigation with liquid fertilizer performance in marginal lands in NC where blueberries are not usually grown. Our field soil is mainly sandy soil with minimum organic matter. This soil drains rapidly, and plants quickly lose available water around their roots. In the high summer temperatures in NC, when the evaporation is high, this results in stressing the plants, shriveling the fruit, and lowering yield. Even the high-yielding cultivars will underperform, and the true potential of a genotype is not rendered in this environment. The NC State blueberry breeding advanced selections are usually evaluated at Ideal Tract Farm in Castle Hayne, where the soil is sandy with high organic matter and plenty of water available through rain or overhead irrigation from May to July when the plant needs water the most during the fruit ripening time. At the end of this project, in year four, we expect to have collected enough data on yield to be able to compare that with a more optimum environment and make recommendations to the growers in the region as to which genotype is performing best in Sandhill, NC or similar areas with the same environment.

Progress report

In the summer of 2022 (July), we asexually propagated 14 advanced selections of our breeding program. By October 2022, 11 accessions had more than 15 decent rooted cuttings that could be transplanted in the field. To compensate for the lack of success in having an adequate number of plants for the experiment, we added one more check to make the experiment at the level that could fill all the designated plots in the field. We transplanted the rooted cutting into the field in Nov 2022 in 3-plant plots and five replications (Fig 1 and 2).

The irrigation lines were installed in Feb 2023, and irrigation of plants started as soon as the plants came out of dormancy in March 2023. Liquid 4-1-9 fertilizer was injected into the line every other day during each irrigation period. We did not prune the plants in the first year, but we will perform winter pruning in the winter of 2023-24 to eliminate twigs and dead wood. In summer 2024, we will perform summer pruning to promote more new growth and be able to start collecting data in summer 2025, which will be the third year after the initial transplantation of the plants.

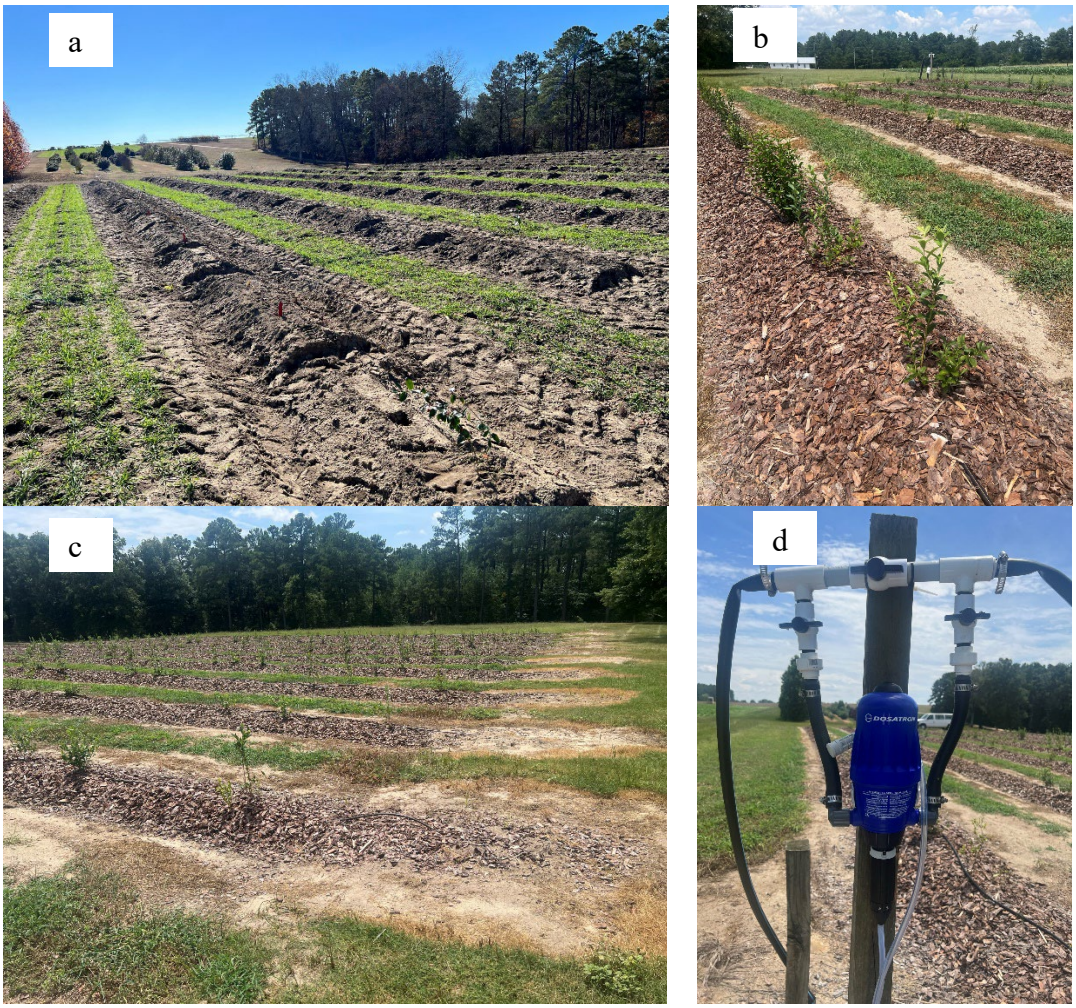

Figure 1. a) Plots after planting b and c) Plots on July 2023, nine months after the planning d) the Dosimeter for injecting the liquid fertilizers into the water.

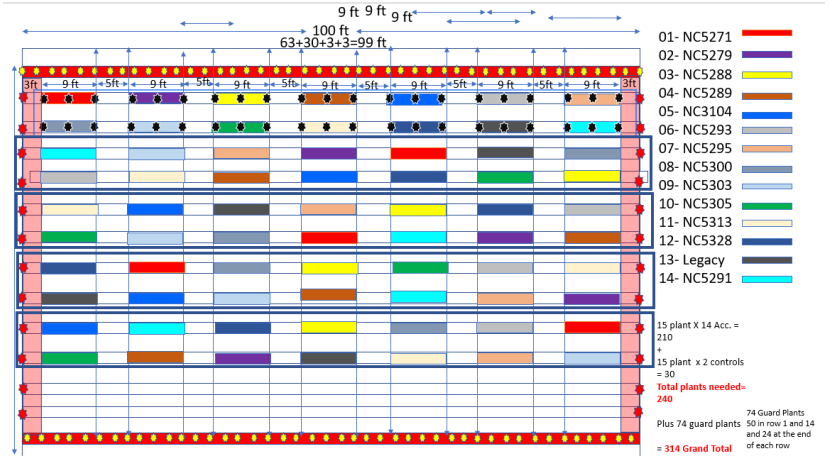

Figure 2. The layout of the experiment and randomization of the accessions among all five replications