2023 SR SFC Project Progress Report

Proposal Category: ___Research _X_Outreach

Proposal Status: ___ New Proposal _X__Previously funded by SRSFC

Title: ***Extension Education on Newly Released Blueberry Cultivars with Improved Fruit Quality Characteristics***

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Abstract:

This research is designed to evaluate the performance of newly released blueberry cultivars with enhanced fruit quality and biological characteristics that have not been previously tested in central Alabama conditions. The purpose is to develop educational curriculum on new cultivars production practices and post-harvest handling techniques and provide training to growers and Extension personnel. The outcomes will directly benefit a large number of specialty crop family farms growing this high-value berry crop, praised for providing sought after valuable health benefits.

Description of Activities:

Rabbiteye blueberries are historically an important commercial crop for Alabama, and many farms produce rabbiteye blueberries for sale in the fresh market either exclusively, or as a supplemental crop. Essentially 100% of the blueberries currently produced in Alabama are sold in the fresh market. In Alabama, 310 acres were harvested in 1998, yielding 730 kg/acre. According to the National Agricultural Statistics Service (2010), over the next decade, there was only a 3% increase in harvested acreage, but a 71% increase in yield per acre in Alabama. The blueberry acreage almost tripled by 2017, when 834 acres were grown on 536 farms according to the 2017 Census.

Two new blueberry cultivar releases from the UGA breeding program are reported to produce large size berries. ‘Titan’ and ‘Krewer’ berry size is reported to be twice as large as the berry size of most rabbiteye blueberry cultivars. ‘Pink Lemonade’ (recommended as a backyard cultivar) possesses unique pink fruit color and ripens late. ‘Pink Lemonade’ has a very attractive and unusual appearance and draws consumers curiosity and attention at the marketplace. ‘Alapaha’ is known for its very early ripening, surpassing ‘Climax’, while its blooming season is about 7 to 10 days after that of ‘Climax’, which reduces the risk of late spring frost and freeze damage to the crop. ‘Vernon’ is another early season cultivar that has not been evaluated for production in Alabama conditions. ‘Ochlockonee’ is reported to mature about a week after ‘Tifblue’ and can extend the harvest season.

Since these improved blueberry cultivars have not been previously tested for their agricultural performance in Alabama environment, an experimental plot was established to

evaluate their vegetative growth, production potential and fruit quality characteristics in order to develop cultivar recommendations to specialty crop producers in the Southeast. Traditionally grown cultivars such as the early season 'Climax', 'Premier', and the late ripening 'Powderblue' and 'Tifblue' were included as controls.

The above mentioned newly released and established blueberry cultivars were planted as a RCBD experiment with 4 single plant replications at the Chilton REC, Clanton in central Alabama. Each cultivar had a single plant on each of the four rows in the experiment. Data to determine each cultivar bud break and flowering phenology were collected periodically starting in February 2023 until end of March. A late spring freeze events occurred on March 14, 18, and 19 of March when temperatures fall to 20 degrees F. Row covers (Figure 1) were used to protect the experimental bushes every time critically low temperatures were expected starting as early as January 2023 until the last freeze in mid-March. The early row cover application was due to the fact that low chill cultivars such as 'Krewer' and 'Pink Lemonade' had had some open flowers in January. By mid-February, 'Climax' and 'Alapaha' had about 10 percent open flowers and all other cultivars have completed dormancy and were in more advanced phenological stages of development, ranging from bud swell to fully opened flowers. Since blueberry plants can withstand temperature of 20^0 F and below during the dormancy period, but are susceptible to cold injury at 28^0F at the full bloom stage, all cultivars sustained cold injury and sustained a complete crop loss (Figures 2 A,B).

Figure 1. Row covers were used to protect the blueberry plants from the late spring subfreezing temperatures on March 14, 18, and 19, and were removed on March 23, 2023.


A


B

Figure 2 A,B. Cold damage to open flowers (A) and younf fruit set (B) of early and late season blueberry cultivars, 2023.

Despite the major crop loss this season, yield data was collected on June 20 and the sugar content of the berries was measured. No statistical analysys was performed due to the very scarce number of berries surviving and harvested from each bush. It was no surprise that early seaon cultivars including ‘Vernon’, ‘Climax’, ‘Premier’, ‘Pink Lemonade’, ‘Titan’ practically had no yield, while between 91 and 322 g of fruit was harvested from ‘Krewer’, ‘Alapaha’, ‘Powderblue’, ‘Ocklochlokonee’and ‘Tifblue’ (Figure 3).

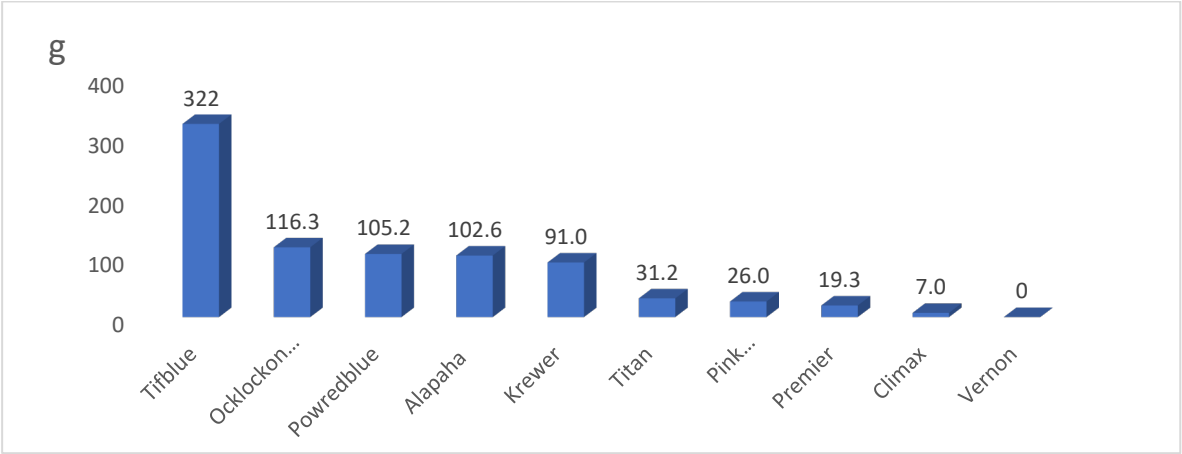

Figure 3. Total yield of selected blueberry cultivars grown at the CREC, Clanton, AL, 2023.

- Blueberry Cultivar Evaluation Trial was presented at the Alabama Fruit and Vegetable Growers Association Annual Meeting, Gulf Shore, February 9-10, 2023.
- A Blueberry Cultivar Selection workshop and Demonstration was conducted on June 6, 2023 at the Chilton Research and Extension Center. Information highlighting the performance of the tested blueberry cultivars was offered to the participants. Using high tunnels as a method to overcome the risk of cold damage in blueberry production was also presented during the workshop by Dr. Melba Salazar. Blueberry cultivars demonstration provided an opportunity for a first-hand look at the blueberry bushes and multiple management options were discusses.
- Webinar on Blueberry Cultivar Selection was developed for the ACES Commercial Horticulture Team webinar series on August 28, 2023.
- A blog article was developed for the Alabama IPM Sustainability Newsletter:

  https://www.aces.edu/blog/topics/crop-production/early-performance-of-newly-released-blueberry-cultivars-with-improved-fruit-quality-characteristics/
- An article on early blueberry performance was published in the Small Fruit Newsletter of the SR SFC:

  https://www.aces.edu/blog/topics/crop-production/early-performance-of-newly-released-blueberry-cultivars-with-improved-fruit-quality-characteristics/