

Southern Region Small Fruit Consortium – 2023 Progress Report

Title:

Effects of Biostimulants on Yield and Postharvest Quality of Two Popular Southeastern Strawberry Varieties in an Organic Production System

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*Note: Samantha Flowers who was originally on the project took a new job and Brooke Keadle Emery has joined the project.

Abstract:

The Southeast accounts for both 20% of the total strawberry acreage and farms in the U.S. The majority of this acreage is produced under an annual plasticulture system planted with June-bearing varieties such as ‘Sweet Charlie’ and ‘Chandler’. Organic strawberries can command a premium in the market, but to meet the growing market demand, growers need to increase efficient resource use to produce high-yielding, marketable crops in a way that is also financially and environmentally sustainable. Soil health and proper nutrient management is critical, not only for a successful harvest season but for long-term viability of an operation. However, in an organic system, growers are constrained by USDA/NOP regulations on fertility inputs and management. Organic growers must implement management practices that produce healthy, marketable crops and improve or maintain soil health and nutrient levels without the use of synthetic fertilizers. One potential solution to increase harvest yield and quality while maintaining soil health in an organic system is through the application of approved biostimulants. They are comprised of microbes and/or other substances. Biostimulants potentially provide many benefits to crops, such as improvement of the efficiency of the plant’s metabolism to induce yield increases and enhance crop quality (i.e., sugar content, color, etc.), increased plant tolerance to and recovery from abiotic stresses, more efficient water use, and others. In this project, we are assessing whether biostimulants can assist in managing abiotic stress and critical nutrient levels, and improve crop quality and yield. Additionally, we will produce a module on strawberry postharvest handling to maintain quality from the field to the consumer, which will be used in agent trainings and grower webinars across the Southeast.

Objectives:

1) To determine the effects of two certified organic biostimulants (John & Bob’s Maximize and Earth Alive Soil Activator) on two popular organic strawberries varieties (‘Chandler’ and ‘Sweet Charlie’) for plant establishment, crown development, and fruit bud development, as well as yield and postharvest quality; 2) To develop a module on strawberry postharvest handling that can be used for virtual agent trainings and grower webinars in the Southeast.

Activities:

Project Timeline

<i>Years</i>	<i>Activity</i>
<i>2023</i>	
Fall	<p>Ground tilled, Bob & John's Maximize applied in treatment plots, then plastic mulch and irrigation laid in all beds (10/4).</p> <p>Planted Chandler plugs, treated Chandler plots with Earth Alive and watered in (10/5).</p> <p>Planted Sweet Charlie plugs, treated Sweet Charlie plots with Earth Alive and watered in (10/12). (Later planting due to shipping error.)</p> <p>Replanted missing plugs in all plots (10/18).</p> <p>Chandler week 3 height, diameter, and establishment data collection (10/27).</p> <p>First frost (10/30).</p> <p>Sweet Charlie week 3 height, diameter, and establishment data collection (11/2).</p> <p>Chandler week 6 height, diameter, and establishment data collection (11/17).</p> <p>Sweet Charlie week 6 height, diameter, and establishment data collection (11/22).</p>
<i>2024</i>	
Winter	<p>Cover plants with row cover when weather gets cold.</p> <p>Create strawberry postharvest handling module.</p>
Spring	<p>Re-apply Bob & John's Maximizer in April.</p> <p>Harvest strawberries. Collect data regarding yield, fruit color, soluble solids, and firmness.</p> <p>Place strawberries in cooler for 1 week at 0 °C. Collect data regarding fruit color, soluble solids, firmness, and quality.</p>

Preliminary Findings

During fall 2023, measurements were taken three and six weeks after planting to compare plant height, diameter, and establishment. Chandler plants are more vigorous than Sweet Charlie, with nearly 100% plant stands. Sweet Charlie plugs arrived with more disease and establishment is reduced in two of the biostimulant plots. No differences in plant height and diameter by biostimulant treatment have been observed.

A one-year extension is requested, as strawberries were not planted until Fall 2023 as per standard practice.