

## Introduction

Greenhouse or high tunnels tabletop production can offer some crop and pest management advantages to conventional production, but it can be a costly alternative in Florida. So, can a tabletop system be adapted for commercial production under open-field conditions?



**Figure 1:** Strawberry Encore™ grown in open-field tabletop.

## Hypothesis

- 1- Open-field tabletop system can offer a successful alternative or supplemental strawberry production system in Florida.
- 2- This system can be an economically feasible alternative.

## Objectives

- 1- Develop an adapted/modified tabletop system for open-field strawberry production in Florida.
- 2-Conduct a preliminary cost analysis of the system, potential infrastructure, and recommendations. Pending full project completion.

## Methodology

On-farm trial was set up in approximately 1/8 acre and replicated in conventional and organic systems to evaluate various parameters over the course of three seasons.

## Parameters considered:

Soilless substrate, irrigation, fertigation, pest management, cost analysis and feasibility, labor, and harvest/picking practices.

## Season 1 (2024-2025):

Soilless substrate mixtures tested with white (W) and black (B) plastic mulch covers:

C: coco coir (control)

P1: pine bark + yard waste (compost)

P2: pine bark + yard waste (compost) + vermicompost

## Season 2 (2025-2025):

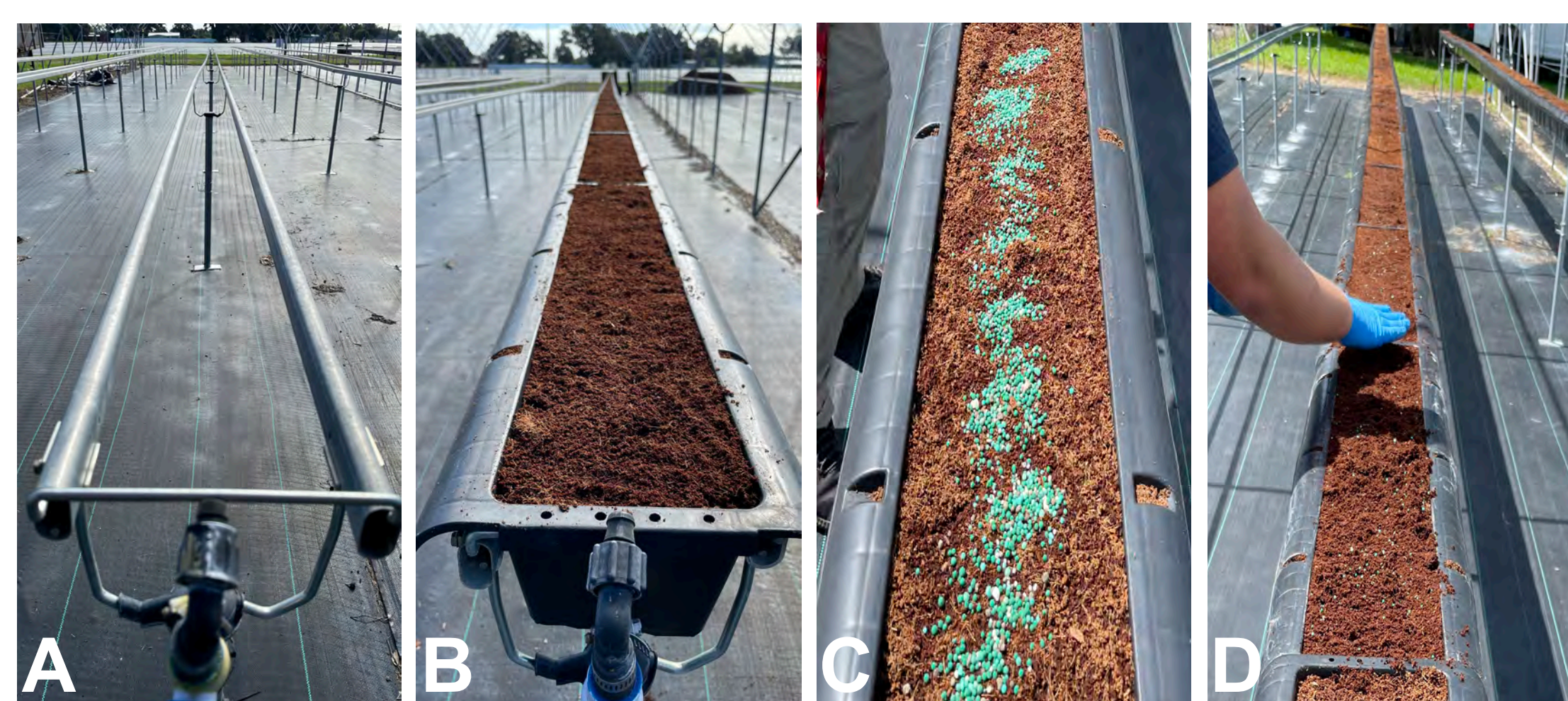
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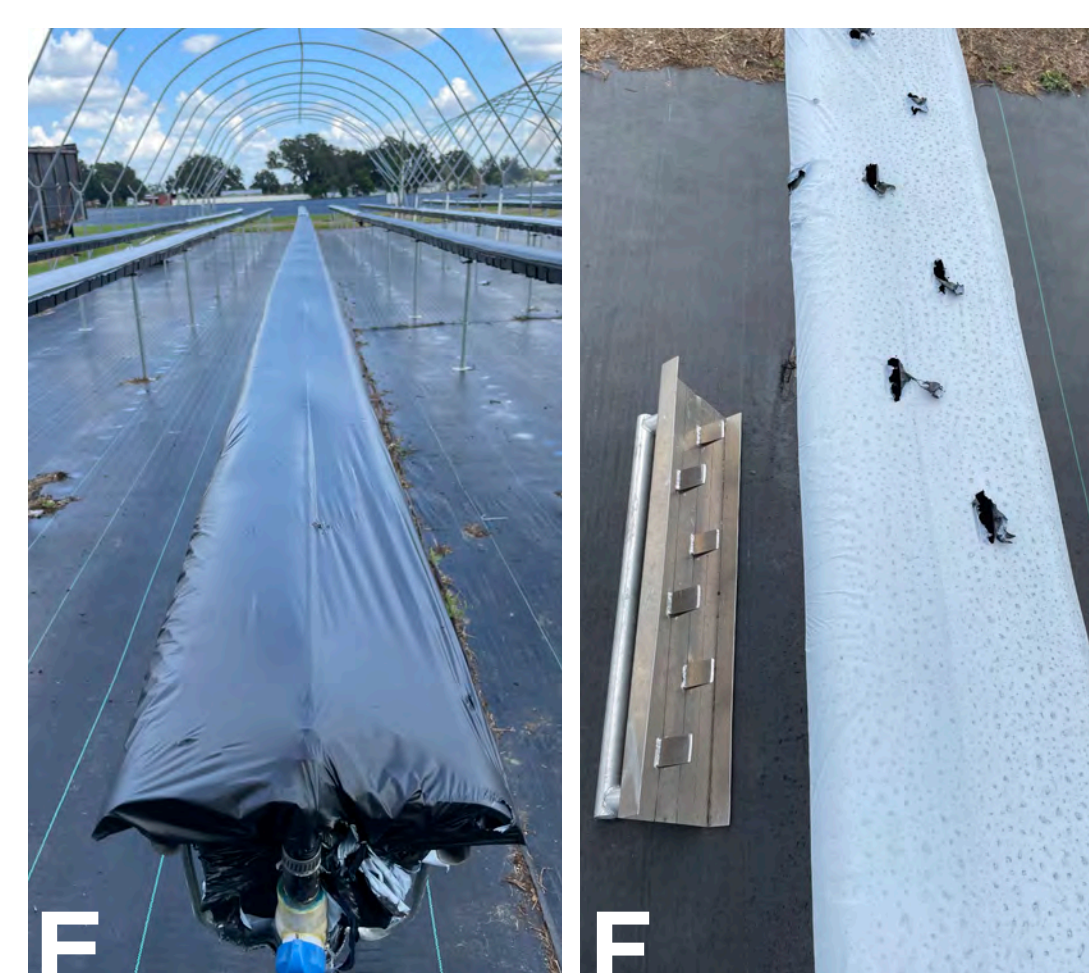
The trial was laid out in a completely randomized design.

Data collection: Various data parameters were collected, including plant vigor, dry and wet plant weight (end of season), water pH, and yield data. We'll focus here on yield patterns among treatments.



**Figure 2:** The process of preparing the troughs for planting:

- A) Installed tabletop structure
- B) Place filled troughs with the substrate on rails
- C) Add slow-release fertilizer
- D) Mix fertilizer with substrate
- E) Lay drip tape & cover with plastic mulch
- F) Punch plant holes



**Figure 3:** Fertigation dosatron injection systems. **Left:** two parallel systems for injecting NPK mixtures and calcium products separately. **Right:** injection system of the organic trial Multizone in each setup to allow for changing fertigation needs for different substrates.

| Mainline 1  |          | 02:59/05:00 mm:ss |             |        |       |             |             |
|-------------|----------|-------------------|-------------|--------|-------|-------------|-------------|
| Irrigation  | Flow     | Pressure          | Amount      | Dosing | Shift | Next        | Last        |
| ORG PINE AM | 4.68 GPM | 0.00 PSI          | 05:00 mm:ss | --     | 1/1   | ORG PINE PM | ORG PINE PM |
| Mainline 2  |          | 02:32/05:00 mm:ss |             |        |       |             |             |
| Irrigation  | Flow     | Pressure          | Amount      | Dosing | Shift | Next        | Last        |
| ORG COCO AM | 1.70 GPM | 0.00 PSI          | 05:00 mm:ss | --     | 1/1   | ORG COCO PM | ORG COCO PM |

**Figure 4:** Automated irrigation and fertigation system. The system is fully customizable to adjust irrigation runtimes and number of cycles. It also offers real-time monitoring of irrigation events, pressures, and notification and programable safety shutoffs.



**Figure 5:** **Left:** planting bareroot plants, November 2024. **Right:** established plants, December 2025.



**Figure 6:** Harvest crew picking strawberry during 2025-2026 (second) growing season.

## Results and Discussion

Yield data collected from both conventional and organic trials show that treatment P2 [pine bark + yard waste (compost) + vermicompost] has outperformed other treatments throughout the season (Fig 8 & 9). This is to be expected considering the additional nutrients in treatment P2. However, the additional cost of vermicompost should be considered.

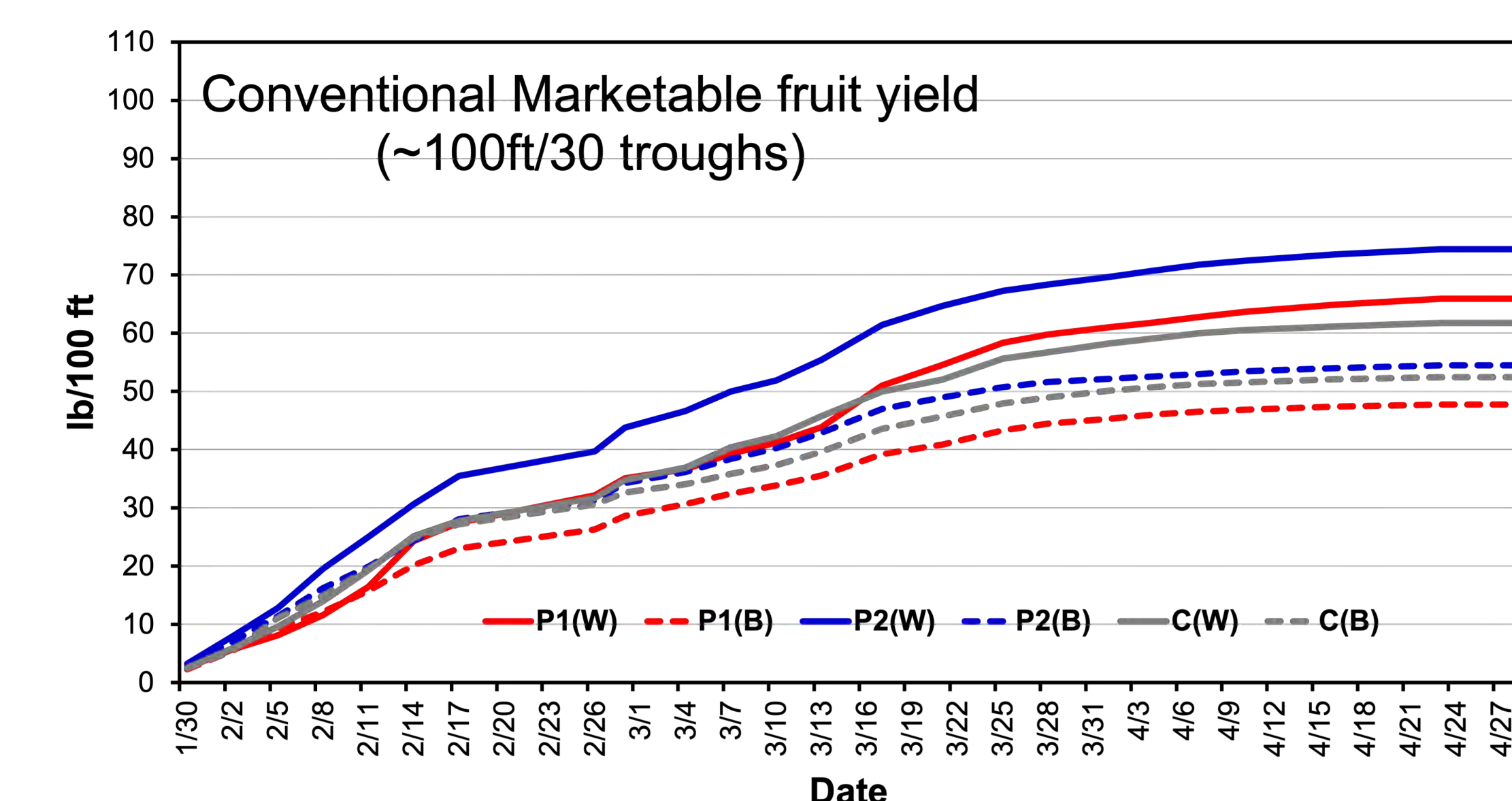
White plastic mulch has also consistently performed better than black plastic mulch under the same irrigation and fertility settings. This could be due to the higher reflected light from the white plastic on the plant canopy that can potentially increase the photosynthetic capacity of the plants, resulting in more vigor. White plastic showed less fluctuations in soil moisture and temperature.

Season 2 data is currently being collected and analyzed. However, preliminary analysis of treatment performance shows the same patterns seen in season 1. This is true for the P2 substrate, which greatly outperforms coco coir as the control. Similarly, white plastic mulch outperforms black plastic in both soil substrates tested.

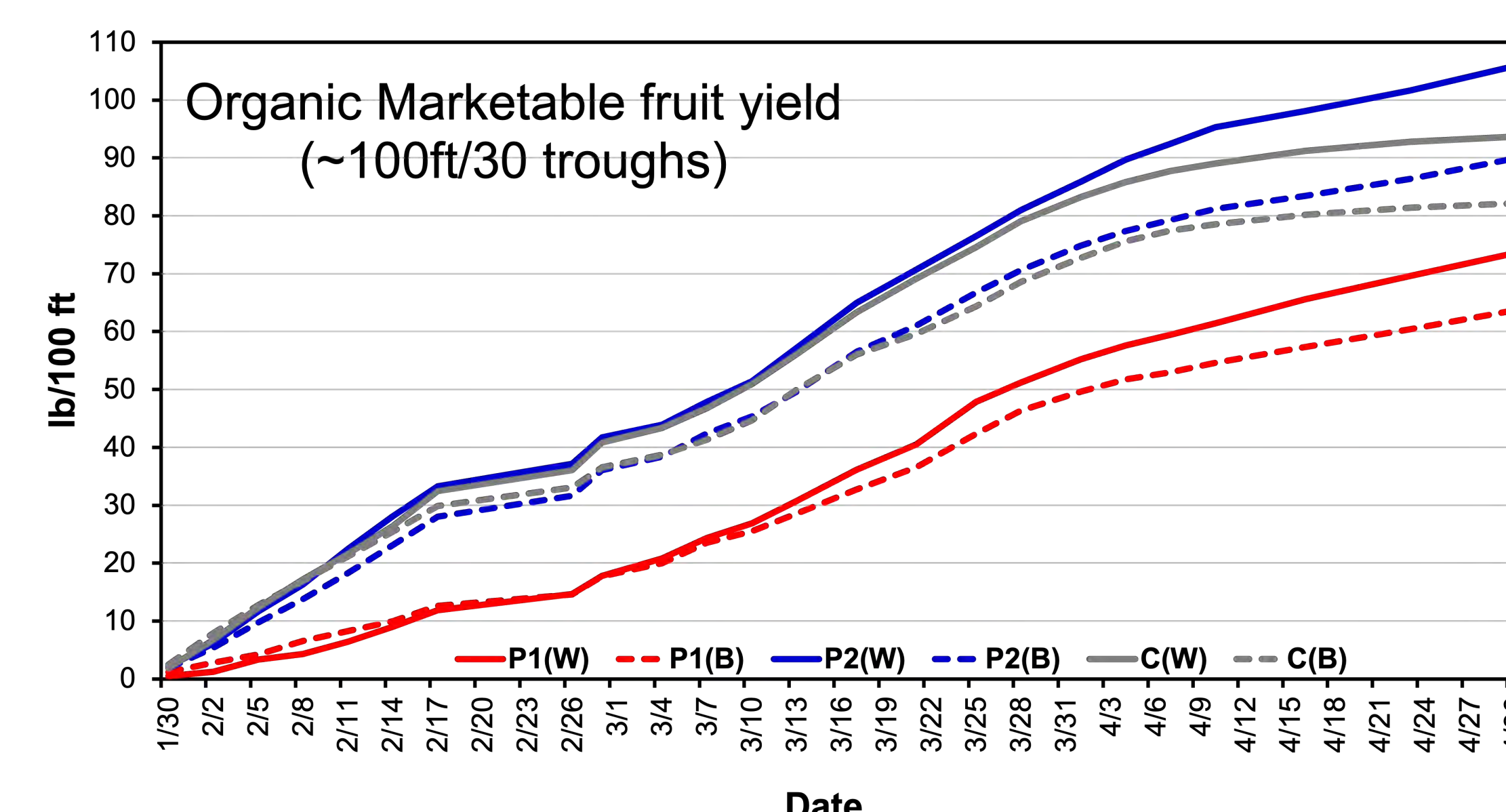
Coco coir is a challenging substrate due to its higher moisture retention and requires close pH monitoring, which is critical, especially for micro nutrient availability.



**Figure 7:** Micronutrient (Fe, Zn, Mg) deficiency symptoms observed in organic coco coir treatments under both white and black plastic mulch.



**Figure 8:** Yield date collected in conventional production tabletop for treatments P1, P2, and C with white and black plastic mulch designated by (W) and (B), respectively.



**Figure 9:** Yield date collected in organic production tabletop for treatments P1, P2, and C with white and black plastic mulch designated by (W) and (B), respectively.

## Conclusions

The tabletop system has a higher initial cost investment but has initially succeeded as a proof of concept in open-field.

Pine+compost+vermicompost substrate mixture is suitable with good drainage, offering comparatively lower pH, which is an essential component for strawberry as a demanding long-season crop.

White plastic higher performance is likely due to the higher light reflection on the canopy parts. Lesser soil temperature and moisture fluctuations may be contributing to lower stress to the plants and ultimately higher performance; however, further investigation is required.

Further optimizations to the infrastructure may be required for financial feasibility while harnessing the various benefits of this raised production system in crop management, integrated pest management, and reduced food safety risks.

## Acknowledgment: Funding and Partners

