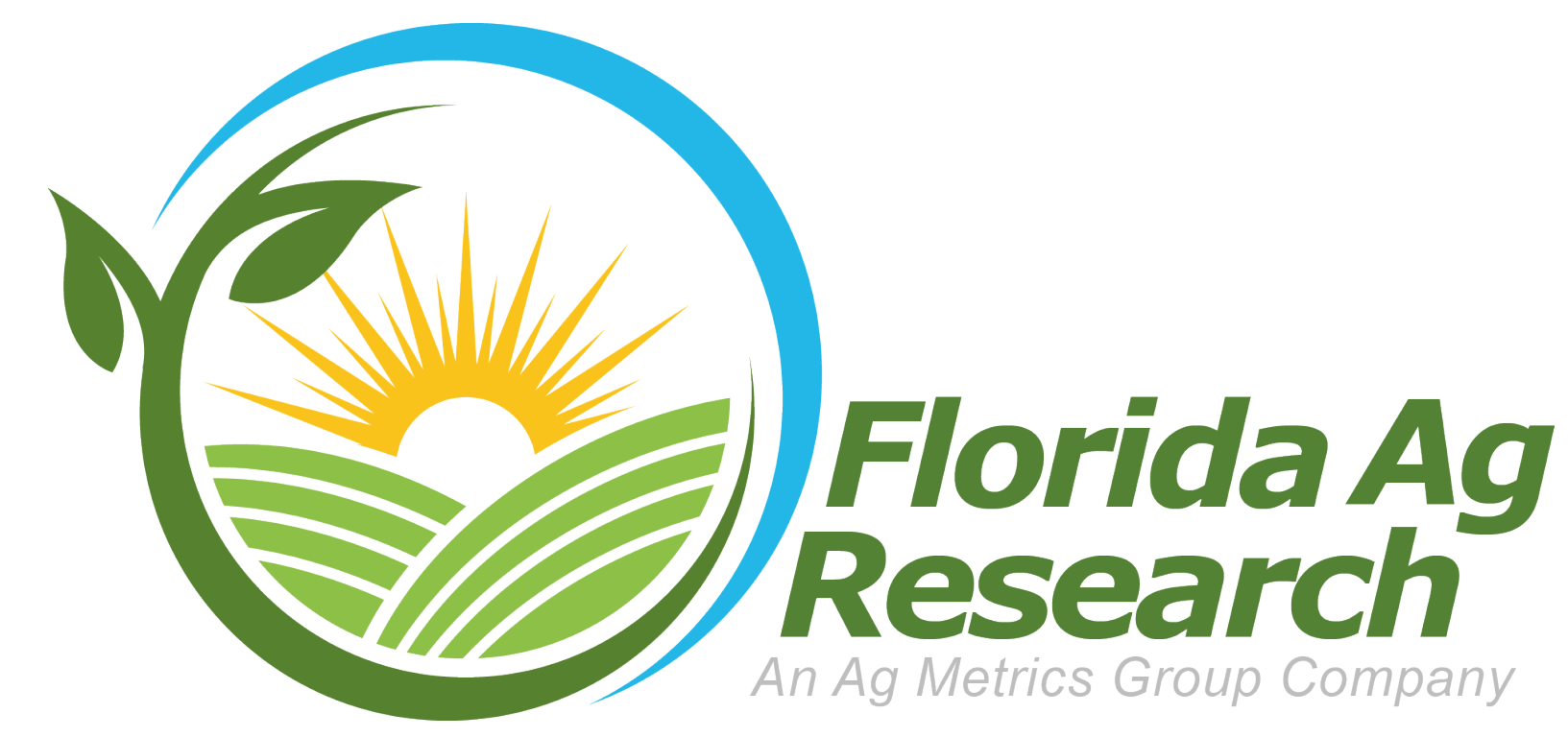


SOIL SOLARIZATION AND ANAEROBIC SOIL DISINFESTATION FOR CONTROL OF NEMATODES, WEEDS, AND SOIL BORNE PLANT PATHOGENS IN CENTRAL FLORIDA STRAWBERRY: RAISED BED vs FLAT GROUND



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Introduction

Management of soil borne pests in commercial Florida strawberry farms is a reoccurring challenge. To meet the demand for domestically produced winter fruit, while remaining in compliance with regulatory pressure and production costs, Florida's strawberry growers have limited options for soil borne pest control and have come to rely on use of the few remaining fumigants, and, organically, new land, isolation, high rates of soil amendments, and a variety of organically approved products with varying levels of efficacy.

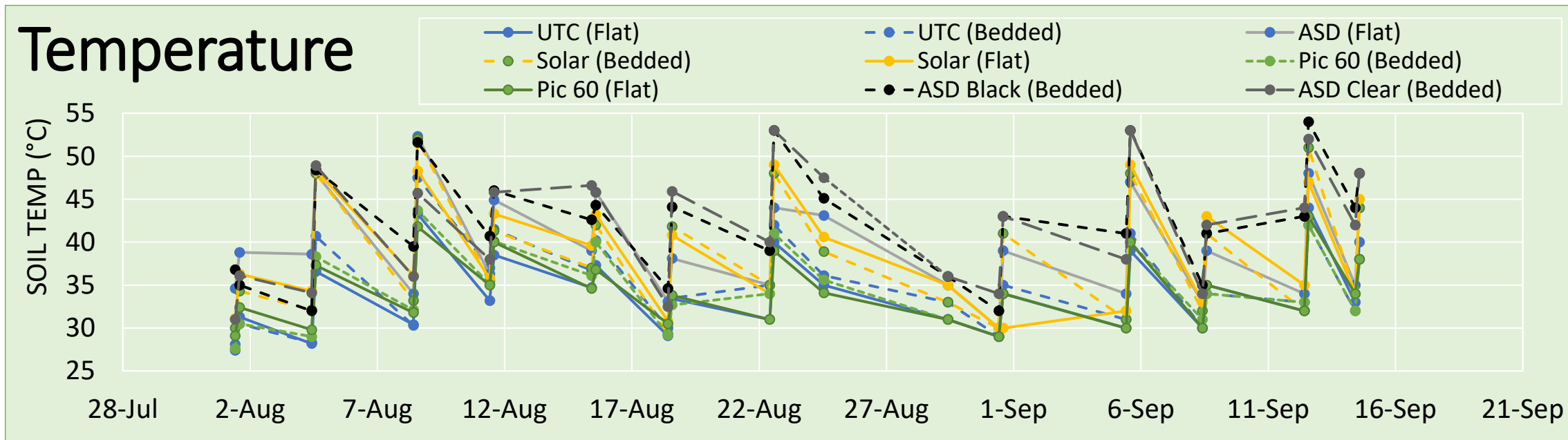
Here, we build on previous work from these and other researchers to develop site-specific "Best Practices" for alternative nematode and pathogenic soil fungi control for Central Florida. Two summer solarization trials took place at the Dover Lab and yields for ASD + Solarization were on par with fumigation. This season we increased precision of applications for manure and molasses and included raised beds or flat ground comparisons.



Direct metered injection of chicken litter and molasses to raised beds, July 2023.

Raised Bed: The beds were formed before the application of materials; A Clamco was utilized to knife the chicken litter directly into the treated plot, followed by molasses pumped directly into the treated area. Beds were then rototilled and reformed then covered with clear or opaque plastic depending on the treatment.

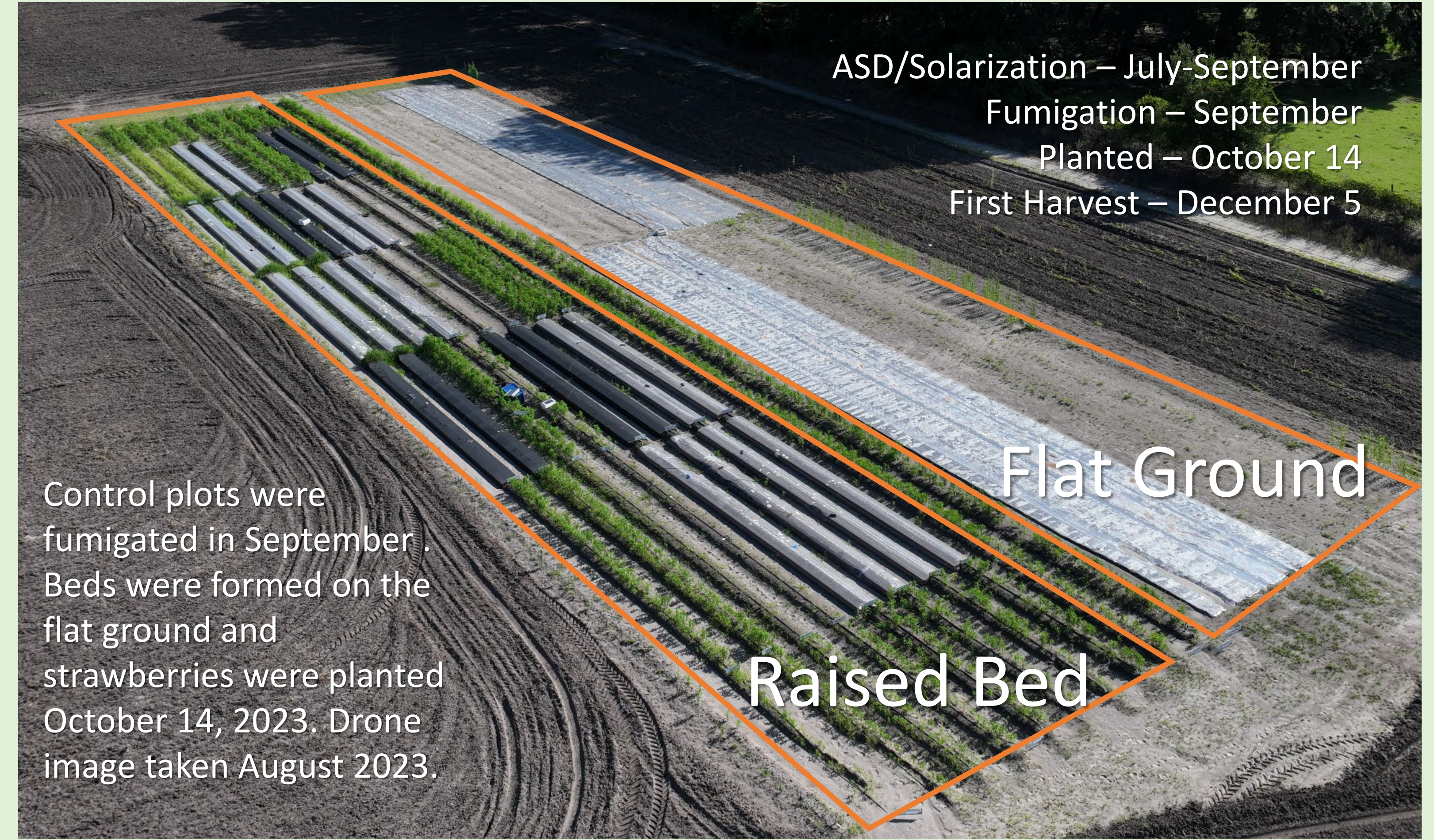
Flat Ground: In many commercial settings, ASD and Solarization treatments are easier accomplished on flat ground. Here, the chicken manure was applied to the treated area utilizing a cone spreader, followed by mechanical injection of molasses, then the area was disked and plastic mulched.



Methodology

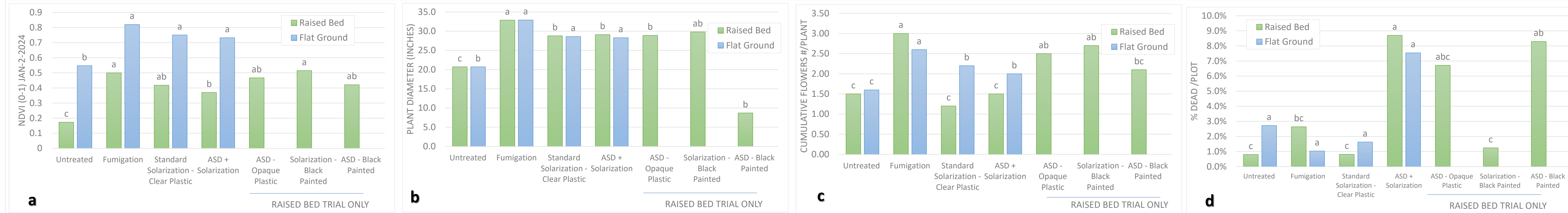
Raised Bed: Planting beds were inoculated with soil-borne diseases, Sting nematodes, and common weed seeds before treatment. Four replicates of five treatments were randomly placed into planting beds previously farmed in strawberries. Following summer solarization/ASD, beds were formed in September (Fumigated) and in October, half of the ASD and Solarization plots with clear plastic were painted black.

Flat Ground: Bare ground areas were inoculated with soil-borne diseases, Sting nematodes, and common weed seeds before treatment. Four replicates of four treatments were placed into previously farmed strawberry ground. Each plot comprises one planted bed 120 ft in length. Following summer solarization and ASD plots, beds were formed in September.

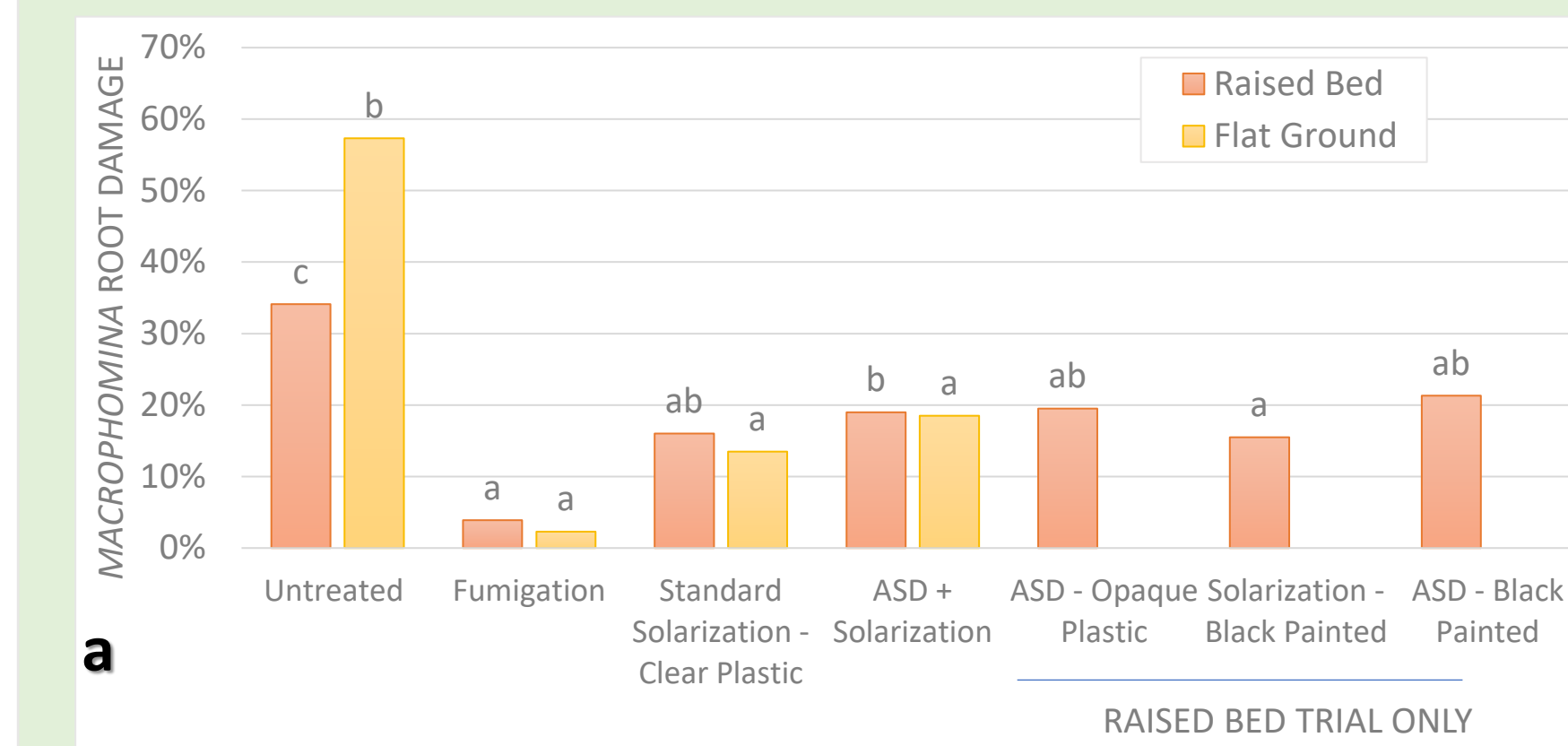


Control plots were fumigated in September. Beds were formed on the flat ground and strawberries were planted October 14, 2023. Drone image taken August 2023.

Crop Health



Soil Pest Control

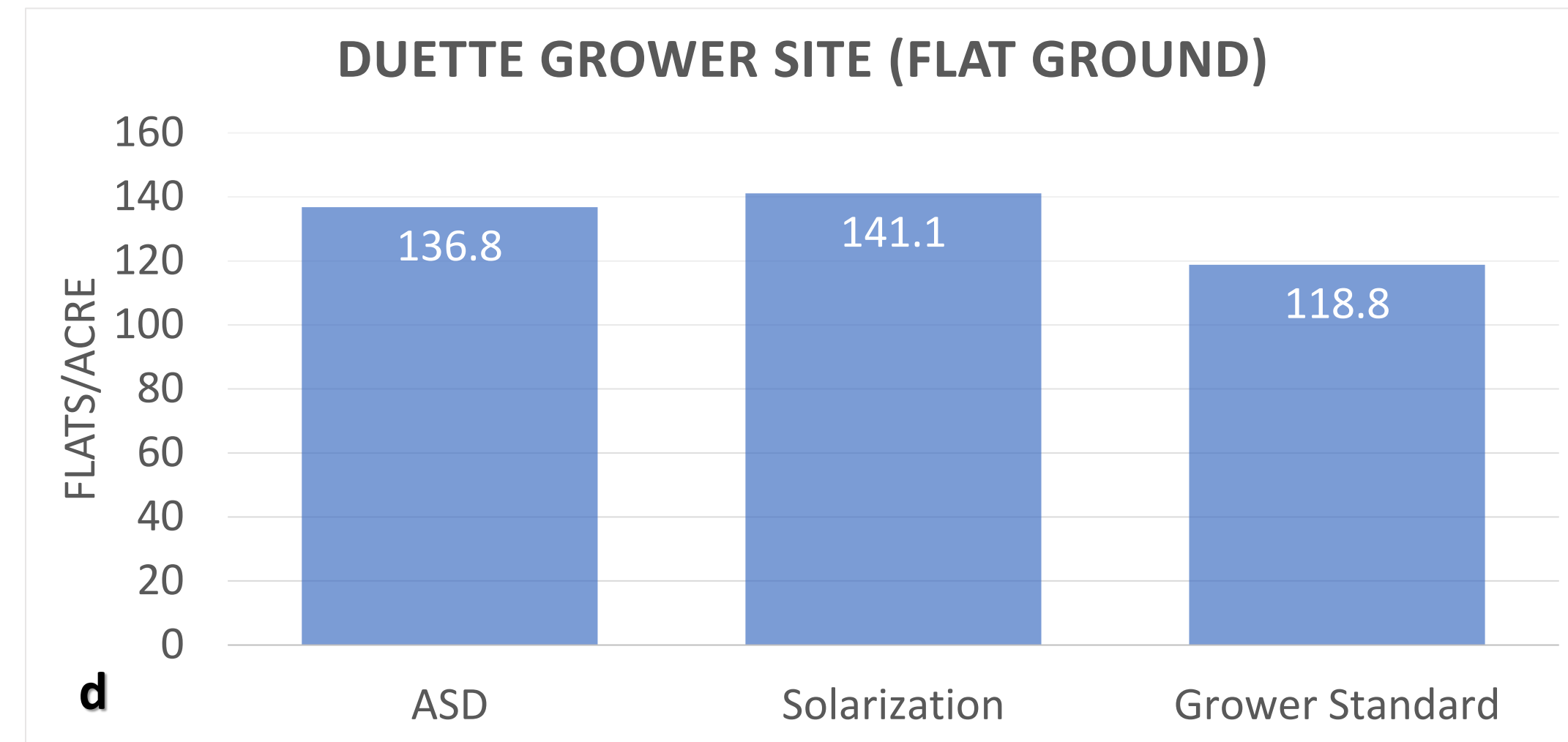
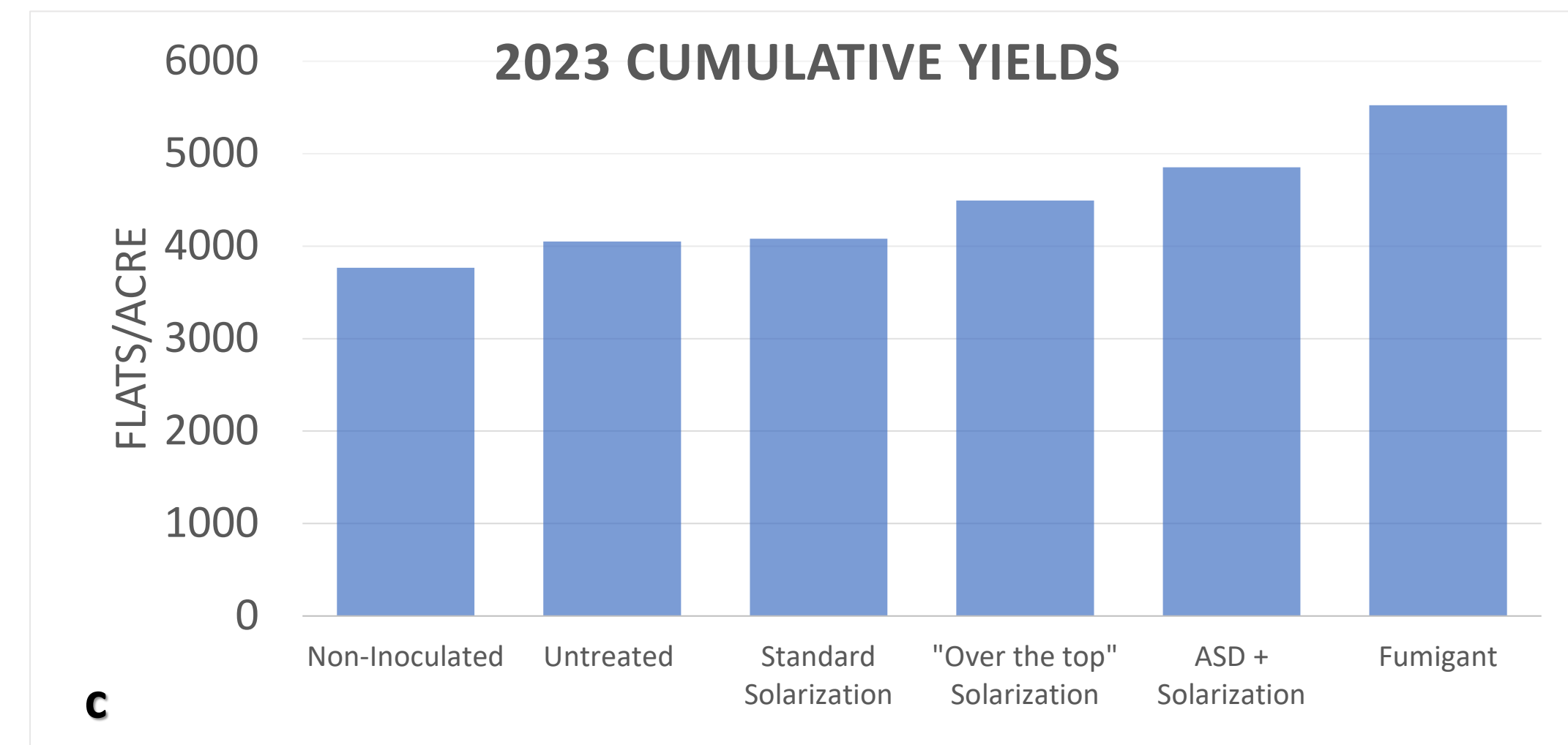
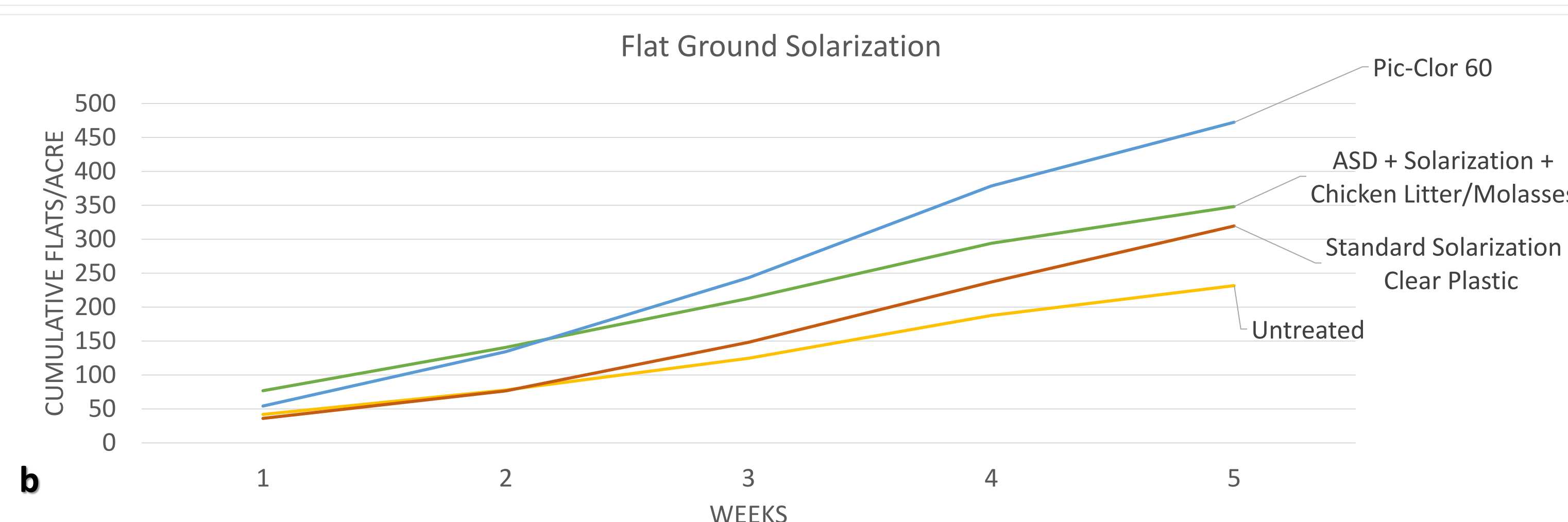
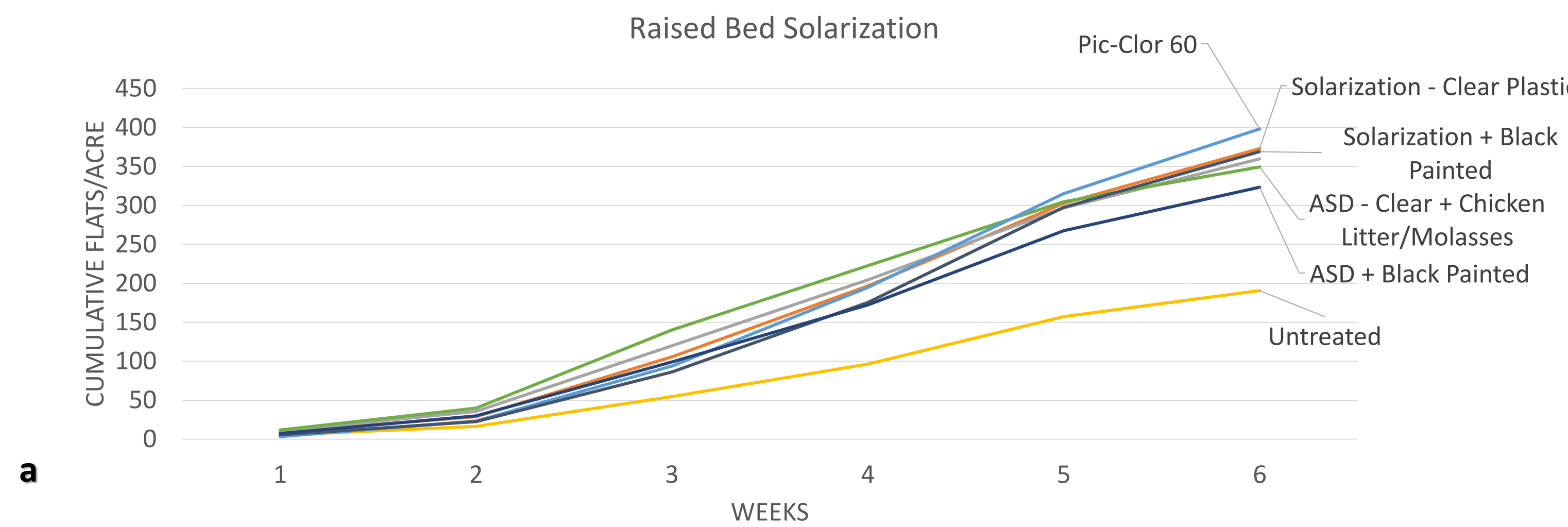


CFUs and Nematodes per 100 G soil	
Treatment	Soil Pathogens 77 DA-P
Name	Macrophomina Sting Nematode
Untreated	123.5a 11.0a
Fumigation	6.3c 0.0c
Standard Solarization - Clear Plastic	37.5b 0.0c
ASD + Solarization	23.3bc 5.0b

Pest control comparison between raised bed and flat ground experiments. Root damage severity due to *Macrophomina* (a) was greater in the untreated inoculated plots. (b) Fumigated soil had significantly lower incidence of soil pathogens.



Yields



Cumulative Yield data for approximately 6 weeks of harvests at the raised bed (a) and flat ground (b) fields, compared to cumulative annual yield from the previous years' study at Dover (c) and the Duette, FL, grower site that was a flat ground treatment (d).



Additional research funding provided by The Florida Strawberry Growers Association Foundation and the USDA

