

## RESILIENT AND SUSTAINABLE COMPACT BED PLASTICULTURE FOR WATERMELON PRODUCTION IN FLORIDA

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Florida is the second-largest producer of fresh fruits and vegetables in the United States, using 337 million gallons of water every day. Plasticulture is the most common method of production for fresh fruits and vegetables but is a high input, cost, and impacting system. In recent years, increased cost, foreign competition, and environmental awareness have made the production of fresh fruits and vegetables difficult in the state of Florida. Compact bed plasticulture has recently been introduced as a resilient and sustainable agricultural strategy for the production of erect crops across the eastern coast of the United States. Recent studies by Holt et. al. show compact bed geometries increase water, pesticide, and nutrient use efficiency while sustaining yield for tomato and eggplant production. Co-benefits identified by Holt et. al. include decreased production costs (\$200/ha), reduced carbon and energy footprints (5-10%), and production risk reduction including reduced soil saturation yield losses and the likelihood of water vectored diseases. Growers were surveyed to determine their conventional bed geometry and likelihood of adopting alternative compact bed geometries. Once a conventional, 76 cm by 20 cm, and two alternative compact, 46 cm by 30 cm and 41 cm by 30 cm, bed geometries were identified, they were evaluated on commercial farms in historically watermelon producing areas of the state. The first season's preliminary results show no difference in yield between geometries with a potential for increased system efficiency similar to the results seen in erect crops. In-bed water and nutrient management were also evaluated to determine if compact bed geometries resulted in more ideal soil moisture content and reduced nutrient leaching from irrigation and rainfall events. The use of compact bed plasticulture might offer a win-win solution to reduce the environmental impact of plasticulture while sustaining Florida fresh fruit and vegetable producers.

**PRESENTER BIO:** Kira Hansen is a PhD student who has conducted eleven seasons of on-farm research with commercial vegetable growers from New Jersey to South Florida. Her research focuses on the evaluation of compact bed plasticulture with regards to: water and nutrient efficiencies; fumigation types and rates; and soil-borne pests and diseases.