

## Table to Farm: A Sustainable, Systems-based Approach for a Safer and Healthier Melon Supply Chain in the U.S.



### **Summary:**

The Yuma Center of Excellence for Desert Agriculture (YCEDA) was responsible for melon variety trials in Yuma, AZ from 2018-2021. YCEDA planted the melon seed, maintained the crops, harvested the fruit, and shipped the melons to laboratories at Texas A&M and University of Arizona for analysis each year. Additionally, YCEDA obtained melons from commercial fields and transported the harvested fruit to Dr. Sadhana Ravishankar's laboratory at the University of Arizona in Tucson for testing. Corresponding environmental samples were also collected from the melon fields and delivered to Dr. Ravishankar for laboratory analysis every year.

### **Planting:**

Seeds of multiple varieties received from Texas A&M, including new melon lines developed for this research project and commercial varieties, were planted in 50ft rows with 2ft spacing between the seeds. Each variety was replicated twice at random in a half-acre field. The number of seeds were limited to around 100 per variety and two seeds were planted together and later thinned, leaving 50 plants in total from each variety. Our trials were planted close by or next to larger melon field trials which helped facilitate the volunteer pollinators.

### **Varieties:**

Varieties were grown following local commercial standards for cantaloupe. Six varieties were planted in the first-year trial (2018): DaVinci, HD150, HD252, OC164, Infinite Gold, and F39. The second-year trial (2019) consisted of the varieties from the previous year and some hybrid varieties. Twelve varieties were grown: DaVinci, HD150, HD252, OC164, Infinite Gold, F39, TH11, TH10, TH7, TH8, TH12, and TH9. Brix testing was completed to eliminate fruit that did not meet the standard specified by the research team. The fruit not meeting the standard was not shipped to Texas, only to Tucson for microbial analysis. During the third-year trial (2020), the sixteen varieties planted included TH1, TH5, TH6, TH9, TH10, TH11, TH12, TH13, TH14, S-SU, S-TR, S-AC, S-SW, S-TA, S-SA, and S-MA. In year four (2021), we grew eighteen varieties: TH1, TH5, TH6, TH9, TH10, TH12, TH13, TH16, TH17, TH18, TH19, TH20, TH21, F39, Infinite Gold, 252HQ, HD150, and DaVinci.

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### ***Irrigation and Pesticide Applications:***

Drip irrigation was used in each year after planting for germination. After germination, irrigation was switched to drip or furrow. Insecticides, pesticides, and fungicides were applied periodically and if pest pressure was high. Some fertilizers were applied through furrow water.

### ***Challenges:***

We encountered several challenges over the four years. Fruit maturity during harvest was one. Since we were dealing with multiple varieties, timing the harvest when optimal for all fruit was somewhat difficult. Vine decline was another complication, and it forced us to harvest earlier than we would have liked. We often encountered white flies on the melon crops, but these were managed with insecticide applications. The planting date for the year-three trial had to be postponed a few weeks due to multiple rainstorms, which are not common in the Yuma area. Additionally, the unusual rainfall resulted in a pest problem, higher than normal population of flies in the Yuma area. The fly larva fed on the melon seeds preventing them from germinating. Damage was mitigated by incorporating a pyrethroid insecticide in the seed line prior to planting. COVID-19 and remote work conditions resulted in less frequent inspections of the crops and prevented us from hosting another in-person conference/field day in Yuma, AZ.

### ***Shipping:***

The harvested melons were shipped to laboratories at the Texas A&M for consumer testing and the University of Arizona in Tucson for food safety testing. The Tucson lab also received commercially grown melons and corresponding environmental samples from the Yuma area each year during the fall growing season, except in 2020 due to lab closures at the University of Arizona during the pandemic. The number of melons each laboratory received varied each year.

### ***Outreach:***

A melon research field day was held in Yuma, AZ in June 2018 at the University of Arizona's Yuma Agricultural Center. Project leaders, researchers, seed suppliers, and commercial melon growers from Arizona and California attended the event. Presentations from the research team showcased the project objectives and the discussion allowed attendees to provide feedback on the project goals and methodology. After the presentations, attendees participated in a field tour at the trial site to observe the crops and sample the melons. We planned to host another in-person research field day and stakeholder conference in Yuma, AZ during 2021, but the COVID-19 pandemic prevented us from doing so. Instead, the July 2022 Melon Research and Outreach Workshop was held in Tucson, AZ at the University of Arizona to share research findings.



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