Organic Screenhouse Trial of Parthenocarpic Cucumbers

Preliminary Results April-June 2019

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Introduction

Locally produced cucumbers are in high demand, but production challenges associated with pest management are a significant bottleneck to growing cucumbers in Hawaii (Valenzuela et al., 1994). This is especially true for certified organic producers. In particular, the challenge has been the management of fruit flies and pickleworm which can seriously damage fruit and dramatically reduce marketable yield. Organic producers do have some effective NOP-compliant pesticides available to them, but they are expensive and frequent use can result in the development of pesticide resistance. Pest exclusion strategies like screen houses can effectively control these pests with no or minimal pesticide use, and has shown particular promise for tomato (Sugano et al., 2014). Our objective in this trial was to evaluate the performance of five parthenocarpic cucumber varieties under organic production in a screen house.

Methodology

Untreated seeds of five non-transgenic cucumber varieties (Table 1) were seeded in an OMRI listed, peat-based potting mix (Sunshine® #4). Six week old greenhouse grown seedlings were hardened off and transplanted to the certified organic plots at the Waimanalo Research Station in April 2019. The experiment was laid out in randomized complete block with 4 replications. Plants were drip irrigated and supplied 150 lbs N/acre pre-plant using OMRI listed Sustane® fertilizer (8-2-4). Weeds were suppressed with mulch obtained from local tree trimmers. The 'Lower-and Lean' trellising method was used for this trial, for more information on this technique please visit Johnny's Seed® (https://www.johnnyseeds.com/videos/video-v87.html) Harvests were initiated on 14 May, 2019 and continued for ~6 weeks. In addition to total yield, individual fruit characteristics were also evaluated. Data was analyzed using Statistix® and SigmaPlot®.

Results

The top performing varieties were 'Corinto', 'Socrates' and 'Tasty Jade.' Low yields in 'Tyria' and 'Diva' were due to an apparently high susceptibility to damping off. While 'Tyria' suffered die back though out the entire trial, 'Diva's' susceptibility was only immediately pot-transplat. These results agreed with similar trials at Purdue, where 'Socrates' was one of the highest yielding varieties and 'Tyria' the lowest (Jett, 2011). Yields would be expected to be somewhat higher and produced over a longer period if grown in the winter. Consumer preference will also play a role in marketability of the cucumbers: 'Corinto', 'Socrates' and 'Tasty Jade' represent different market types that vary in appearance and skin thickness (Table 1, Table 2, Figure 2). It is clear that cucumbers can be grown as a part of a broader crop rotation in organic screenhouses and that evaluation of cucumber varieties for organic screenhouse production should continue to include additional varieties, locations and seasons.

Table 1. Seed sources of varieties used in this trial.

Varieties	Producer	Description	Disease Resistance
Tyria F1	High Mowing	Burpless European, long/slender fruit (14"), thin skin	PM, SCAB, TLS
Tastey Jade F1	Johnny's	Japanese, long (11-12") thin skin	PM
Socrates F1 OG	Johnny's	Beit Alpha, large, cold conditions, 7-8", greenhouse	SCAB, TLS, PM
Diva	Johnny's	Thin skin, compact, harvest when small (5-7")	CVYV, SCAB, PM
Corinito F1 OG	Johnny's	Slicing var. (5-7") dark green, thicker skin	CMV, CVYV, PM

Figure 1. Total yield per plant of certified organic, screenhouse-grown Cucumbers harvested 5/14/19- 6/7/19.

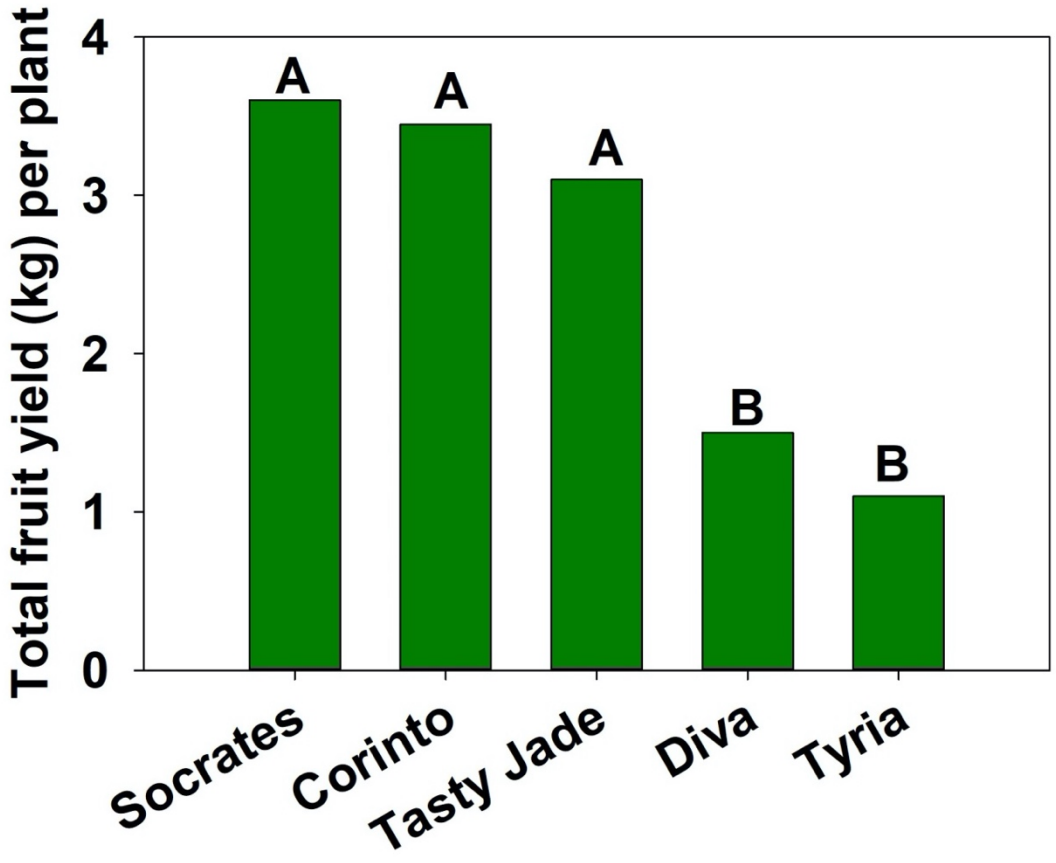
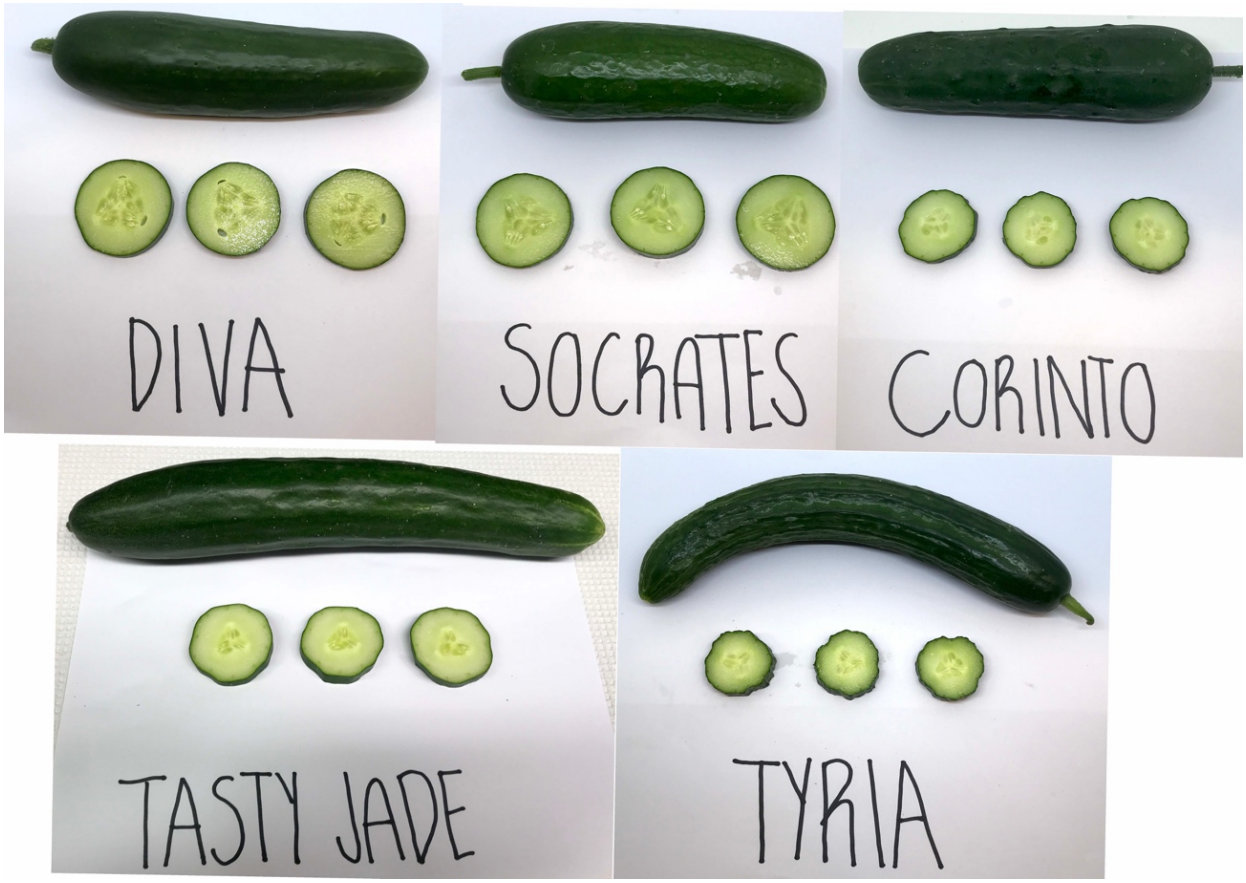


Table 2. Individual fruit characteristics of varieties

Variety	Fruit Weight (g)	Fruit Diameter (cm)	Fruit Length (cm)	Number of Fruit per Plant
Socrates	233	4.5	20.1	16
Corinto	301	4.6	24.4	11
Tasty Jade	401	4.7	31.1	8
Diva	317	4.2	19.7	4
Tyria	298	4.4	27.6	3

Figure 2. Individual fruit characteristics of varieties



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