Evaluation of Strawberry Cultivars and transplant steaming in Organic Production in Florida

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Summary

Sensation and Radiance had the highest yield under organic growing conditions. Transplant steaming prior to planting had no negative effect on growth of any of the cultivars.

Background

Nematode management options in organic strawberries are limited. Sting nematode is one of the main problems for organic strawberry production in Florida. Without fumigants, the only option for organic growers to manage nematodes is to use cultural practices (crop rotation, cover crops), apply bio-nematicides and organic approved soil amendments. Thermotherapy, by steaming transplants prior to planting, is

Methods

Studies were conducted in the certified organic field at the University of Florida's Gulf Coast Research and Education Center in Wimauma, FL, USA, during the 2020-21 and 2021-22 strawberry seasons (Table 1). Products were all applied thru the drip irrigation system (1 drip tape in the center of the bed) in 38 ft long plots.

The cultivars used were Sensation® Florida127, Florida Brilliance, Florida Radiance, WinterstarTM 'FL 05-107', Florida Elyana, Strawberry Festival, and Florida Beauty. Strawberry cultivars were applied as whole plots (250 ft long x 2.5 ft wide) and plant steaming (steamed and non-steamed) as sub-plots (13 ft long x 2.5 ft wide) with a 10 ft buffer zone between each subplot. Beds were raised, and a totally impermeable field plastic (TIF Total Blockade, Berry Plastics Corporation, Evansville, IN) was used to cover the newly raised beds at least seven days before planting. Bare-root strawberry cultivars were obtained from a nursery in California, and plants were kept in a cooler for no longer than two weeks at 4 °C before steaming. The seven cultivars were submitted to 1 h treatment at 37°C, a 1 h cool-down, and a 4 h treatment at 44°C

as described in Wang et al. (2019). Steamed plants were hand-transplanted in the field on October 15th and 21st for the 2020-21 and 2021-22 seasons, respectively.

Plant vigor was recorded on eight measurement dates in both growing seasons (Table 2), starting four weeks until 18 weeks after transplanting (WAT) using a Green Seeker™ sensor (Trimble, Sunnyvale, CA). Marketable strawberry fruits were hand-picked once a week and weighted from each plot during 12 weeks in the 2020-21 season (November 16th to February 25th) and 14 weeks in the 2020-21 season (December 10th to March 10th). Soil samples were collected early- (October 9th), mid- (January 6th), and end-season (March 4th) (table 1). A composite sample of six soil cores to a depth of 30 cm and 2.5 cm diameter was collected from each subplot using a cone tube sampler. Free-living and plant-parasitic nematodes were extracted using sugar flotation,

Results

The best yielding cultivar was Sensation, which produced 4.62 and 3.47 kg/plot, and Radiance producing 3.26 and 3.45 kg/plot in 2020-21 and 2021-22, respectively. Other cultivars (Brilliance, Festival, Beauty, Winterstar, Elyana, and Pearl ranged from 1.44 to 2.54 kg/plot (Figure 1). Transplant steaming did not significantly affect plant yield (P-value > 0.05) in any of the growing seasons (Figure 2).

Transplant steaming did not significantly affect plant vigor at any of the eight measurement dates collected during both seasons, except for 4 WAT in 2021-22 trial when slightly reduced plant vigor was observed on steamed plants (data not given).

Plant-parasitic nematodes in the field were root-knot, sting, ring and spiral nematodes (data not given). Sting, ring and spiral nematodes were few (0-10 nematodes/200 cc soil). Root-knot nematodes (*Meloidogyne javanica*) were also low for all cultivars except for cv. Winterstar, which had high populations (> 100 nematodes/200 cc soil).

Contact

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Figure 1. Total fruit yield of different strawberry cultivars when grown in organic field at GCREC (2020-21 and 2021-22). Strawberry cultivar sharing the same letter do not differ significantly (P > 0.05).

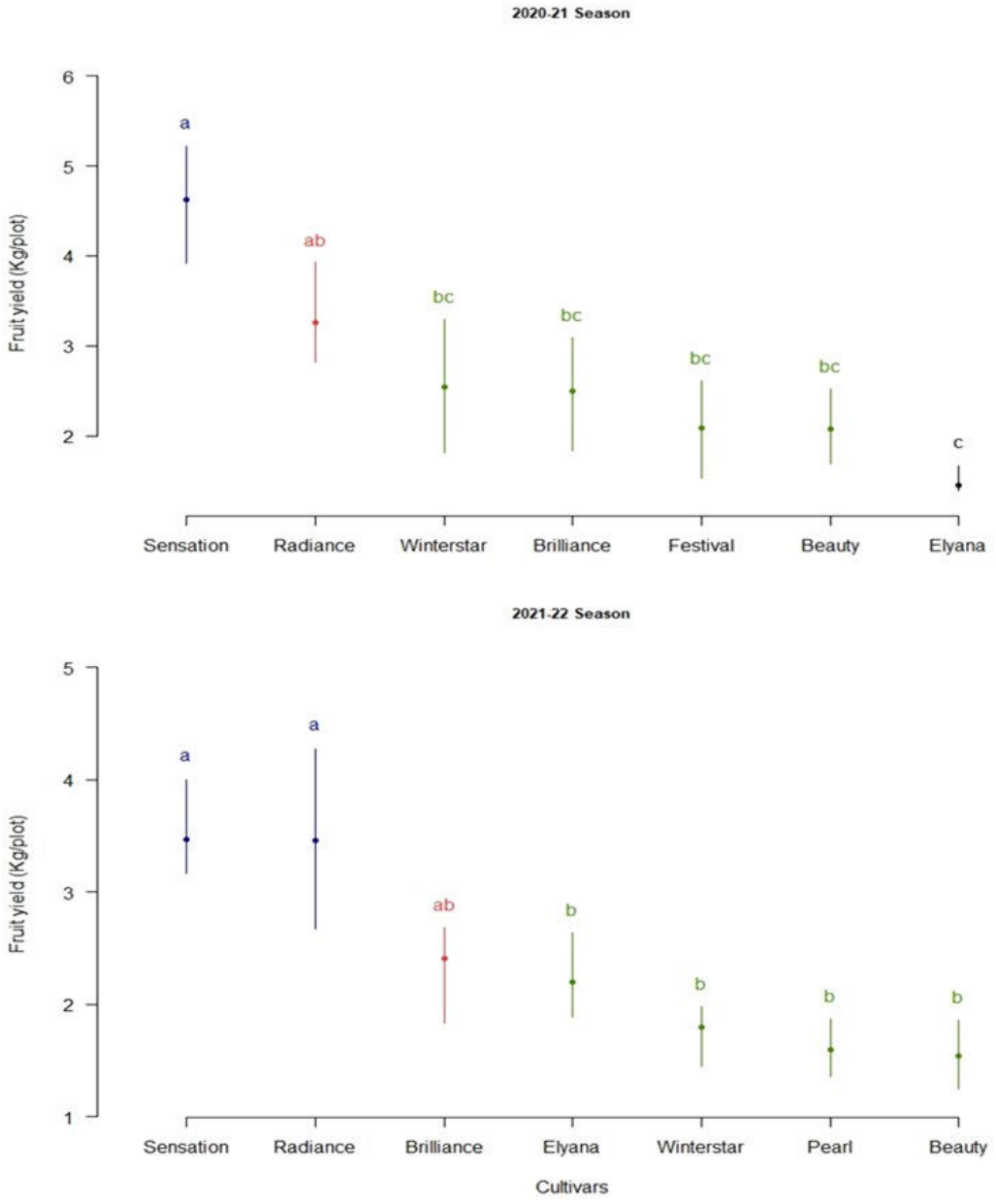

Figure 2. Effect of steaming transplants before planting on total yield in 2020-21 and 2021-2 (no treatment effect was observed)