

Pepper Seedlings in Soil Blocks and Plug Trays

Staff Contact:

Liz Kolbe – (515) 232-5661
liz@practicalfarmers.org

Cooperators:

• Susan Jutz & Carmen Black - Solon

Funding By:

CERES

Web Link:

http://bit.ly/pfi_horticulture

In a Nutshell

- This was an informal trial to compare bell pepper production from seedlings started in soil blocks vs. plug trays.
- Data were collected from 72 plants in each treatment; peppers were harvested at green and red stages.

Key Findings

- Though statistical analysis was not possible, pepper plants started in soil blocks had higher yield and number of green and red peppers per plant and fewer cull fruit.

Project Timeline:

March 2015 - October 2015



Soil block maker and plug trays.

Background

The best way to start bell pepper seedlings is an annual debate between ZJ Farm and another nearby vegetable farm. ZJ prefers to use free-standing soil blocks, the other farmer, Laura Krouse at Abbe Hills Farm, contends that plastic plug trays work just as well. According to Carmen Black, plant seedlings started in soil blocks are less prone to being root-bound than starts in plug trays. This side-by-side field demonstration was conducted to determine if the starting method for bell pepper seedlings, soil blocks or plug trays, impacts pepper yield during the growing season.

Objective:

Determine if pepper yield is different between bell pepper seedlings started in soil blocks versus plug trays.

Methods

Bell pepper seeds (cv. Ace) were sown in flats for germination on April 26. Ace

was chosen for this trial because it is the preferred green-to-red pepper variety at ZJ Farm. On May 11, at the cotyledon stage, pepper seedlings were transplanted to soil blocks and plug trays, 72 plants to each treatment. Soil block dimensions were 1 ¾ in. x 1 ⅝ in. x 1 ⅞ in. deep (volume 5.33 in.³), made with a soil blocker from Johnny's Seeds. Plug dimensions were 1 ½ in. diameter x 2 ½ in. deep (slightly conical, volume ~3 in.³). The same Beautiful Land Products potting mix was used in both treatments.

All plants were transplanted to the field on June 2. A single row was dedicated to each treatment, 72 plants long with 16 in. spacing between plants and between rows. Black plastic was used for weed control.

Peppers were irrigated six times during the season, and harvested 10 times. During the first harvest on July 20 approximately one green pepper per plant was picked. The rest were left on the plants to mature to red. Beginning Aug. 6, red peppers

were picked weekly until Oct. 1. On Oct. 13, all remaining peppers (most less than 50% red) were picked from the plants and counted as green peppers.

Because each pepper treatment was planted to a single row without replication, no statistical analysis could be performed. Data analysis is a single-replication side-by-side comparison.

Results and Discussion

Plants started in soil blocks produced higher yield throughout the season than plants started in plug trays (**Figure 1**). By season end on October 12, plants started in soil blocks had an average pepper yield (red and green) of 3.09 lb/plant, while plants started in plug trays averaged 2.52 lb/plant.

Plants started in soil blocks also produced more green and red fruit per plant, with the difference in red fruit count between treatments being more pronounced.

Figure 2 shows red and green fruit count

Figure 1

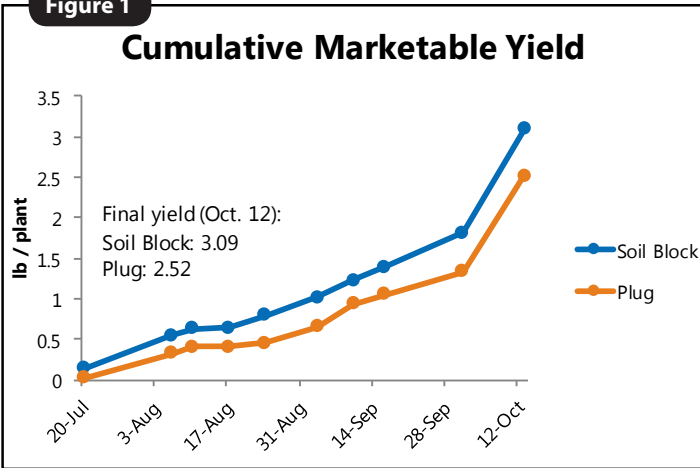


Figure 1: Cumulative marketable yield (lb/plant) of all marketable peppers (harvested at green and red stages).

Figure 2

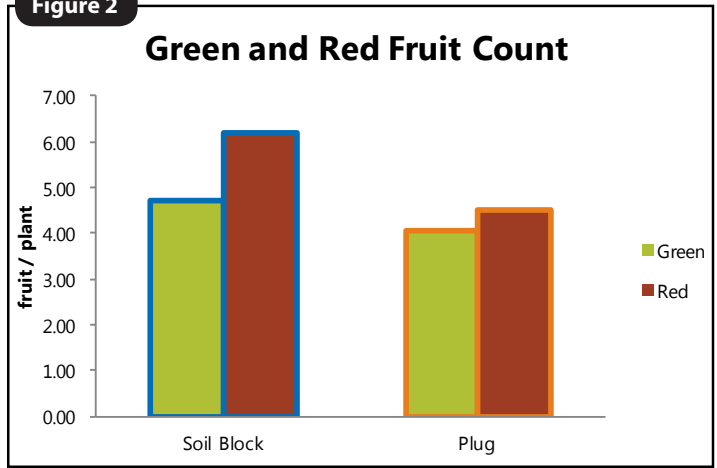


Figure 2: Number of fruit per plant, separated into green and red fruit, by treatment (soil block vs. plug). Blue and orange borders correspond to treatments in Figure 1.

per plant by treatment. Plants started in soil blocks produced an average of 6.19 red fruits and 4.72 green fruits, compared to 4.53 red fruits and 4.06 green fruits from plants started in plug trays. More detailed yield components are listed in **Table 1**. Fruit weight was the same by treatment for green fruit (0.30 lb/fruit), but red fruit, on average, was larger on plants started in plug trays (0.29 lb/fruit) than those from soil blocks (0.27 lb/fruit). This could be driven by more red fruits per plant on soil block plants. The percent of harvested red fruit that was marketable was higher for plants started in soil blocks (87%) than for plants started in plug trays (82%).

Table 1

Yield components for green and red peppers from plants started in soil blocks and plug trays.

Fruit Color	Yield Components	Soil Block	Plug
Green*	lb/plant	1.41	1.21
	fruit/plant	4.72	4.06
	lb/fruit	0.30	0.30
Red	lb/plant	1.68	1.31
	fruit/plant	6.19	4.53
	lb/fruit	0.27	0.29
	% marketable fruit**	87%	82%

* Green fruit is first and last harvest, fruits are <50% red.
 ** % marketable fruit data was not available for green peppers.

Conclusions and Next Steps

Though this demonstration project does not carry statistical significance, preliminary findings can be observed. In this side-by-side trial, bell pepper plants (cv. Ace) started in soil blocks produced more red and green peppers in terms of yield and fruit number than plants started in plug trays, and had fewer cull fruit.

Carmen Black noted that the seedlings coming out of the soil blocks were nearly twice as tall as the seedlings from plugs at the transplant-to-field date. This could be due to the differences in root structure, or simply driven by having more soil volume per seedling (~ 45%) in the soil blocks than the plug trays. This increased early growth could impact red bell pepper production, because fruits will be able to set earlier and ripen longer.

Carmen also discussed the differences in labor, suggesting the soil blocks may require more labor to make, but the plug trays require more labor to plant. She said, "The soil blocks take more skill to make, but if you're good at it I'm not sure they actually take more time. However, there's a steep learning curve with the soil-block-maker, so new workers would definitely be faster at filling-in and seeding in the plug trays. In the field I feel like the plug trays take longer to transplant because it's more difficult to release the plants from the tray than with the soil blocks, which you can just grab and put in the ground. I also think workers often accidentally kill more plants when planting out of the plastic trays than when using the soil blocks."



Ace pepper on July 19 at ZJ Farm. The first harvest of green peppers was July 20.

PFI Cooperators' Program

PFI's Cooperators' Program gives farmers practical answers to questions they have about on-farm challenges through research, record-keeping, and demonstration projects. The Cooperators' Program began in 1987 with farmers looking to save money through more judicious use of inputs. If you are interested in conducting an on-farm trial contact Stefan Gailans @ 515-232-5661 or stefan@practicalfarmers.org.