

Cultivar Selection for Colored Pepper Production

RFR-A1854

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Introduction

Specialty colored bell peppers are becoming increasingly popular to grow in Iowa. Therefore, examining different colored peppers for their yield and quality attributes is critical. Vegetable cultivar evaluations are region-specific and response could significantly vary based on weather conditions (temperature, relative humidity, rainfall), soil characteristics, and management operations. The 2018 bell pepper cultivar trial evaluated seven popular colored bell pepper cultivars to determine yield potential and susceptibility to insect, disease, and physiological disorders.

Materials and Methods

Cultivars were selected to represent a range of common colors found in ripened bell peppers. Red cultivars were Archimedes and Red Knight (Seedway, LLC.). Yellow cultivars were Flavorburst (Seedway, LLC.), Summer Sweet (Rupp 2017, Harris Seeds 2018), and Sirius (Sieggers Seed Co.). One orange cultivar, Delirio (Seedway, LLC), and one purple cultivar, Tequila (Seedway, LLC), also were included. Peppers were seeded in the ISU Department of Horticulture greenhouses April 30, 2018, and managed based on standard commercial production practices.

Transplants were grown in the greenhouse for five weeks and then hardened off for 4–5 days. On June 11, 2018, transplants were planted at the Muscatine Island Research Farm, Fruitland, Iowa, on raised-beds with black plastic mulch and drip irrigation. Transplants were planted in staggered double

rows with 18 in. between row spacing and 12 in. within-row spacing. Each row consisted of eight plants totaling 16 plants/cultivar treatment. A randomized complete block design with four replications was used.

Soil type was light-colored coarse sand. Fertilizer was applied preplant incorporated in the bed at a rate of 70 lb/acre nitrogen (N), 70 lb/acre P₂O₅, and 200 lb/acre K₂O. An additional 30 lb/acre N was applied through drip lines during the growing season. Weed control between rows was achieved by spraying Strategy[®] and Sandea[®] herbicides between the beds, and hand weeding as necessary. No insecticide or fungicide was applied throughout the growing season.

Plots were harvested on a weekly basis from August 6 to September 26, 2018. Peppers were harvested each week when at least 80 percent of the fruit surface had turned from green to its respective color. The fruit was graded visually to determine marketability. Non-marketable fruit was sorted into categories based on sunscald, blossom end rot (BER), diseases, insect damage, and size (diameter less than five centimeters). Fruit count and weight was recorded for all categories of fruit for each harvest.

Results and Discussion

There was no significant difference among cultivars for the number of marketable fruits, which ranged from 74 to 100, however there were differences in marketable weight ($P = 0.0033$) (Table 1). Summer Sweet produced the highest marketable weight. The lowest marketable weight was recorded for Tequila. Fruits categorized as non-marketable due to sun scald were highest in number in Delirio and lowest in Archimedes. Typically, sunscald damage is lower in plants that produce enough canopy, thereby shielding fruits from direct

sun. A similar trend was observed in the occurrence of BER where Delirio and Archimedes had the highest and lowest number of fruits with BER, respectively. Blossom-end rot is caused by insufficient calcium in the tissue of the pepper. Calcium moves into the plant with water so the conditions that cause blossom-end rot are closely linked to either low calcium concentration in the soil and/or inconsistent soil moisture throughout the growing season. There were significant differences in the number of fruits damaged by insects. Sirius showed more damage compared with any other cultivar tested in this study.

This study does show some promising colored bell pepper cultivars for coarse sandy soils. Archimedes (red), Flavorburst (yellow), Tequila (purple), and Summer Sweet (yellow) had higher number of marketable fruits. However, the small fruit size of Tequila may not appeal to all consumers. Archimedes (red) and Summer Sweet (yellow) all had large fruit size that may be desirable for direct-to-

consumer markets. Occurrence of sunscald and blossom end rot also is a critical factor growers should consider when choosing cultivars. Blossom end rot could be corrected with proper soil calcium application and irrigation scheduling. Picking cultivars that have less susceptibility will reduce losses. Colored bell peppers are harvested late in the season so they are more susceptible to adverse weather conditions, insects, and diseases. Choosing appropriate cultivars is the key. Overall, the production of colored bell peppers in Iowa looks promising, although more research is needed to improve the production system and manage soil moisture for optimum yields.

Acknowledgements

Special thanks to the Iowa Department of Agriculture and Land Stewardship Specialty Crop Block Grant Program for providing partial funding for this study. Thanks to all undergraduates for their assistance with plot establishment and data collection.

Table 1. Marketable and non-marketable colored pepper yield from seven cultivars* grown at the Muscatine Island Research Farm, Fruitland, IA.*

| Cultivar | Marketable | | Sunscald | | Blossom end rot | | Insect damage | | Small size | |
|--------------|--------------|--------------------|--------------|--------------------|-----------------|--------------------|---------------|--------------------|--------------|--------------------|
| | No. of fruit | Wt. of fruits (lb) | No. of fruit | Wt. of fruits (lb) | No. of fruit | Wt. of fruits (lb) | No. of fruit | Wt. of fruits (lb) | No. of fruit | Wt. of fruits (lb) |
| Archimedes | 90 | 54.9 ab** | 5 d | 2.6 cd | 5 d | 2.6 cd | 1 b | 0.2 b | 6 | 2.9 abc |
| Delirio | 81 | 41.8 cd | 17 a | 7.8 a | 17 a | 7.8 a | 1 b | 0.2 b | 5 | 2.8 abc |
| Flavorburst | 100 | 51.3 bc | 10 bcd | 4.3 bc | 10 bcd | 4.4 bc | 0 b | 0 b | 3 | 1.3 cd |
| Red Knight | 74 | 49.1 bc | 12 ab | 6.5 ab | 12 ab | 6.5 ab | 0 b | 0 b | 4 | 1.8 bcd |
| Sirius | 87 | 54.7 ab | 6 cd | 2.9 cd | 6 cd | 2.9 cd | 7 a | 2.6 a | 7 | 4.0 a |
| Summer Sweet | 96 | 64.2 a | 11 bc | 5.6 ab | 11 bc | 5.6 ab | 1 b | 0.4 b | 6 | 3.4 ab |
| Tequila | 95 | 36.0 d | 8 bcd | 1.7 d | 8 bcd | 1.7 d | 0 b | 0 b | 2 | 0.5 d |
| P value | 0.1686 | 0.0033 | 0.0060 | 0.0005 | 0.0060 | 0.0005 | <.0001 | <.0001 | 0.0698 | 0.0143 |

P values indicate significance of the main effect of treatment based on F-test.

*Each cultivar/treatment consisted of 16 plants in twin rows with 8 plants/row. Harvest period: August 6–September 26, 2018.

**Means within a column followed by the same letter are not significantly different at $P \leq 0.05$ based on Fisher's protected least significant difference test.