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# Evaluation of 19 Specialty Pepper Cultivars In Southwest Michigan

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## **Objective:**

To evaluate performance of 19 specialty pepper cultivars for adaptability to Southwest Michigan growing conditions.

## **Summary:**

All entries evaluated proved to have commercial potential in their category for production in Southwest Michigan. Pepper types with sufficient entries were subjected to statistical analysis for entries within that type. Significant statistical differences were found for the traits evaluated with lunchbox-types showing the largest differences while jalapeño entries showed the least.

## **Methods:**

**Fertilizer:** Following soil test results, prior to planting, nitrogen (15.5-0-0), potassium (0-0-62), sulfur (95%), and boron (10%) were broadcast at 31, 112, 25, and 3 pounds per acre, respectively. After planting, nutrients were applied through the drip irrigation system using Nitro Plus (18N-5Ca-1.5Mg and a proprietary growth regulator) at 15 gallons/acre on June 8, 15, 22, 29, July 6, and August 17. Harvest More Urea Mate (5-10-27 plus minor nutrients) at 20#/acre was applied July 13, 20, 23, 27, and August 3, 10, 24, 31 for a total of 219# nitrogen and 132# potassium/acre. Epsom Salt (Magnesium sulfate) was added through the drip at a rate of 10#/acre on August 17.

**Weed control:** Weeds were controlled by black plastic on the beds and between row weeds were controlled through hand hoeing and cultivating.

**Planting:** Plants were started in the greenhouse April 15 and planted to the field June 3. Plants were set on raised, black plastic mulched beds, 6" high, 22" wide at the top and 5.5-feet on center. Plants were set in double rows 14" between rows and 18" in the row (10,560 plants/acre). The trial was planted as a completely randomized design with 16 plants per plot and 4 replications. Four guard plants separated plots.

**Plant care:** Plots were irrigated as needed and insects and diseases controlled using standard commercial practices.

**Harvest and data collection:** Harvest was conducted August 10 and 18, and September 1 and 15 and fruit graded into number 1, number 2 and culls. Due to its late ripening, the lone habanero (SVHH5137) was also harvested October 1. Each category was counted, weighed and converted into 1.25-bushel cartons per acre. Number 2 fruit were misshapen but still suitable for processing. Cull fruit were small, poorly shaped, or damaged, primarily due to blossom end rot. Average number one fruit weight was also determined. Peppers in similar categories (lunch box, jalapeño, and banana) were subjected to statistical analysis.

## **Results and Discussion:**

The 2020 pepper-growing season had a difficult start due to the novel coronavirus, COVID-19, as well as weather experienced shortly after planting. COVID-19 concerns delayed greenhouse seeding which led to delayed field planting. Weather shortly after planting turned warm, stressing developing transplants. Poor plant growth was observed by late June and a decision was made to apply additional nutrients. Even with additional nutrients, plants did not fill rows as desired. Temperatures were also high during the fruit maturing stage, most likely contributing to blossom end rot of several entries

### **Lunchbox Peppers:**

Seven lunchbox-type peppers were entered into the trial, all from Tozer Seeds (Table 1 and Figures 1–4). All measured traits had statistical differences. Total yield ranged from 246 to 468 1.25-bushel cartons/acre. These are 35-pound cartons and may not be the best unit for these peppers. However, numbers are relative to each other. Orange, Red, and Yellow Sweetness and Yellow Sweetie had similar total yield. Yellow Sweetie, Yellow Sweetness and Orange Sweetness also had similar yield of number 1 fruit. Fruit weight ranged from 16 to 25.5 grams. Three entries, Orange Sweetie, Yellow Sweetie, and Purple Sweetie all had similar high fruit weight. Number 2 and cull fruit also had statistical differences between entries.

Purple Sweetie had a strongly purple immature fruit color, even under warm conditions. The mature color of Purple Sweetie is orange as can be seen in Figure 3. It was picked too mature in this trial to have good purple color. Care will have to be taken when harvesting Purple Sweetie to be sure it is mature enough not to be bitter, but not so mature as to start changing to its mature color. The two red entries had some of the lowest fruit weights, something that appears to be common among red-fruited lunchbox peppers. Orange Sweetness in this trial had some plants that produced red fruit (Figure 3).

### **Jalapeño Peppers:**

The five jalapeño entries had similar total yield, yield of number 1 fruit, and average fruit weight (Table 2). Ahome was alone in having the highest yield of number 2 fruit and the lowest yield of cull fruit. Ahome number 2 fruit had a pointed tip, not the typical jalapeño end. Fruit from the second harvest are shown in Figures 1, 5, and 6.

### **Banana Peppers:**

The three banana peppers had statistically similar total yield and yield of number 2 fruit (Table 3). Fury had the lowest number 1 fruit yield and the highest cull fruit yield. The shift from number 1 to cull fruit was largely due to blossom end rot. Fury was impressive in that it maintained good size over all harvests. However, cultural measures should be taken to help minimize blossom end rot. Angara stood alone in having the lowest fruit weight. This was more evident in the last two yields than it was in the second yield

shown in Figure 7. Fury and Angara are both hot, with Angara being hotter, while SVPP8114 is sweet.

### **Other Peppers:**

Four peppers in the trial did not fit well into the previous categories discussed. Therefore, they were not included in any statistical analysis. Data from these peppers appears in Table 4 and pictures shown in Figures 1, 8, and 9.

Wildcat is a red to green cayenne-type pepper. Wildcat had a total yield of 831 1.25-bushel cartons and had an average number 1 fruit weight of 46.8 grams. Fruit was judged as number 2 or cull due to size, excessive fruit curling and blossom end rot.

Entry 11069 is a variegated selection with green and white striped fruit maturing to chocolate and red striped (Figure 8). The plant also has green and white variegated foliage. Young seedlings are totally green with variation developing as the plants mature. Entry 11069 could possibly have been included in the statistical analysis of the lunchbox types since it is similar. Entry 11069 would have been at the higher end of total yield and similar in number 2 and cull yield. Entry 11069 would probably have had statistically larger fruit size than others in the lunchbox category.

Entry 10877 is listed as a green to red; however, in this trial it had some yellow-fruited plants (Figures 1 and 8). Many 10877 fruit did not have the three and four-lobed fruit desired in a true bell pepper. As a midi-bell, 10877 had larger, thicker walled fruit than other entries, thus contributing to its increased number 1 fruit weight.

Entry SVHH5137 is a habanero and as a habanero, maturity is late as is seen in Figure 1 where there is no fruit at the second harvest of the other entries. To compensate for this lateness, SVHH5137 was harvested a fifth time, while others were harvested only four. Despite the additional harvest, SVHH5137 still had low total yield but this is most likely due to the small average number 1 fruit weight because yields are based on weight, not volume. SVHH5137 had a typical habanero-shaped fruit with a bright red, attractive color (Figure 9). If growers are going to grow any habanero pepper, they need to be planted as early as possible in northern production areas like Michigan.

Table 1. Yield in 1.25-bushel cartons per acre and fruit quality of seven lunchbox peppers grown at the Southwest Michigan Research and Extension Center, Benton Harbor, Michigan in 2020. Plant population was 10,560 plants per acre. Numbers in bold are not statistically different from the highest number in that column.

Entry	Seed Source	Total Yield	Yield No. 1	Average No. 1 Weight (grams)	Yield No. 2	Yield Cull
<b>Yellow Sweetie</b>	Tozer	<b>468</b>	<b>414</b>	<b>24.6</b>	35.8	<b>18.0</b>
<b>Yellow Sweetness</b>	Tozer	<b>438</b>	<b>393</b>	21.9	32.8	12.1
<b>Red Sweetness</b>	Tozer	<b>411</b>	314	17.4	<b>87.2</b>	9.3
<b>Orange Sweetness</b>	Tozer	<b>383</b>	<b>344</b>	20.6	32.2	6.5
<b>Orange Sweetie</b>	Tozer	337	288	<b>23.1</b>	27.5	<b>20.7</b>
<b>Red Sweetie</b>	Tozer	319	231	16.0	<b>84.0</b>	3.7
<b>Purple Sweetie</b>	Tozer	246	201	<b>25.5</b>	41.6	3.5
	<b>Isd<sub>0.05</sub></b>	<b>106</b>	<b>93</b>	<b>3.2</b>	<b>25.1</b>	<b>7.7</b>

Table 2. Yield in 1.25-bushel cartons per acre and fruit quality of five jalapeño peppers grown at the Southwest Michigan Research and Extension Center, Benton Harbor, Michigan in 2020. Plant population was 10,560 plants per acre. Numbers in bold are not statistically different from the highest number in that column.

Entry	Seed Source	Total Yield	Yield No. 1	Average No. 1 Weight (grams)	Yield No. 2	Yield Cull
<b>Ahome</b>	Bejo	1025	917	39.7	<b>96.5</b>	11.5
<b>Tzotzil</b>	Seminis	951	862	40.8	38.7	<b>50.1</b>
<b>Panuco</b>	Seminis	892	819	39.4	38.8	<b>33.4</b>
<b>Abasolo</b>	Bejo	885	768	39.8	59.3	<b>58.0</b>
<b>Bejo3176</b>	Bejo	852	792	38.0	32.4	<b>27.7</b>
	<b>Isd<sub>0.05</sub></b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>27.3</b>	<b>36.1</b>

Table 3. Yield in 1.25-bushel cartons per acre and fruit quality of three banana peppers grown at the Southwest Michigan Research and Extension Center, Benton Harbor, Michigan in 2020. Plant population was 10,560 plants per acre. Numbers in bold are not statistically different from the highest number in that column.

Entry	Seed Source	Total Yield	Yield No. 1	Average No. 1 Weight (grams)	Yield No. 2	Yield Cull
<b>Fury</b>	Seminis	915	517	<b>65.1</b>	61	<b>337</b>
<b>SVPP8114</b>	Seminis	885	<b>743</b>	<b>70.0</b>	68	74
<b>Angara</b>	Bejo	795	<b>673</b>	38.9	87	36
	<b>Isd0.05</b>	<b>NS</b>	<b>169</b>	<b>6.6</b>	<b>NS</b>	<b>91</b>

Table 4. Yield in 1.25-bushel cartons per acre and fruit quality of four specialty peppers grown at the Southwest Michigan Research and Extension Center, Benton Harbor, Michigan in 2020. Plant population was 10,560 plants per acre. Data was not subjected to statistical analysis.

Entry	Seed Source	Total Yield	Yield No. 1	Average No. 1 Weight (grams)	Yield No. 2	Yield Cull
<b>Wildcat</b>	Seminis	831	700	46.8	84.6	45.5
<b>11069</b>	PanAmerican	514	463	34.3	36.9	14.8
<b>10877</b>	PanAmerican	488	393	57.1	66.7	27.7
<b>SVHH5137</b>	Seminis	352	317	14.2	26.6	7.9





Figure 1. Fruit from the second harvest of the 2020 Southwest Michigan Research and Extension Center specialty pepper trial. Front row left to right: 10877, 11069, PEP064, PEP018, PEP017. Second row, left to right: PEP063, Orange Sweetness, Red Sweetness, Yellow Sweetness, Wildcat. Third row, left to right: SVPP8114, SVHH5137, Tzotzil, Panuco, Fury. Back row, left to right: Abasolo, Ahome, Bejo 3176, Angara.





Figure 2. Number 1 fruit from the second harvest of (left to right) Red Sweetie, Orange Sweetie, Yellow Sweetie.





Figure 3. Number 1 fruit from the third harvest of (left to right) Purple Sweetie, Orange Sweetness, Red Sweetness.



Figure 4. Number 1 fruit from the second harvest of Yellow Sweetness.





Figure 5. Number 1 fruit from second harvest of (left to right) Ahome, Tzotzil, and Panuco.





Figure 6. Number 1 fruit from the second harvest of (left to right) Abasolo and Bejo 3176.





Figure 7. Number 1 fruit from the second harvest of (left to right) Fury, SVPP8114, and Angara.





Figure 8. Number 1 fruit from the second harvest of (left to right), 10877, 11069, and Wildcat.



Figure 9. Number 1 fruit from the third harvest of SVHH5137.