

# Northern Ohio Pepper Variety Trial - 2017

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Peppers are an important crop in both the fresh market and processing market in Sandusky County and throughout North Central Ohio, where a significant percentage of Ohio vegetables are grown. Many different varieties of peppers are grown by producers with fresh market roadside stands, and still others are grown for mid and late season shipping and processing markets, meaning growers demand a diverse selection of pepper varieties and maturities. Growers have indicated this diversity should include Bell, Banana, and Jalapeño, varieties with different stages of maturity, and specifically Bell peppers that offer a variety of mature colors. Many new varieties are becoming available to meet these grower demands, and this study sought to determine which ones would perform acceptably in Northern Ohio, and which would have the desired traits growers are seeking. For this trial, 20 varieties of Bell, 9 varieties of Jalapeño, and 5 varieties of Banana, were grown in 4 replicated plots at the Ohio State University's North Central Agricultural Research Station near Fremont, Ohio.

## Materials and Methods

The purpose of this trial was to evaluate a significant number of newer varieties of multiple species of peppers, helping seed companies determine which varieties would be suitable to continue breeding and developing for commercial seed sales, and helping growers determine which currently available varieties would be best suited for their specific market demands, including fresh market, shipping, and processing.

The trial examined multiple varieties of Banana, Bell, and Jalapeño peppers. Growers and Seed Companies suggested varieties to be grown, with a strong preference for inclusion given to new and experimental varieties, for comparison alongside industry standard varieties. The evaluation used four replicated plots, grown under best management practices, to give growers a fair comparison of the different varieties grown on lake bed soils, within a normal Northern Ohio pepper growing season. Plots consisted of 25 foot rows, replicated 4 times, on 5 foot raised beds, with randomized variety location within each replication, but the 3 species of peppers remained in a block within each replication. For data collection, 5 plants at the center of each row were harvested.

The trial was conducted on Colwood fine sandy loam soil at the North Central Agricultural Research Station. Best management practices were utilized prior to and during the trial.

Best management practices were utilized prior to and during the trial. Peppers were seeded in the greenhouse on April 11, and fertilized with 20-20-20 at 200 ppm on May 1, 4, 8, 11, 15, 18. Smaller plants were also fertilized with the same mix on additional dates of May 10 and 12. On April 17, the field received a broadcast application and incorporation consisting of 500 lbs / acre 0-0-60, 150 lbs / acre of 10-52-0, 200 lbs / acre 46-0-0, and 7 lbs / acre of 10% granular Boron. The field was disk chiseled on April 17, and worked with finisholl tool on April 18. Raised beds were formed on April 19. Beds were reformed on May 15 and packed on May 16. On May 17 the field received a herbicide application: 16 oz/A Dual Magnum, 8 oz/A Command and 6 oz/A Interlock. On May 31, plants were transplanted with 12 inch plant spacing and 5 foot row spacing, with 0.7 quarts of 10-34-0 per 50 gallons of transplant water. 10 Insecticide and fungicide applications were made at approximate 10 day intervals from June 15 through September 15.

For data collection, 5 plants at the center of each row were harvested, with 3 harvests conducted on each type of pepper. Timing of harvest was subjectively determined by the researchers based on plant health, weather conditions, and maturity of the crop.

Peppers were evaluated at each harvest for yield including quantity and size of fruit, in both marketable and non-marketable categories. Banana and Jalapeño varieties were measured for average length and width of fruit, based on random selection of 5 peppers from the marketable fruit in each rep. Bell peppers were sorted on industry standards for size, with Jumbo fruit being 3.5 inches in diameter or greater, Extra-large fruit being 3.0-3.5 inches, and large fruit being less than 3.0 inches in diameter. Bell peppers were also evaluated in the field at the time of the 2<sup>nd</sup> harvest on September 7 for color in the fruit, with percentage of full color peppers subjectively observed and recorded on the non-data plants for each variety, meaning no harvest of any fruit had occurred on those plants observed for color data.

## Results and Discussion

Results of the harvest for each species of peppers are shown in tables below, with total harvest data compiled and averaged from all 4 replicated plots. Since maturity and fresh market characteristics are an integral part of the desired data, the percentage of total yield of both marketable and cull fruit from each variety is also calculated and displayed below.

As we have come to expect in Northern Ohio, there is no “normal” growing season anymore, as the weather changes rapidly and several extremes have been noted throughout the trial. These extremes in 2017 included extended early periods of lower than average temperatures and overcast skies, leading to slower than normal buildup of growing degree days. The growing season for this trial overall was near average normal temperatures. Below normal precipitation for Sandusky County was experienced for the first 3 weeks after transplant, followed by a 4 week period in late June/early July of significantly above normal precipitation, which did lead to moderate disease pressure and some early rotting of fruit. August was significantly drier with no measurable rainfall for an extended period, but below average temperatures allowed soil moisture to remain adequate throughout the trial. Total rainfall including irrigation from transplant to final harvest was 12.66 inches.

There was significant difference in fruit size, appearance, and maturity in terms of color across the varieties within each species of peppers, some of which is reflected in the data tables and/or observations. Pictures were taken to record maturity in terms of color in the peppers, and can be accessed by contacting the researchers. Plant lodging was a non-issue across the entire trial, and fruit lodging was insignificant throughout the trial. It should be noted that dropped fruit was not collected or included in the evaluation. Overall health of the bell pepper plants was fair to excellent, but the fruit quality was slightly low, and slow to mature, with untimely heavy rains and extended dry periods contributing to some fruit rotting just prior to maturity. New fruit was set after each harvest, but maturity of those new sets was slow.

Results displayed in the tables below shows that as expected with the parameters of this trial, what is determined to be the most successful variety may be in the eyes of the breeder, the grower, or the marketer, depending on their goals. For the purpose of the study to highlight differences in varieties in terms of early yields, consistent season long producers, late yields, and good ratios of marketable vs. cull fruit, this was certainly accomplished. The color % rating utilized on the non-data plants during mid-harvest of bells should provide very useful information for shipping markets looking to utilize colored fruit. In addition, the measurements for size of bells, and width and length of fruit vs. overall yield based on weight for the bananas and Jalapeños should give good indications to growers making variety selection for fresh vs. processing markets, as this will relate directly to volume in shipping containers, and appearance on fresh market shelves.

# Bell Peppers

**Table 1.** Weight and quantity of marketable and non-marketable fruit for 21 varieties of Bell peppers. Data represents combined counts and weights from 3 harvest dates of all four replicated plots – August 14, September 7, and September 26.

Variety #	Variety Name	# of Market Fruit / acre	Tons Marketable Fruit / acre	Average Market Fruit weight (lbs.)	# of Cull Fruit per acre	Tons of Cull Fruit per acre	Average Cull Fruit Weight (lbs.)	Marketable to Cull Weight Ratio
1	Karisma	56192	17.10	0.61	15246	3.48	0.46	4.91
2	Currier	64469	19.43	0.60	13068	3.35	0.51	5.79
3	HMX51008	62726	18.32	0.58	11761	2.61	0.44	7.01
4	Boca	59677	17.66	0.59	11326	2.42	0.43	7.31
5	Galileo	49179	19.32	0.79	15682	3.16	0.40	6.12
6	Aristotle	53579	16.71	0.62	13068	2.87	0.44	5.81
7	Turnpike	53143	17.16	0.65	16988	5.01	0.59	3.43
8	Playmaker	54886	17.01	0.62	17424	3.51	0.40	4.85
9	PS09979325	52272	15.86	0.61	13939	3.14	0.45	5.06
10	PS09941819	61855	19.12	0.62	10019	2.29	0.46	8.36
11	SV3255PB	60984	16.49	0.54	13939	3.05	0.44	5.41
12	SV3964PB	57935	18.34	0.63	15246	3.53	0.46	5.20
13	Summer Sweet	55757	16.14	0.58	15246	4.38	0.57	3.69
14	Mercer	55757	17.03	0.61	16988	3.75	0.44	4.55
15	Samurai	52272	14.16	0.54	14810	2.87	0.39	4.92
16	Ninja	51836	14.03	0.54	22651	4.38	0.39	3.20
17	RPP43212	40511	11.89	0.59	32234	6.10	0.38	1.95
18	RPP43215	50094	14.59	0.58	29185	6.08	0.42	2.40
19	Triology	56192	15.90	0.57	14375	3.57	0.50	4.45
20	Mingun	59242	17.23	0.58	13068	2.22	0.34	7.75
	<b>Averages</b>	<b>55428</b>	<b>17</b>	<b>0.60</b>	<b>16313</b>	<b>3.59</b>	<b>0.45</b>	<b>5.11</b>

**Table 2.** Percentage of marketable and non-marketable fruit for each of 3 harvest dates for 21 varieties of Bell peppers. Data represents combined counts and weights from 3 harvest dates of all four replicated plots – August 14, September 7, and September 26.

Variety #	Variety Name	1st Harvest % of Total Culls	2nd Harvest % of Total Culls	3rd Harvest % of Total Culls	1st Harvest % of Total Mkt Yield	2nd Harvest % of Total Mkt Yield	3rd Harvest % of Total Mkt Yield
1	Karisma	4%	72%	24%	31%	50%	19%
2	Currier	1%	75%	24%	26%	57%	18%
3	HMX51008	0%	70%	30%	38%	45%	17%
4	Boca	5%	31%	64%	34%	45%	22%
5	Galileo	0%	46%	54%	50%	42%	9%
6	Aristotle	3%	58%	39%	44%	43%	13%
7	Turnpike	10%	83%	7%	37%	50%	13%
8	Playmaker	7%	51%	42%	38%	43%	19%
9	PS09979325	5%	57%	38%	41%	46%	13%
10	PS09941819	0%	55%	45%	35%	53%	12%
11	SV3255PB	0%	41%	59%	43%	32%	25%
12	SV3964PB	8%	57%	35%	39%	46%	14%
13	Summer Sweet	5%	76%	19%	43%	44%	13%
14	Mercer	6%	55%	38%	38%	46%	16%
15	Samurai	7%	64%	30%	34%	49%	16%
16	Ninja	1%	59%	40%	42%	44%	14%
17	RPP43212	6%	82%	12%	45%	41%	14%
18	RPP43215	1%	67%	32%	46%	41%	13%
19	Triology	4%	66%	30%	44%	48%	9%
20	Mingun	7%	52%	41%	46%	40%	15%
	<b>Averages</b>	<b>4%</b>	<b>61%</b>	<b>35%</b>	<b>40%</b>	<b>45%</b>	<b>15%</b>

**Table 3.** Bell Pepper Marketable Fruit Size breakdown, Color Rating observations as of September 7, and snap rating. Snap rating scale: 1 = easy pull, 5 = difficult/some fruit or plant damage.

Variety #	Variety Name	% of large fruit count	% of Large fruit by weight	% of XL Fruit Count	% of XL Fruit by Weight	% of Jumbo Fruit Count	% of Jumbo Fruit by Weight	% Full Color	Snap Rating
1	Karisma	22%	16%	38%	37%	40%	48%	25	4
2	Currier	20%	16%	45%	41%	36%	43%	10	3
3	HMX51008	28%	23%	49%	47%	24%	30%	15	3
4	Boca	31%	23%	37%	37%	32%	40%	40	3.5
5	Galileo	10%	5%	44%	42%	46%	53%	5	3.5
6	Aristotle	13%	9%	39%	34%	48%	56%	20	3.5
7	Turnpike	12%	12%	39%	34%	48%	55%	35	3
8	Playmaker	24%	18%	31%	26%	45%	56%	25	3
9	PS09979325	20%	16%	39%	38%	41%	45%	30	2.5
10	PS09941819	12%	9%	45%	40%	43%	50%	20	2
11	SV3255PB	24%	21%	46%	43%	29%	36%	25	3
12	SV3964PB	22%	15%	24%	22%	54%	63%	5	4
13	Summer Sweet	13%	10%	45%	44%	41%	45%	10	2
14	Mercer	16%	12%	44%	40%	41%	48%	30	2
15	Samurai	28%	23%	49%	49%	23%	27%	35	2
16	Ninja	25%	20%	32%	30%	43%	51%	30	2
17	RPP43212	10%	6%	40%	33%	51%	61%	35	1.5
18	RPP43215	20%	15%	39%	36%	41%	49%	20	3.5
19	Triology	24%	21%	39%	36%	37%	43%	15	4
20	Mingun	17%	13%	35%	31%	49%	56%	30	3.5
	<b>Averages</b>	<b>19%</b>	<b>15%</b>	<b>40%</b>	<b>37%</b>	<b>41%</b>	<b>48%</b>	<b>23</b>	<b>2.9</b>

## Jalapeño Peppers

**Table 6.** Weight, quantity, and tons per acre of marketable and non-marketable fruit for 9 varieties of Jalapeño peppers. Data represents combined counts and weights from 3 harvest dates of all four replicated plots.

Variety #	Variety Name	# of Marketable Fruit per acre	Tons of Marketable Fruit per acre	Avg Mkt Fruit weight (lbs.)	Average Mkt Fruit Length (inches)	Average Mkt Fruit Diameter (inches)	# of Cull Fruit per acre	Tons of Cull Fruit per acre	Marketable to Cull Weight Ratio
21	SV3198HJ	366340	15.68	0.09	4.38	1.23	50530	1.60	9.80
22	SV8066HJ	335412	16.93	0.10	3.83	1.44	34412	1.18	14.37
23	PS11435810	277042	16.20	0.12	3.84	1.54	43560	1.76	9.19
24	SV7017HJ	412078	17.96	0.09	3.82	1.38	23958	0.79	22.84
25	Ballpark	495713	15.98	0.06	3.62	1.15	35284	0.70	22.92
26	Ringleader	446490	17.72	0.08	3.44	1.26	20473	0.52	33.90
27	Teniente	357192	19.89	0.11	4.01	1.48	26136	1.01	19.63
28	Cuatrero	263102	17.78	0.14	4.14	1.60	12197	0.61	29.16
29	San Joaquin, BSS1147FI	449539	25.42	0.11	3.66	1.60	19166	0.79	32.33
	<b>AVERAGES</b>	<b>378101</b>	<b>18.17</b>	<b>0.10</b>	<b>3.86</b>	<b>1.41</b>	<b>29524</b>	<b>1.00</b>	<b>21.57</b>

**Table 7.** Percentage of marketable and non-marketable fruit for each of 3 harvest dates for 8 varieties of Jalapeño peppers. Data represents combined weights from all four replicated plots.

Variety #	Variety Name	1st Harvest % of Total Culls	2nd Harvest % of Total Culls	3rd Harvest % of Total Culls	1st Harvest % of Total Mkt Yield	2nd Harvest % of Total Mkt Yield	3rd Harvest % of Total Mkt Yield
21	SV3198HJ	11%	20%	69%	34%	29%	37%
22	SV8066HJ	28%	26%	46%	26%	31%	43%
23	PS11435810	12%	27%	60%	48%	21%	31%
24	SV7017HJ	14%	36%	50%	37%	14%	48%
25	Ballpark	20%	17%	63%	25%	25%	51%
26	Ringleader	23%	40%	38%	29%	35%	36%
27	Teniente	17%	31%	52%	31%	28%	41%
28	Cuatrero	4%	61%	36%	41%	22%	38%
29	San Joaquin, BSS1147FI	10%	43%	47%	35%	23%	42%
	<b>AVERAGES</b>	<b>15%</b>	<b>33%</b>	<b>51%</b>	<b>34%</b>	<b>25%</b>	<b>41%</b>

## Banana Peppers

**Table 4.** Weight and quantity of marketable and non-marketable fruit for 5 varieties of Banana peppers. Data represents combined counts and weights from 3 harvest dates of all four replicated plots.

Variety #	Variety Name	# of Marketable Fruit per acre	Tons of Marketable Fruit per acre	Avg Mkt Fruit weight (lbs.)	Average Mkt fruit length (inches)	Average Mkt Fruit Diameter (inches)	# of Cull Fruit per acre	Tons of Cull Fruit per acre	Marketable to Cull Weight Ratio
30	SV3782PP	214315	18.03	0.17	6.52	1.65	37026	1.88	9.57
31	SV7685PP	186437	16.62	0.18	6.89	1.75	39640	2.38	6.97
32	Inferno	207346	18.68	0.18	6.73	1.68	62291	3.44	5.43
33	SV3301HW	315374	23.13	0.15	6.53	1.59	58370	2.82	8.20
34	Beacon	197762	22.10	0.22	7.10	1.71	55321	3.80	5.81
	<b>Averages</b>	<b>224247</b>	<b>19.71</b>	<b>0.18</b>	<b>6.75</b>	<b>1.68</b>	<b>50530</b>	<b>2.87</b>	<b>7.20</b>

**Table 5.** Percentage of marketable and non-marketable fruit for each of 3 harvest dates for 7 varieties of Banana peppers. Data represents combined weights from all four replicated plots.

Variety #	Variety Name	1st Harvest % of Total Culls	2nd Harvest % of Total Culls	3rd Harvest % of Total Culls	1st Harvest % of Total Mkt Yield	2nd Harvest % of Total Mkt Yield	3rd Harvest % of Total Mkt Yield
30	SV3782PP	20%	14%	66%	55%	20%	25%
31	SV7685PP	49%	22%	28%	47%	40%	12%
32	Inferno	20%	25%	55%	40%	38%	22%
33	SV3301HW	19%	32%	49%	39%	23%	38%
34	Beacon	34%	27%	39%	37%	36%	27%
	<b>AVERAGES</b>	<b>28%</b>	<b>24%</b>	<b>48%</b>	<b>44%</b>	<b>31%</b>	<b>25%</b>

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