

Northern Ohio Pepper Variety Trial- 2025

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Peppers are an important crop in both the fresh market and processing market 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, Poblano, and Jalapeño, varieties with different stages of maturity, and 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, 10 varieties of Bell peppers were grown in 4 replicated plots at the Ohio State University's North Central Agricultural Research Station near Fremont, Ohio.

Material 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 Bell 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 lakebed 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 block. Plots were simulated for a population of 8,712 plants per acre. This was a blind trial and variety locations were unknown to the researchers. For data collection, 7 plants at the center of each row were harvested.

The trial was conducted on Kibbie Fine Sandy Loam soil at the North Central Agricultural Research Station in Fremont, Ohio. Best management practices were

utilized prior to and during the trial. Peppers were seeded in the greenhouse on April 9, 2025. On June 12, 2025, 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. Insecticide and fungicide applications were made throughout the trial. There was a total of 15 fertilizer applications before transplant. After transplant, there was a total of 11 insecticide and fungicide treatments at approximately 10-day intervals from June 24 through September 19. Complete list of management practices, and dates of activity in the trial are shown below in the log of operations.

For data collection, 7 plants at the center of each row were harvested, with 4 harvests conducted. 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. 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.

Results and Discussion

Results of the harvest of Bell 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 non-marketable, or 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 2025 included extended periods of higher-than-average temperatures and higher than average rainfall. This led to a delayed transplant to the field while growing degree days continued to rise quickly. After the warm and wet spring, the growing season became very dry while continuing the above average warm temperatures. Once harvest started, Northern Ohio had developed into a slight to moderate drought with the drought continuing to become more severe as harvest continued. Total rainfall from transplant to final harvest was 13.25 inches with 10.45 inches of the total amount coming before the first harvest.

There was significant difference in fruit size, appearance, and maturity in terms of color across the varieties, 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, with rapid maturity in some varieties leading to nearly total culling of any fruit with color, and other varieties slow to mature with virtually no color appearing throughout the season. Some fruit experienced rotting just prior to maturity, and others were slow to mature. New fruit was set after each harvest, but maturity of those new sets was slow. While blossom end rot and sun scald were not noted, pressure from aphids was noted this year, affecting several varieties as indicated below.

Results displayed in the tables below show 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. In addition, the measurements for size of bells 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.

Table 1. Weight and quantity of marketable and non-marketable fruit for 10 varieties of Bell peppers. Data represents combined counts and weights from 4 harvest dates of all four replicated plots.

Variety #	Variety Name	# Market Fruit / acre	Tons Marketable Fruit / acre	Avg Mkt Fruit weight per pepper (lbs.)	# of Cull Fruit per acre	Tons of Cull Fruit per acre	Avg Cull Fruit Weight per pepper (lbs.)	Marketable to Cull Weight Ratio
1	Big Stack	52,583	10.97	0.42	21,158	2.99	0.28	3.66
2	SPP8079	65,962	15.33	0.46	18,669	3.17	0.34	4.83
3	SV9503	63,473	16.19	0.51	19,602	2.66	0.27	6.09
4	Redfish	63,162	14.57	0.46	32,359	4.31	0.27	3.38
5	Tarpon	65,340	14.79	0.45	29,559	3.79	0.26	3.90
6	Captain	63,784	14.29	0.45	22,091	3.41	0.31	4.18
7	Wayfinder	74,052	17.56	0.47	21,469	3.37	0.31	5.21
8	EZ96	59,117	13.00	0.44	24,580	3.25	0.26	4.00
9	Aristotle	68,140	15.07	0.44	25,203	3.24	0.26	4.66
10	Paladin	80,586	16.16	0.40	28,314	3.60	0.25	4.49
	Averages	65,620	14.79	0.45	24,300	3.38	0.28	4.44

Table 2. Percentage of marketable and non-marketable fruit for each of 4 harvest dates for 10 varieties of Bell peppers. Data represents combined counts and weights from 4 harvest dates of all four replicated plots.

Variety #	Variety Name	1st Harvest % of Total Culls	2nd Harvest % of Total Culls	3rd Harvest % of Total Culls	4 th Harvest % of Total Culls	1st Harvest % of Total Mkt Yield	2nd Harvest % of Total Mkt Yield	3rd Harvest % of Total Mkt Yield	4 th Harvest % of Total Mkt Yield
1	Big Stack	3.38	22.86	44.42	29.35	20.43	31.70	15.74	32.13
2	SPP8079	3.19	8.09	59.07	29.66	26.19	19.78	28.61	25.41
3	SV9503	9.94	7.02	49.71	33.33	20.85	26.37	37.61	15.18
4	Redfish	2.89	13.54	58.30	25.27	32.89	24.67	27.02	15.43
5	Tarpon	1.85	10.06	58.52	29.57	26.35	32.35	27.09	14.20
6	Captain	2.28	28.47	40.32	28.93	27.82	27.65	21.83	22.70
7	Wayfinder	1.62	9.93	57.74	30.72	26.14	18.96	36.73	18.17
8	EZ96	0.96	9.09	70.81	19.14	27.64	29.05	25.72	17.59
9	Aristotle	6.25	17.07	47.36	29.33	27.97	24.41	25.03	22.60
10	Paladin	7.56	22.68	41.90	27.86	27.25	29.51	22.92	20.32
	Averages	3.99	14.88	52.81	28.32	26.35	26.45	26.83	20.37

Table 3. Bell Pepper Marketable Fruit Size breakdown, Color Rating observations as of September 2.

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
1	Big Stack	62.72	52.41	33.14	40.92	4.14	6.67	25
2	SPP8079	67.92	58.35	26.42	32.97	5.66	8.67	25
3	SV9503	46.57	36.94	42.16	41.11	11.27	21.95	10
4	Redfish	50.74	41.70	43.35	49.39	5.91	8.92	45
5	Tarpon	60.95	51.24	33.33	40.45	5.71	8.31	15
6	Captain	59.91	49.05	33.66	40.72	6.83	10.23	25
7	Wayfinder	60.92	52.19	31.09	36.86	7.98	10.94	15
8	EZ96	68.42	58.63	29.47	37.90	2.11	3.47	25
9	Aristotle	62.56	53.30	31.05	36.17	6.39	10.53	25
10	Paladin	72.20	62.83	25.48	33.56	2.32	3.61	45

Acknowledgments

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F. Thayer and R. Shaw managed field operations, and with the North Central Agricultural Research Station seasonal staff, assisted with fieldwork and data collection.

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Log of Operations:

Date	Description of Operation
8/29/2024	Deep ripped all but Rye cover and double crop soybeans with 6155M and Landoll 1500 inline deep ripper
11/27/2024	Deep ripped bean area with 6155M and Landoll 1500 inline deep ripper
3/17/2025	Recovered Greenhouse
3/18/2025	Replaced jet tube in greenhouse
3/19/2025	Started disinfecting greenhouse plastic and benches
3/20/2025	Disinfected heat mats, dibblers
3/24/2025	Set up and disinfected flat filler, headhouse, finished setting up heat mats
3/25/2025	Put up and disinfected greenhouse divider and finished setting up flat filler
4/3/2025	Trial received 1.35 inches of rainfall
4/5/2025	Trial received .65 inches of rainfall
4/6/2025	Trial received .35 inches of rainfall
4/9/2025	Filled and seeded 11-200 cell trays for trial. Seeded 1 tray per variety.
4/10/2025	Trial received .4 inches of rainfall
4/15/2025	Trial received .05 inches of rainfall
4/17/2025	Took down greenhouse divider and set up remaining center benches
4/19/2025	Trial received .15 inches of rainfall
4/20/2025	Trial received .05 inches of rainfall
4/22/2025	Thinned and pricked
4/23/2025	Disk chiseled field with JD6155M and Billion 7 shank disk chisel
4/24/2025	Worked field with JD6155M and Landoll Finisholl
4/25/2025	Fertilized with 200ppm 20-20-20
4/26/2025	Trial received .6 inches of rainfall
4/28/2025	Fertilized with 200ppm 20-20-20
4/30/2025	Fertilized with 200ppm 20-20-20
5/1/2025	Worked field with JD6155M and Landoll Finisholl
5/2/2025	Fertilized with 200ppm 20-20-20
5/2/2025	Trial received .15 inches of rainfall
5/3/2025	Trial received .35 inches of rainfall
5/4/2025	Trial received .65 inches of rainfall
5/5/2025	Fertilized with 200ppm 20-20-20
5/5/2025	Put racks on and disinfected 1st wagon
5/5/2025	Trial received .6 inches of rainfall
5/8/2025	Trial received .1 inches of rainfall
5/12/2025	Set drive flags for spreading fertilizer

5/12/2025	Fertilized field with 400lbs/A 0-0-60, 150 lbs/A 11-52-0, 150 lbs/A 21-0-0-24(AMS) 175 lbs/A 46-0-0 and 10lbs/A Boron With 7210 and cart from Anderson's cart set for double spread
5/12/2025	Fertilized with 200ppm 20-20-20
5/12/2025	Put racks on and disinfected 2nd wagon
5/13/2025	Trial received .05 inches of rainfall
5/14/2025	Trial received .6 inches of rainfall
5/15/2025	Trial received .8 inches of rainfall
5/16/2025	Fertilized with 200ppm 20-20-20
5/19/2025	Worked field with 7210 and Perfecta
5/19/2025	Worked field with 6155M Landoll and Packer
5/19/2025	Drove alleys with 6310 for plot start and stop marks
5/20/2025	Set flags for pulling up beds
5/20/2025	Pulled up beds for trial with JD7210 and 3 row disk bedder
5/20/2025	Fertilized with 200ppm 20-20-20
5/21/2025	Trial received .4 inches of rainfall
5/22/2025	Small Peppers - fertilized with 200 ppm 20-20-20
5/22/2025	Trial received 1.7 inches of rainfall
5/23/2025	Small Peppers - fertilized with 200 ppm 20-20-20
5/23/2025	Put racks on and disinfected 3rd wagon
5/23/2025	Moved plants onto wagon to harden off
5/23/2025	Trial received .1 inches of rainfall
5/28/2025	Small Peppers - fertilized with 200 ppm 20-20-20
5/30/2025	Herbicide Application - 16 oz/A Dual Magnum, 8 oz/A Command 3ME and 5.75 oz/A Justified
5/30/2025	Power bedded beds 2 times with JD6155M and 3 row power bedder
6/2/2025	Packed beds with Kubota and big Packer
6/2/2025	Fertilized with 200ppm 20-20-20
6/3/2025	Drove alleys with Kubota
6/3/2025	Emptied soil out of flat filler
6/6/2025	Trial received .1 inches of rainfall
6/9/2025	Fertilized with 200ppm 20-20-20
6/9/2025	Trial received .3 inches of rainfall
6/10/2025	Re-drove alleys
6/11/2025	Fertilized with 200ppm 20-20-20
6/12/2025	Cut trays and randomized for planting
6/12/2025	Transplanted and put out plot stakes for trial with JD7210 and 3 row transplanter used .7 qt 10-34-0 / 50-gal transplant water
6/14/2025	Trial received 1.9 inches of rainfall
6/16/2025	Washed out flat filler
6/16/2025	Took racks off and cleaned up 2 of the wagons
6/17/2025	Trial received .25 inches of rainfall
6/18/2025	Trial received .35 inches of rainfall

6/19/2025	Trial received .45 inches of rainfall
6/23/2025	Cultivated trial with Kubota and 1 row sled cultivator
6/24/2025	Fungicide Application - 1 lb/A Manzate Prostick and 8 oz/A Orondis Ultra
6/26/2025	Hoed and hand weeded trial
6/26/2025	Took down center benches in greenhouse
6/27/2025	Deep ripped between beds with 6155M and Landoll deep ripper
6/30/2025	Trial received .7 inches of rainfall
7/3/2025	Fungicide and Insecticide application - 1.75 lbs/A Manzate Prostick and 1.92 oz/A Warrior II
7/3/2025	Trial received .1 inches of rainfall
7/7/2025	Cultivated trial with Kubota and 1 row sled cultivator
7/7/2025	Hoed and hand weeded trial
7/7/2025	Trial received .1 inches of rainfall
7/8/2025	Trial received 1.7 inches of rainfall
7/9/2025	Trial received .05 inches of rainfall
7/12/2025	Insecticide application - 10.3 oz/A Hero
7/12/2025	Fungicide Application - 1.5 pt/A Initiate
7/14/2025	Cultivated trial with Kubota and 1 row sled cultivator
7/16/2025	Trial received 1.5 inches of rainfall
7/19/2025	Trial received .05 inches of rainfall
7/20/2025	Trial received .45 inches of rainfall
7/23/2025	Fungicide and insecticide application - 11.2 oz/A Miavis Prime, 2.75 oz/A Ranman and 4 oz/A Assail
7/23/2025	Hoed and hand weeded trial
7/25/2025	Cultivated with Ford 1710 and plastic cultivator
7/26/2025	Trial received .75 inches of rainfall
7/28/2025	Trial received .2 inches of rainfall
7/30/2025	Hoed and pulled big weeds
7/31/2025	Trial received .9 inches of rainfall
8/1/2025	Trial received .35 inches of rainfall
8/4/2025	Fungicide application - 8 oz/A Orondis Ultra and 1.5 pt/A Initiate 720
8/5/2025	Insecticide Application - 1.6 oz/A Baythroid XL
8/8/2025	Cultivated trial with Ford 1710 and Plastic cultivator
8/11/2025	Trial received .1 inches of rainfall
8/12/2025	Flagged 7 plants from center of plot for harvest
8/13/2025	Trial received .55 inches of rainfall
8/14/2025	Fungicide application - 1.5 pt/A Initiate and 2.75 oz/A Ranman
8/14/2025	1st pepper harvest - harvested and evaluated
8/15/2025	Insecticide application - 4 oz/A Mustang Maxx
8/19/2025	Trial received .2 inches of rainfall
8/20/2025	Trial received .05 inches of rainfall
8/22/2025	Fungicide application - 11.4 oz/A Miravis Prime and 4 oz/A Presidio
8/22/2025	Insecticide Application - 15 oz/A Exirel

8/28/2025	Trial received .05 inches of rainfall
8/29/2025	Fungicide and Insecticide application - 15 oz/A Quadris and 3.5 oz/A Avaunt
9/2/2025	2nd pepper harvest and evaluation
9/3/2025	Fungicide and insecticide application - 13 oz/A Aprovia Top and 4 oz/A Beleaf
9/4/2025	Trial received .3 inches of rainfall
9/12/2025	Fungicide and insecticide application - 15 oz/A Quadris and 4 oz/A Mustang Maxx
9/19/2025	Fungicide and insecticide application - 1.5 pt/A initiate and 4 oz/A Mustang Maxx
9/23/2025	Trial received .1 inches of rainfall
9/24/2025	Trial received .2 inches of rainfall
9/25/2025	Trial received .3 inches of rainfall
9/30/2025	3rd harvest and evaluation of trial
10/7/2025	Trial received .75 inches of rainfall
10/19/2025	Trial received .85 inches of rainfall
10/20/2025	4th and final pepper harvest and evaluation
10/27/2025	Disked down trial with JD 6155M and 10ft IH Disk

Rainfall

Date	Rainfall in inches
4/3/2025	1.35
4/5/2025	0.65
4/6/2025	0.35
4/10/2025	0.4
4/15/2025	0.05
4/19/2025	0.15
4/20/2025	0.05
4/26/2025	0.6
5/2/2025	0.15
5/3/2025	0.35
5/4/2025	0.65
5/5/2025	0.6
5/8/2025	0.1
5/13/2025	0.05
5/14/2025	0.6
5/15/2025	0.8
5/21/2025	0.4
5/22/2025	1.7

5/23/2025	0.1
6/6/2025	0.1
6/9/2025	0.3
6/14/2025	1.9
6/17/2025	0.25
6/18/2025	0.35
6/19/2025	0.45
6/30/2025	0.7
7/3/2025	0.1
7/7/2025	0.1
7/8/2025	1.7
7/9/2025	0.05
7/16/2025	1.5
7/19/2025	0.05
7/20/2025	0.45
7/26/2025	0.75
7/28/2025	0.2
7/31/2025	0.9
8/1/2025	0.35
8/11/2025	0.1
8/13/2025	0.55
8/19/2025	0.2
8/20/2025	0.05
8/28/2025	0.05
9/4/2025	0.3
9/23/2025	0.1
9/24/2025	0.2
9/25/2025	0.3
10/7/2025	0.75
10/19/2025	0.85