2015 High Tunnel Bell Pepper Variety Trials

Kansas State University
Horticulture Research and Extension Center
Olathe, Kansas

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www.hightunnels.org

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Materials & Methods

- **Planted** in tunnel: May 1st
- Five plants per plot
- 18” in-row spacing
- Stake-and-weave
- **Fertilize:**
  - **Preplant:** calcium nitrate and potassium nitrate using equal portions of nitrogen at 75 lbs nitrogen/acre total.
  - **Fertigate:** carried out at a rate of 10lbs nitrogen/acre per application and 10lbs magnesium/acre on May 19, June 26, and July 18
- **Harvest** from July 9 to October 2
- **IPM:** BT for army worms

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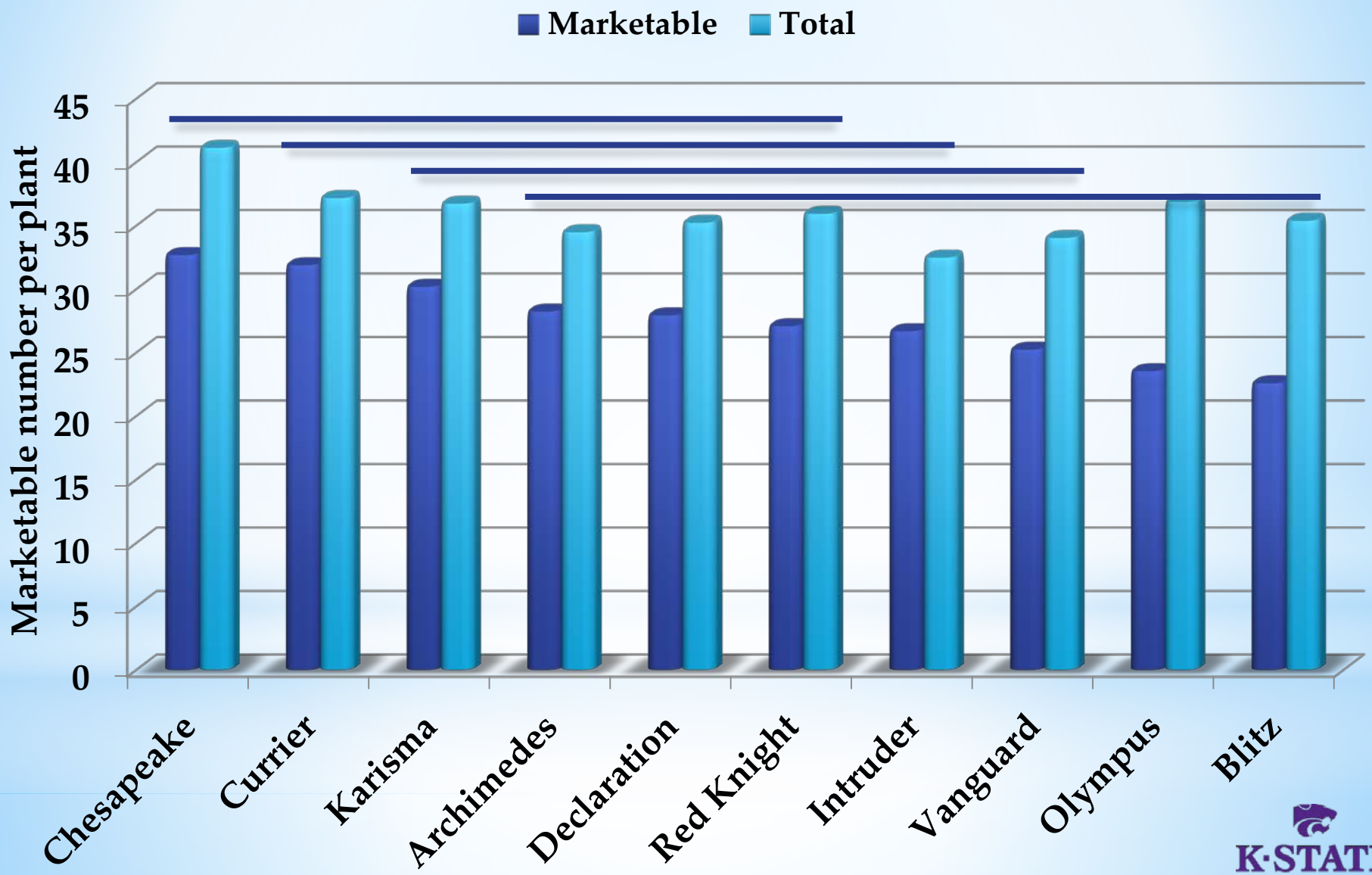
2015 KVGA High Tunnel Pepper Variety Trial



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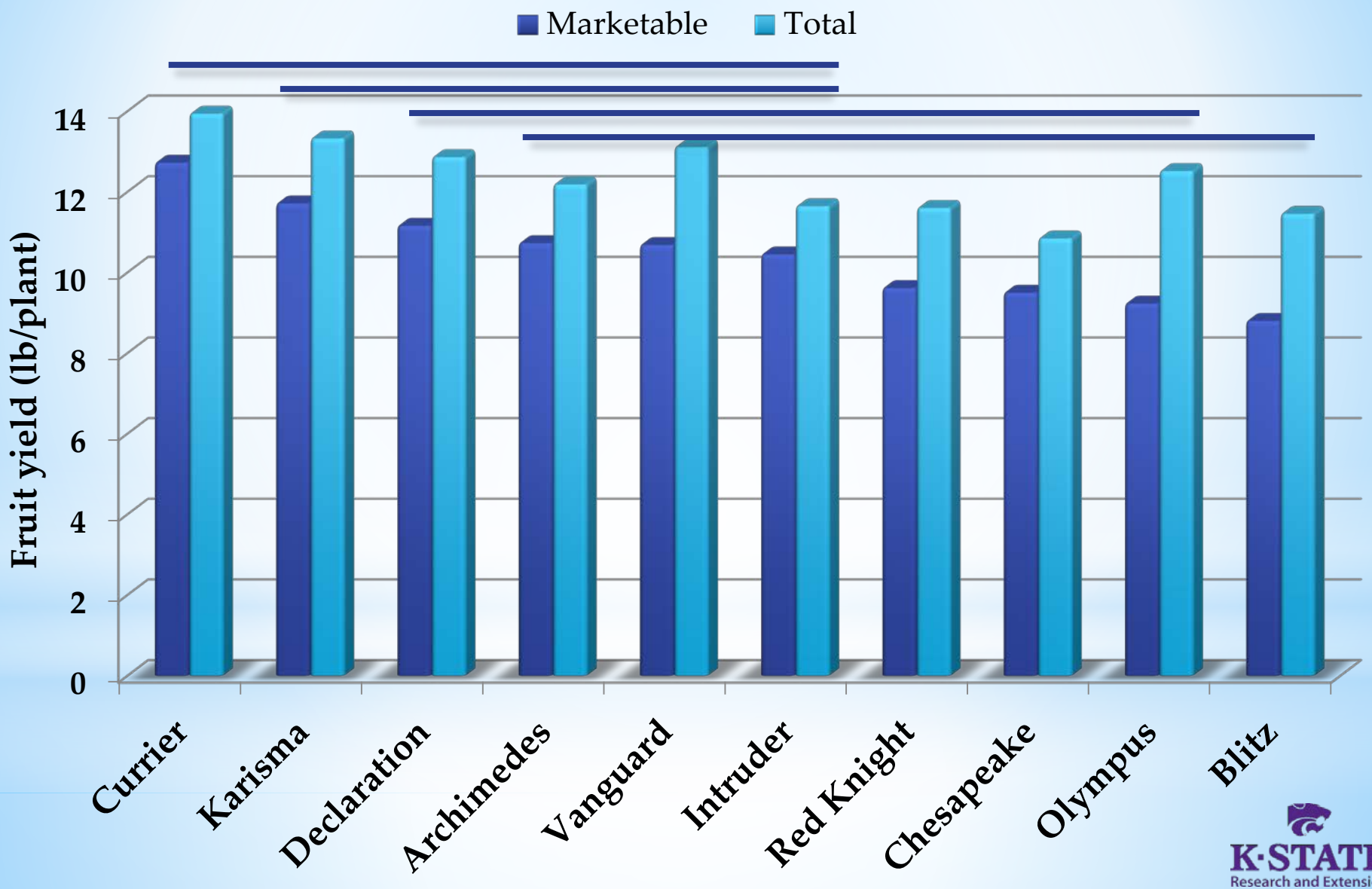
*Values below the same horizontal line are not statistically different (α=0.05) . Total per plant includes terminated last harvest grades 1 & 2

2015 KVGA High Tunnel Pepper Variety Trial



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2015 KVGA High Tunnel Pepper Variety Trial

Marketable and total per plant fruit yield of green pepper varieties grown in a three season high tunnel in Olathe, Kansas.

Variety	Marketable				Total			
	Number		Wt (lbs)		Number		Wt (lbs)	
Archimedes	28.2	abcd	10.72	abcd	34.5	a	12.18	abc
Blitz	22.6	a	8.79	a	35.4	ab	11.45	ab
Chesapeake	32.7	d	9.49	ab	41.1	b	10.84	a
Currier	31.9	cd	12.22	d	37.2	ab	13.93	d
Declaration	27.9	abcd	11.15	bcd	35.2	ab	12.85	bcd
Intruder	26.7	abc	10.44	abc	32.5	a	11.64	abc
Karisma	30.2	bcd	11.71	cd	36.7	ab	13.32	cd
Olympus	23.5	a	9.22	ab	36.9	ab	12.51	abcd
Red Knight	27.1	abcd	9.61	ab	35.9	ab	11.59	abc
Vanguard	25.2	ab	10.67	abcd	34.0	a	13.10	bcd

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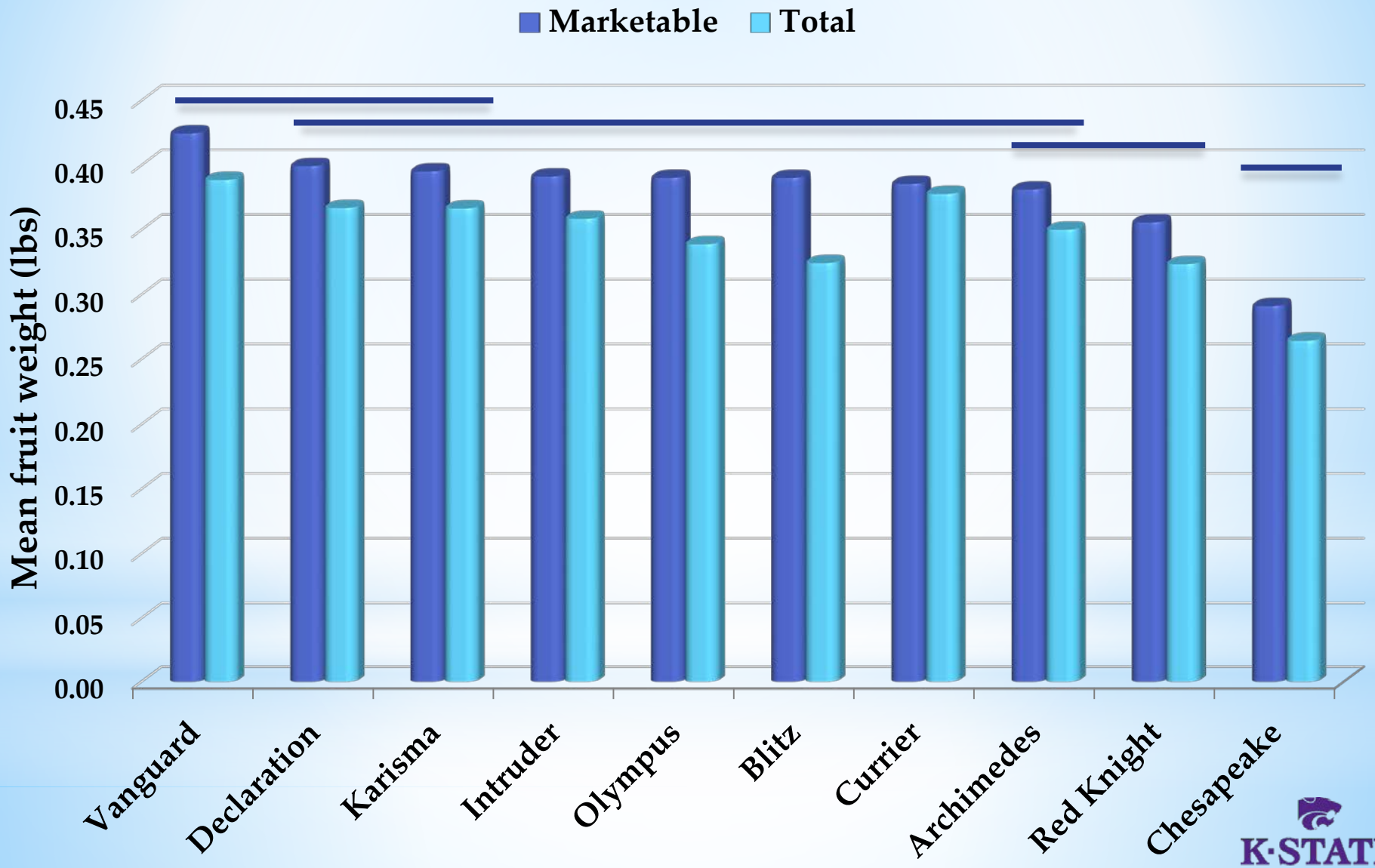
Total per plant includes terminated last harvest grades 1 & 2

2015 KVGA High Tunnel Pepper Variety Trial



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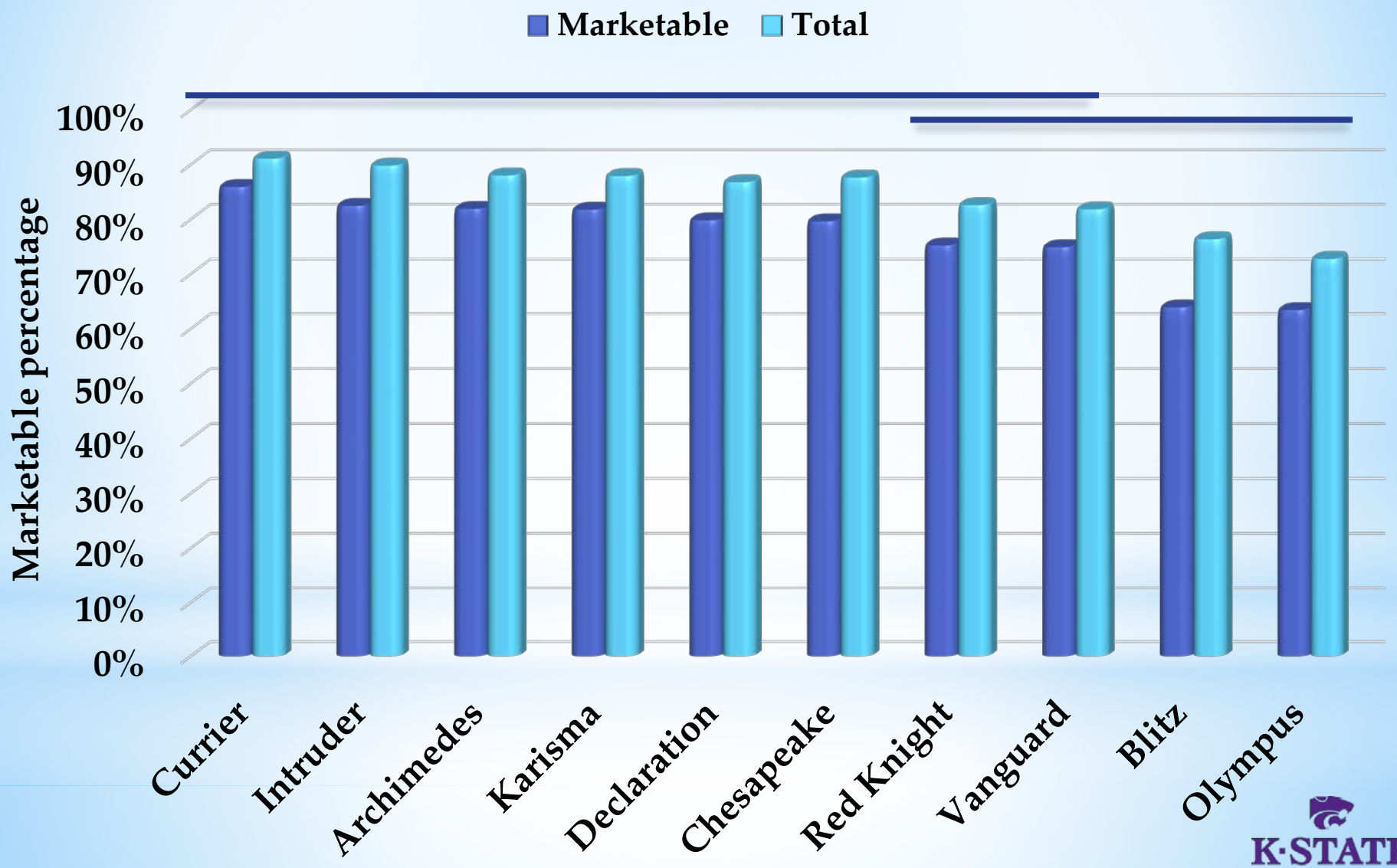
2015 KVGA High Tunnel Pepper Variety Trial



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2015 KVGA High Tunnel Pepper Variety Trial

Mean pepper fruit size (lbs) and marketability of green pepper varieties grown in a three season high tunnel in Olathe, Kansas.

Variety	Average Fruit Size (lbs)				Percent Marketability			
	Marketable		Total		Number		Weight	
Vanguard	0.42	d	0.39	e	74.9%	ab	81.8%	abc
Red Knight	0.36	b	0.32	b	75.2%	ab	82.6%	bc
Olympus	0.39	c	0.34	bc	63.4%	a	72.7%	a
Karisma	0.40	c	0.37	cde	81.7%	b	87.9%	c
Intruder	0.39	c	0.36	cde	82.4%	b	89.8%	c
Declaration	0.40	cd	0.37	cde	79.8%	b	86.7%	c
Currier	0.39	c	0.38	de	85.9%	b	87.7%	c
Chesapeake	0.29	a	0.26	a	79.6%	b	87.6%	c
Blitz	0.39	c	0.32	b	63.9%	a	76.3%	ab
Archimedes	0.38	bc	0.35	bcd	81.9%	b	88.0%	c

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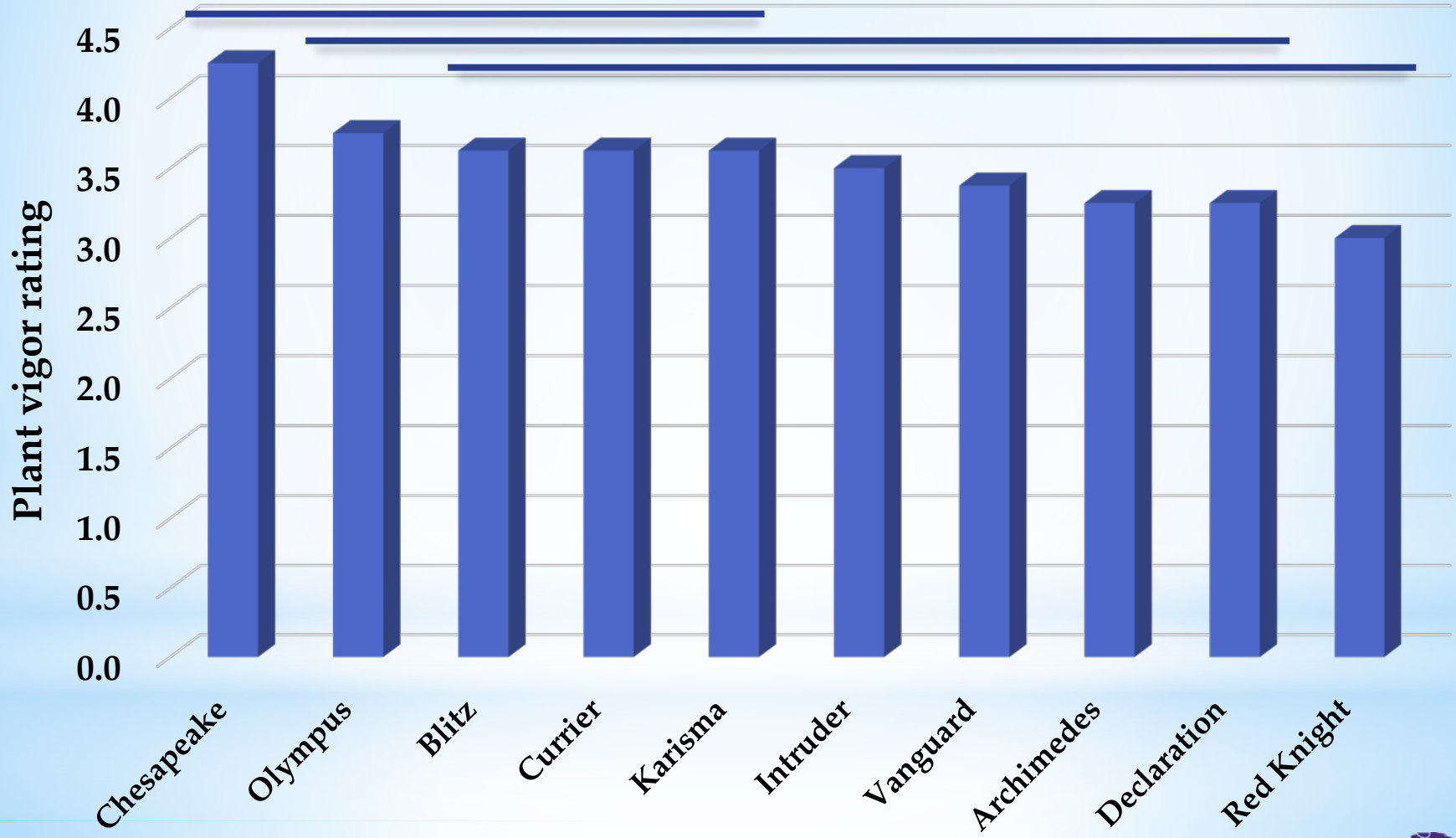

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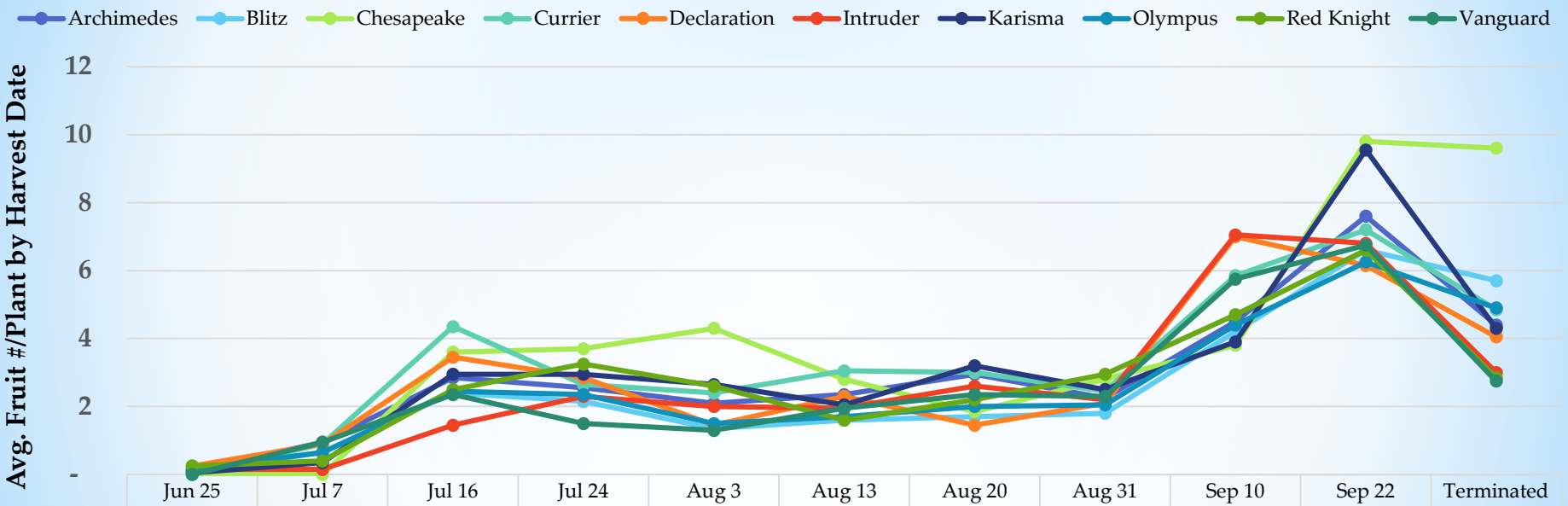

	Jun 25	Jul 7	Jul 16	Jul 24	Aug 3	Aug 13	Aug 20	Aug 31	Sep 10	Sep 22	Terminated
Archimedes	0	1	3	3	2	2	3	2	5	8	4
Blitz	0	1	2	2	1	2	2	2	4	7	6
Chesapeake	-	-	4	4	4	3	2	3	4	10	10
Currier	-	1	4	3	2	3	3	2	6	7	5
Declaration	0	1	3	3	1	2	1	2	7	6	4
Intruder	0	0	1	2	2	2	3	2	7	7	3
Karisma	0	0	3	3	3	2	3	3	4	10	4
Olympus	0	1	2	2	2	2	2	2	4	6	5
Red Knight	0	0	3	3	3	2	2	3	5	7	3
Vanguard	-	1	2	2	1	2	2	2	6	7	3

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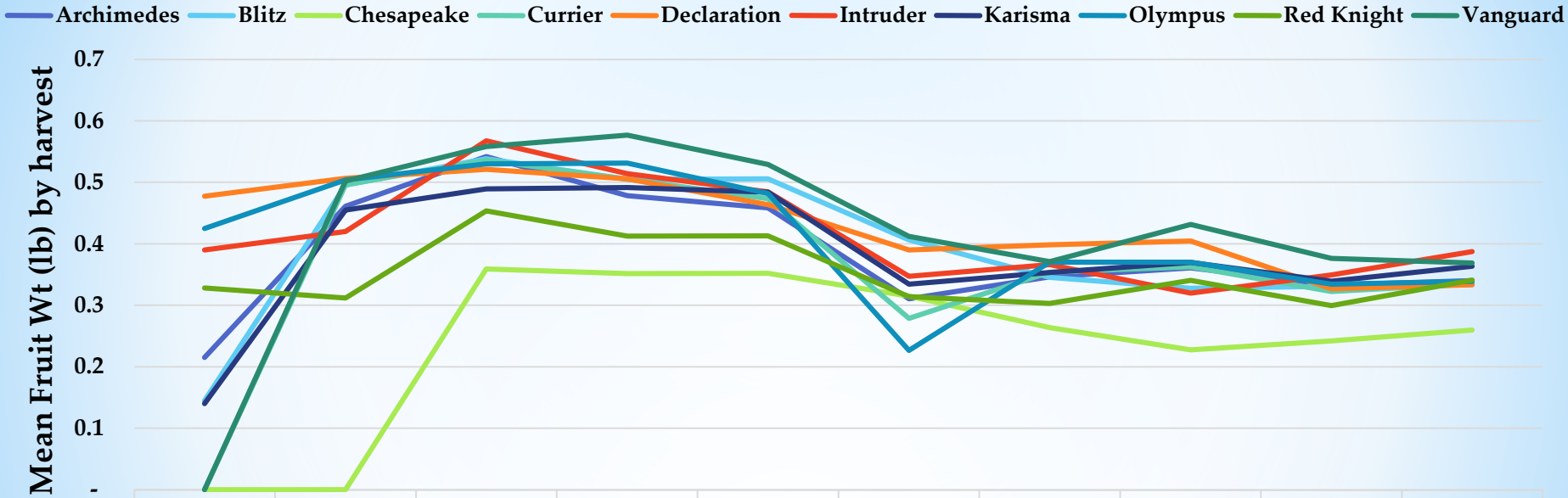
2015 KVGA High Tunnel Pepper Variety Trial



	Jun 25	Jul 7	Jul 16	Jul 24	Aug 3	Aug 13	Aug 20	Aug 31	Sep 10	Sep 22
Archimedes	0.22	0.46	0.54	0.48	0.46	0.31	0.35	0.36	0.33	0.34
Blitz	0.15	0.50	0.54	0.50	0.51	0.41	0.35	0.33	0.33	0.33
Chesapeake	-	-	0.36	0.35	0.35	0.32	0.26	0.23	0.24	0.26
Currier	-	0.50	0.54	0.51	0.47	0.28	0.35	0.36	0.32	0.33
Declaration	0.48	0.51	0.52	0.51	0.46	0.39	0.40	0.40	0.33	0.33
Intruder	0.39	0.42	0.57	0.51	0.48	0.35	0.37	0.32	0.35	0.39
Karisma	0.14	0.46	0.49	0.49	0.48	0.33	0.35	0.37	0.34	0.36
Olympus	0.43	0.50	0.53	0.53	0.48	0.23	0.37	0.37	0.33	0.34
Red Knight	0.33	0.31	0.45	0.41	0.41	0.31	0.30	0.34	0.30	0.34
Vanguard	-	0.50	0.56	0.58	0.53	0.41	0.37	0.43	0.38	0.37

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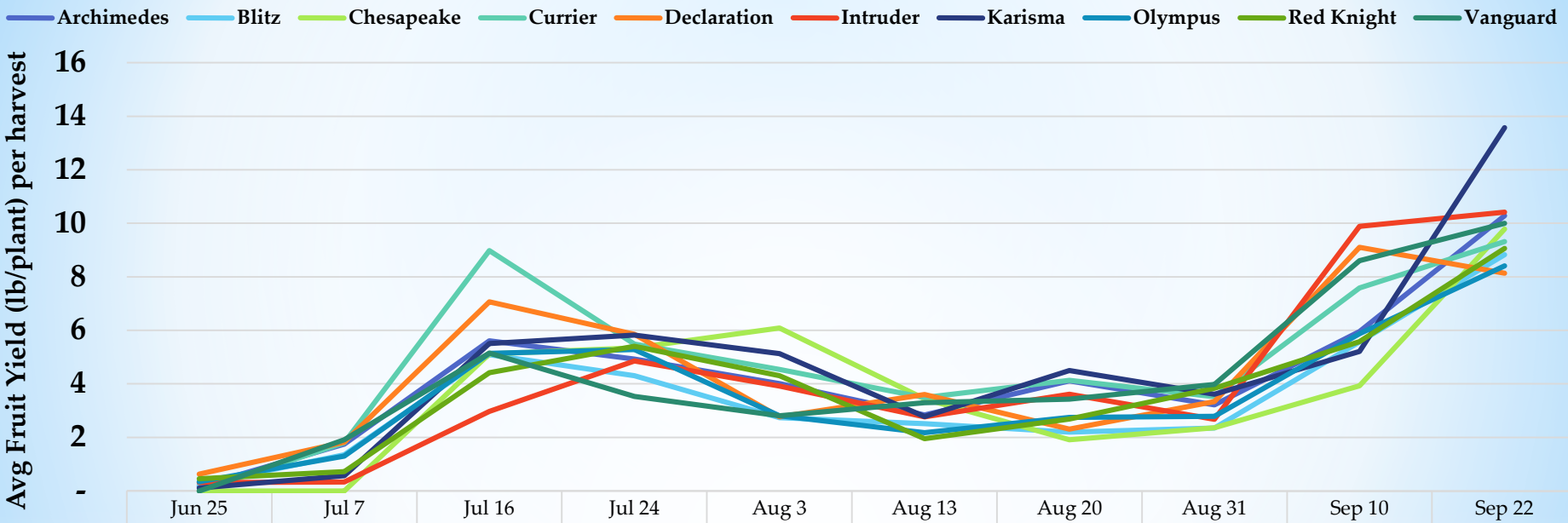
2015 KVGA High Tunnel Pepper Variety Trial



	Jun 25	Jul 7	Jul 16	Jul 24	Aug 3	Aug 13	Aug 20	Aug 31	Sep 10	Sep 22
Archimedes	0.17	1.74	5.61	4.92	4.01	2.84	4.11	3.22	5.96	10.28
Blitz	0.23	1.35	5.09	4.30	2.73	2.51	2.20	2.35	5.57	8.82
Chesapeake	-	-	5.12	5.34	6.08	3.44	1.92	2.36	3.92	9.79
Currier	-	1.80	8.98	5.49	4.54	3.49	4.14	3.52	7.58	9.32
Declaration	0.63	1.82	7.06	5.85	2.76	3.60	2.30	3.34	9.10	8.13
Intruder	0.31	0.34	2.97	4.86	3.92	2.77	3.61	2.68	9.89	10.42
Karisma	0.11	0.57	5.51	5.82	5.13	2.78	4.50	3.62	5.21	13.57
Olympus	0.34	1.30	5.14	5.28	2.81	2.18	2.75	2.78	5.88	8.41
Red Knight	0.45	0.72	4.42	5.41	4.31	1.95	2.68	3.84	5.58	9.06
Vanguard	-	1.92	5.15	3.53	2.81	3.29	3.43	3.98	8.60	10.00

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2014 KVGA High Tunnel Pepper Variety Trial

Variety	BLS					Phytophthora	TMV	PVY	CMV	TSWV	TEV	PMV
	1	2	3	4	5							
Archimedes	R	R	R			IR		R				
Blitz	R	R	R	R	R		R				IR	
Chesapeake							R			IR		
Currier	R	R	R			IR	R	R	IR			R
Declaration	R	R	R		R	IR			IR	R		
Intruder	R	R	R			IR	R				R	
Karisma	R	R	R				R	R	IR			R
Olympus	R	R	R				R	R	IR			
Red Knight	R	R	R				R	IR				
Vanguard	R	R	R	R	R	IR			IR			

R=Resistant , I=Intermediate Resistance, N=None

Resistance information gathered from seed companies

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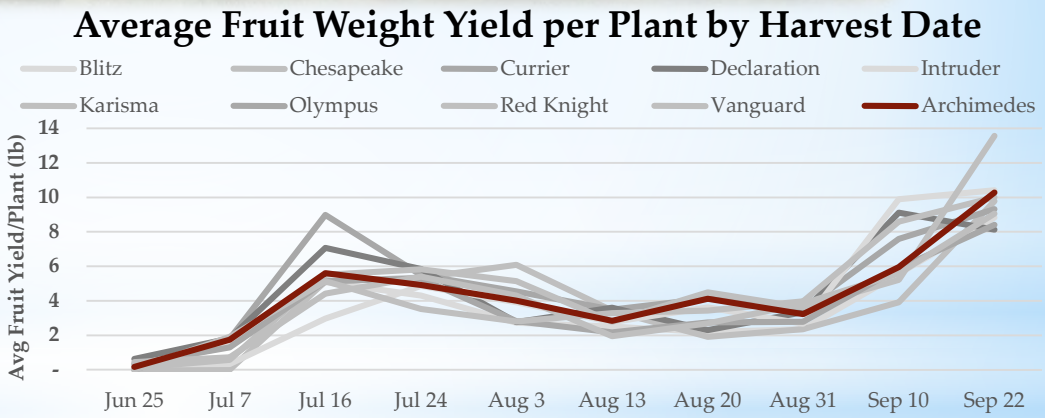
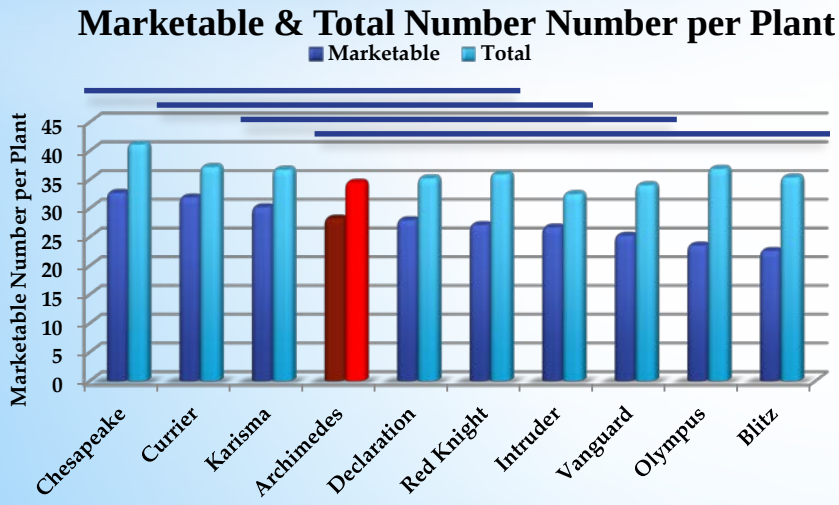
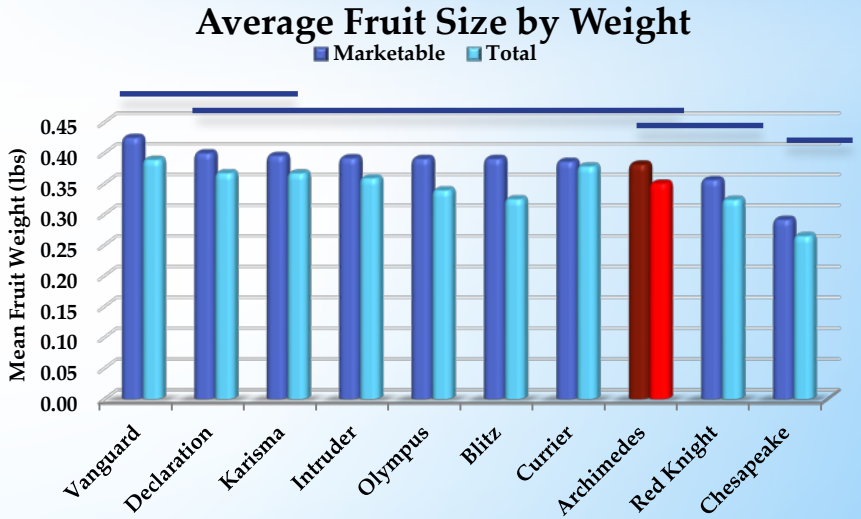
ARCHIMEDES

DAYS: 76
FRUIT SIZE: 4 ¾″ x 4 ½″
PLANT TYPE: Medium large, good canopy
VIGOR: 3.25 out of 5
LOBES: 4

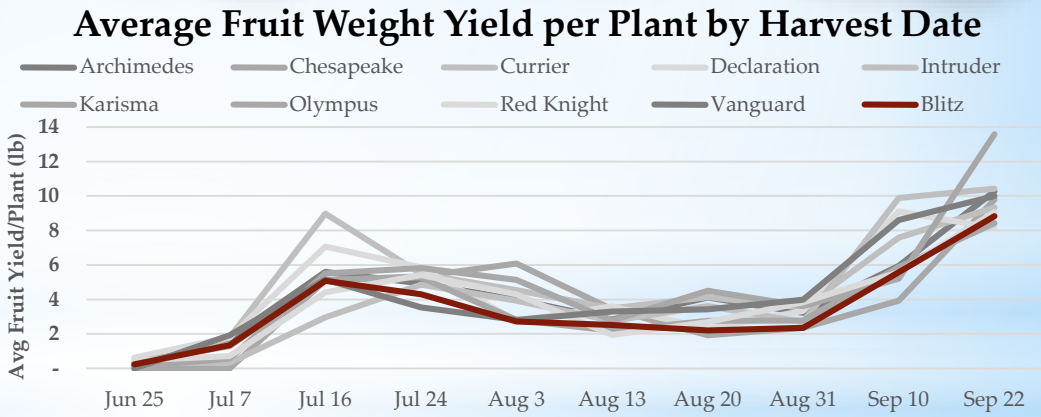


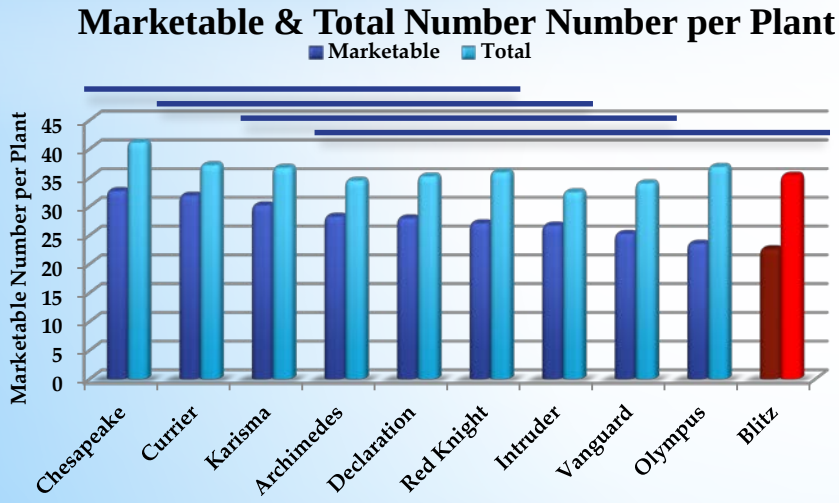


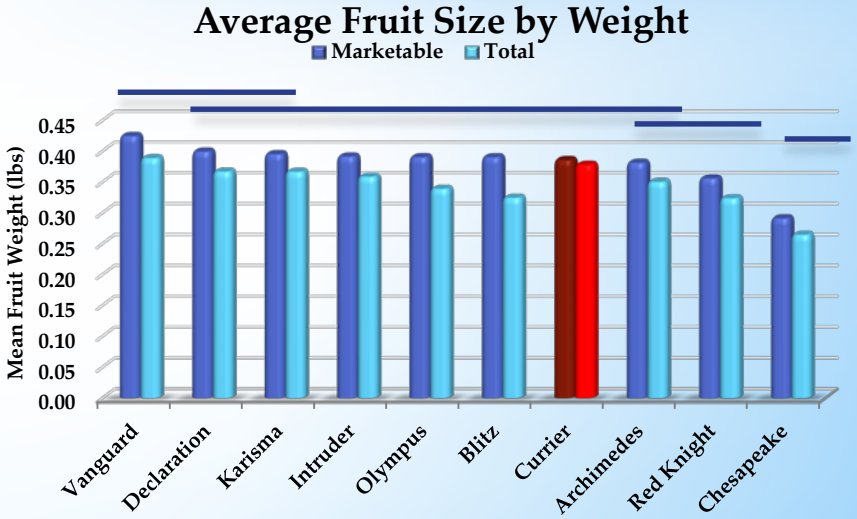


BLITZ

DAYS: Mid-early
FRUIT SIZE: 4″ x 4 ½″
PLANT TYPE: Medium large, good canopy
VIGOR: 3.625 out of 5
LOBES: 4

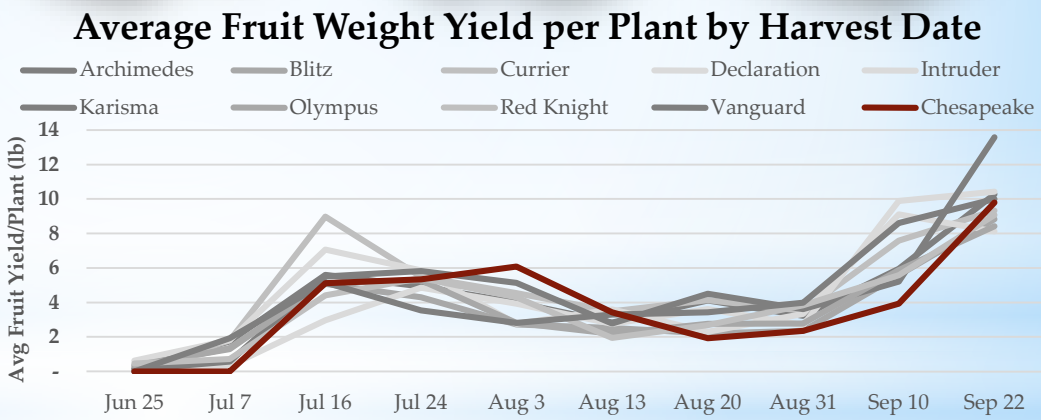


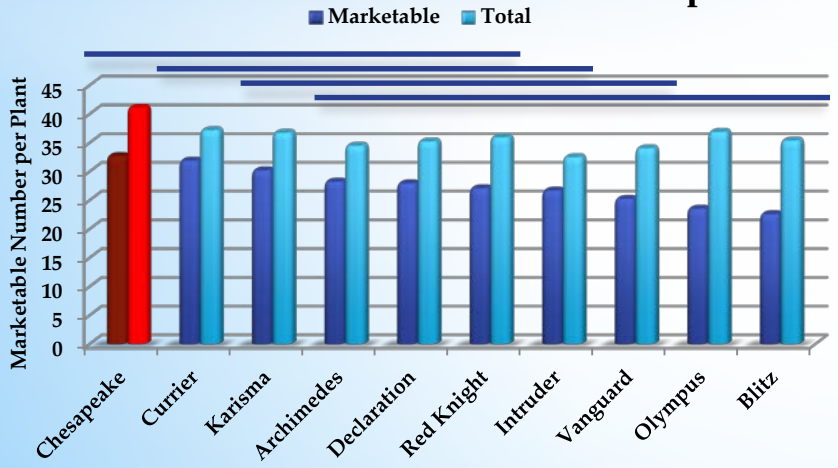


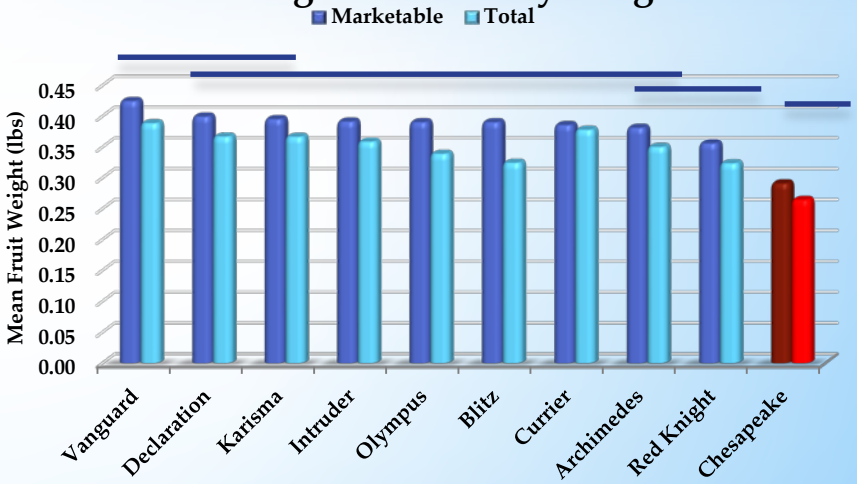


CHESAPEAKE

DAYS: 72
FRUIT SIZE: 4″ x 4 3/4 ″
PLANT TYPE: Large, vigorous canopy
VIGOR: 4.25 out of 5
LOBES: 4

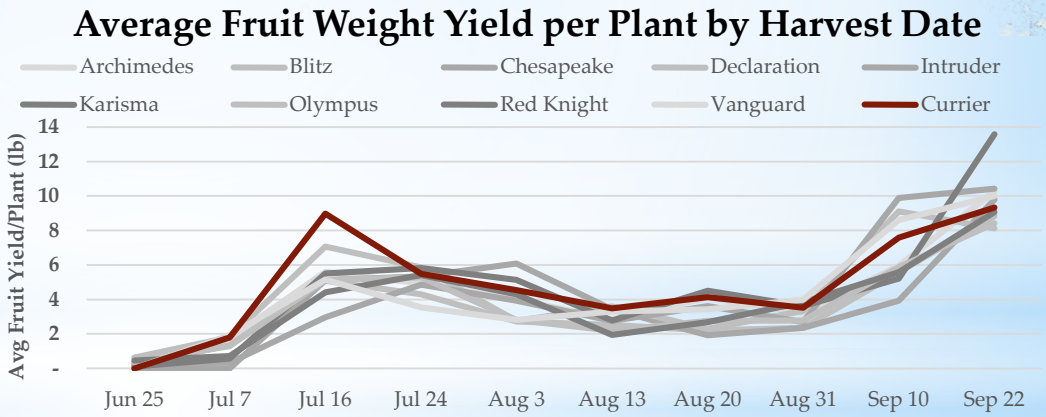


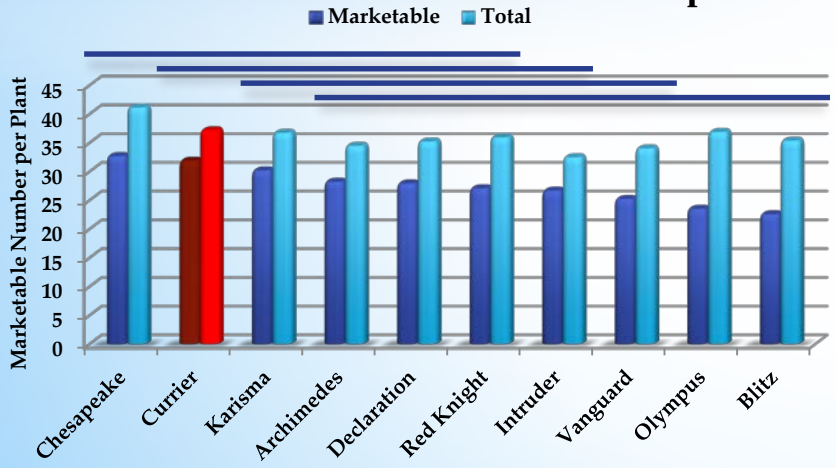


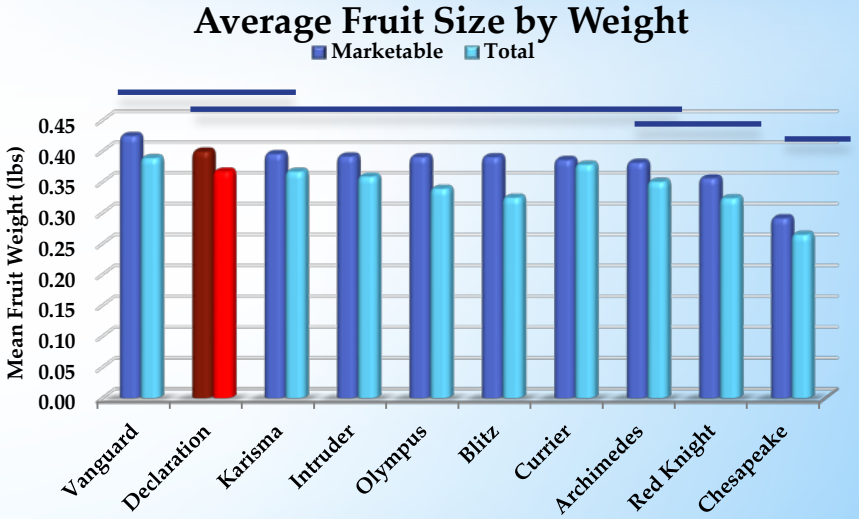


CURRIER

DAYS: 73
FRUIT SIZE: 4″ x 4 ½″
PLANT TYPE: Medium large canopy
VIGOR: 3.625 out of 5
LOBES: 4

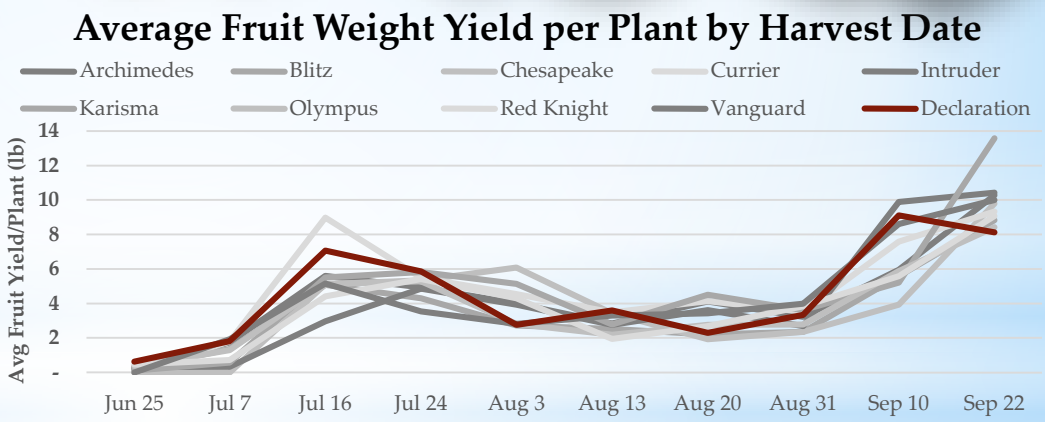


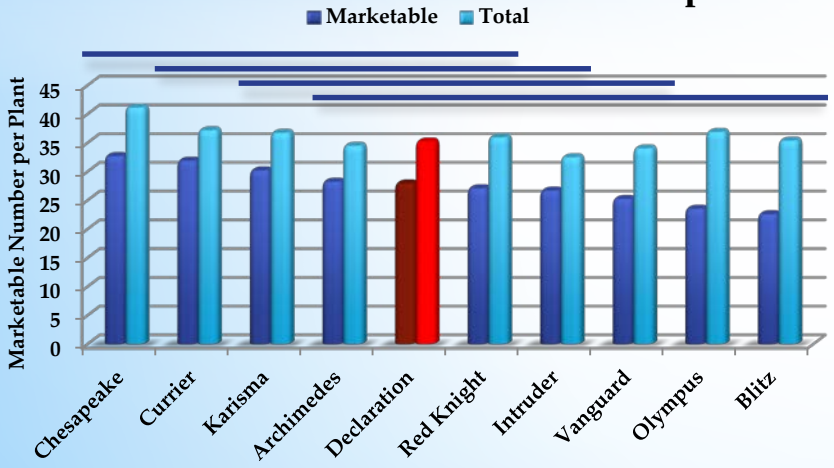


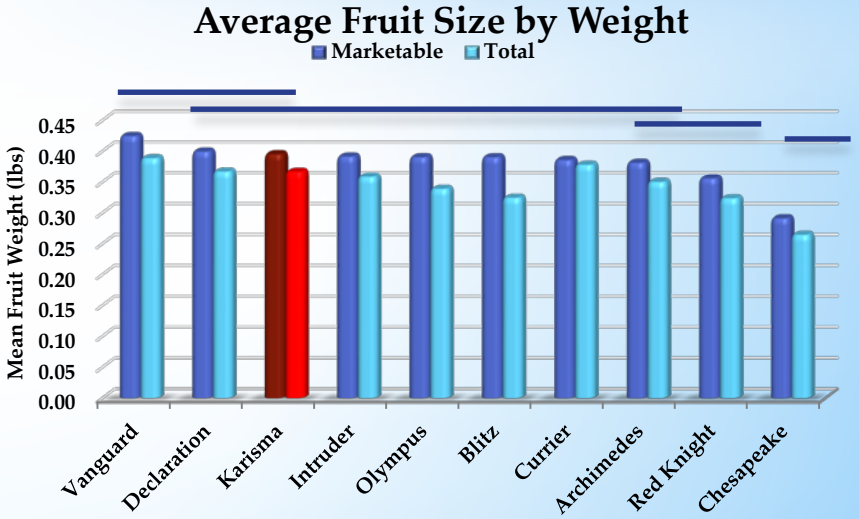


DECLARATION

DAYS: 70
FRUIT SIZE:
PLANT TYPE: tall plants that provide excellent leaf coverage and a continuous set
VIGOR: 3.25 out of 5
LOBES: 4



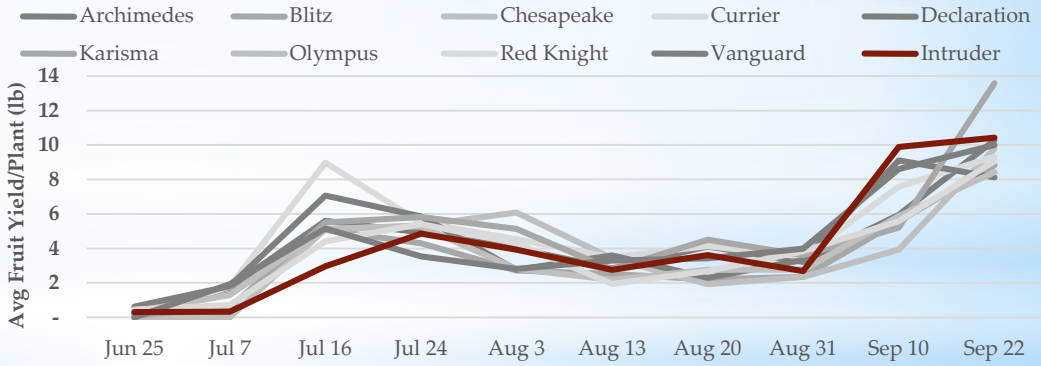




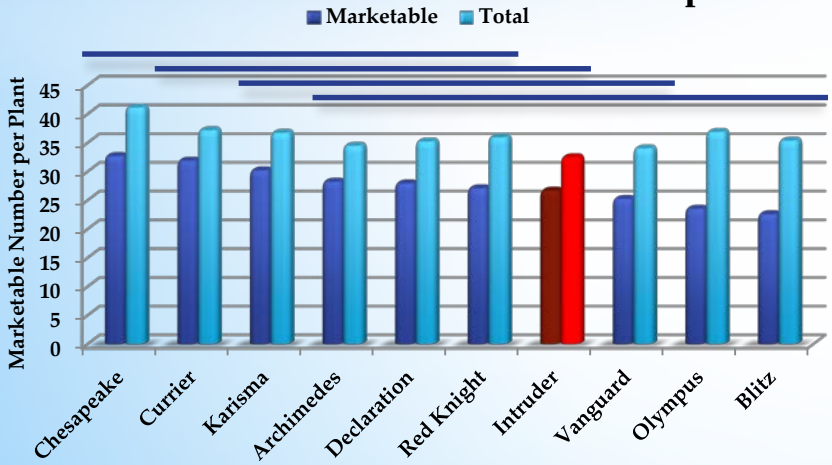
INTRUDER

DAYS: 75
FRUIT SIZE:
PLANT TYPE: medium-sized canopy
VIGOR: 3.5 out of 5
LOBES: 4

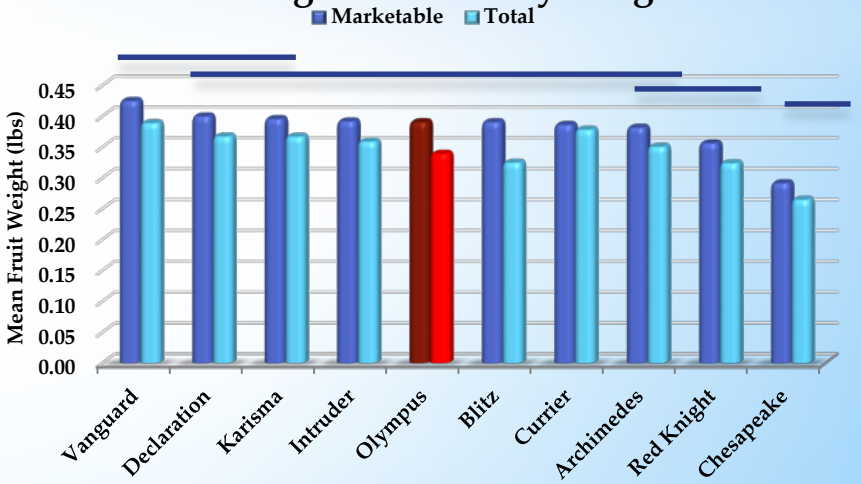
Average Fruit Weight Yield per Plant by Harvest Date



Marketable & Total Number Number per Plant

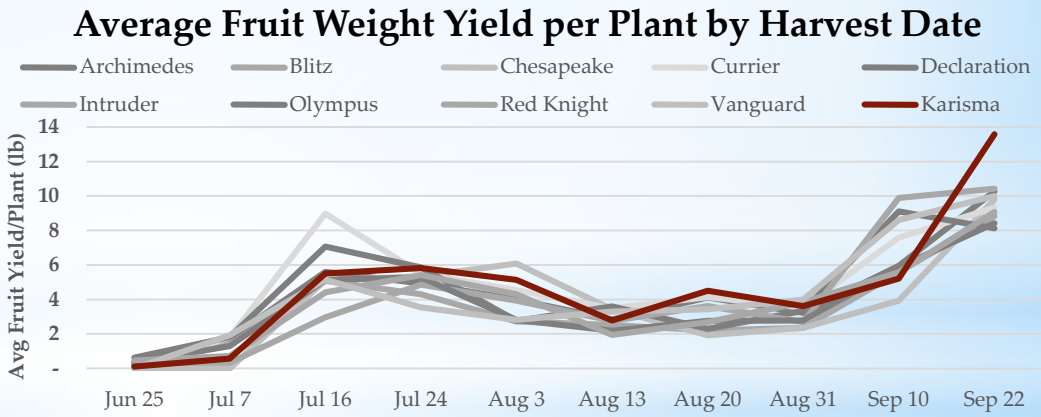


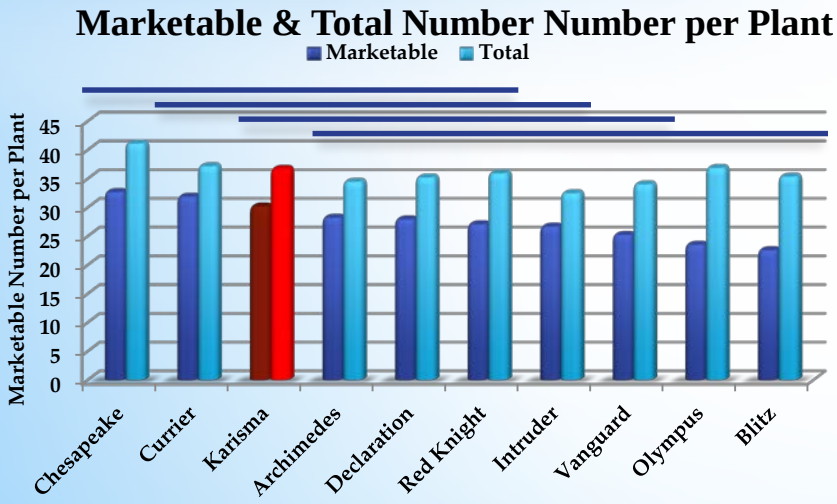
Average Fruit Size by Weight

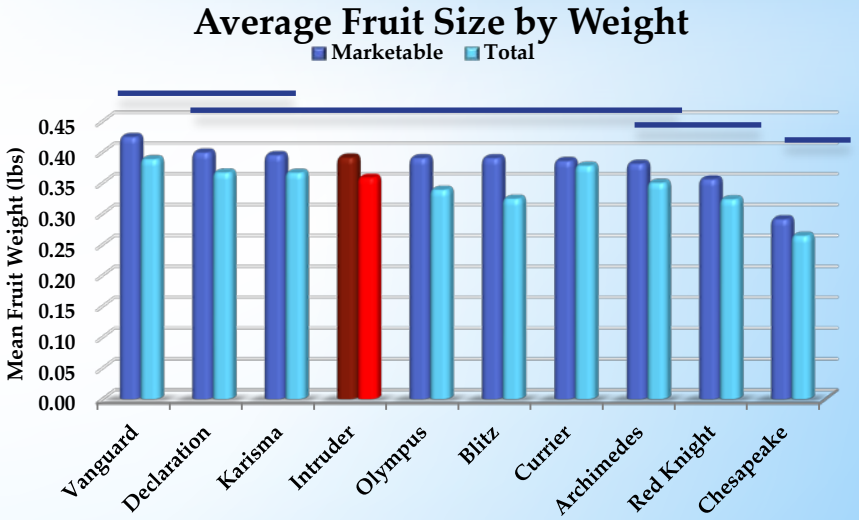


KARISMA

DAYS: 75
FRUIT SIZE: 4 ½″ x 4″
PLANT TYPE: large-sized canopy
VIGOR: 3.625 out of 5
LOBES: 4



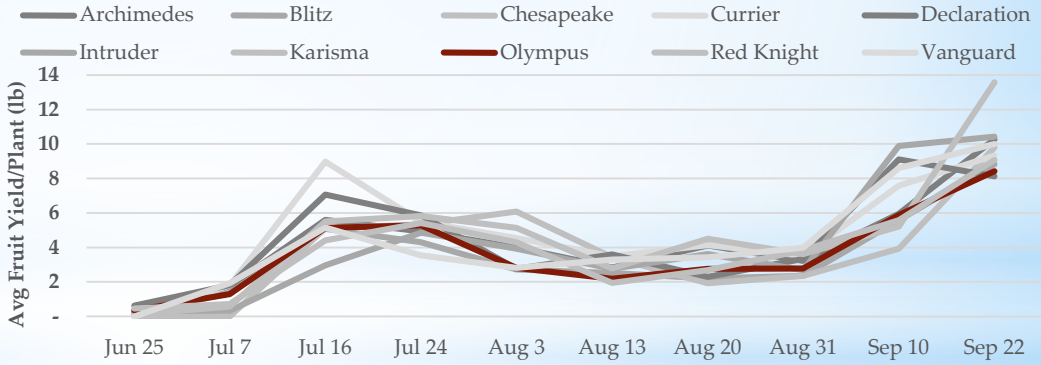




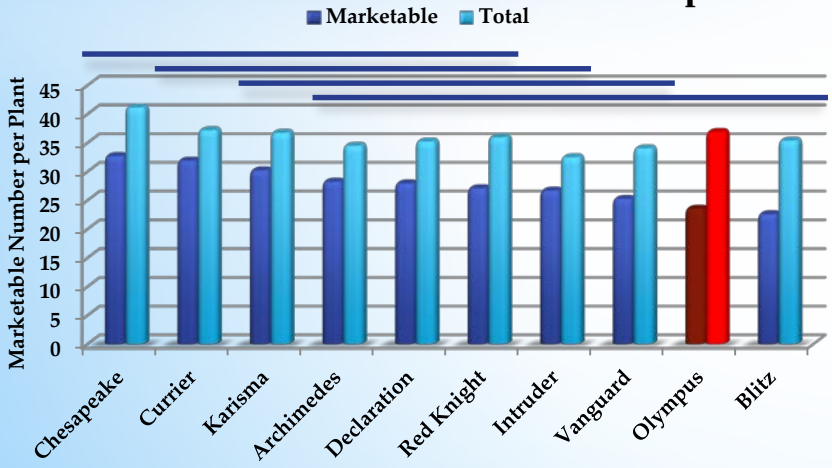
OLYMPUS

DAYS: 65
FRUIT SIZE:
PLANT TYPE: medium sized
VIGOR: 3.75 out of 5
LOBES: 4

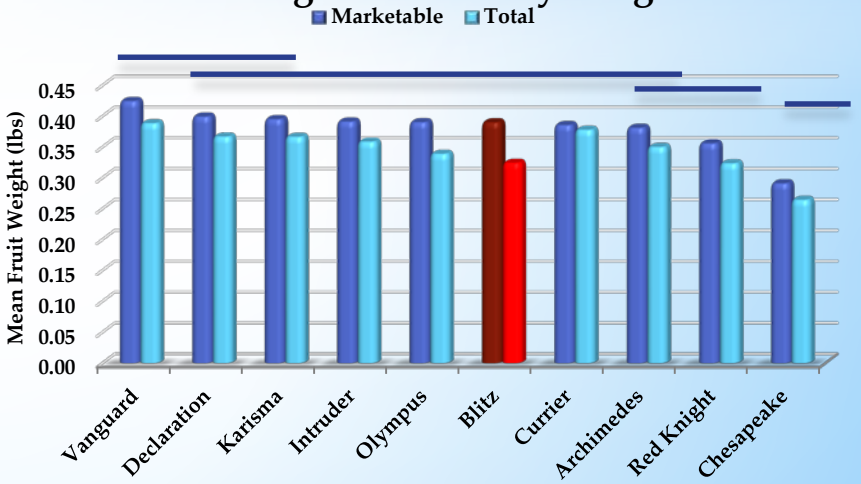
Average Fruit Weight Yield per Plant by Harvest Date



Marketable & Total Number Number per Plant



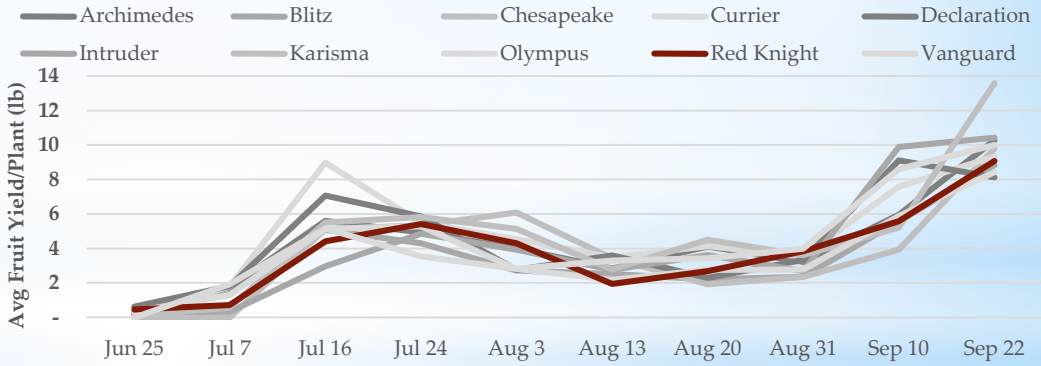
Average Fruit Size by Weight



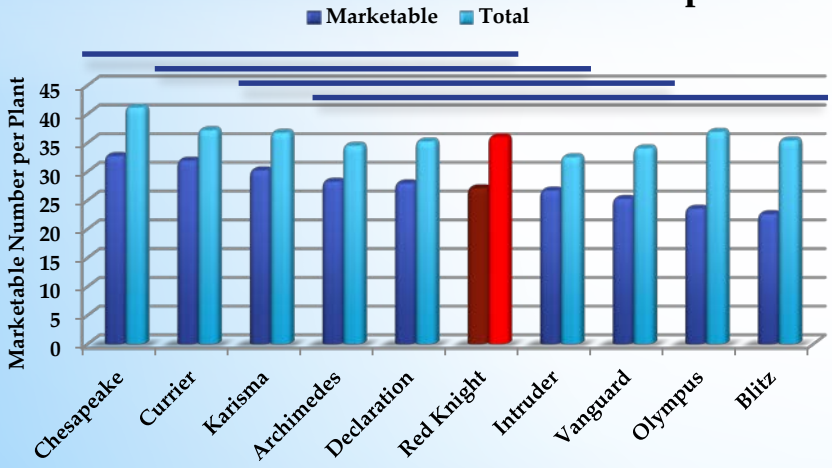
RED KNIGHT

DAYS: 64
FRUIT SIZE: 4½" x 4½"
PLANT TYPE: compact sturdy
VIGOR: 3 out of 5
LOBES: 4

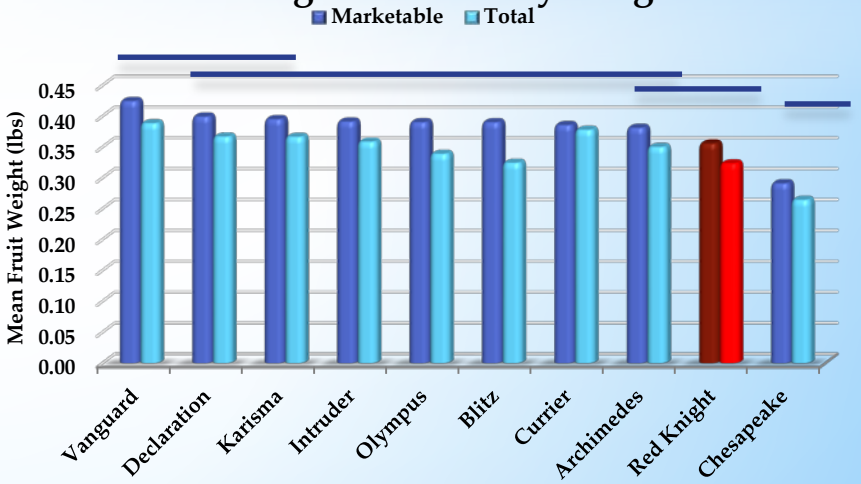
Average Fruit Weight Yield per Plant by Harvest Date



Marketable & Total Number Number per Plant



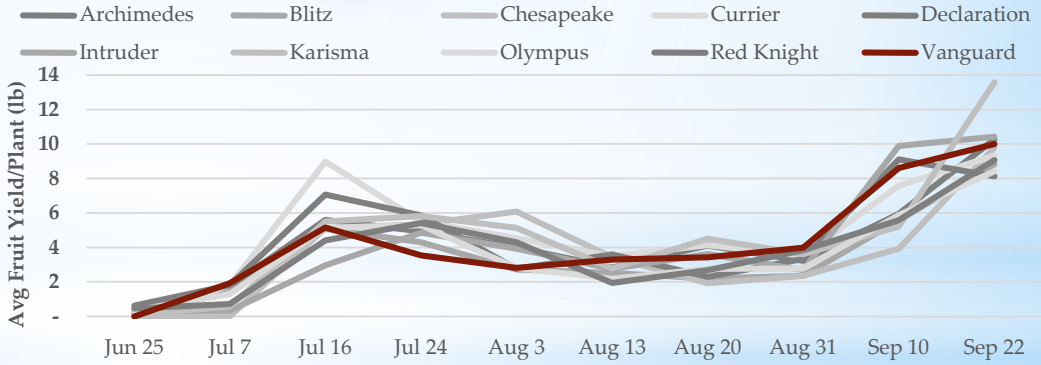
Average Fruit Size by Weight



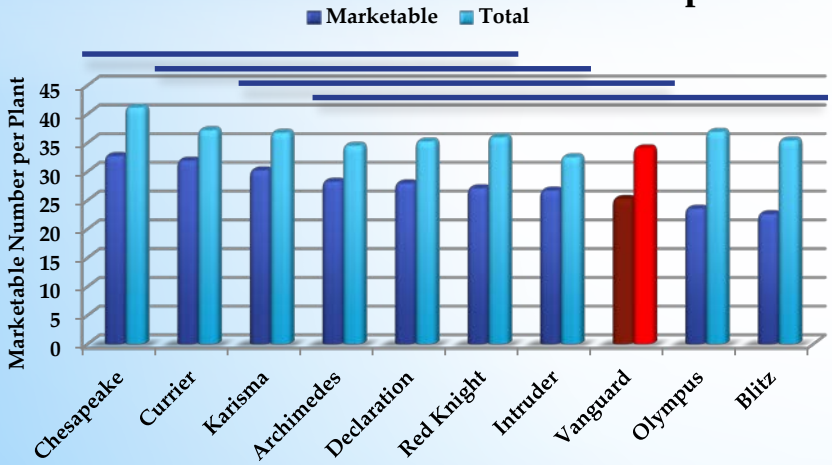
VANGUARD

DAYS: 73
FRUIT SIZE: 4½″ x 4½″
PLANT TYPE: medium tall
VIGOR: 3.375 out of 5
LOBES: 4

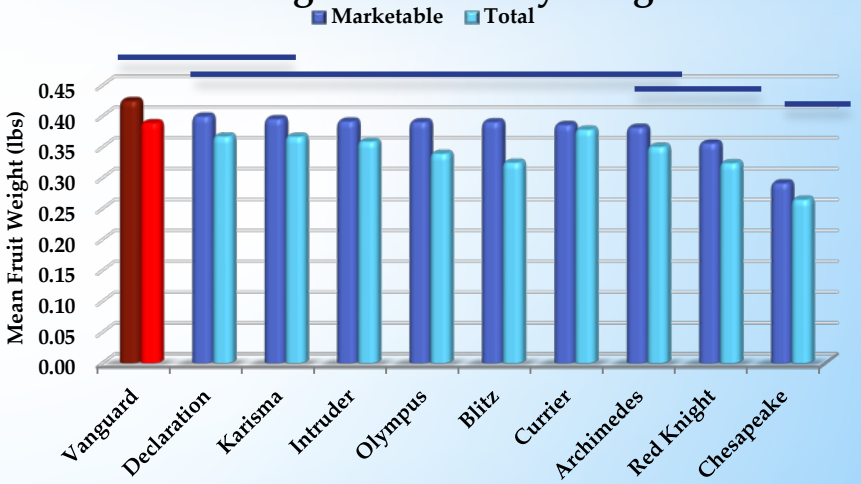
Average Fruit Weight Yield per Plant by Harvest Date



Marketable & Total Number Number per Plant



Average Fruit Size by Weight



Summary

In our trial, there were no statistically significant differences between any of the varieties in regards to marketable and total yield as measured by fruit weight. However, there were some differences observed in fruit number ($P<0.05$). 'Chesapeake' had the highest marketable and total fruit number per plant. Marketable fruit number of 'Chesapeake' was statistically similar to 'Red Knight' and 'Declaration', but was higher than the other varieties that were tested ($P<0.05$). 'Karisma' had the highest average marketable fruit size, but was statistically similar to 'Olympus', 'Blitz', 'Vanguard', and 'Currier F1'. 'Chesapeake' had a particularly low average marketable fruit size and was statistically lower than all the other varieties. In 2013, 'Karisma', 'Vanguard' and 'Olympus' had the highest average fruit size in a similar trial. Depending on how important average fruit size is to the market, this data can be interpreted differently. If smaller fruit are accepted/preferred for market, 'Chesapeake' may be an ideal variety as peppers are typically sold per piece at retail markets. However, if larger fruit are preferred, 'Declaration' or 'Currier F1' may be more valuable as they maintain good fruit size and have higher yield (weight) than many of the other varieties tested. Similar to 2013, 'Intruder' had the highest percent marketability although 'Chesapeake' and 'Red Knight' were statistically similar. A large portion (>80%) of the fruit quality problems seen in this trial was the result of blossom end rot (BER). Although the cull fruit were not graded specifically for this issue, the results seen in this study were most likely the result of a lower incidence of BER.

Total weekly fruit yield was plotted in order to summarize early vs. mid- and late-season production (data not shown). In contrast to the 2013 trial, several varieties showed excellent production early and mid-season, whereas in 2013 the majority of the yield came in September. Three varieties showed high potential for early-season production, which can be advantageous for marketing high-value fruit. In particular, 'Karisma', 'Blitz', and 'Declaration' showed the highest yields during July (data not shown). At the peak of the season, 'Currier F1', 'Intruder', 'Vanguard', and 'Archimedes' had the highest production and were dramatically higher than the other varieties tested. During the peak harvest, and throughout the month of August, 'Blitz' had very poor production. 'Red Knight', 'Chesapeake', and 'Archimedes' had the highest yields late in the season (data not shown).

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The Variety Trial results are published in the Midwest Vegetable Variety Trial Report and HighTunnels.org

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