2015 High Tunnel Tomato 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: April 16th
- Five plants per plot
- 18" in-row spacing
- Pruned to first fruit hand
- 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 June 29 to October 2
- **IPM:** BT for army and horn worms

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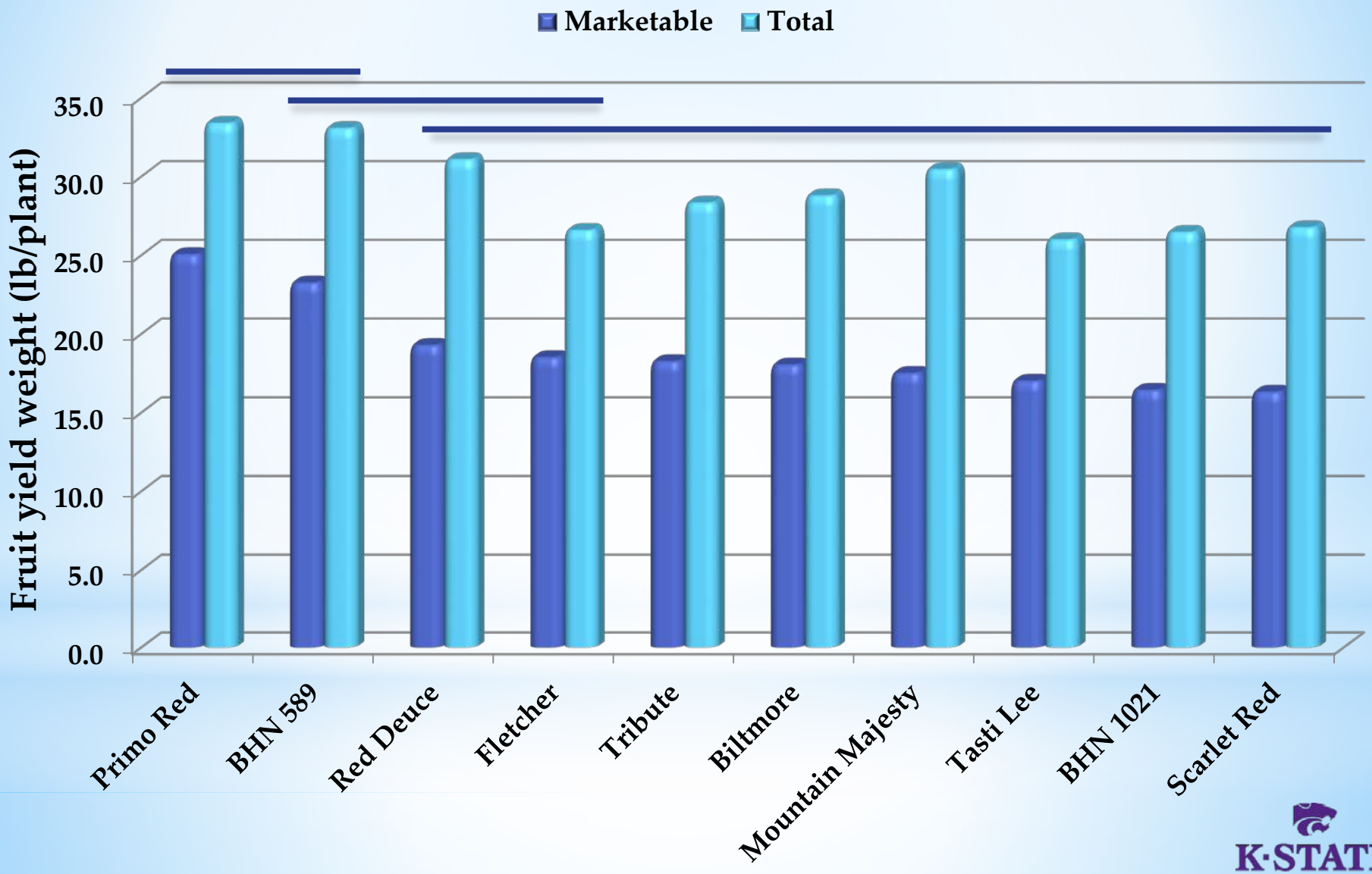
2015 KVGA High Tunnel Tomato Variety Trial



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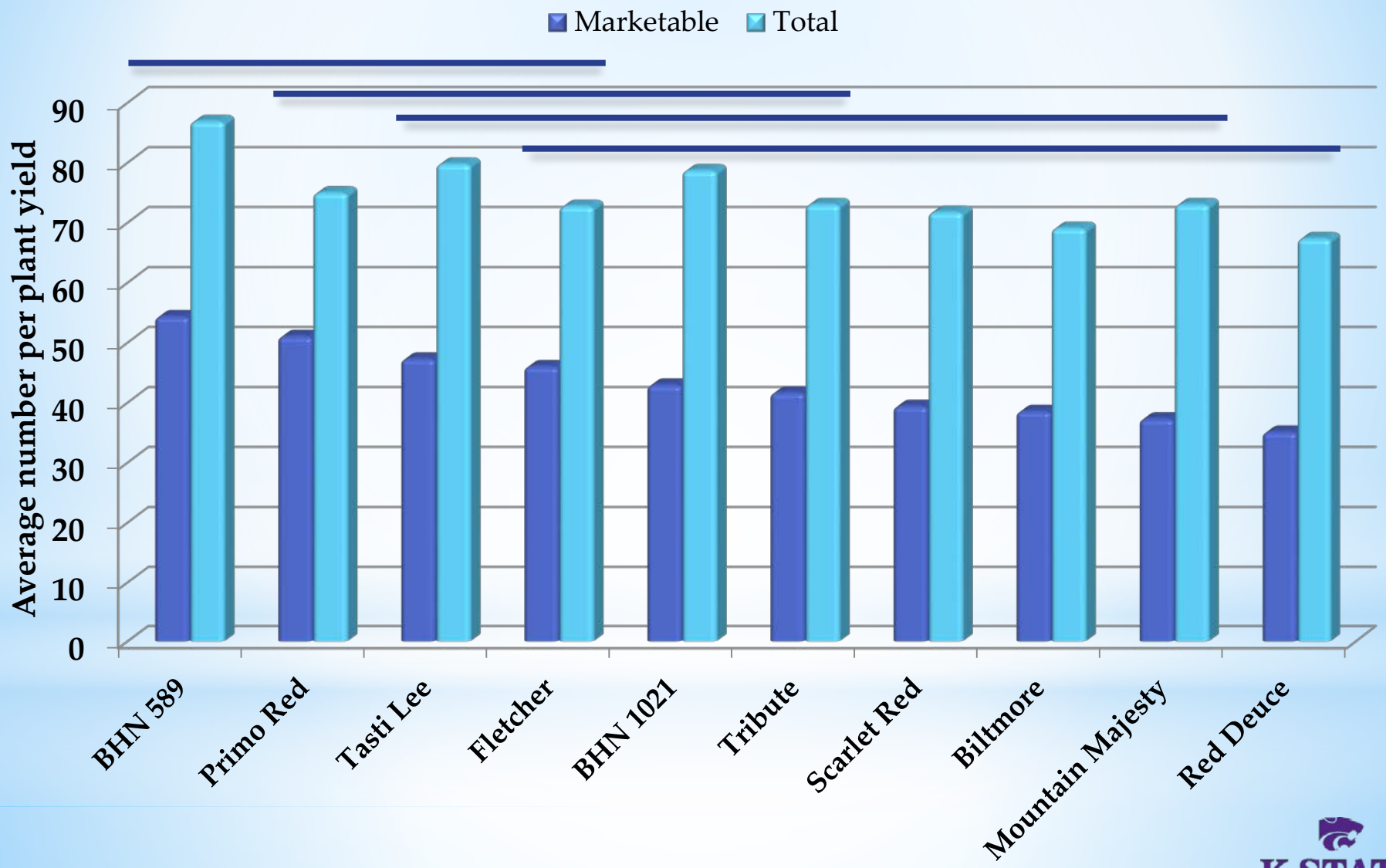
The status bars above show the marketable statistical similarities. For full details, see table on page 4

2015 KVGA High Tunnel Tomato Variety Trial



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2015 KVGA High Tunnel Tomato Variety Trial

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

Variety	Marketable				Total			
	Number		Wt (lbs)		Number		Wt (lbs)	
BHN 589	54.4	d	23.2	bc	86.9	c	33.1	cd
Primo Red	51.1	cd	25.0	c	75.0	abc	33.4	d
Tasti Lee	47.3	bcd	17.0	a	79.8	bc	26.0	a
Fletcher	46.0	abcd	18.5	ab	72.8	ab	26.6	ab
BHN 1021	43.0	abc	16.4	a	78.7	abc	26.5	ab
Tribute	41.7	abc	18.2	a	73.1	ab	28.3	abc
Scarlet Red	39.4	ab	16.3	a	71.8	ab	26.8	ab
Biltmore	38.6	ab	18.0	a	69.1	ab	28.8	abcd
Mountain Majesty	37.3	ab	17.5	a	73.1	ab	30.4	abcd
Red Deuce	35.1	a	19.3	ab	67.4	a	31.1	bcd
$LSD_{(0.05)}$	10.945		4.9168		11.953		4.9447	

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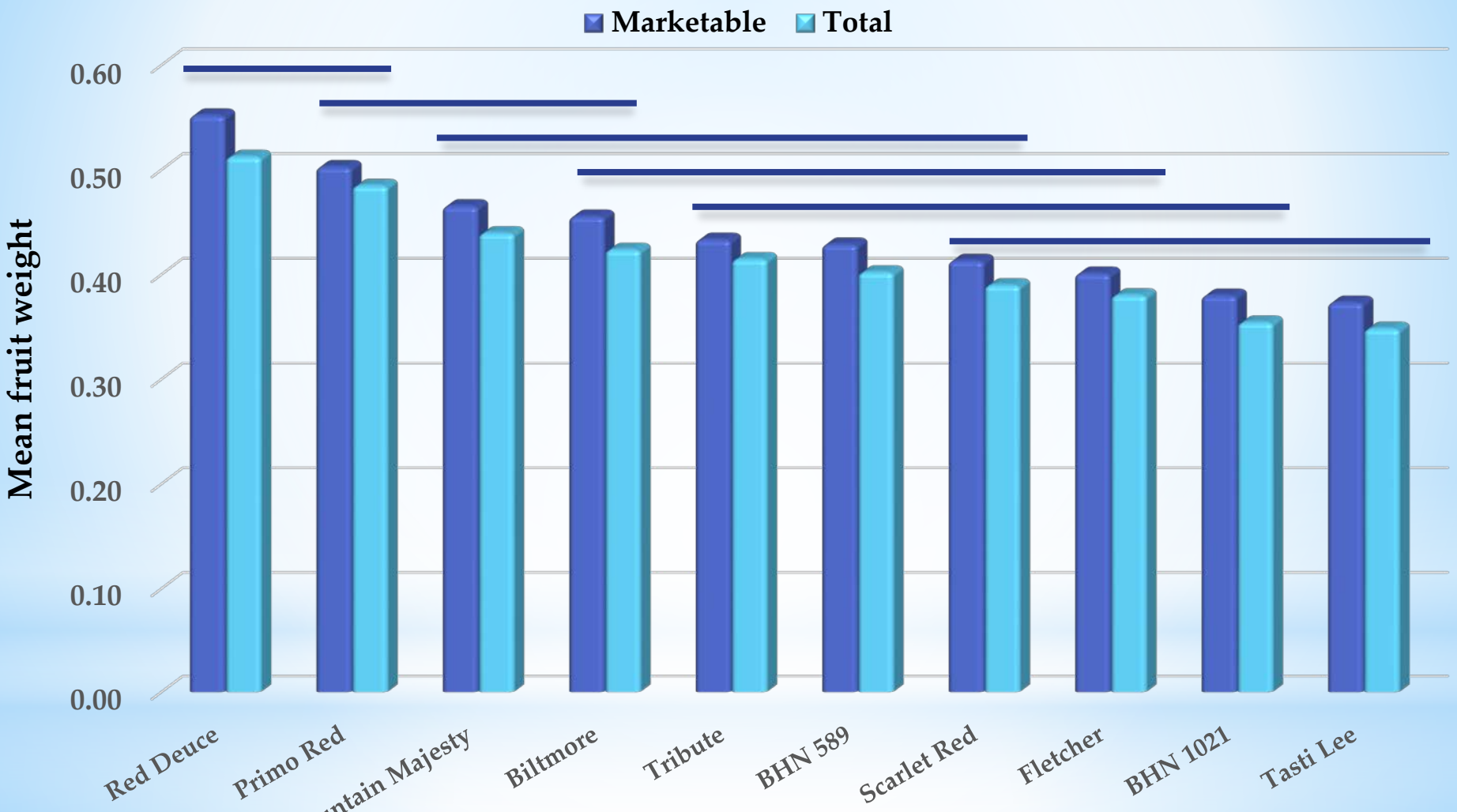

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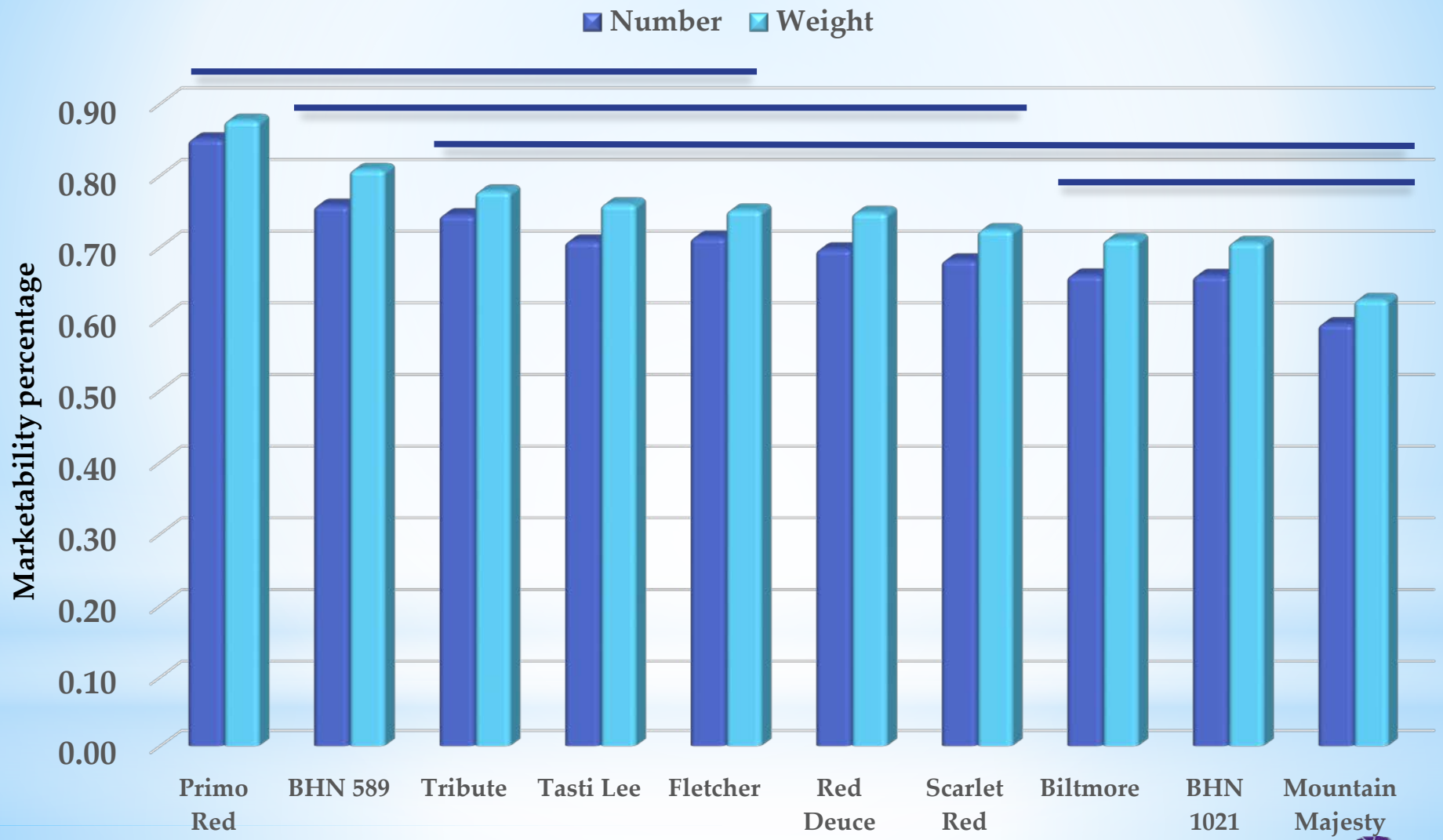

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The status bars above show the marketable statistical similarities. For full details, see table on page 8

2015 KVGA High Tunnel Tomato Variety Trial

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

Variety	Average Fruit Size (lbs)				Percent Marketability			
	Marketable		Total		Number		Weight	
Red Deuce	0.55	f	0.46	f	69.7%	bc	74.8%	bc
Primo Red	0.50	ef	0.45	ef	85.1%	c	87.7%	d
Mountain Majesty	0.47	de	0.41	cde	59.3%	ab	62.7%	ab
Biltmore	0.46	cde	0.41	cde	66.1%	ab	71.0%	ab
Tribute	0.43	bcd	0.39	cd	74.5%	bc	77.8%	bc
BHN 589	0.43	bcd	0.38	bcd	75.8%	ab	80.8%	cd
Scarlet Red	0.41	abcd	0.38	bcd	68.2%	ab	72.4%	bc
Fletcher	0.40	abc	0.37	abc	71.4%	bc	75.2%	bcd
BHN 1021	0.38	ab	0.33	ab	66.0%	bc	70.6%	ab
Tasti Lee	0.35	a	0.33	a	70.8%	bc	76.0%	bc
$LSD_{(0.05)}$	0.06		0.05		0.10		0.09	

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*based on visual observations of plant height, biomass, and plant canopy

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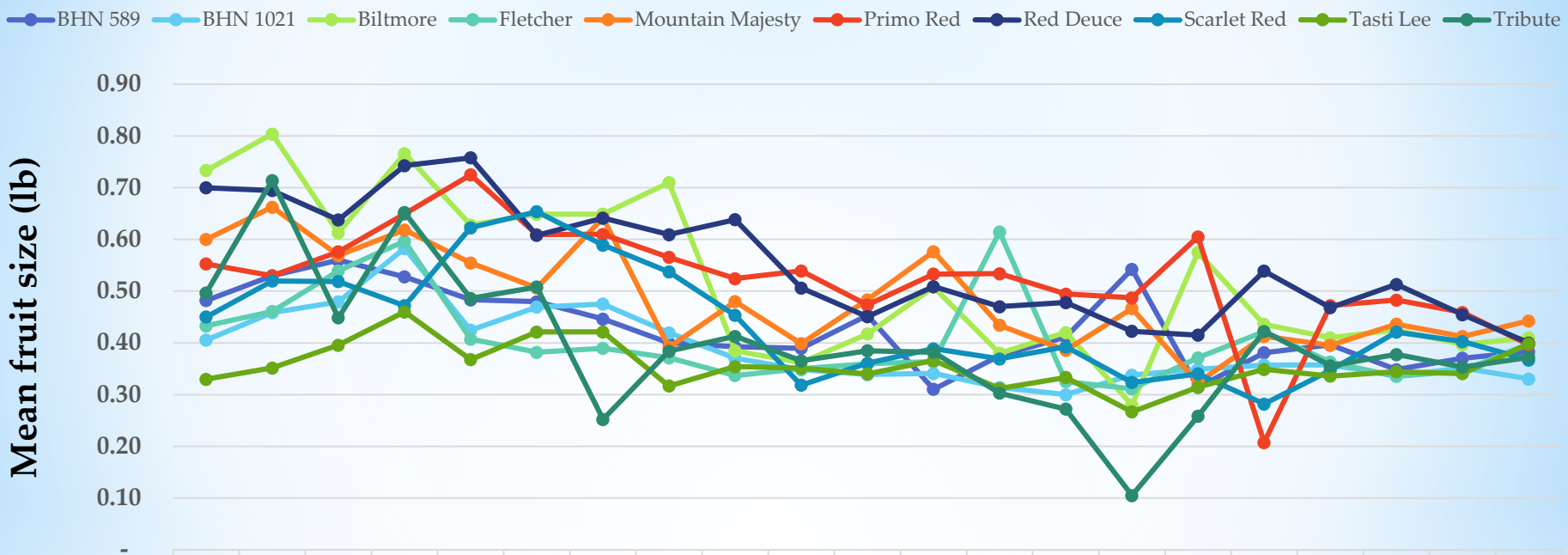

	Jun 29	Jul 6	Jul 9	Jul 13	Jul 16	Jul 20	Jul 23	Jul 27	Jul 30	Aug 3	Aug 6	Aug 13	Aug 17	Aug 20	Aug 25	Aug 31	Sep 8	Sep 15	Sep 23	Sep 29	Oct 7
BHN 589	0.48	0.53	0.56	0.53	0.48	0.48	0.45	0.40	0.39	0.39	0.45	0.31	0.38	0.41	0.54	0.31	0.38	0.40	0.35	0.37	0.38
BHN 1021	0.41	0.46	0.48	0.58	0.42	0.47	0.48	0.42	0.37	0.35	0.34	0.34	0.31	0.30	0.34	0.35	0.36	0.36	0.34	0.35	0.33
Biltmore	0.73	0.80	0.61	0.77	0.63	0.65	0.65	0.71	0.38	0.36	0.42	0.51	0.38	0.42	0.28	0.58	0.44	0.41	0.43	0.40	0.41
Fletcher	0.43	0.46	0.54	0.60	0.41	0.38	0.39	0.37	0.34	0.35	0.36	0.36	0.61	0.33	0.31	0.37	0.42	0.36	0.34	0.35	0.40
Mountain Majesty	0.60	0.66	0.57	0.62	0.55	0.51	0.64	0.39	0.48	0.40	0.48	0.58	0.43	0.39	0.47	0.32	0.41	0.40	0.44	0.41	0.44
Primo Red	0.55	0.53	0.58	0.65	0.72	0.61	0.61	0.57	0.52	0.54	0.47	0.53	0.53	0.49	0.49	0.61	0.21	0.47	0.48	0.46	0.40
Red Deuce	0.70	0.69	0.64	0.74	0.76	0.61	0.64	0.61	0.64	0.51	0.45	0.51	0.47	0.48	0.42	0.42	0.54	0.47	0.51	0.45	0.40
Scarlet Red	0.45	0.52	0.52	0.47	0.62	0.65	0.59	0.54	0.45	0.32	0.36	0.39	0.37	0.39	0.32	0.34	0.28	0.35	0.42	0.40	0.37
Tasti Lee	0.33	0.35	0.40	0.46	0.37	0.42	0.42	0.32	0.35	0.35	0.34	0.37	0.31	0.33	0.27	0.31	0.35	0.34	0.34	0.34	0.40
Tribute	0.50	0.71	0.45	0.65	0.49	0.51	0.25	0.38	0.41	0.37	0.38	0.38	0.30	0.27	0.11	0.26	0.42	0.36	0.38	0.35	0.37

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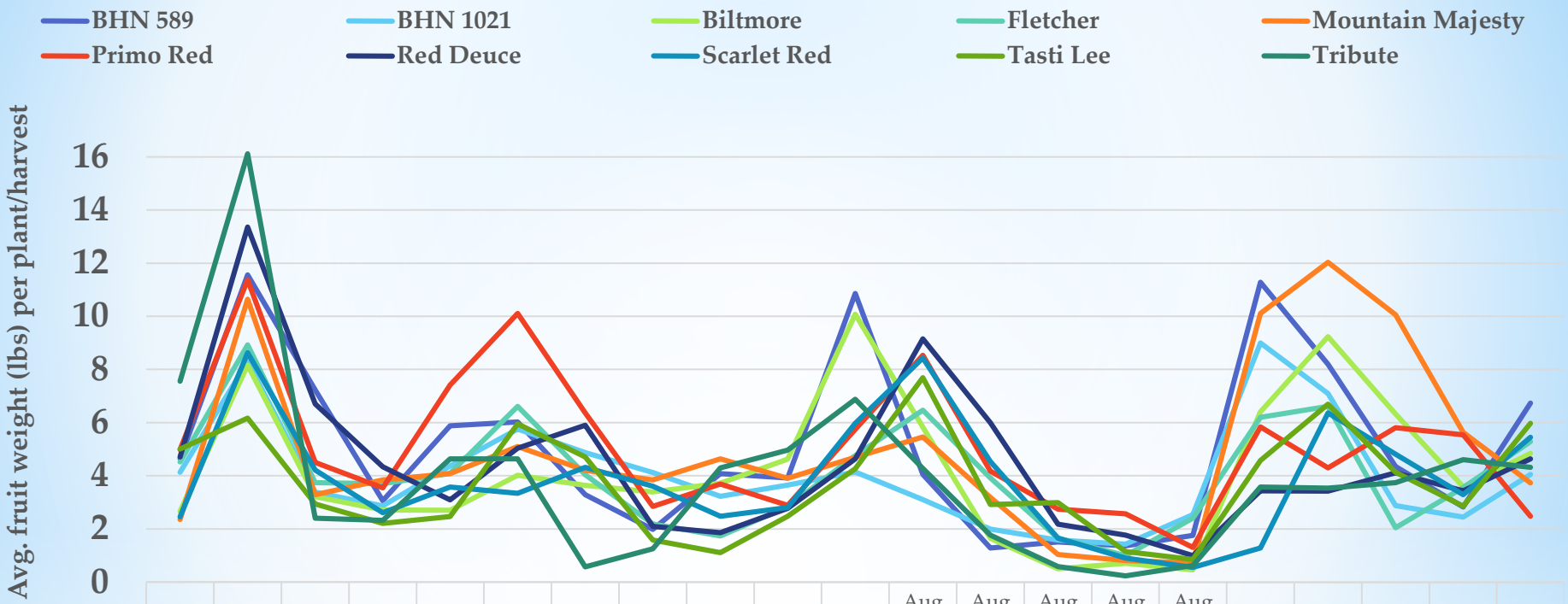

	Jun 29	Jul 6	Jul 9	Jul 13	Jul 16	Jul 20	Jul 23	Jul 27	Jul 30	Aug 3	Aug 6	Aug 13	Aug 17	Aug 20	Aug 25	Aug 31	Sep 8	Sep 15	Sep 23	Sep 29	Oct 7
BHN 589	4.64	11.56	7.22	3.06	5.88	6.02	3.29	1.98	4.08	3.92	10.86	4.05	1.28	1.51	1.37	1.76	11.28	8.20	4.34	2.83	6.74
BHN 1021	4.13	8.30	3.38	2.87	4.37	5.76	4.88	4.12	3.22	3.64	4.14	3.10	1.99	1.58	1.42	2.54	9.00	7.09	2.87	2.45	4.05
Biltmore	2.66	8.17	3.22	2.71	2.70	4.02	3.64	3.39	3.72	4.62	10.08	5.82	1.64	0.50	0.70	0.46	6.40	9.23	6.32	3.59	4.84
Fletcher	4.52	8.92	3.74	3.70	4.09	6.61	4.04	2.19	1.74	2.83	4.76	6.47	3.91	1.65	1.00	2.40	6.20	6.61	2.04	3.55	5.29
Mountain Majesty	2.35	10.64	3.29	3.85	4.08	5.10	4.20	3.84	4.64	3.91	4.70	5.46	3.18	1.03	0.81	0.72	10.10	12.04	10.06	5.64	3.73
Primo Red	4.98	11.37	4.50	3.54	7.41	10.11	6.37	2.84	3.69	2.89	5.75	8.54	4.18	2.74	2.56	1.30	5.84	4.29	5.81	5.54	2.48
Red Deuce	4.71	13.36	6.71	4.34	3.09	5.03	5.90	2.10	1.86	2.77	4.63	9.15	5.99	2.18	1.76	0.99	3.44	3.42	4.11	3.43	4.63
Scarlet Red	2.46	8.62	4.22	2.60	3.58	3.34	4.32	3.60	2.47	2.81	5.97	8.44	4.53	1.65	0.90	0.55	1.28	6.36	4.81	3.28	5.44
Tasti Lee	5.00	6.17	2.94	2.20	2.47	5.95	4.71	1.58	1.11	2.47	4.27	7.69	2.92	2.99	1.15	0.85	4.57	6.70	4.13	2.86	5.97
Tribute	7.56	16.12	2.40	2.32	4.64	4.63	0.57	1.25	4.30	4.96	6.88	4.27	1.76	0.58	0.23	0.63	3.57	3.54	3.74	4.61	4.32

2015 KVGA High Tunnel Tomato Variety Trial

Variety	TSWV	Fusarium Wilt		Verticillium Wilt (r1)	Root-knot Nematode	TMV	Alternaria Stem Canker	Grey Leaf Spot
		Race 1	Race 2					
BHN589	R	R	R	R	R			
BHN1021	R	R	R	R	R			
Biltmore		R	R	R			R	R
Fletcher	R	R	R	R	R	R		
Mountain Fresh		R	R	R	R			
Primo Red	IR	R	R	R		R		
Red Deuce		R	R	R		R		R
Scarlet Red		R	R	R			R	R
Tasti Lee		R	R	R				
Tribute	IR	R	R				R	IR

R=Resistant , I=Intermediate Resistance

Resistance information gathered from seed companies

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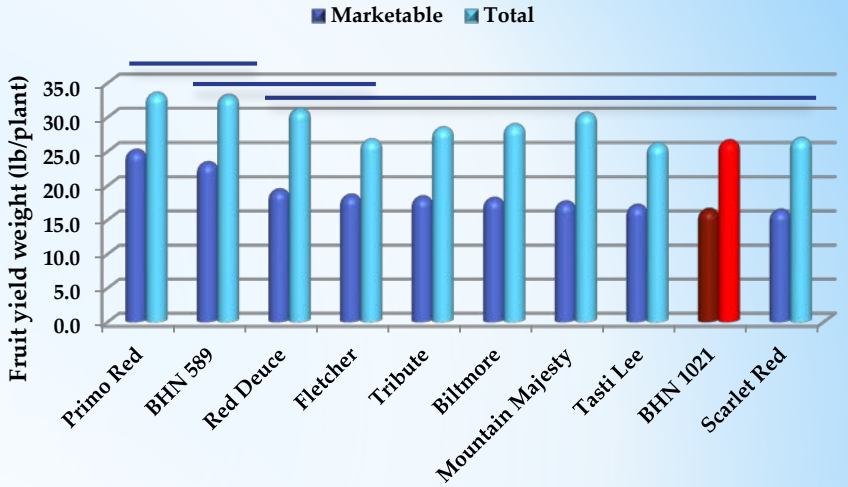
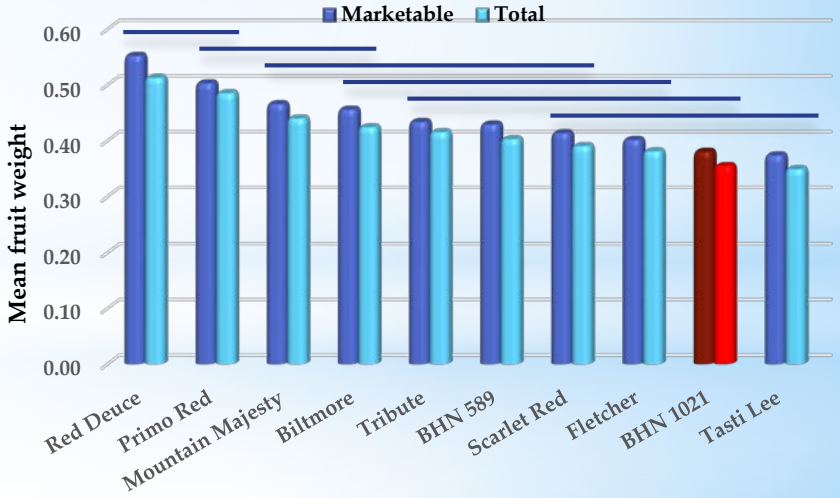
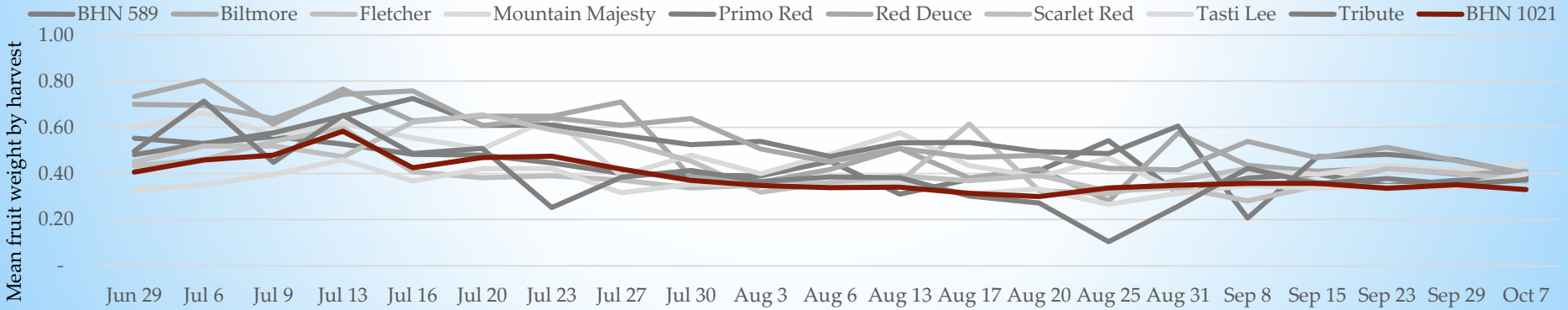
BHN 1021

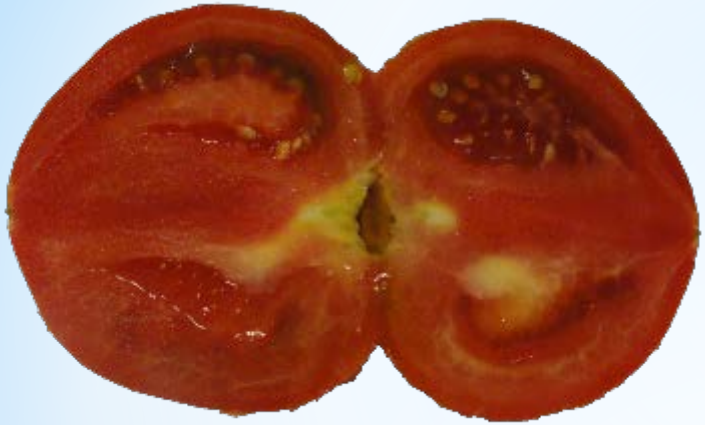
DAYS: 76
FRUIT SIZE: 10oz.
PLANT TYPE/HEIGHT: 3-4ft
VIGOR: 4 out of 5



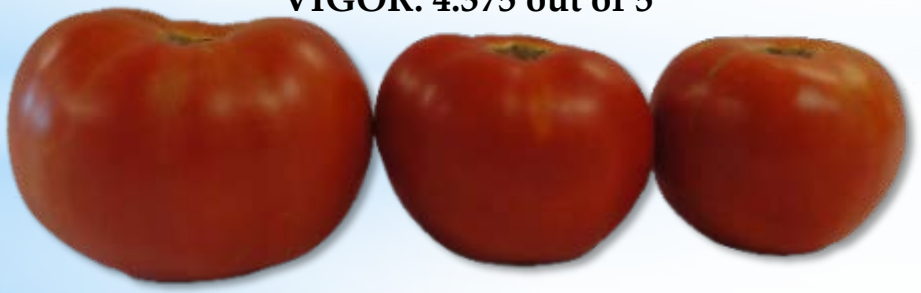


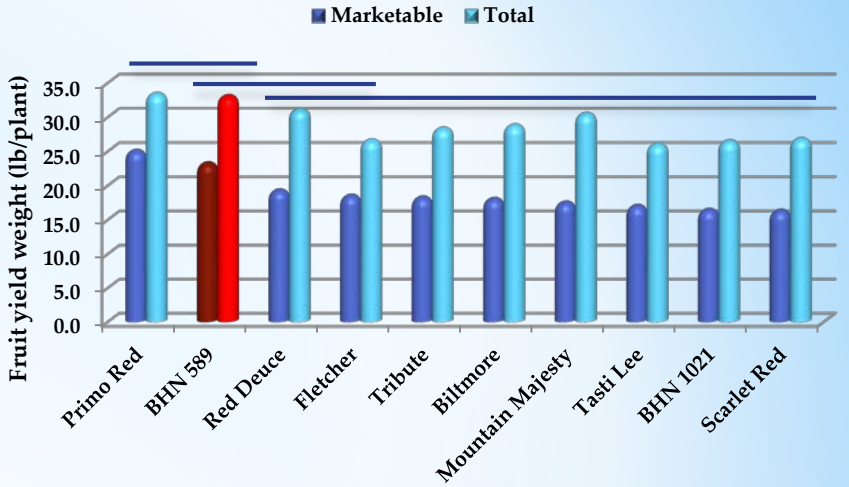


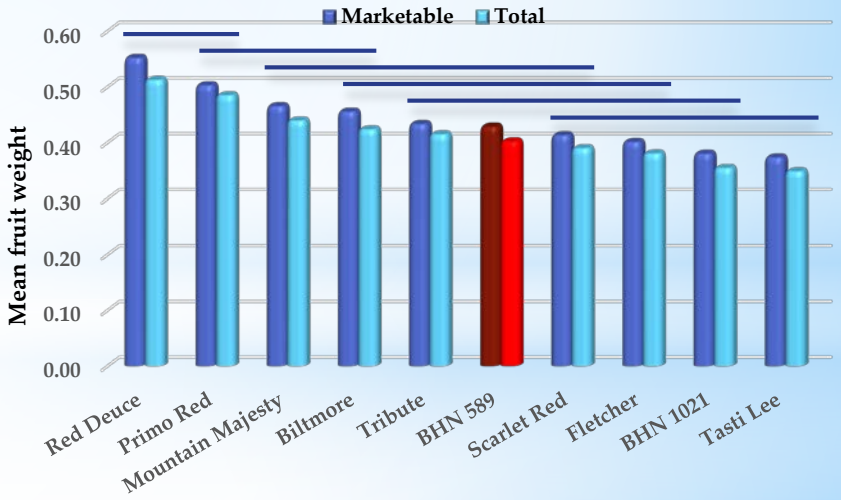
BHN 589

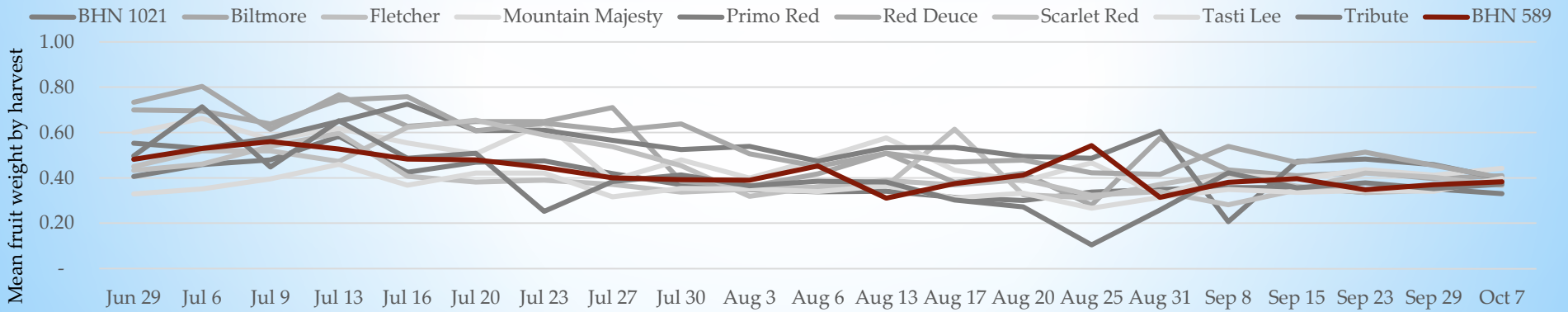


DAYS: 75
FRUIT SIZE: 7oz.
PLANT TYPE/HEIGHT: 3ft
VIGOR: 4.375 out of 5



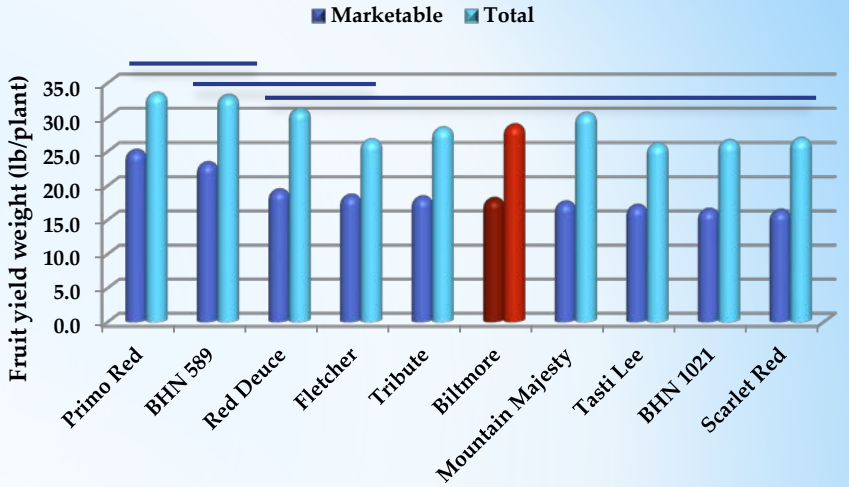


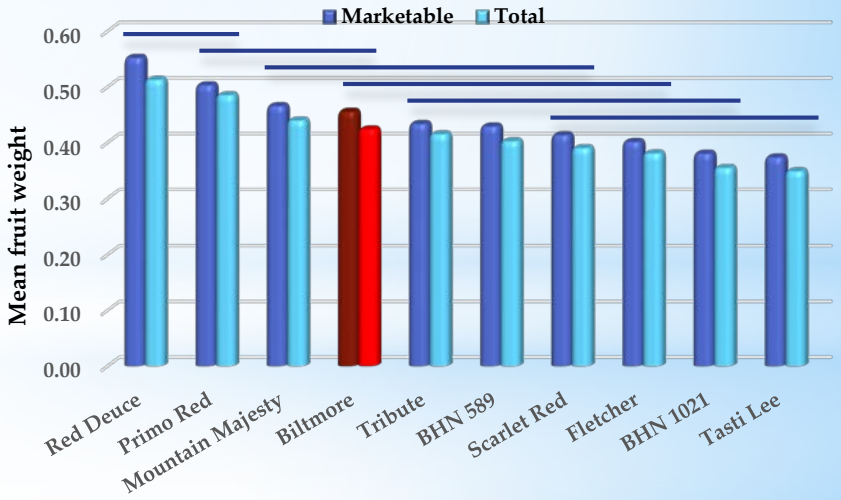


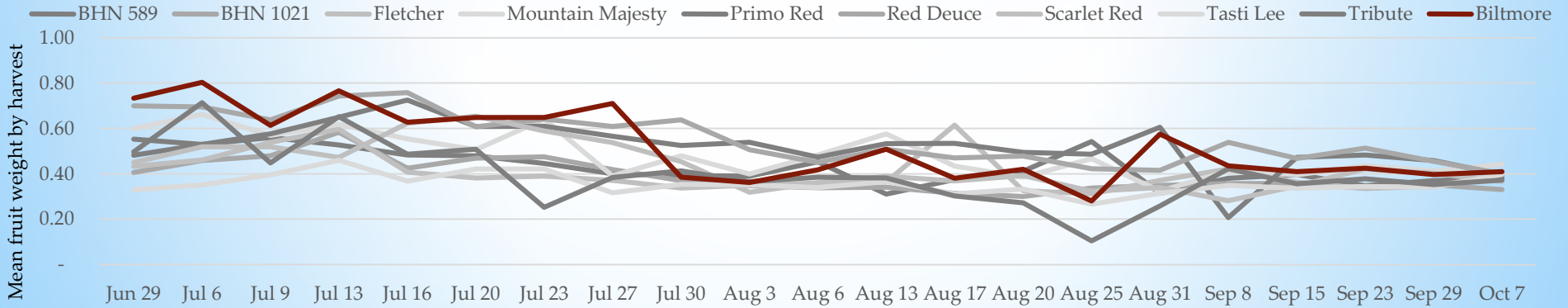


BILTMORE

DAYS: 70
FRUIT SIZE: 10oz.
PLANT TYPE/HEIGHT: 2-3ft
VIGOR: 4 out of 5

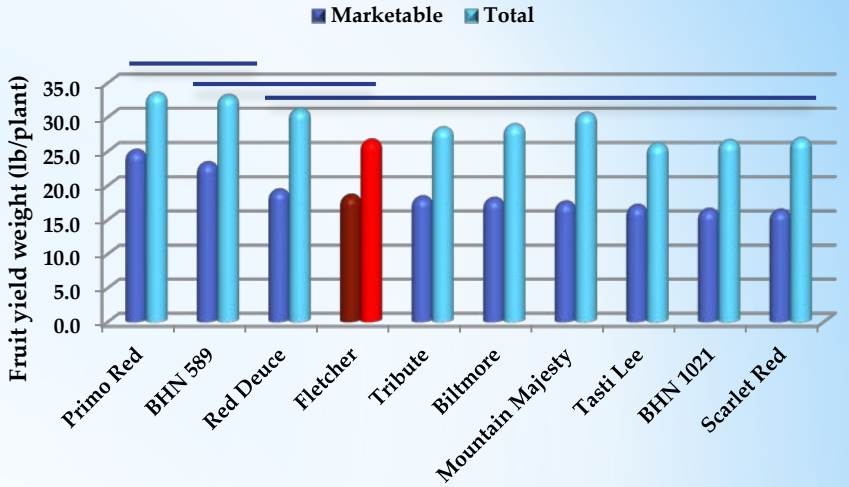


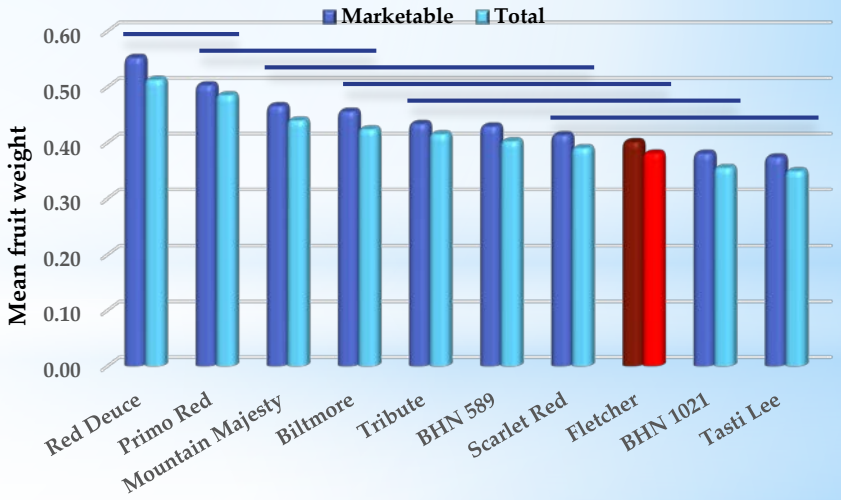


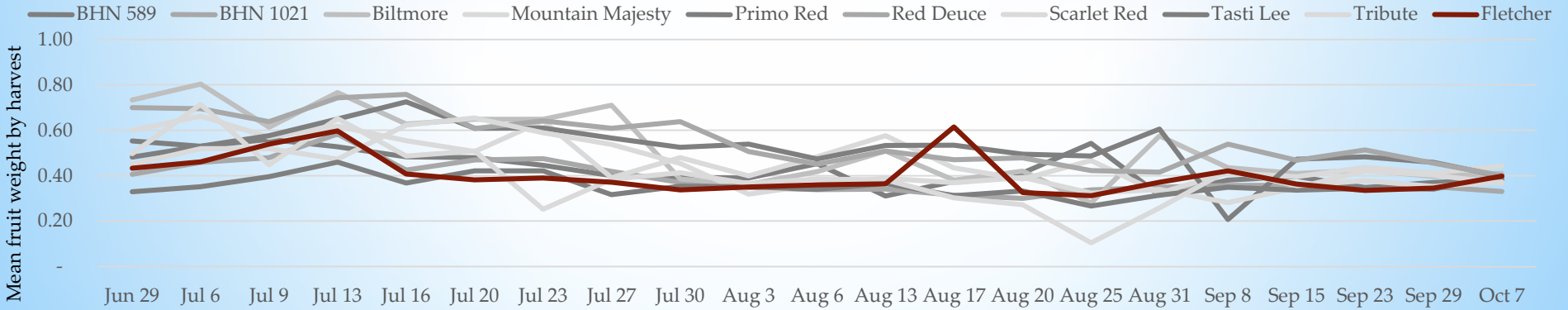


FLETCHER

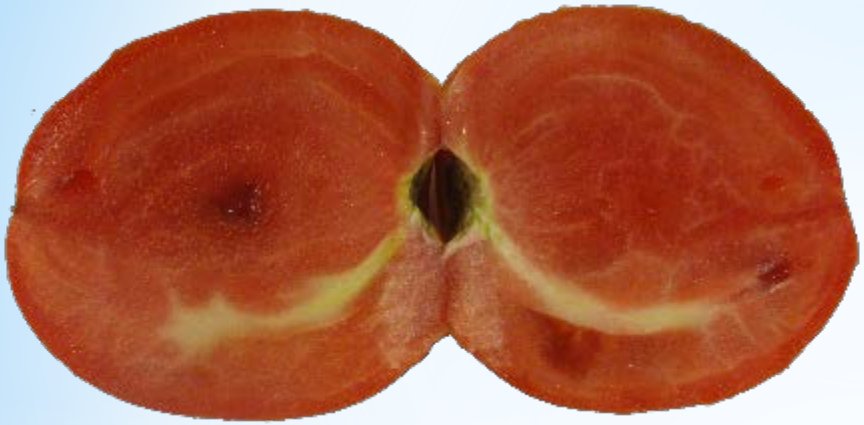
DAYS: 72
FRUIT SIZE: 10oz.
PLANT TYPE/HEIGHT: 2-3ft
VIGOR: 4.5 out of 5



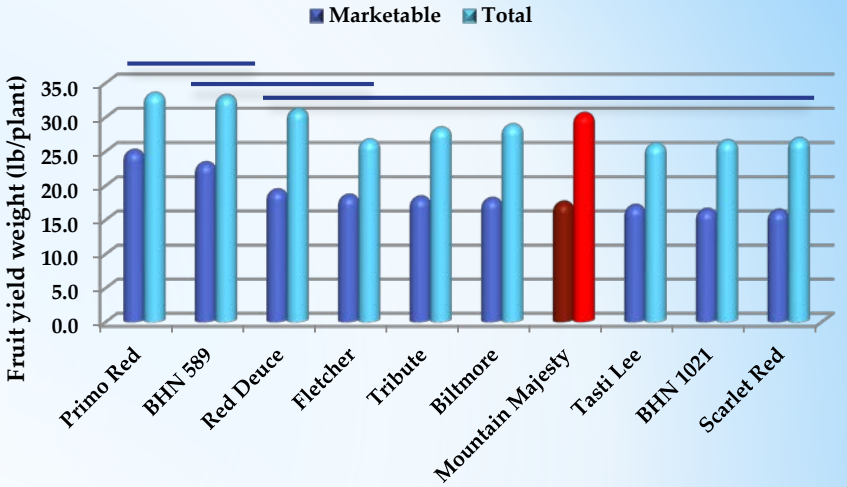


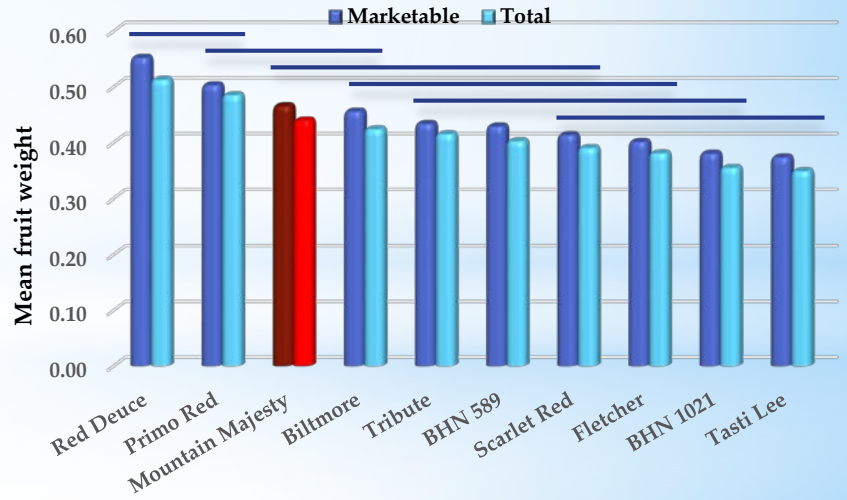


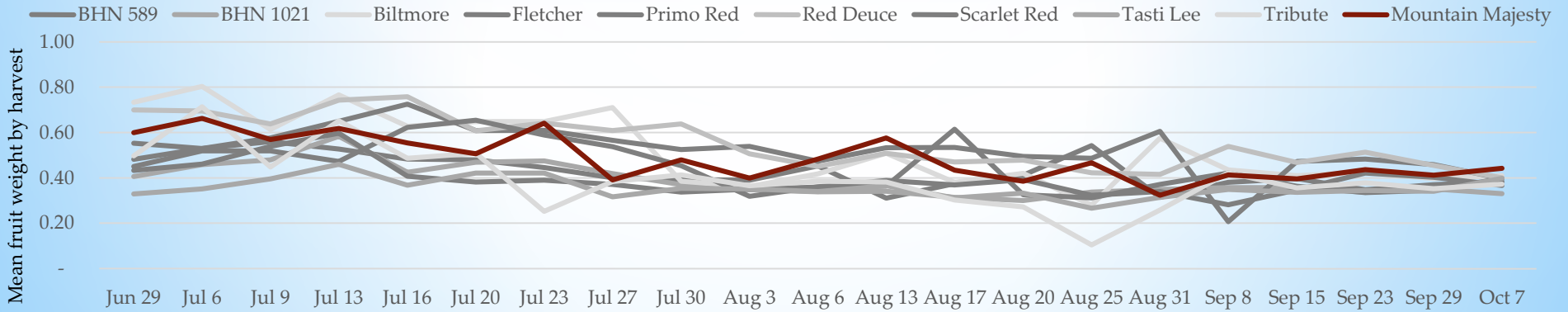
MOUNTAIN MAJESTY



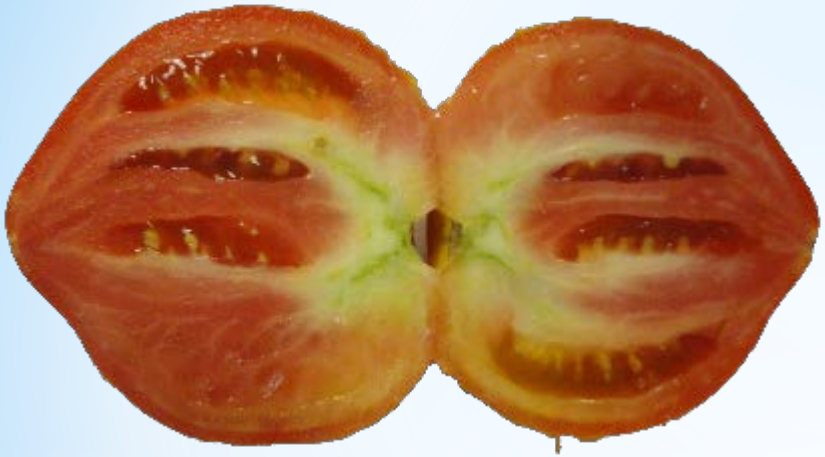
DAYS: 78
FRUIT SIZE: 10-12oz.
PLANT TYPE/HEIGHT: 4ft
VIGOR: 4.25 out of 5
Good Canopy



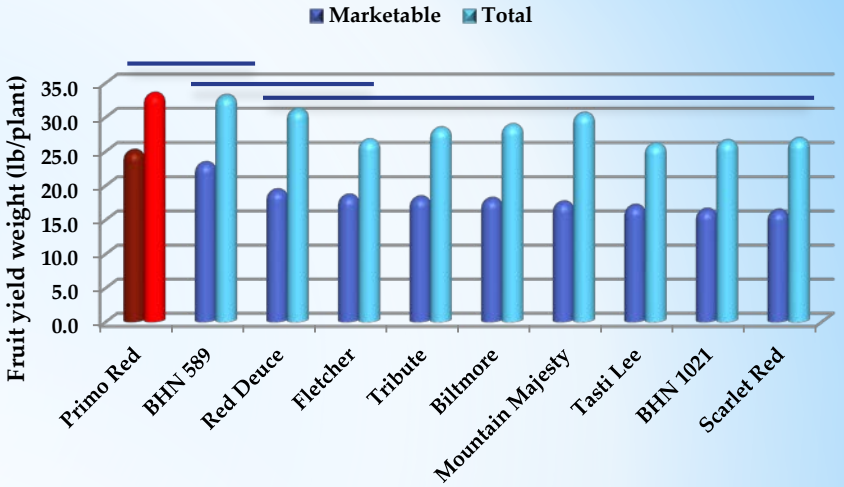


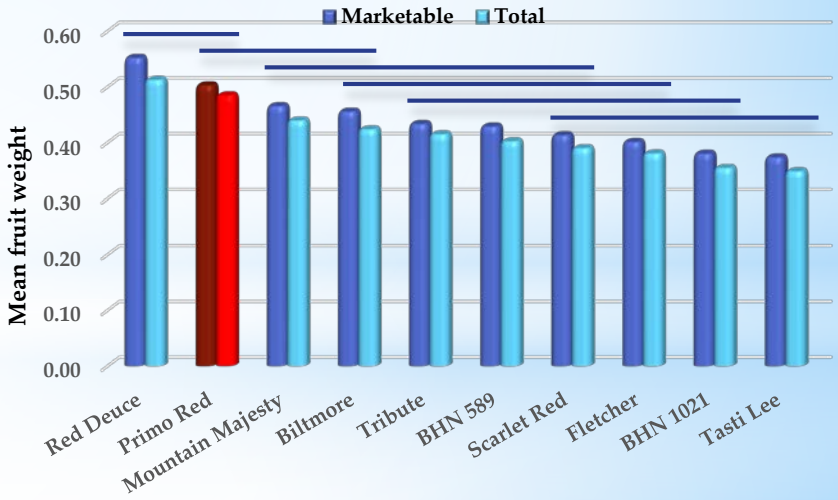


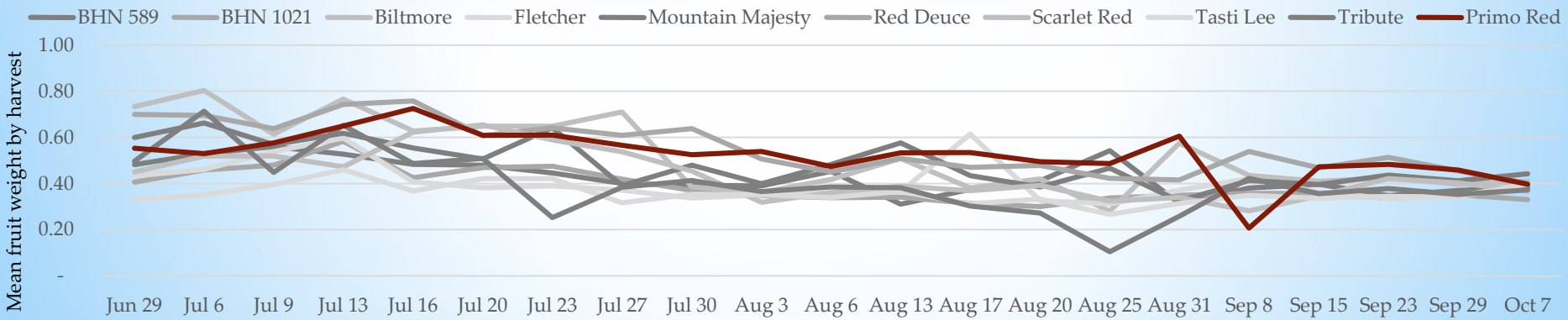
PRIMO RED



DAYS: 65
FRUIT SIZE: 8.5oz.
PLANT TYPE/HEIGHT: Compact
VIGOR: 3 out of 5

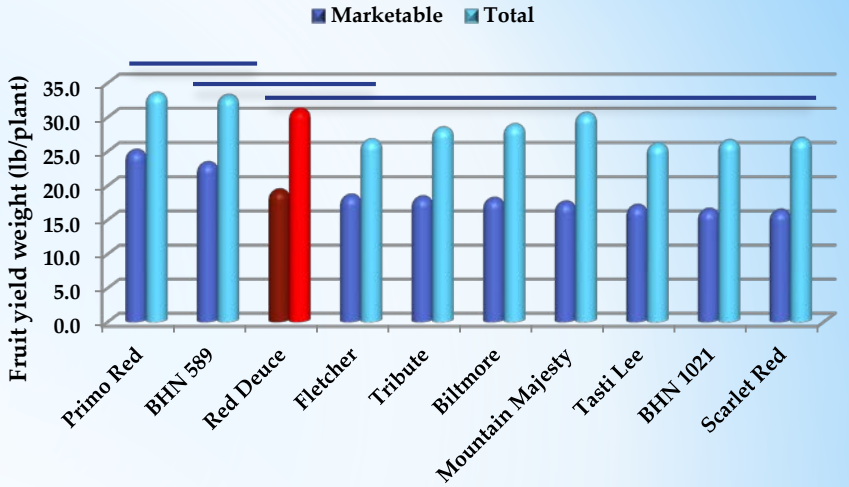


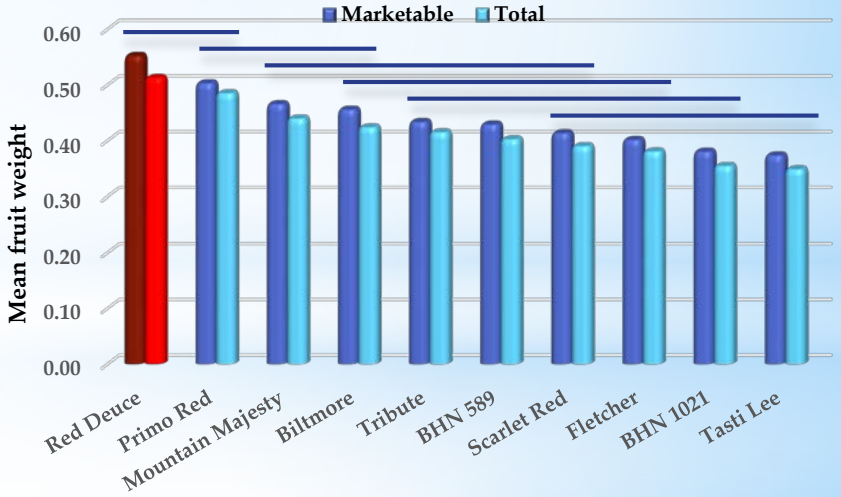


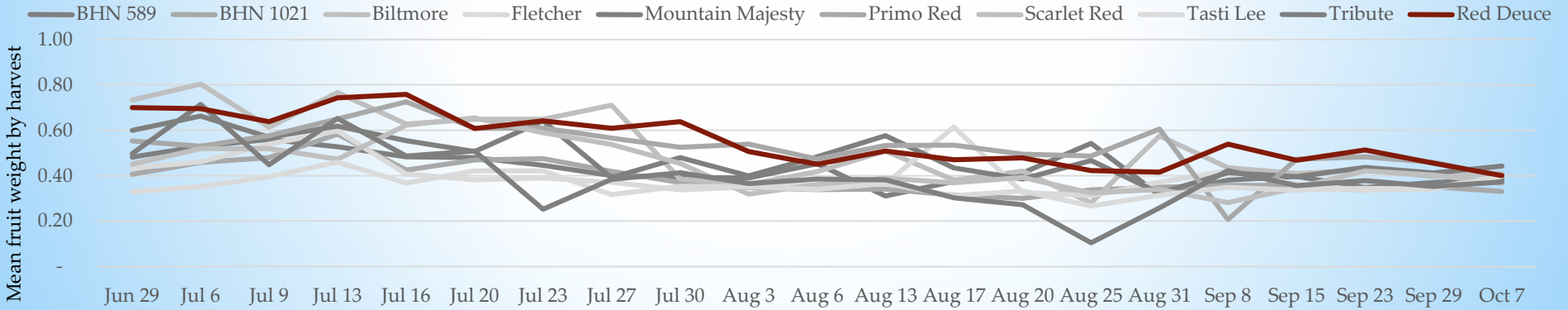


RED DEUCE

DAYS: 72
FRUIT SIZE: 10oz.
PLANT TYPE/HEIGHT: 2-3ft
VIGOR: 4.25 out of 5

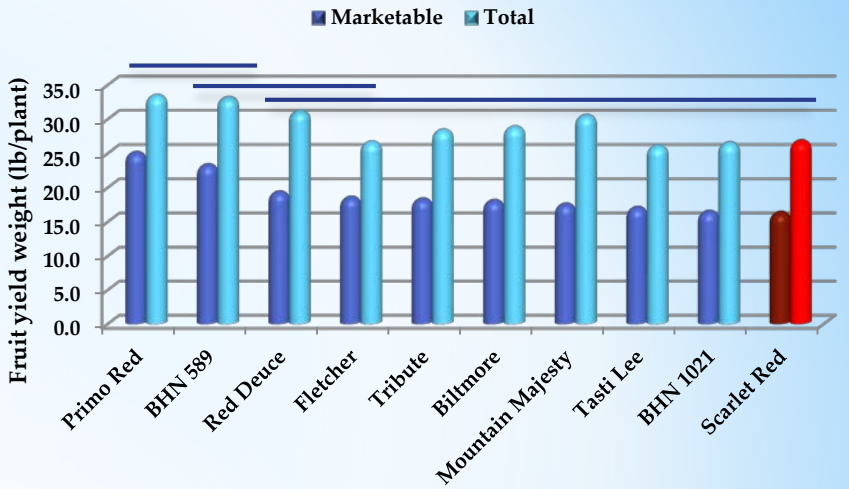


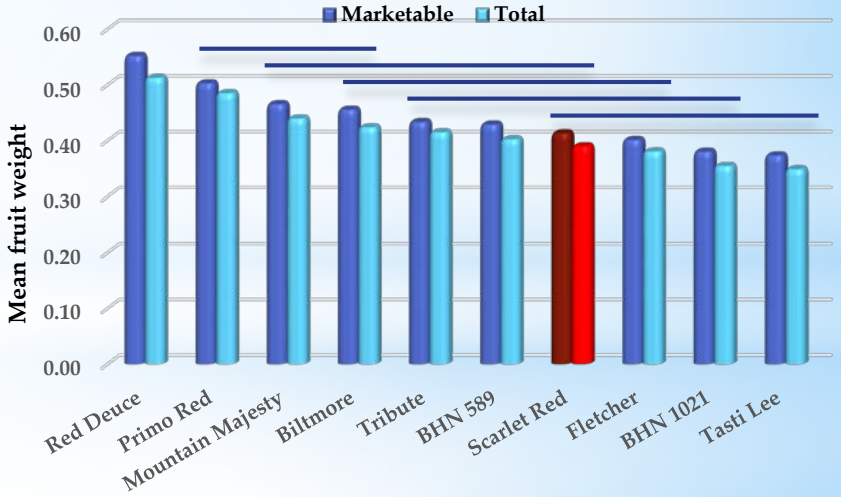


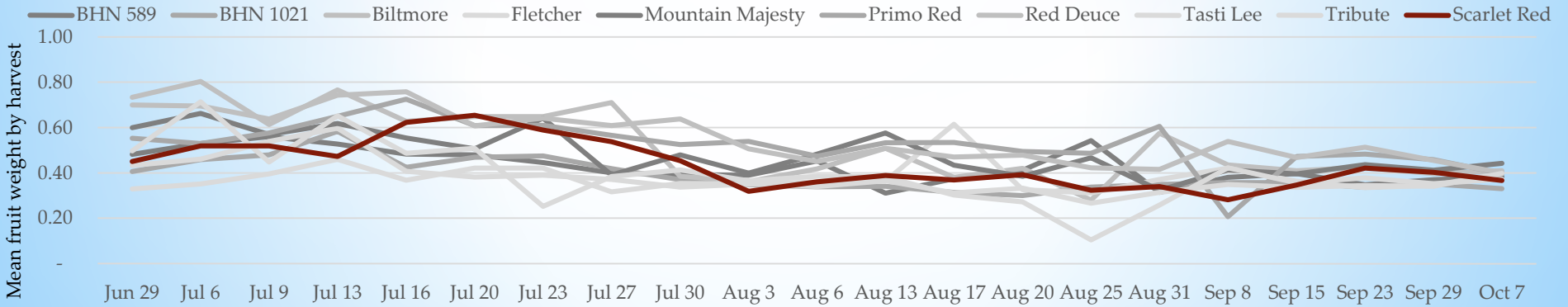


SCARLET RED

DAYS: 75
FRUIT SIZE: 12oz.
PLANT TYPE/HEIGHT: 4ft
VIGOR: 4 out of 5

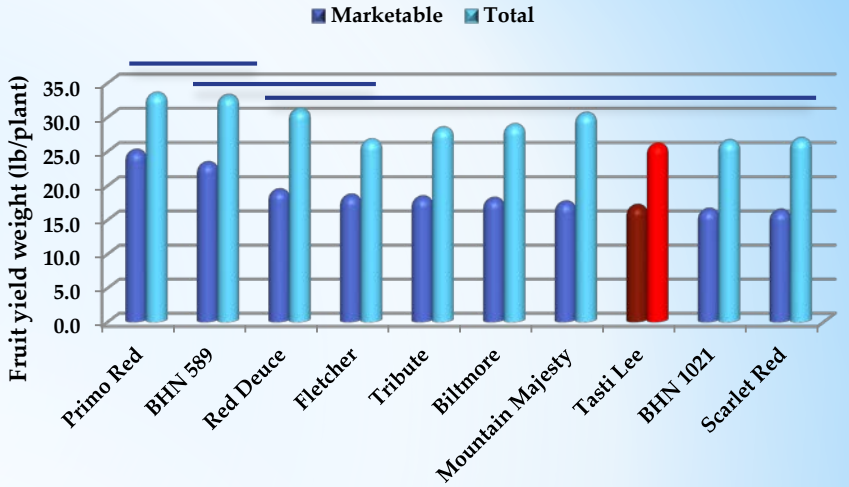


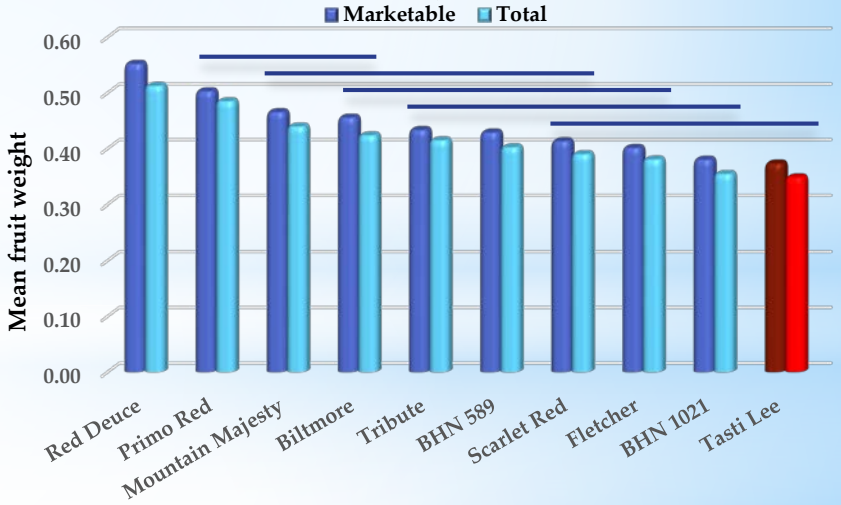


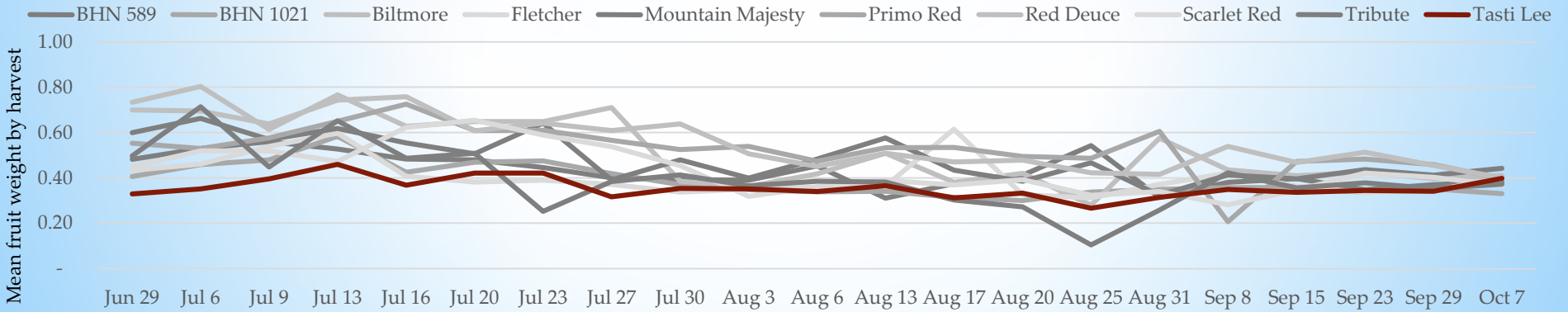


TASTI LEE

DAYS: 75
FRUIT SIZE: 6-9oz.
PLANT TYPE/HEIGHT:
Good Vigorous Plant
VIGOR: 4.75 out of 5

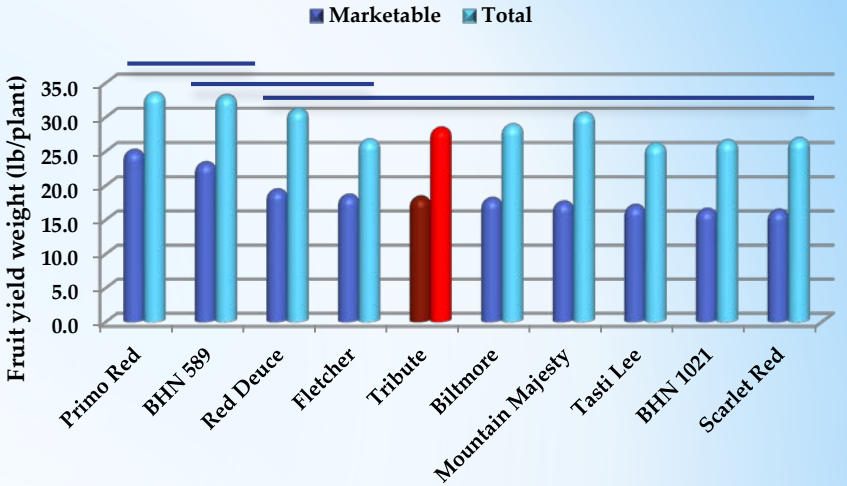


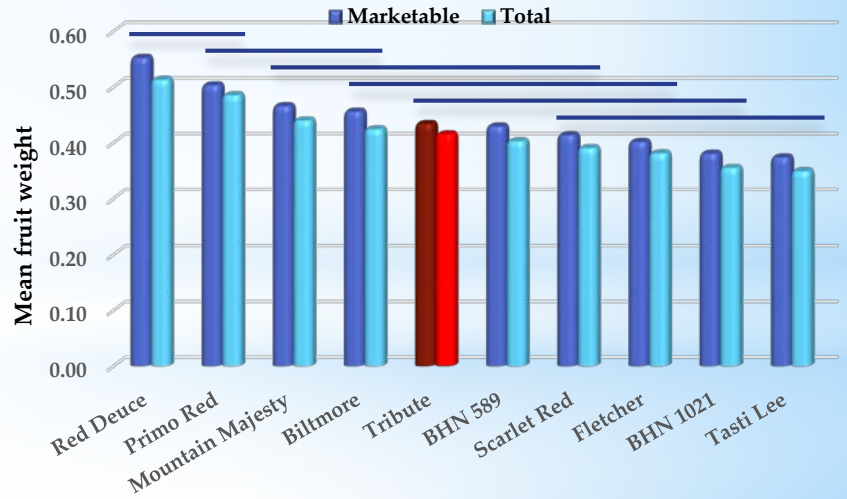


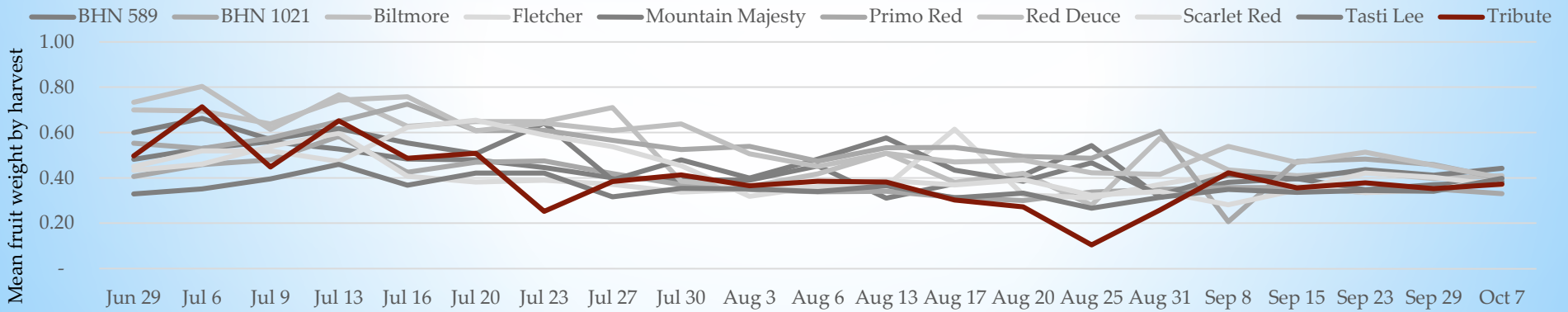


TRIBUTE

DAYS:
FRUIT SIZE:
PLANT TYPE/HEIGHT:
VIGOR:







Summary

'Red Deuce' had the highest per plant total and marketable yield, but marketable yield was statistically similar to 'Primo Red', 'Biltmore', 'Scarlet Red', and 'BHN 1021' ($P<0.05$). 'Red Deuce' had statistically similar yield to 'BHN 1021' and 'BHN 589'. A similar trial was conducted in 2013, and 'Red Deuce' had the highest marketable and total yield. 'Primo Red' was a new entry into the annual variety trials conducted at our location and also performed very well. It was second to 'Red Deuce' in marketable fruit production as well as total and marketable fruit size. Interestingly, the proportion of marketable fruit produced by 'Primo Red' was dramatically increased over the other entries and was 91.7% for marketability by weight as compared to the other varieties, which ranged from 72.6% to 84.8%. The major portion (>60%) of the fruit quality problems seen in this trial were 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.

Several varieties showed good potential for early-season production, which can be advantageous for marketing high-value fruit. In particular, 'Primo Red', 'Volante', and 'BHN 589' showed the highest yields during the early weeks of July (data not shown). 'Mountain Fresh', 'Red Deuce', and 'Biltmore' had the highest yields at peak harvest. 'Biltmore' also showed very strong production in the early part of September, which may be useful for growers looking to cater to late markets. 'BHN 589' is one of the more common semi-determinate varieties grown in high tunnels. In this trial, 'BHN 589' produced more consistently from week-to-week than any of the others. In fact, it had the highest yields early in the season but had the lowest yield at peak harvest (data not shown).

Acknowledgements

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  - The Kansas Vegetable Growers Association for support of this project.
  - Seeds were donated by Harris Moran, Seedway, and Johnny's Selected Seeds.
  - Technical support provided by Kimberly Oxley, Stephanie Gruetze, Kelly Gude, David Loewen, Tracy Oelschlaeger and Cameron Smith
  - We also thank the Olathe Horticulture Research and Extension Center for assistance with this project.

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

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