High Cordon Machine Pruned Trellis Comparison to Three Standard Systems in Lodi

65th Lodi Grape Day
7 February 2017

Paul Verdegaal
UC Farm Advisor
San Joaquin County

Balanced Vines

Purposes of Pruning

A. J. Winkler 1962

Establish and maintain vine form

Distribute bearing wood by capacity

Control crop load

Concerns of Pruning $

Reality 2017

Lower Costs - Less Labor & Laws

High Production – High Quality

Disease Prevention

Viticultural Practices

Pruning $

Irrigation

Nutrients

Crop Load / Canopy Management

Crop Load / Canopy Management

Cluster Thin

Shoot Thin

Leaf Removal

Tipping

Trimming

Harvesting $

Considerations of Mechanization for Sustainability

- Disease
- Labor
  - Availability
  - Experience
- Regulations
  - Wage Laws
  - Benefits
  - Safety Laws
- Market Competition
- Grape Prices

Trunk Canker Diseases in Vineyards

- Eutypa Dieback *Eutypa lata (& others?)*
- Bot Canker *Botryosphaerai spp*.
- Esca/ Black Measles/Vine Decline/Petri Disease/ Black Goo (many names, complex of fungi)
  - *Phaeoacromonium spp., Phaeomoniella spp, Togninia spp., etc.*
- Phomopsis Dieback *Phomopsis viticola*

HDC

Cane Pruned

Standard Bilateral Cordon ‘T’

HCMP

Standard Bilateral Cordon ‘T’

HCMP

HDC

Cane Pruned

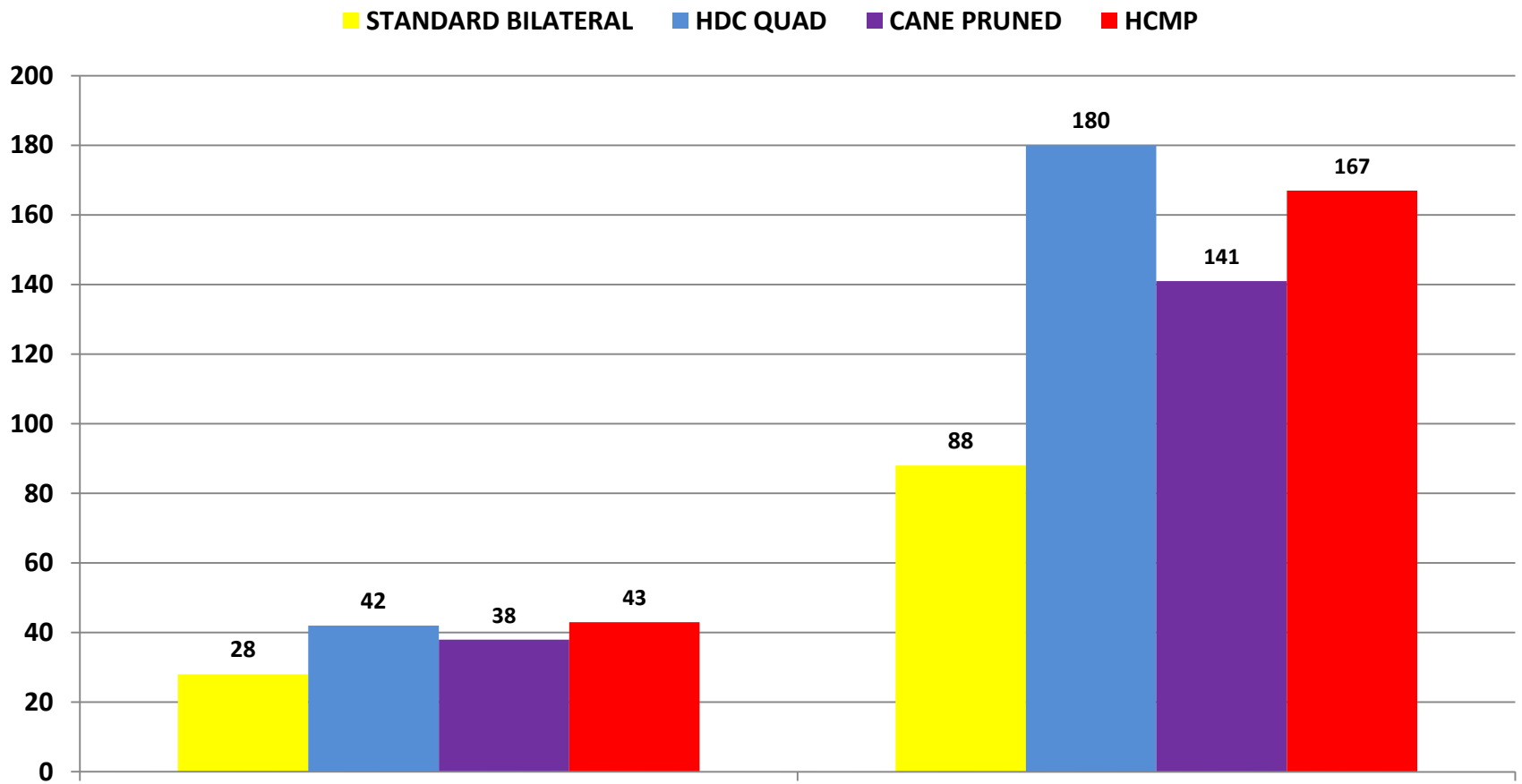
HCMP System Design Factors

- Studded T posts 133
- 10 GA wire
- Spaciong 7-8 ft x 10-11 ft
- Cordon Height 60 inches (minimum) to 72 inches
- Years 1-3 Vines shoot thinned & Cluster thinned (possibly)
- Year 1-4 Hand pruned
- Year 5+ Machine Hedged; **8 to 10** inch “box”
  - Hand touch up 3 to 5 cents per vine
- 50 to 100 HP tractor


CASE


farmmachinerysales

PRUNING AND TRELLIS SYSTEM COMPARISON TRIAL
KAUTZ VINEYARDS
2016



LSD P=.05

LB FRUIT/VINE 13.88

CLUSTERS/VINE 83.95

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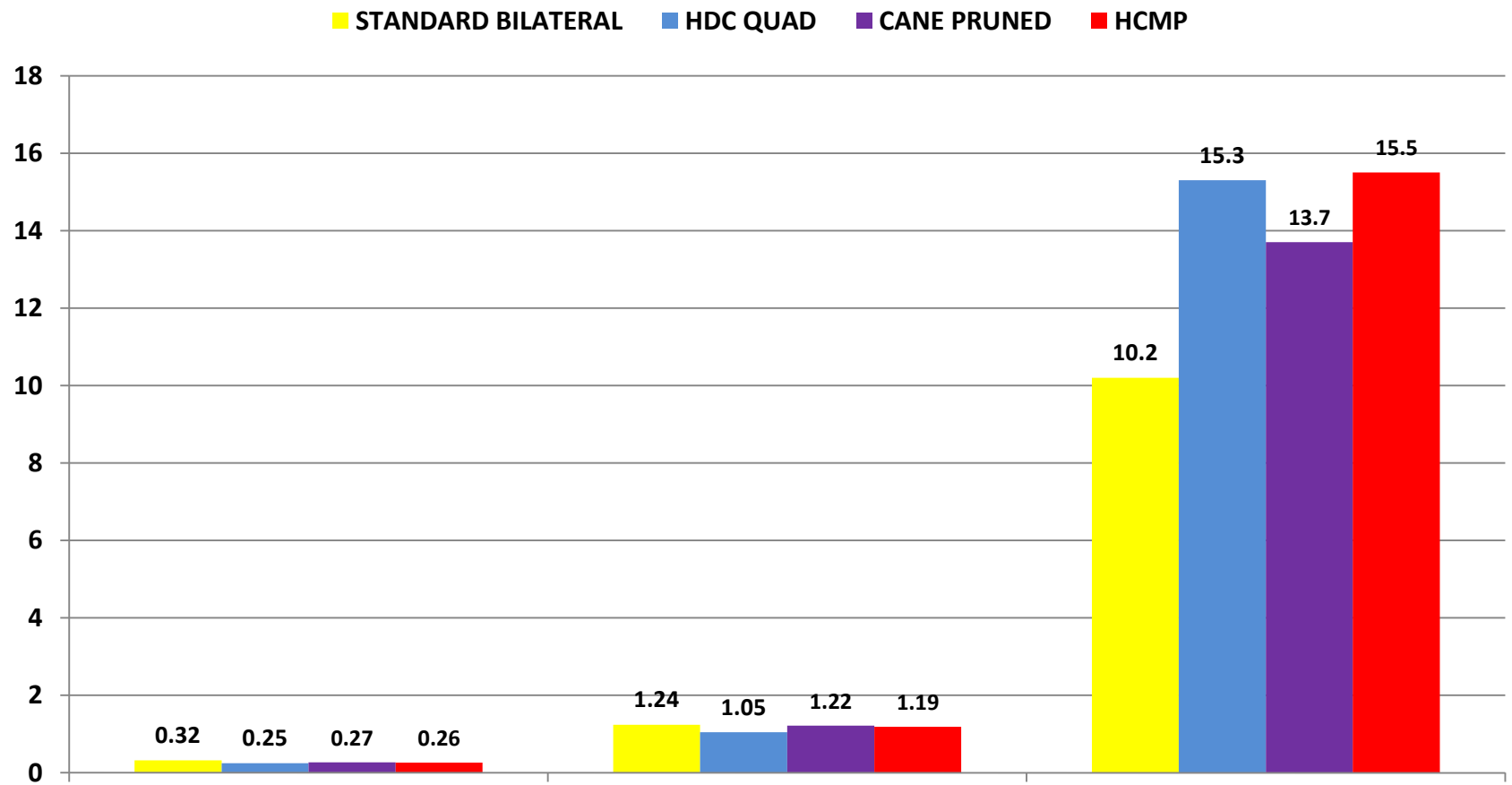
PRUNING AND TRELLIS SYSTEM COMPARISON TRIAL
KAUTZ VINEYARDS
2016



	CLUSTER Wt. LBS	BERRY Wt. GMS	TPA
LSD P=.05	0.125	0.11	5.02

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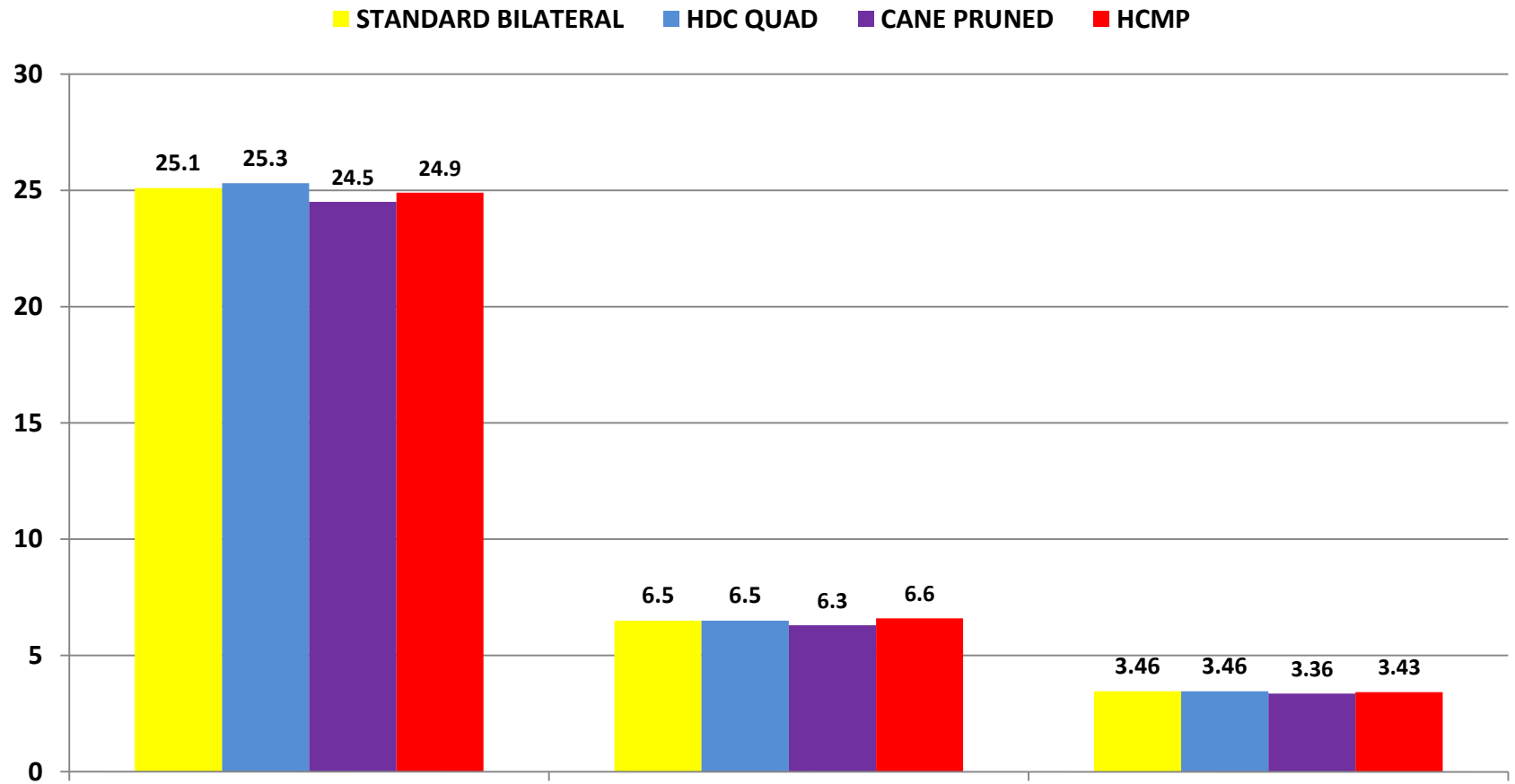
PRUNING AND TRELLIS SYSTEM COMPARISON TRIAL
KAUTZ VINEYARDS
2016



LSD P=.05 1.45 0.61 0.134

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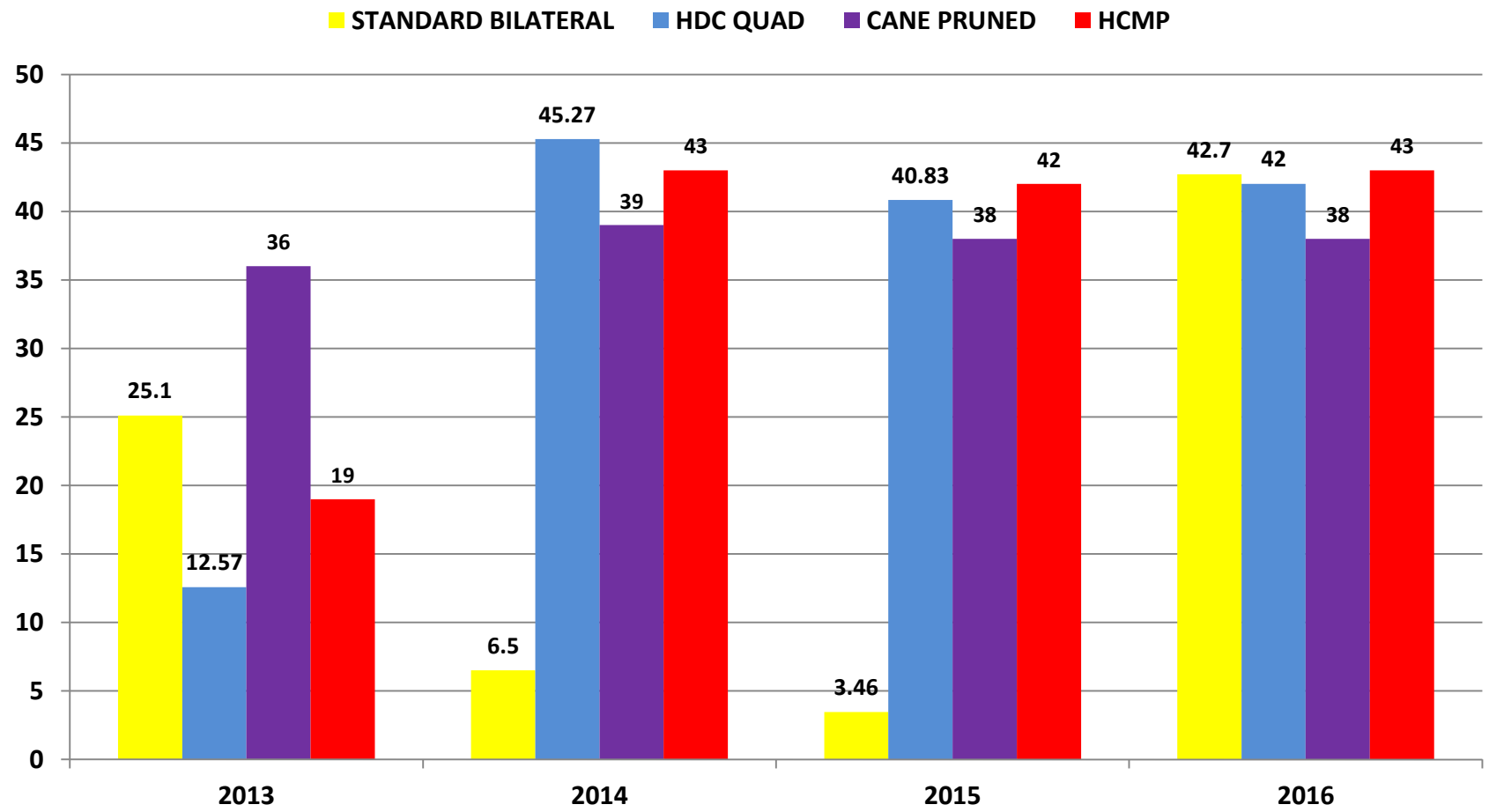
PRUNING AND TRELLIS SYSTEM COMPARISON TRIAL
KAUTZ VINEYARDS



POUNDS FRUIT/VINE

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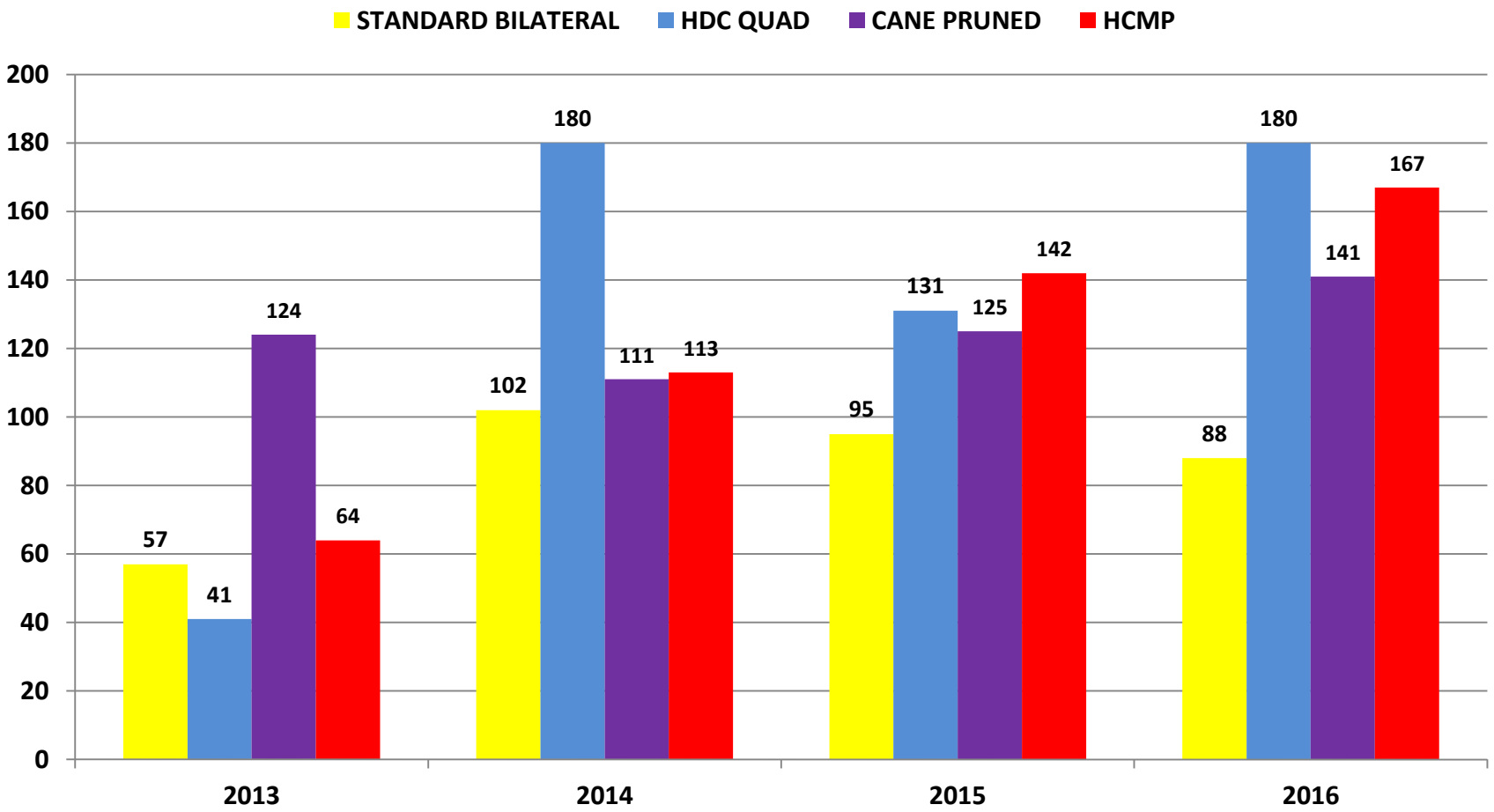
PRUNING AND TRELLIS SYSTEM COMPARISON TRIAL
KAUTZ VINEYARDS



CLUSTERS/VINE

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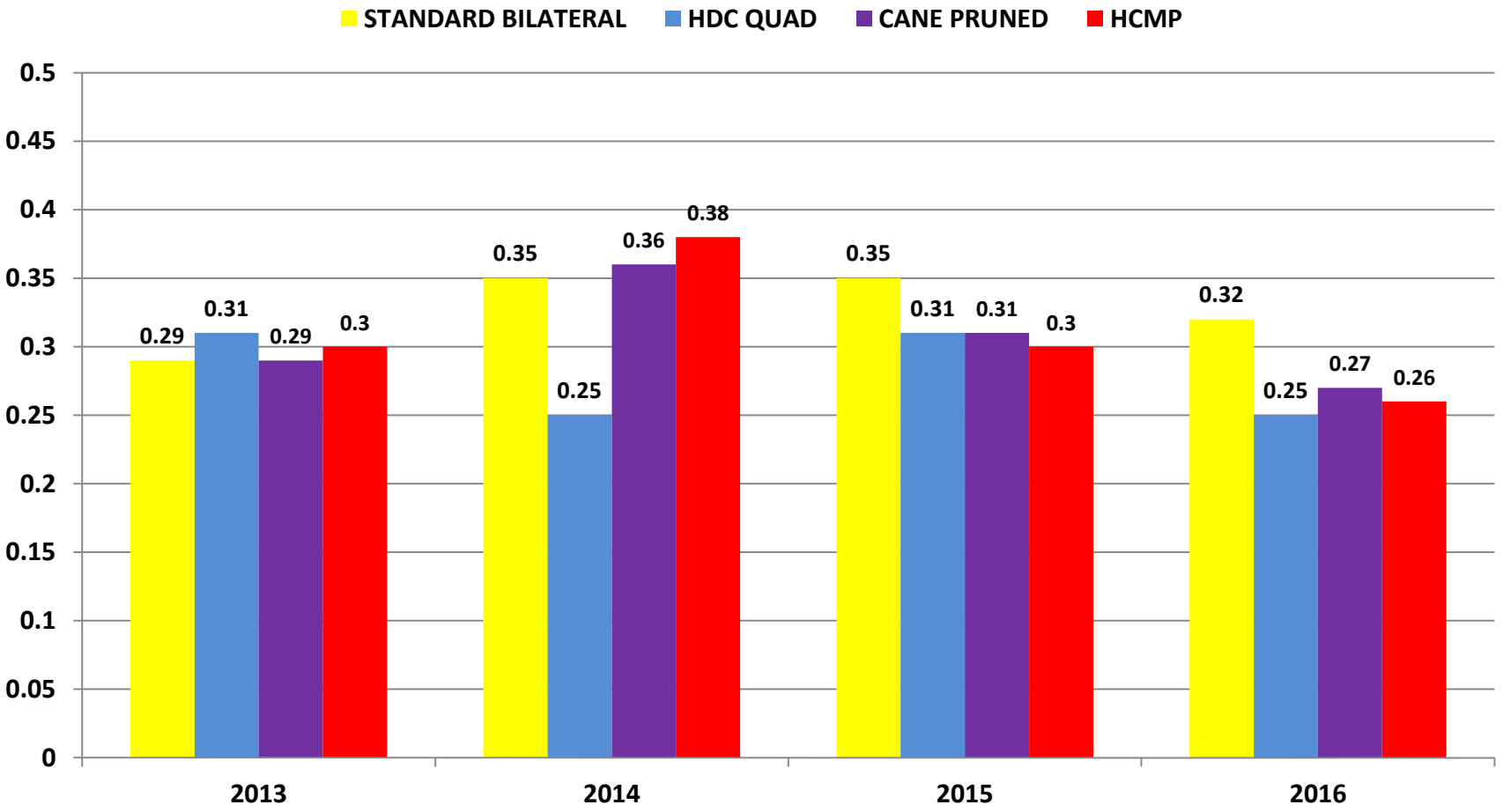
PRUNING AND TRELLIS SYSTEM COMPARISON TRIAL
KAUTZ VINEYARDS



CLUSTER WEIGHT LBS

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Kautz Vineyard Juice Analysis

	2014	Juice	Analysis	
	Brix	pH	T.A. g/L	
Bilateral Cordon	24.6	3.57 b	6.5	
HDC	24.8	3.57 b	6.4	
Cane Pruned	25.3	3.53 b	6.6	
HCMP	26.7	3.67 a	6.7	
	NS		NS	
	2015	Juice	Analysis	
	Brix	pH	T.A. g/L	
Bilateral Cordon	25.5 a	3.78 ab	5.1	
HDC	25.5 a	**3.85** a	4.9	
Cane Pruned	22.8 b	3.67 b	5.5	
HCMP	23.6 ab	3.77 ab	5.7	
			NS	
	2016	Juice	Analysis	
	Brix	pH	T.A. g/L	
Bilateral Cordon	25.1	3.46	6.5	
HDC	25.3	3.46	6.5	
Cane Pruned	24.5	3.36	6.3	
HCMP	24.9	3.43	6.6	
	NS	NS	NS	

9 October

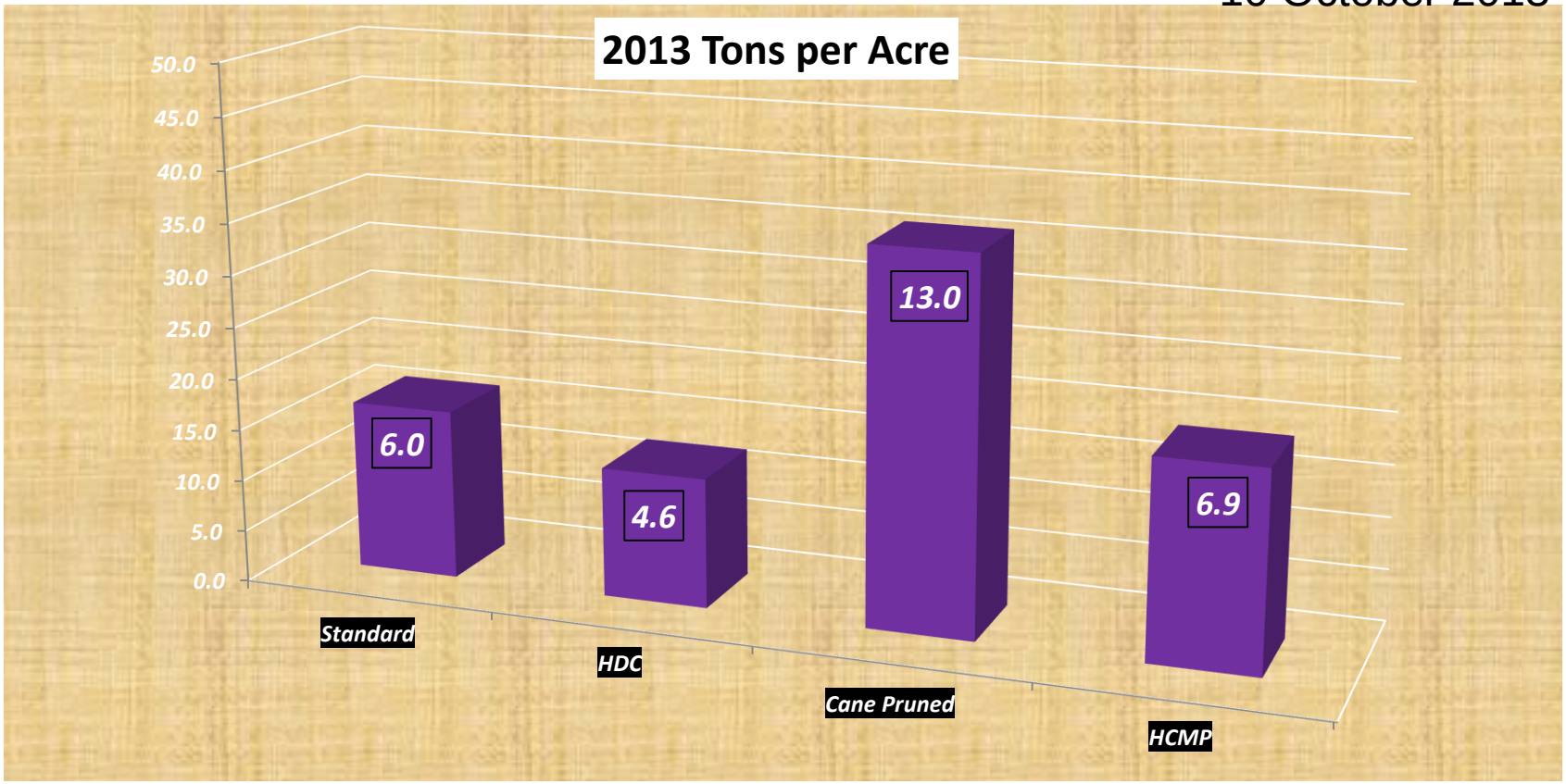
1 October

14 October

First Harvest Yields

Kautz Vineyard

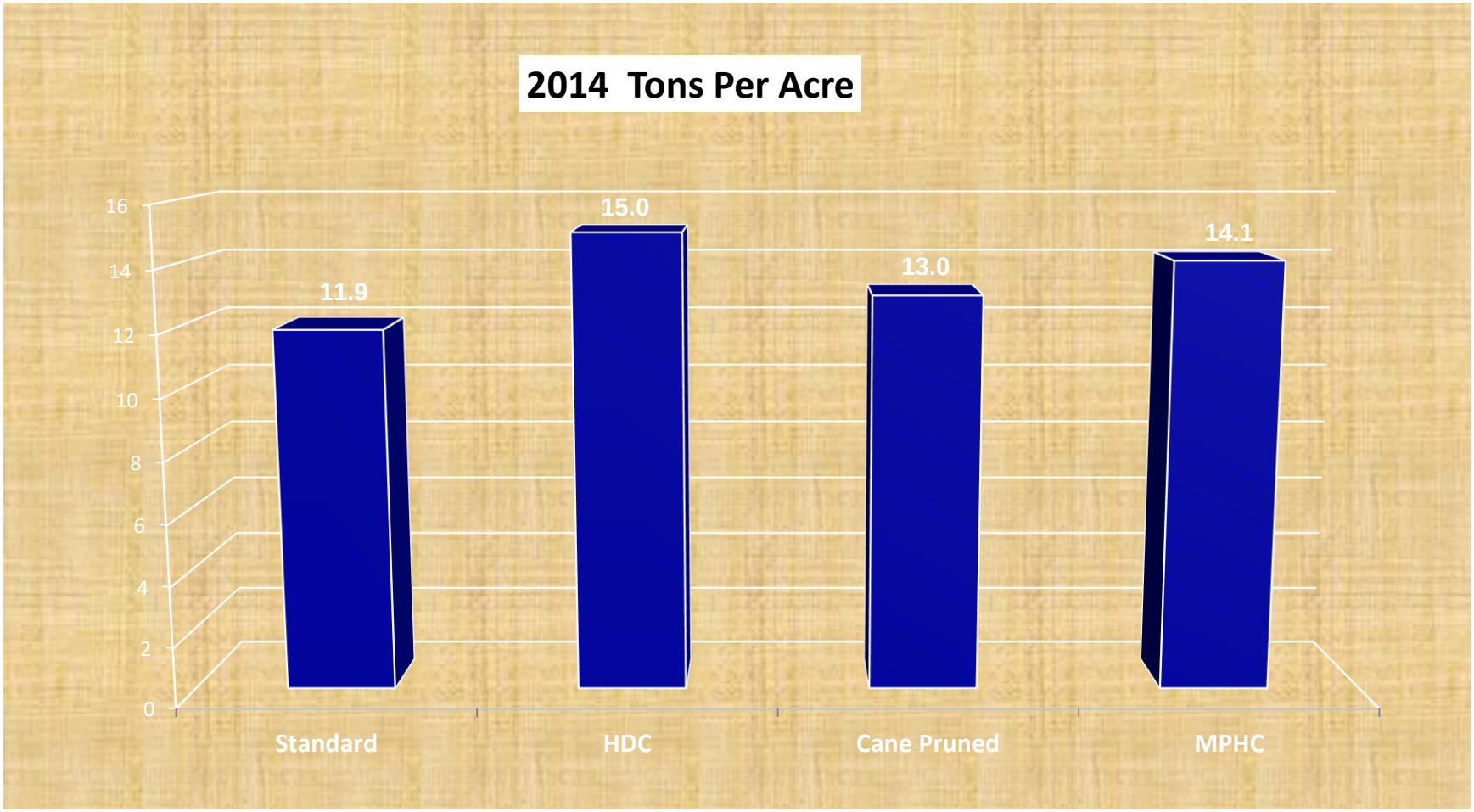
10 October 2013



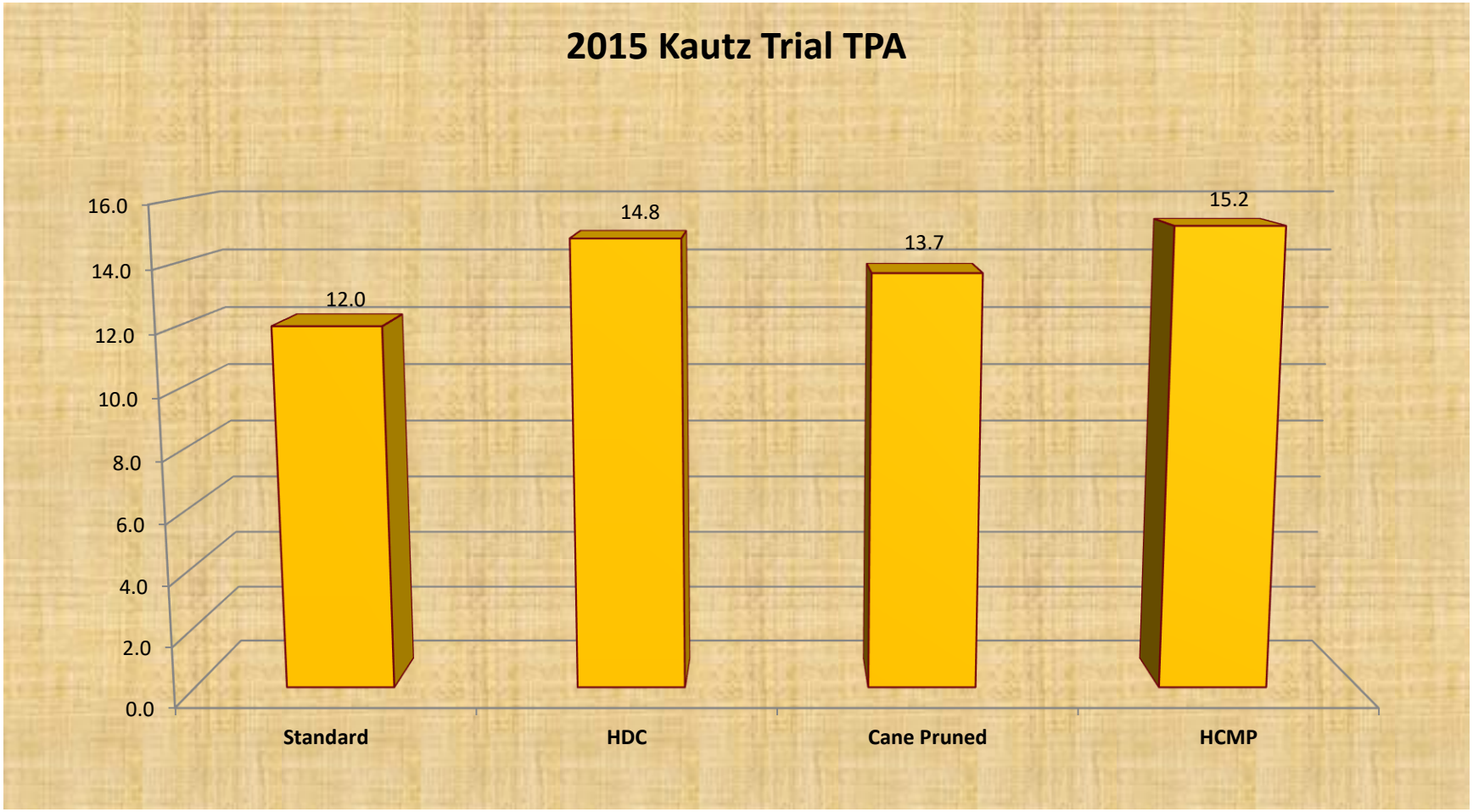
° Brix	24.0	24.3	23.1	24.9	nsd

Harvest Yield

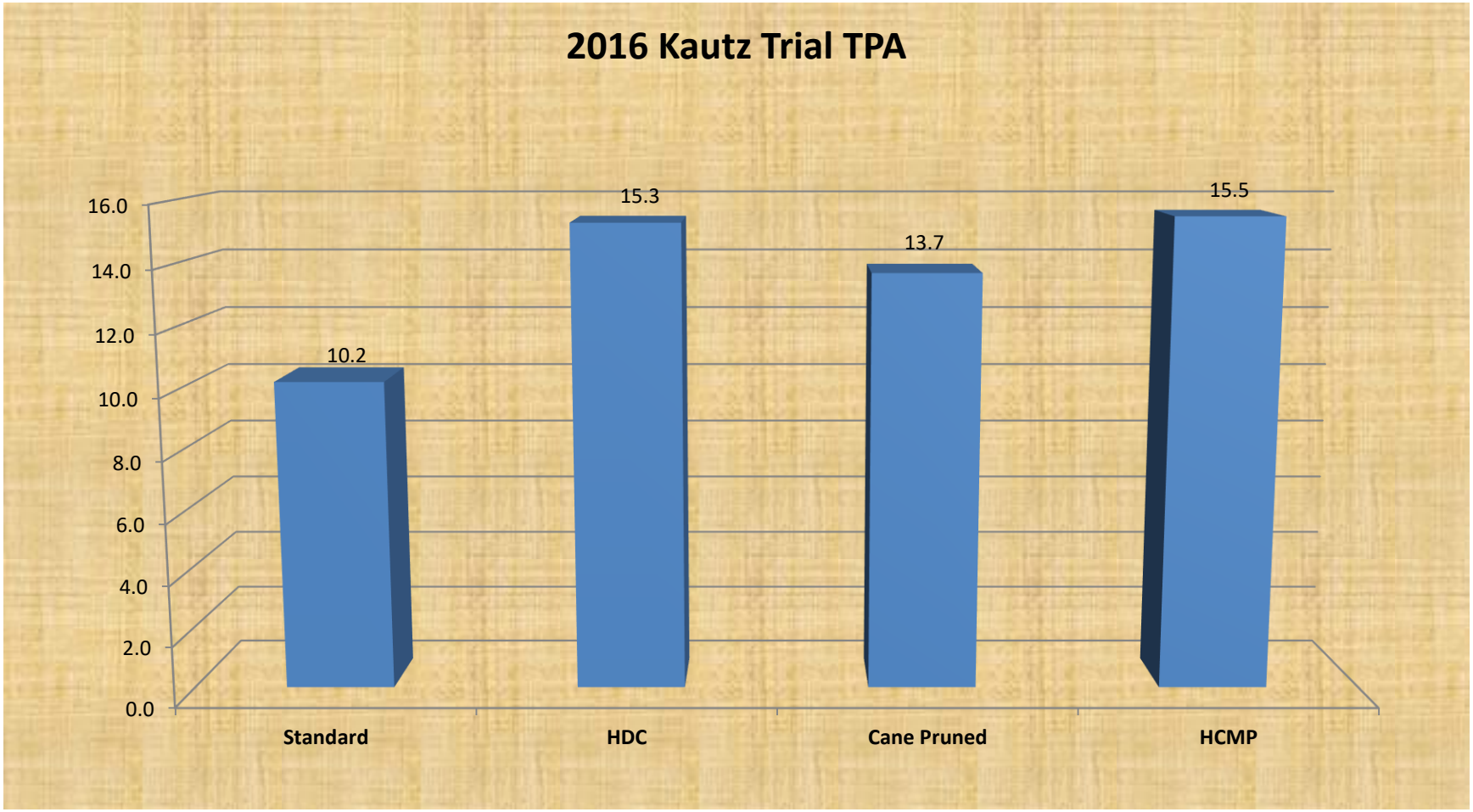
9 October 2014



Brix	24.6	24.8	25.3	26.7


2015 Kautz Trial TPA
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
12.0
14.8
13.7
15.2
Standard
HDC
Cane Pruned
HCMP

1 October


2016 Kautz Trial TPA
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
10.2
15.3
13.7
15.5
Standard
HDC
Cane Pruned
HCMP

14 October

Pruning Systems Comparison

Kautz Vineyard

Accumulated Yield & Estimated Returns
2013 to 2016

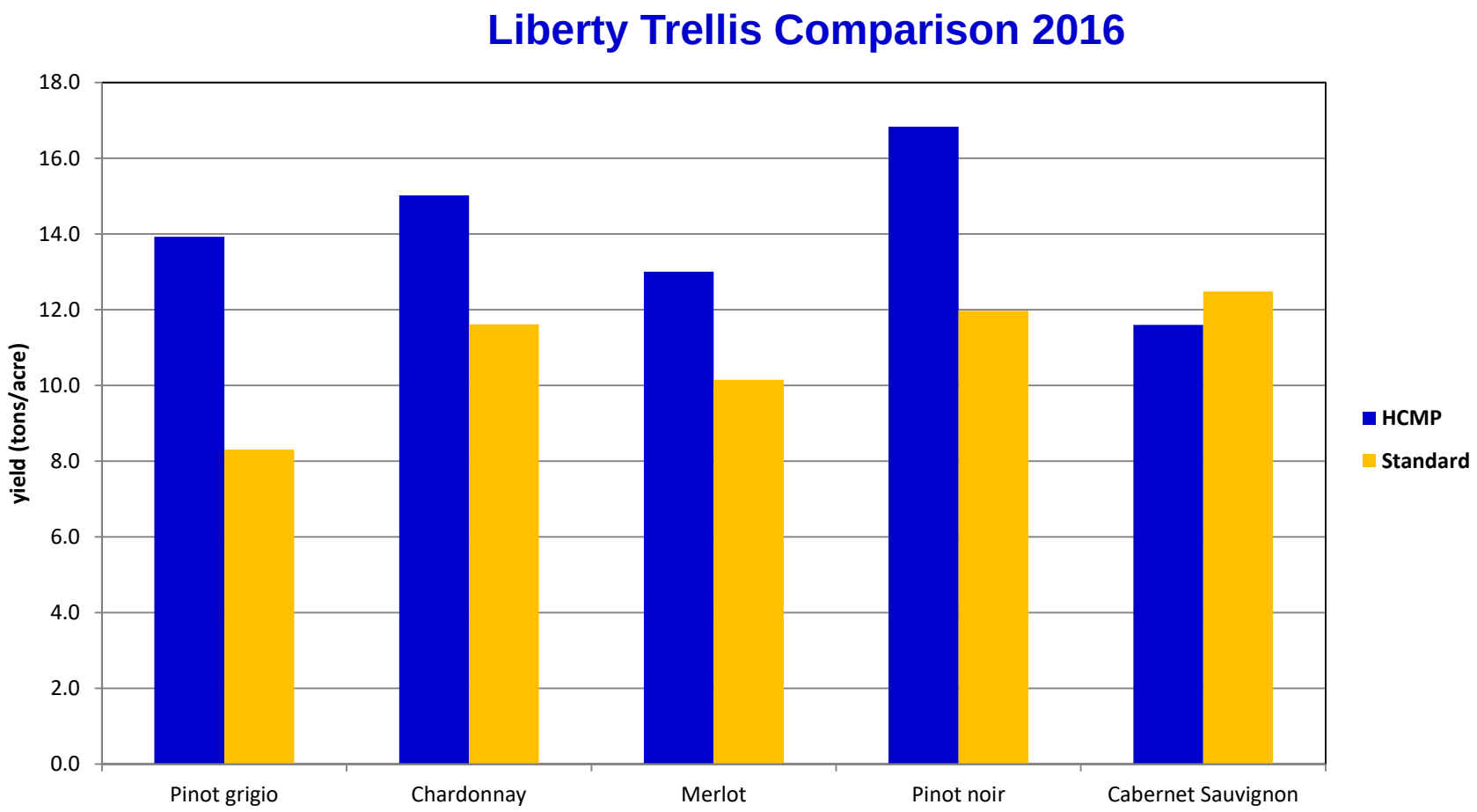
	TPA	$ Return/Acre*	Cost/Acre
Standard Bilateral Cordon	40.1	28,078	_
HDC	49.6	34,720	_
Cane Pruned	53.4	37,380	_
HCMP	51.8	36,260	_

$700/ton

Gallo Liberty Vineyard

Cordon Height 60 inches vs 42 inches

Harvest Yield TPA



Liberty Gallo

- **HCMP Harvest Differential Days**
- Pinot grigio +10 to 14 days
- Chardonnay 0
- Pinot noir -2 to 3
- Merlot +14 to 16
- Cabernet Sauvignon +7 to 10

Summary

- Vine Capacity Should Be Fully Utilized
- Balance of Production versus Growth
- Maximum Yield for Total Inputs
- Quality Wines at a Reasonable Price

- Some Varieties may not be adaptable or with caution
  - Cabernet sauvignon; Sauvignon blanc; Chardonnay; Syrah; Malbec
  - Merlot; Pinot noir; Viognier
  - Pinot grigio; Zinfandel
- More Input with Higher Yields
  - Water
  - N & K
- Scale of Operation or Custom Services required
- Capital Investment or Specialization of Services

- *Thanks to*

- **Joe Valente, Kautz Vineyards**
- **John Kautz Farms**
- **Ernie and Jeff Dosio, Pacific AgriLands, Inc.**
- **Gallo Vineyards**
- **Lodi Winegrape Commission LWC**
- **Lodi District Grape Growers Association LDGGA**

Remember Our Military

The Land of the Free because the Home of the Brave

Winkler's Principles

Pruning decreases vine capacity

Crop depresses vine capacity in following year(s)

Vine capacity varies with shoot number

Shoot vigor is inverse to shoot number and crop load

Vine fruitfulness varies (within limits) inversely with shoot vigor

Large shoot or arm can produce more than small one

and should carry more fruit buds

Vines can nourish and ripen a certain quantity of fruit;

its capacity is limited by its history and environment

1929-60

Vegetative vs Reproductive

Crop : Prunings Ratio

3 – 5 “Coastal”

5 – 7 “Balanced”

7 – 10 Cash flow

Prunings / cordon 0.3 to 1.0 kg/m

0.6 to 1.0 lb/ft

Shoots per cordon length 1 / 5cm

50 to 75 % of clusters visible*