Economics of Walnut Costs and Returns

Advances in Walnut Production Course, November 5, 2018

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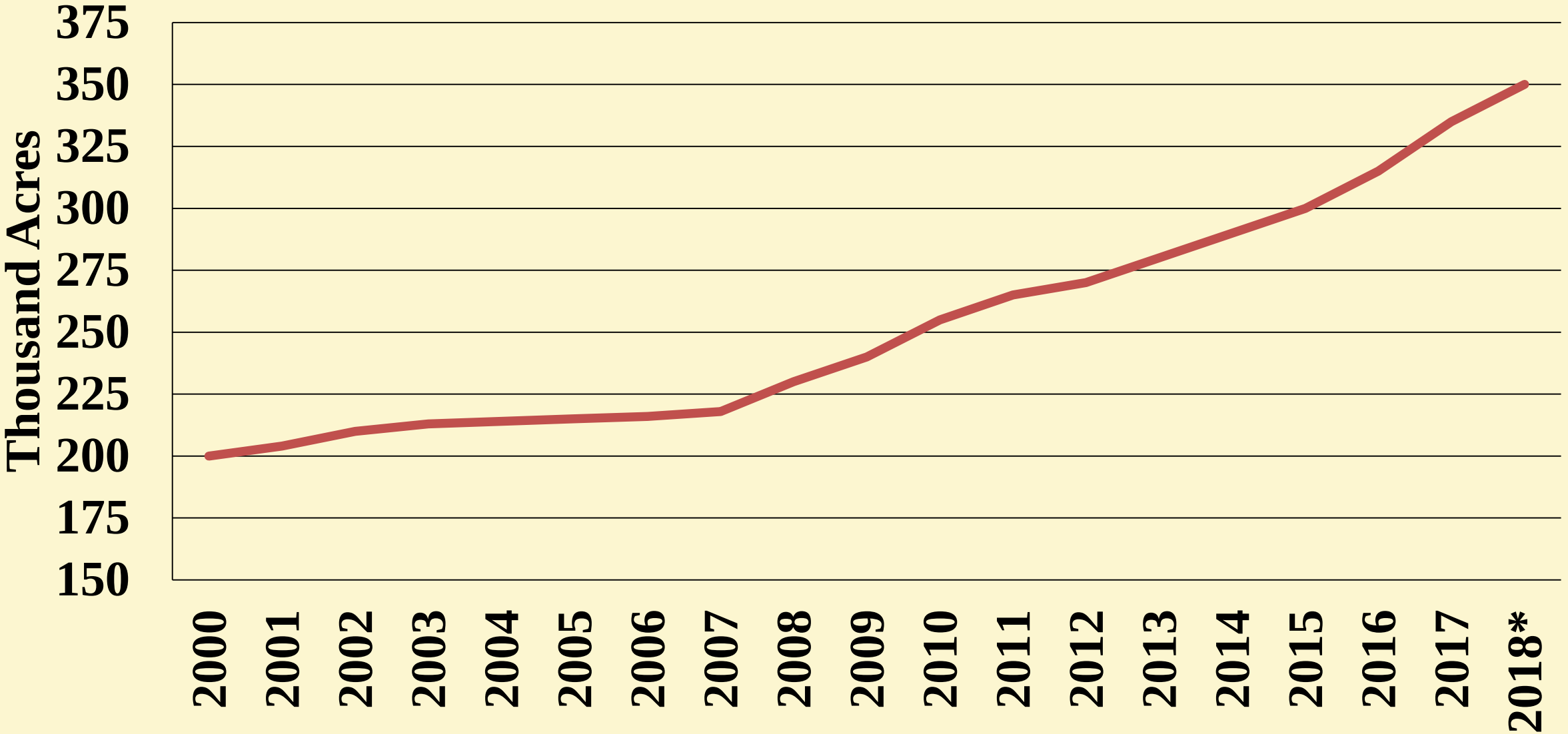
Objectives and Outline

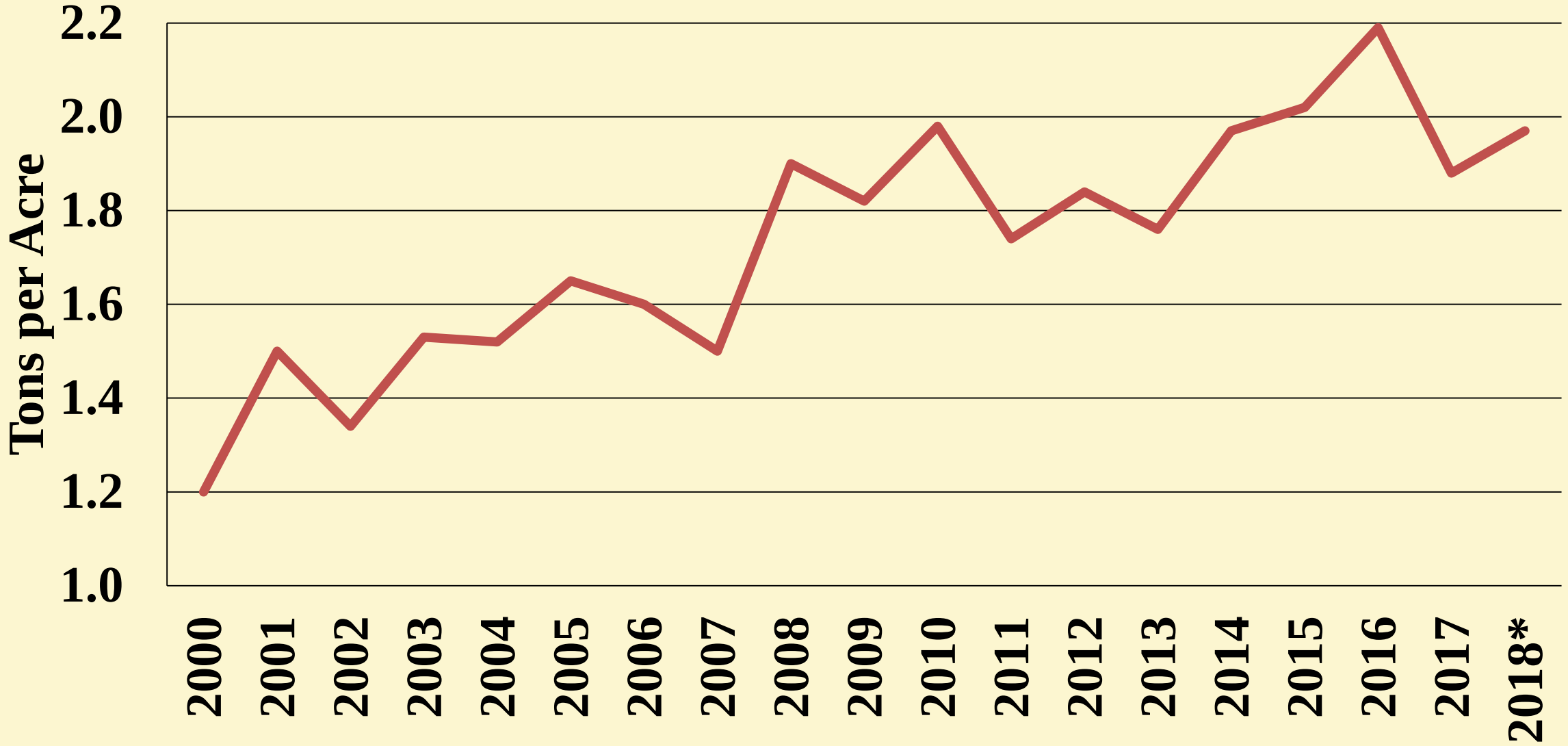
1. **Review recent walnut economic trends and drivers.**
   - **Production and prices**
   - **Economics of major supply and demand issues**
2. **Understand the current economic costs and returns at the farm using the new Sacramento Valley cost study as the representative case**
   - **Background and assumptions,**
   - **Tables on practices and costs**
   - **Revenues and ranging analysis**
3. **Where is the California walnut industry heading, given supply issues and costs and demand-side drivers including global competition**

Walnut Bearing Acreage



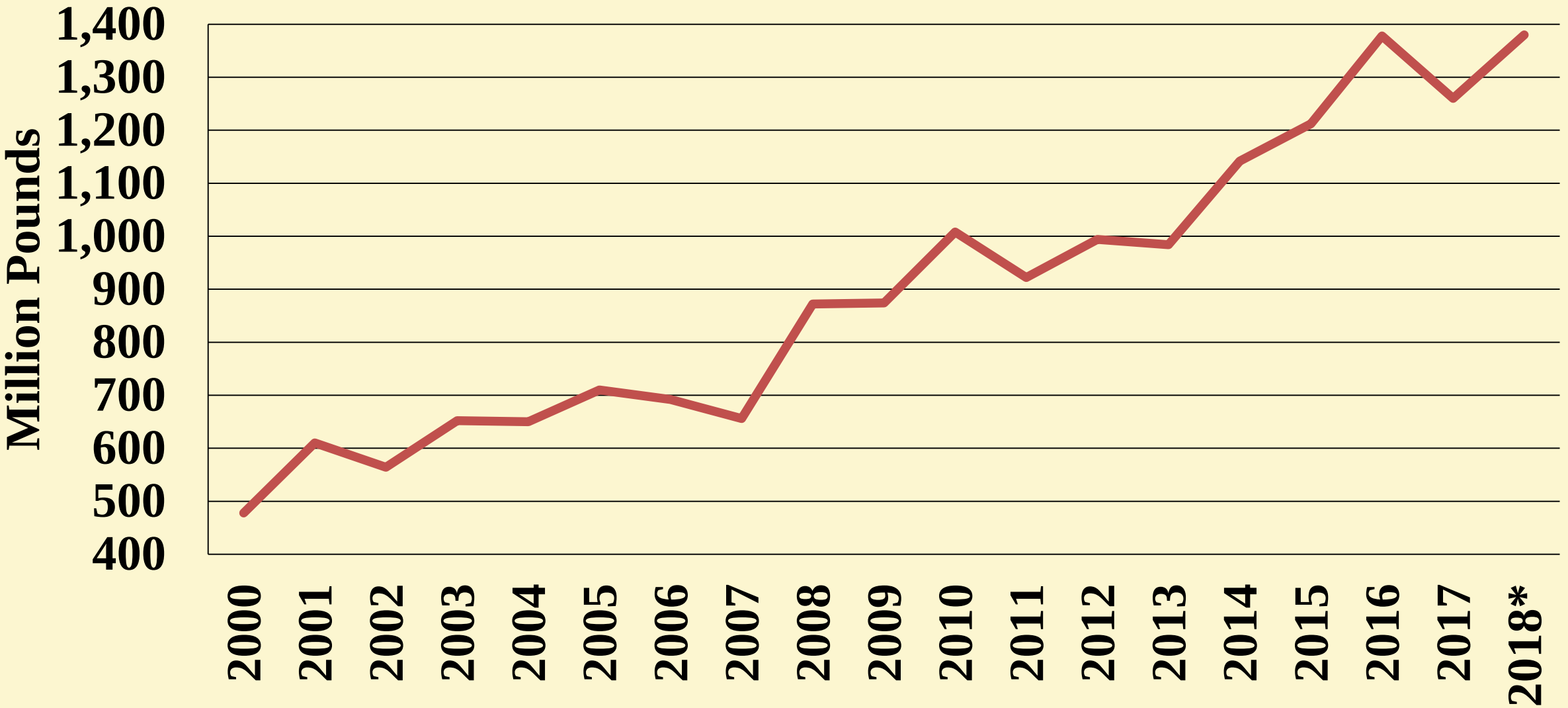
*Forecasted value

Walnut Yield



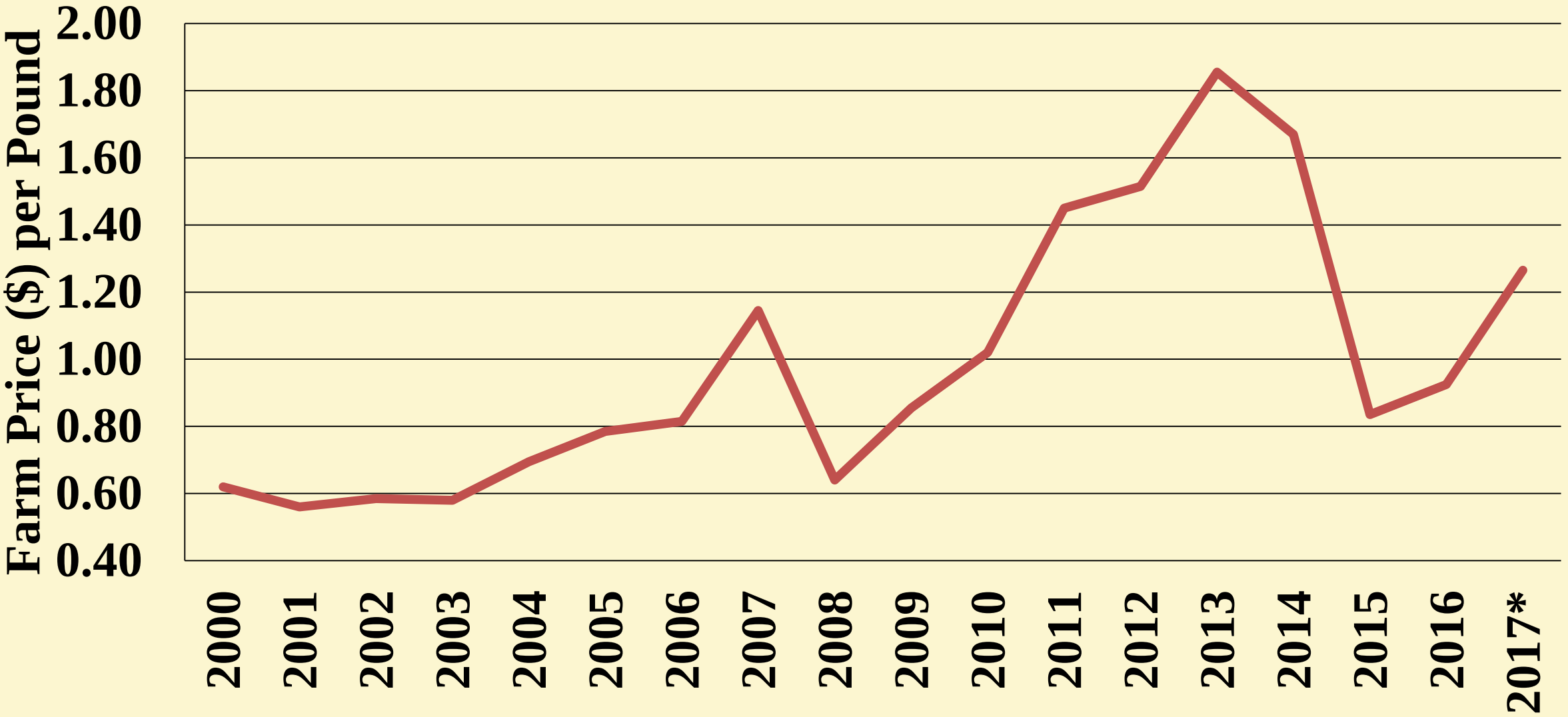
*Forecasted value

California Walnut Production



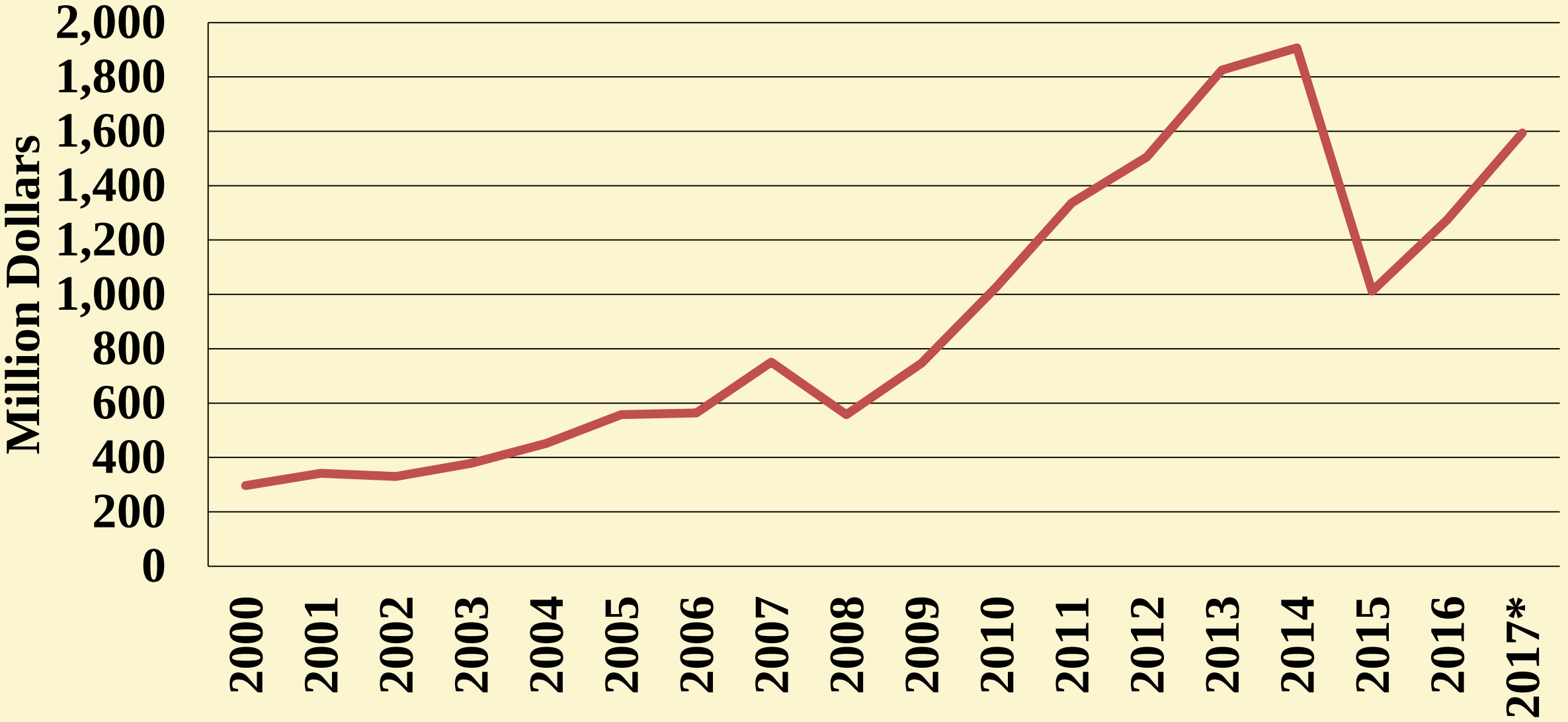
*Forecasted value

California Walnut Farm (marketing year) Price



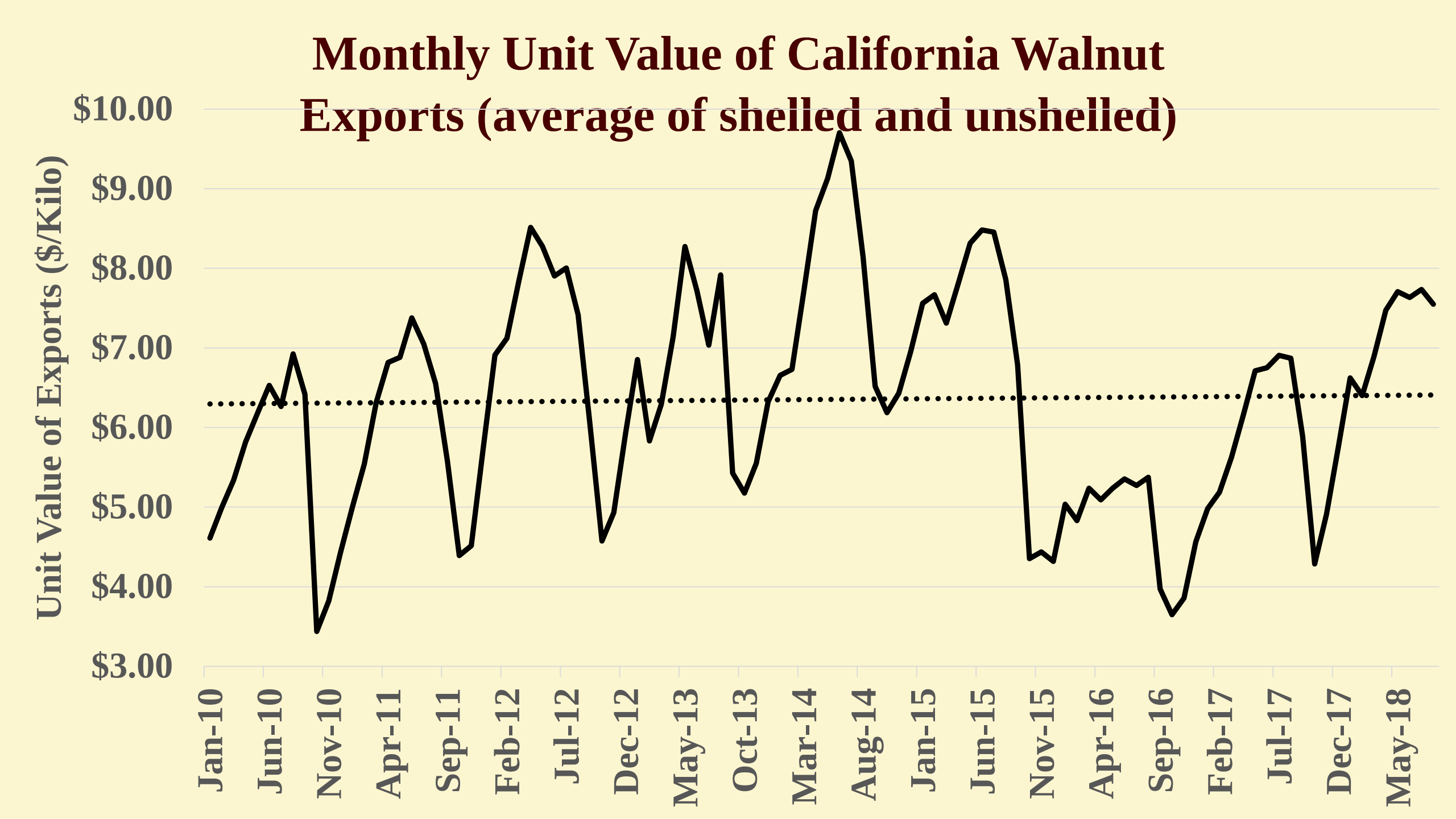
*June 2018 preliminary data

Farm Value of California Walnuts



*June 2018 preliminary data

Monthly Unit Value of California Walnut Exports (average of shelled and unshelled)



2018 Projections

- Total bearing acreage now at 350,000, and higher next year
- Planting density up to 75.5 trees per acre
- Yield per acre forecast at 1.97 short tons/acre ~3,940 pounds
- Therefore, at the end of August, USDA forecast the walnut crop to be record 690,000 tons in 2018, just barely higher than 2016, which had a record high yield of 2.19 tons/acre.
- Is that how it turned out?

Farm Price? Looks bad now, but what for the full marketing year?

If price is $0.70/pound, as some have been saying, the total value of the crops will be $966,000. The first time in a decade that the value of the crop has been below one billion!

The Industry Economic Picture: Factors and Trends

1. **Production is high and prices have collapsed. Can this continue probably not. With time to adjust new markets can be found, but economic damage is real and severe..**
2. **After very higher price for several years in 2011-14 an adjustment was likely. Prices through the spring of 2018 looked relatively strong and then export issues arose.**
3. **Global consumer demand for nuts will continue to expand**
4. **But, other suppliers from Chile to Europe can take advantage of US export problems. And, they see opportunities in walnuts that now look less bright in California.**

2018 Sample Costs to Establish and Produce

ENGLISH WALNUTS
in the
SACRAMENTO VALLEY

Table I.

General Summary of 1931 Walnut Study

	High Profit Group	Low Profit Group	Average All Records	Your Record No.
Number of records	7	7	14	
Total acres covered by reports	227.25	188.6	415.85	
Average age of trees in each group	12.3	10.9	11.7	
Average number trees per acre	16.1	20.1	17.9	
Yield--merchantable nuts per acre, lbs.	1029.2	666.8	864.8	
Total yield--pounds per acre	1188.1	787.8	1006.5	
Per cent of nuts merchantable	86.6	84.7	85.9	
Average net price per cwt. all nuts	$ 14.69	$ 11.55	$ 13.58	
Cost of production per cwt.	7.76	9.81	8.49	
Net profit per cwt.	6.93	1.74	5.09	
Cultural labor cost per acre	12.78	9.94	11.49	
Harvesting cost per acre	18.93	11.40	15.52	
Total labor cost per acre	31.71	21.34	27.01	
Material cost per acre	3.06	2.71	2.90	
Cash overhead cost per acre	5.94	5.52	5.75	
Total cash and labor cost per acre	40.71	29.57	35.66	
Depreciation per acre	10.52	7.13	8.99	
Sub-total	51.23	36.70	44.65	
Interest on investment	40.97	40.64	40.81	
Total all costs	92.20	77.34	85.46	
Income per acre	174.52	91.02	136.65	
Income above cash costs per acre	133.81	61.45	100.99	
Capital and management income per acre	123.29	54.32	92.00	
Net profit above all costs per acre	82.32	13.68	51.19	
Investment per acre	682.83	677.29	680.31	
Per cent earned on investment	18.0	9.0	13.5	

Authors and Background for the 2015 Study

1. Janine K. Hasey, UC Cooperative Extension Farm Advisor
2. Dani Lightle, UC Cooperative Extension Farm Advisor
3. Katherine Jarvis-Shean, UC Cooperative Extension Farm Advisor
4. Luke Milliron , UC Cooperative Extension Farm Advisor
5. Emily Symmes, UC Cooperative Extension Farm Advisor
6. Brad Hanson, UC Cooperative Extension Weed Specialist, UC Davis
7. Jeremy Murdock, Staff Research Associate, Ag Issues Center, Department of Agricultural and Resource Economics, UC Davis
8. With help from Sacramento Valley growers (we do not usually name the names)

Just type in: Coststudies.ucdavis.edu … Search for walnuts

Background and Assumptions

- The individual cost and returns studies are intended as a guide and pertain to sample costs to establish and/or produce a crop in a specific region of California using the specified technology and for the other farm characteristics listed.
- The cultural practices described represent production operations and materials considered typical for a well-managed farm in the region.
- Obviously, costs, materials, and practices in this study will not apply to all farms and should be adjusted to apply to specific varieties and locations.
- Clearly, timing of and types of cultural practices will vary by location and by season depending upon weather, soil, and insect and disease pressure.

Background and Assumptions, this walnut operation

- Sacramento Valley
- 100 acres of a single parcel of walnuts out of a total of 105 acres
- Micro sprinklers 36 acre inches of applied water after year 3, $7.50 per acre inch
- Establishment on land that previously also had walnuts
- Custom services used for several operation including removing the old orchard.
- Chandler variety only; Clonal paradox rootstock and 26X26 spacing for 64 trees per acre (blow the statewide average)
- Details of pest management and other practices in the study
- Custom harvests begins in year 4; 30 year expected orchard life
- Labor costs set to comply with minimum wage and other regulations

Definitions

- Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. Examples are; interest on operating capital, liability and property insurance, and equipment repairs.
- Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Examples are; land, irrigation systems, equipment and orchard establishment costs.
- Operating costs include the outlays for materials and services needed to produce the crop. Examples are; fertilizer, pesticides, irrigation, labor, custom operations, crop processing and storage.
- Cash costs would include all the individual operating costs. Examples are; cultural and harvesting operations, assessment and environmental fees.

Table 1. Costs per acre to establish an English walnut orchard

Pre-Plant:	
Nematode Sampling	1
Orchard Removal/Cleanup	800
Rip 4 ft. 2X	400
Disc & Roll 2X	50
Laser Leveling	100
Fumigate- 8’ Strip (Telone & Chloropicrin)	1500
Pull Berms-Tree Rows	30
Float-Between Rows	30
Weeds-Pre-Plant Strip Spray (RU PowerMax)	10
TOTAL PRE-PLANT COSTS	3,521
Survey/Mark/Plant-64 Trees/Ac	1,479
Head/Paint/Stake/Wrap Trees	174
TOTAL PLANTING COSTS	1,653

Table 1. Major cultural costs per acre

Year:	Est/1st	2nd	7th
Yield: In Shell; Lbs./Acre			5,000
Cultural:			
Prune-(Sucker Trees 4X-1st Yr.)	178		
Prune/Stack/Alt-Rows (1/3 Ac)		30	
Fertilize: 15-15-15 2X	100	240	
Fertilize-Chemigation UAN32 2X			140
Irrigate 10X	60	113	270
Pests-Diseases-Walnut Blight 2X			263
Pests-Diseases-Bot 2X			96
Pests-Scale			69
Pests-Mites			
Pests-Insects-CM/WHF/Mites			157
TOTAL CULTURAL COSTS	576	561	1,404

Table 1. Costs per acre to establish (continued)

Year:	Est/1st	2nd	7th
Yield: In Shell; Lbs./Acre			5,000
Shake/Sweep/Pickup/Haul			350
Hull & Dry			400
TOTAL HARVEST COSTS			828
Interest On Operating Capital @ 5.0%	273	16	31
TOTAL OPERATING COSTS/ACRE	6,022	624	2,263
TOTAL CASH OVERHEAD COSTS	513	512	566
TOTAL CASH COSTS/ACRE	6,535	1,136	2,829
INCOME/ACRE FROM PRODUCTION			6,000
TOTAL NON-CASH OVERHEAD COSTS	1,727	1,725	2,414
TOTAL COST/ACRE FOR THE YEAR	8,262	2,861	5,243
INCOME/ACRE FROM PRODUCTION			6,000
NET PROFIT/ACRE ABOVE TOTAL COST			757
TOTAL ACCUMULATED NET COST/ACRE	8,262	11,123	20,020

Table 2. Costs per acre to produce walnuts

Operation	Labor Cost	Material Costs	Custom/ Rent	Total Cost
Pests-Insects Scale	0	44	25	69
Irrigate 10X	0	270	0	270
Disease-Walnut Blight 2X	0	213	50	263
Disease-Bot 2X	0	46	50	96
Fertilize-Chemigation 2X	0	140	0	140
Irrigation Labor	49	0	0	49
TOTAL CULTURAL COSTS	184	1004	283	1,514
TOTAL HARVEST COSTS	0	70	838	908
Interest on Operating Capital at 5.0%				32
TOTAL OPERATING COSTS/ACRE	0	1,075	1,120	2,454
TOTAL CASH OVERHEAD COSTS/ACRE				566
TOTAL NON-CASH OVERHEAD COSTS				2,418
TOTAL COSTS/ACRE				5,439

Table 3. Costs and Returns

Yield 5,500; Price 1.20	Value or Cost/Acre
GROSS RETURNS	
Production Years	6,600
TOTAL GROSS RETURNS	6,600
TOTAL OPERATING COSTS/ACRE	2,456
NET RETURNS ABOVE OPERATING COSTS	4,634
TOTAL CASH OVERHEAD COSTS/ACRE	566
TOTAL CASH COSTS/ACRE	3,022
NET RETURNS ABOVE CASH COSTS	3,578
TOTAL NON-CASH OVERHEAD COSTS/ACRE	2,418
TOTAL COST/ACRE	5,440
NET RETURNS ABOVE TOTAL COST	1,160

Table 5. Costs at varying yields

	Yield (Lbs./Acre)		
	4,000	5,500	7,000
Cultural	1,514	1,514	1,514
Harvest	660	908	1,412
TOTAL OPERATING COSTS/ACRE	2,205	2,454	2,703
TOTAL OPERATING COSTS/Pound	0.55	0.45	0.39
TOTAL CASH COSTS/ACRE	2,772	3,020	3,269
TOTAL CASH COSTS/Pound	0.69	0.55	0.47
NON-CASH OVERHEAD/ACRE	2,418	2,418	2,418
TOTAL COSTS/ACRE	5,190	5,439	5,668
TOTAL COSTS/Pound	$1.30	$0.99	$0.81

Table 5. Net returns above costs

	Yield (Lbs./Acre)		
Price ($/Lb.)	4000	5,500	7000
$ Net Return Per Acre Above Cash Costs For Walnuts			
0.60	-372	280	931
1.00	1,228	2,480	3,731
1.20	2,028	3,580	5,131
Net Return Per Acre Above Total Costs For Walnuts			
0.60	-2,790	-2,139	-1,488
1.00	-1,190	61	1,312
1.20	-390	1,161	2,712

Implications and Final Remarks

- **The numbers are worrisome in the short term**
- **If planning to begin harvest in 4 or 5 years, the short-term prices are mostly a wake up call that really bad years can occur.**
- **This year looks bad. No one needed me for that information!**
- **What does this mean for the future of the industry?**
- **If this long term price picture continues, and you can maintain yields at or above these midpoints then the industry will likely expand until this price picture cannot continue.**
- **Because expansion drives down prices!**
- **This is an old story**
- **The only way to beat the averages is to be above average in some dimension …**

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