



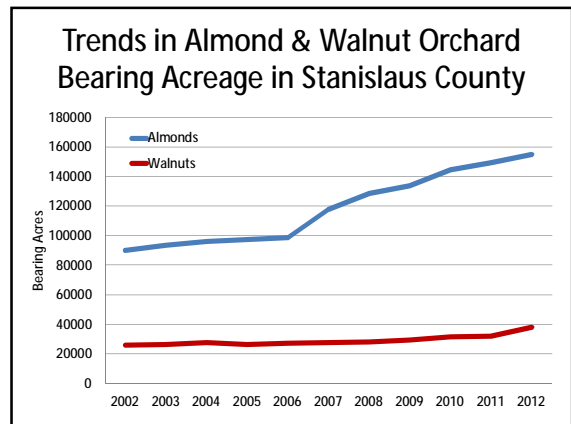
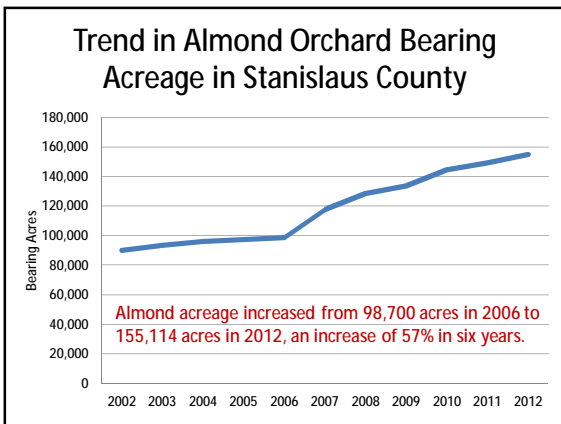
**Where and Why Will Tree Crops Replace Rangeland?**

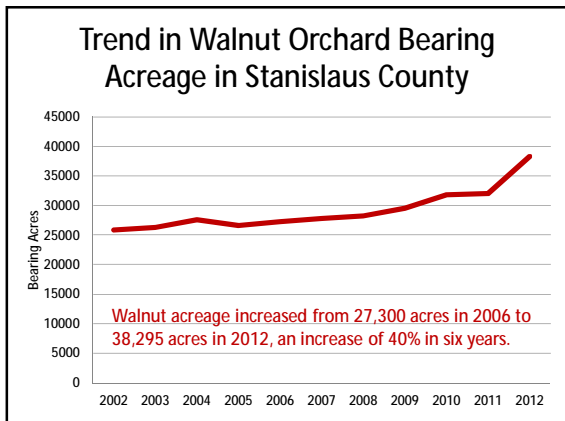
Roger Duncan  
Tree Crops Farm Advisor  
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University of California  
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**California Ag Trends: 1992 - 2012**  
(Klonsky, California Agriculture, July-September 2012).

- Almond acreage increased by 307,000 acres (74%)
- Pistachio acreage increased by 79,500 acres (108%)
- Walnut acreage increased by 38,000 acres (18%)
- Orchard acreage overall increased from 2.2 to 2.8 million acres
- Vineyard acreage increased 197,000 acres (66%)
- Vegetable crop acreage down by 10%
- Field crops down from 15% of farm income to 9%
- **The greatest decline has been in pasture and grazing land, and this trend will likely continue.**





### Nurseries Cannot Keep Up with Demand

- Nurseries are selling out of almond trees one year in advance
- Walnut trees are sold out two years in advance

# Why??

### Almonds are Very Profitable

- Growers currently paid \$2.75 - \$3.00 / pound
- Average production ~ 2,500 pounds / acre
- Cash operating costs ~ \$2,150 / acre\*
- \$6,875 - \$7,500 gross income
- **\$4,725 - \$5,350 per acre net income**

\*University of California 2011 Sample Costs to Establish an Almond Orchard and Produce Almonds

### Almond Establishment Costs per Acre:

• Land Preparation:	\$500
• Purchase trees (124 / acre):	\$651
• Planting costs:	<u>\$223</u>
• Total	\$1,374

- If previous orchard exists, add orchard removal (\$478) & fumigation (\$425).

\*University of California 2011 Sample Costs to Establish an Almond Orchard and Produce Almonds

### Almond Establishment Costs per Acre:

- If installing a new orchard outside of an irrigation district, you must include a well.
  - Installing a 16" well: \$200,000 (150 – 200 acres)
  - Drip / microsprinkler system ~ \$1800 / acre installed

### Walnuts are Even More Profitable

- Growers getting \$2.00 / pound
- Average production ~ 2.5 tons / acre
- Cash operating costs ~ \$1,400 / acre\*
- \$10,000 gross income
- **\$8,600 per acre net income**

*\*University of California 2012 Sample Costs to Establish a Walnut Orchard and Produce Walnuts*

### Walnut Establishment Costs per Acre:

- Land Preparation: \$550
- Purchase trees (65 / acre): \$1,073
- Planting costs: \$528
  - Total \$2,151
- If previous orchard exists, orchard removal & fumigation costs.

*\*University of California 2011 Sample Costs to Establish an Almond Orchard and Produce Almonds*

### Why are Almonds Grown so Successfully in California?

- Excellent soils in much of Central Valley
- "Plentiful", high quality water
- Mediterranean climate – long, hot, dry summers with relatively low chance of severe frost after March 1.
- Mostly mechanized



Almonds have a relatively large window to be harvested and do not need to be processed immediately



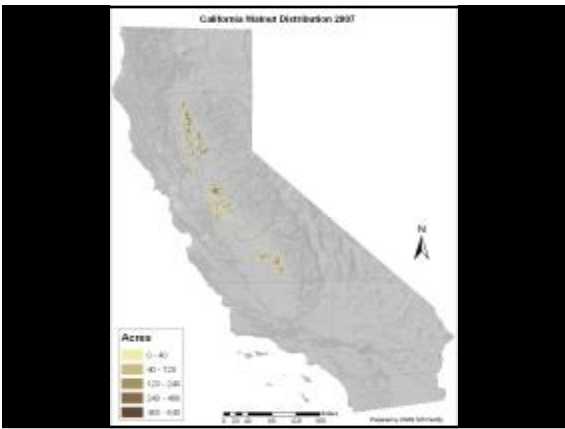
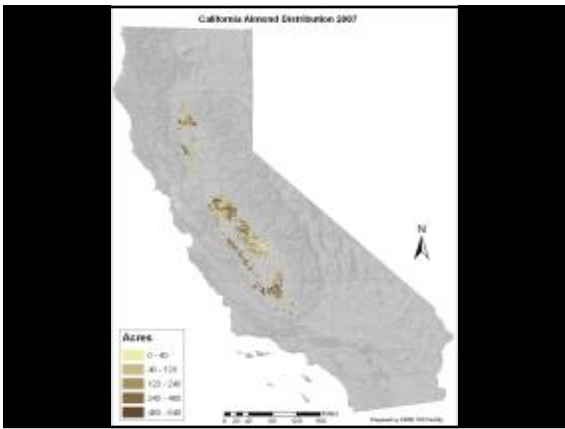

Unprocessed almonds can be stockpiled for several weeks

**Almonds originated from wild species indigenous to deserts of Uzbekistan, Turkmenistan, Afghanistan & Iran**

- They are well adapted to mild, wet winters and very long, dry, hot summers.
- Can tolerate poor soil conditions and drought



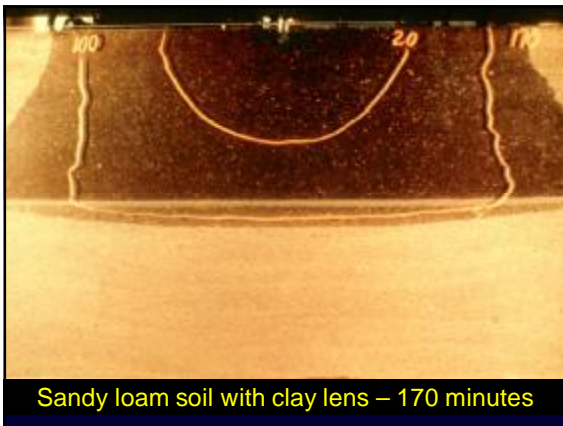
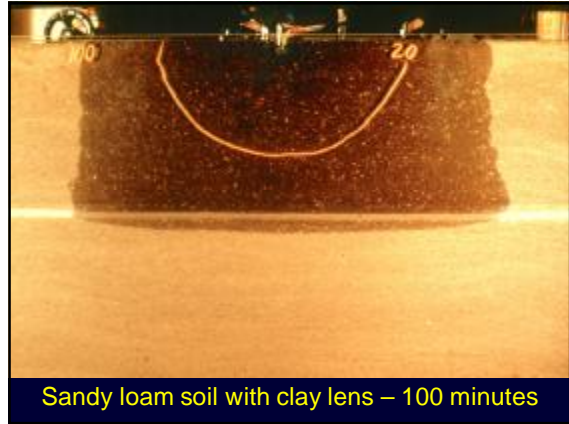
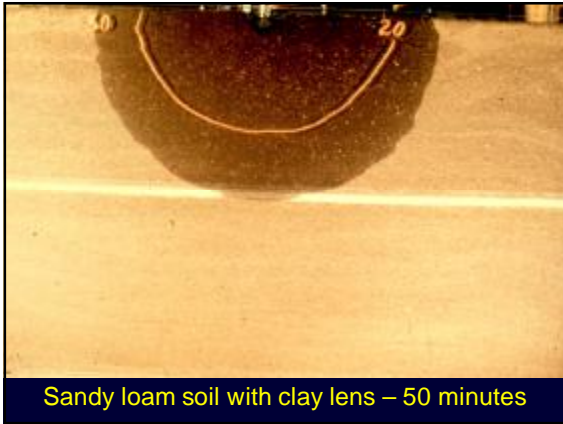
- California produced about 82% of the world's almond supply in 2013 & 100% of U.S. production.
- Australia 5%, Turkey 2%, all Europe 6%



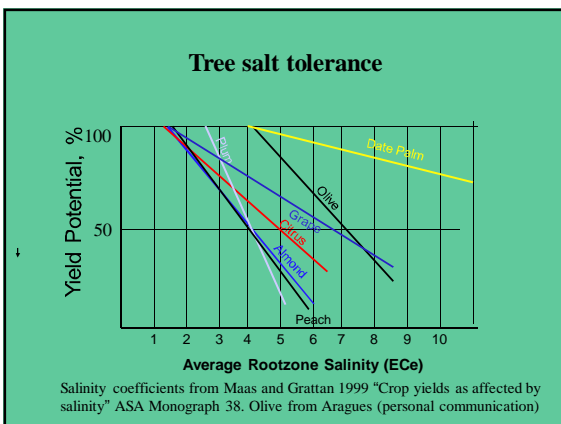
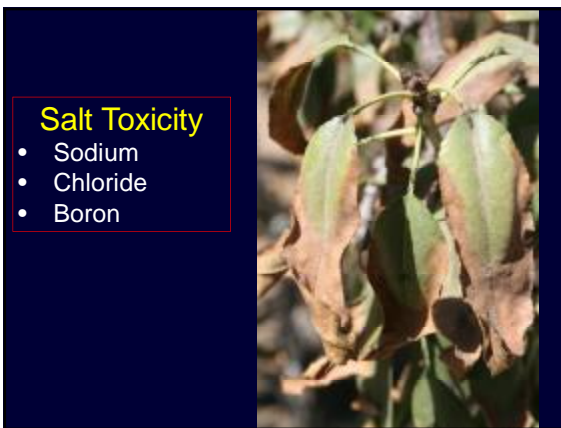
**Limitations to Profitable Almond Growing**

**Overly Wet / Poorly Drained Soils**









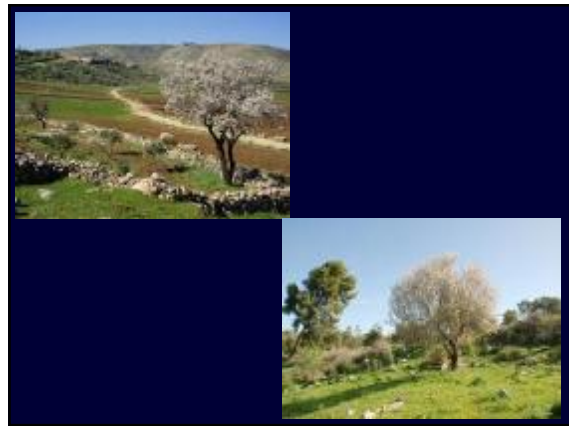
**Relative Salt Tolerance of 15 Almond Rootstocks**

Rootstock	% Sodium	% Chloride
Nemaguard	0.99	0.51
Lovell	0.70	0.50
Guardian	0.76	0.41
Cadaman	0.38	0.25
Empyrean 1	0.09	0.07
Hansen	0.09	0.07
Nickels	0.28	0.15
GF 677	0.04	0.05
Cornerstone	0.04	0.05
Viking	0.29	0.21
Atlas	0.94	0.29
Krymsk 86	0.60	0.32
Penta	0.30	0.41
Julior	0.35	0.16
Adesoto	0.06	0.04

**UC Cooperative Extension Rootstock Trial 2013**

July Critical Levels	
Na	Cl
0.25%	0.3%

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DATE	Previous Water Use Guidelines	New Water Use Guidelines
Mar 1-15	NA	0.54
Mar 15-31	0.54	0.77
Apr 1-15	0.60	0.94
Apr 16-30	0.66	0.99
May 1-15	0.73	1.02
May 16-31	0.79	1.04
June 1-15	0.84	1.08
June 16-30	0.86	1.11
July 1-15	0.93	1.11
July 16-31	0.94	1.11
Aug 1-15	0.94	1.11
Aug 16-31	0.94	1.06
Sept 1-15	0.94	0.93
Sept 16-30	0.91	0.77
Oct 1-15	0.85	0.65
Oct 16-31	0.79	0.52
Nov 1-15	0.70	0.28
<b>Total ETC</b>	<b>38-42"</b>	<b>48-56"</b>

**New University of California Studies show that optimal irrigation of almonds is 25% more than previously believed**

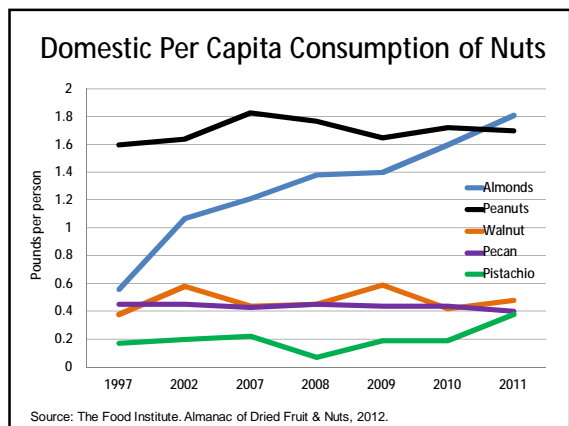
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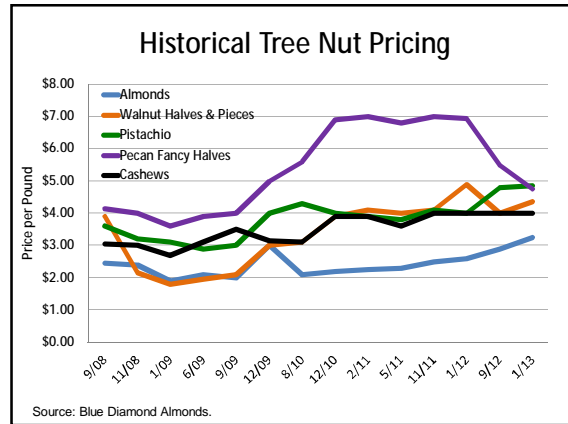
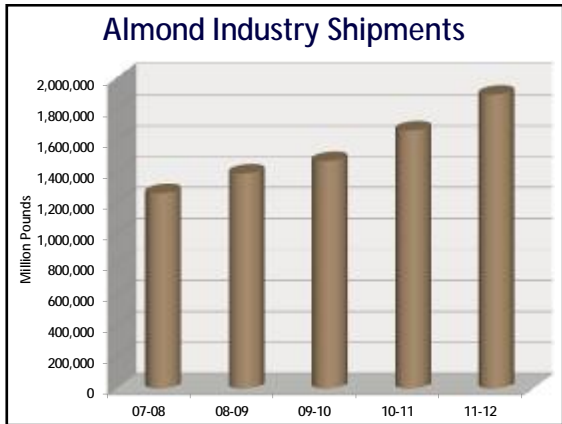
Midday PAR interception	Applied water (inches)	Yield potential (kernel lbs/ac)
10	7	500
20	14	1000
30	21	1500
40	28	2000
50	35	2500
60	42	3000
70	49	3500
80	56	4000
90	63	4500

Dr. Bruce Lampinen, UC Davis

## Have We Flooded the Market?

- According to Blue Diamond's 2013 *Industry Overview*: "Demand continues to outstrip supply"





**When Will the Madness End?**

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When California runs out of land and water

Thank you for your attention.

Questions?

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