Economics of Almond Production:
Panel Participants

Bill Harp, An Almond Grower, Bakersfield, CA

Cornelius L. (Corny) Gallagher, SVP, Food, Ag and Wine Executive, Bank of America Merrill Lynch, Sacramento, CA

John Duarte, President of Duarte Nurseries, Modesto, CA

Joshua (Josh) Cheney, Vice President, Valley Corporate Group, American AgCredit, Stockton, CA
Economic Policy and Trends

Corny Gallagher
SVP – Food, Ag and Wine Executive
Almond Conference
Economic Policy and Trends

December 11, 2012
Corny Gallagher
SVP – Food, Ag and Wine
Executive
Global Commercial Banking
CALIFORNIA’s Economic Policy - Trends

- Water...Adequate and reliable supply of quality WATER for PEOPLE, FOOD PRODUCTION AND ENVIRONMENT.
- Land Use...Preservation of prime farm land to produce almonds.
- Regulations...Regulatory steamlining that enables continued food production and processing.
- Rights to farm and process food products.
- Labor...Adequate supply of on farm and food processing labor.
- Transportation and ports to export almonds.
- Research in health, nutrition and food products.
- Human capital to fill positions with knowledge and expertise.
- Family equity transfer and estate taxes.
- Global financial facts, GDP, Dollar value, income growth.
Food Foresight Priority Trends 2012

1. Farmers’ latitude to operate under intense scrutiny
2. New developments in science poised to reshape the food-health nexus
3. New food chain emerging
4. ‘Big’ data meets production agriculture
5. Greater uncertainty, less predictability and the need to adapt
Delta Flows 12/1/10 to 7/28/11

Total inflows = 29,619,000 AF

Sacramento River + Tributaries @Freeport
18,856,000 AF

East Side Rivers
1,801,000 AF

San Joaquin River
5,889,000 AF

Net Outflow
25,300,983 AF

Net In-Delta Consumptive Use
322,107 AF

CVP Jones Pumps = 1,506,000AF
SWP Banks Pumps = 2,452,000AF

Ocean/Tidal Yolo Flood Bypass
2,955,000AF
Agriculture and the Water Retention Landscape: A New Vision for the Way We Store Water in California

California Roundtable on Water and Food Supply | November 2012
Global Demand and California Agriculture

Daniel A. Sumner
University of California Agricultural Issues Center and UC Davis, Agricultural and Resource Economics
Global markets for farm commodities have exhibited strong long-term trends and have several drivers:

- Demand for farm commodities has been growing strongly for centuries because of populations and per capita income growth.

- Continued demand growth for protein commodities derives primarily from increases in population and income.

- Strong demand growth is a “good news” story. It means that incomes of the world’s poor will continue to expand at rapid rates!
Global markets for farm commodities have exhibited strong long-term trends and have several drivers

- Supply growth derives mainly from:
  - Opening new land area for crop and livestock production,
  - Additions to availability of irrigation water
  - Increased availability of inputs such as improved seed, fertilizer, pesticides and equipment
  - Improved handling and reduced losses off the farm
  - New and newly adapted and adopted technology and practices
PEOPLE AND ENERGY USE
Macro Drivers - Population

*While Arable Land is relatively fixed, World Population is not - it continues to grow*

![World Population Graph](image)

- We are here
- Next 10 Yrs
- Last 10 Yrs

- United States
- Other
- India
- China

Data as of 02/12
Source: UN FAOSTATS

*United Nations (UN) Food and Agriculture Organization Statistics (FAOSTATS)*
World map weighted by estimated population in 2050
California Almonds have a strategic advantage in producing portable protein.
Creating fertile ground for agribusiness growth.
California Almond Industry

Planting Trends, Farming Systems & Alternative crops

John Duarte
President, Duarte Nursery, Inc.
Duarte Nursery, Inc.

- Family owned based in Hughson, CA.
- Diversified permanent crops Nursery
- Seven field reps, five serving CA Almond Ind.
CA Almond Planting Trends

Planting Trends
• Total acres
• Where – regions
• How – farming systems

Competing Crops.
• Region
• Comparative returns
Research methods:

- DNI Sales records
- Survey DNI field reps
- Checked against industry sources
Competing crop qualifications:

- Permanent Crops
- High cash returns
- Lower marketing risk
- Low perishability
- Low to moderate labor input
- Proven over time
Which crops qualify?

Yes.
- Wine and Raisin Grapes
- Walnuts
- Pistachio

No.
- Olives
- Pomegranate
- Table grapes
- Fresh Stone fruit
- Kiwi
- Citrus
Pistachio

- Salt tolerant
- Drought tolerant
- High production
- Good prices
- Low labor
- Many preproductive acres
- Long preproductive period
- Consolidated handlers
Wine and Raisin Grapes

- High input high output farming systems
- Long term contracts available
- Traditional diversification crop
- Rebounding market
- Consolidated buyers
- Higher labor
- Historically cyclical
Walnut

- High production
- High prices
- Low labor
- New farming system advances
- Not salt or drought tolerant
- Late compressed harvest season
How many acres?

Duarte Nursery estimated plantings

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Acres</td>
<td>22000</td>
<td>23936</td>
<td>35000</td>
<td>42000</td>
<td>45000</td>
<td>42000</td>
</tr>
<tr>
<td>Estimated Nursery Trees</td>
<td>2640000</td>
<td>2872320</td>
<td>4200000</td>
<td>5040000</td>
<td>5400000</td>
<td>5040000</td>
</tr>
</tbody>
</table>

- Almond industry would be well served by a reliable confidential nursery survey.
Where and How?

Kern Co.

• Variable water quality and supply
• Large blocks
• Mostly conversion from annual crops
• Hybrid rootstock
• Acidification
• Competition with Pistachio
• Potential for growth
Where and How?

Central Valley drain
  • Variable water quality and supply risk
  • Large blocks
  • Previous cotton ground
  • Hybrid for poor water quality
  • Acidification, humic acids
  • Competition with Pistachio
  • Potential for growth
Where and How?

Westside - Firebaugh

- Strong soils, variable water risks
- Large blocks
- Previous diversified annual ground
- Hit hard by SJ Delta rulings in 2009-2010
- Hybrid and Peach
- Competition with Pistachio
- Growth limited by water security
Where and How?

Eastside districts San Joaquin Co. to Fresno Co.

- Good soil, good water
- Smaller to midsize blocks
- Previous wine grape vyds, raisin, peach
- Peach rootstocks for replant issues
- Many older almond acres
- Competition with wine and raisin grapes
- Limited potential for net growth
Where and How?

Stanislaus and Merced Co. Rangeland
• Out of irrigation district Eastside
• Good quality groundwater
• Large blocks
• Slip plowing
• Peach Rootstocks
• Competition with wine grapes and walnuts
• Potential for growth
Where and How?

SJ Delta?

- Heavier soils
- Reliable water
- Affordable land
- Still to be proven
- K86 rootstock
- Competition with wine grapes
Where and How?

Sacramento Valley

- Good soils
- Good water
- Affordable land
- Frost limits
- Competition with walnut
- K86 rootstock for anchorage
- Potential for growth
Thank you.
California Almond Industry

Josh Cheney
Vice President, American AgCredit
Financing Facilities to Preserve Working Capital

If the almond industry is going to grow supply and manage that supply to meet growing demand, it will need a reliable source of capital to provide liquidity and expansion.
Discussion Points

- Capital is Available
- The Cost to Borrow is Affordable
- Importance of Working Capital
- Specific Financing Products that can Protect Working Capital and Provide for Growth
- How to Procure this Low Cost Financing
Capital is Available

- Financial institutions have the capital and want to lend it to you.
- Competition for your business is fierce
- Interest rates are low!
The Cost to Borrow is Affordable

- The cost to carry inventory for 6 months may be as low as $13 per thousand borrowed.
- For the average grower the cost to borrow for 6 months equates to less than $0.01/lb.
- Fixed rate mortgages at historical lows
- Average 20 Year Return S&P 500 = 8.0-9.0%

Could you get more than $0.01/lb. by having the flexibility to time your sales more strategically?
Importance of Working Capital

- Strong Working Capital Position = Strong Cash Position
- Quick **access** to cash is the key

Why?
Access to cash allows you **FLEXIBILITY** to:

- Manage supply by allowing Growers and Handlers to sell at the optimal time.
- Manage tax liability (i.e. prepaid expenses)
- Seize opportunities (i.e. quick purchase of real estate or equipment)
Specific Financing Products

- Traditional Operating Loan/Line of Credit
- Revolving Equity Line of Credit (RELOC)
- Leasing
- Development Loans
Traditional Line of Credit
“RLOC”

One to Three Year Maturity
Secured By Personal Property (Crops, A/R’s, etc.)

Advantages:

- Secured by personal property, sometimes unsecured
- Only pay interest on your outstanding balance

Disadvantages:

- Have to renew often
- Higher risk and servicing = higher financing costs
- Handlers/Processors often don’t own the inventory = nothing to Secure the Loan with.
Revolving Equity Line of Credit

“RELOC”

Five to Twenty Year Maturity
Secured By Real Estate

Advantages:

- Once and done
- Least restrictive/flexible
- Low risk equals low interest rate
- Only pay interest on your outstanding balance
- Allows you to move quickly in the market

Disadvantages:

- Requires equity in Real Estate
- Reserved for strong, prudent borrowers
Lease

One to Ten Years Maturity
Secured By The Item To Be Financed

Advantages:

- 100% Financing
- Capital Improvements Including:
  - Buildings
  - Solar Facilities
  - Hulling/Shelling Equipment
  - Irrigation Systems
  - Orchard Equipment
- Low Fixed Rates
- Great for Tenant Farmers or When Little Equity in Real Estate
Development Loans

Fifteen to Twenty-Five Year Maturity
Secured By Real Estate

Advantage:

- Interest Only During Development Phase
- Repayment of Principal Begins When Orchard Enters Production
- Flexible
- Preserve Working Capital

Disadvantage:

- Requires equity in Real Estate.
How to Procure Low Cost Financing?

- Must have accurate, high quality, accrual financial information
  - If you don’t know how much money you’re making (or losing) I certainly don’t.
- Too much leverage ties the bank’s hands
- Tax returns are useful for calculating your tax liability, not for demonstrating profitability.
Conclusion

- Money is available
- Take advantage of the low rates to:
  - Build flexibility into your operation
  - Grow your operation
  - Increase ROA - Leverage
- Keep accurate records and invest the time and effort into producing accurate accrual financial statements.
Economics of Almond Production: Panel Participants

Bill Harp, An Almond Grower, Bakersfield, CA
California Almond Industry Economic Overview

Bill Harp, an Almond Grower

December 11-13, 2012
## Grower Return by Region for 2010 CY
by Bill Harp, an Almond Grower

### Almond Growing Region

<table>
<thead>
<tr>
<th></th>
<th>Northern</th>
<th>Central</th>
<th>Southern</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Per Acre</td>
<td>1,698</td>
<td>1,853</td>
<td>2,762</td>
<td>2,200</td>
</tr>
<tr>
<td>Bearing Acres</td>
<td>130,869</td>
<td>318,129</td>
<td>291,002</td>
<td>740,000</td>
</tr>
<tr>
<td>Total Reported Production</td>
<td>222,198,895</td>
<td>586,123,982</td>
<td>819,869,378</td>
<td>1,628,192,255</td>
</tr>
<tr>
<td>Total Paid Weight¹:</td>
<td>220,465,744</td>
<td>579,288,604</td>
<td>810,308,061</td>
<td>1,610,062,409</td>
</tr>
<tr>
<td>Total Paid Weight/Acre:</td>
<td>1,685</td>
<td>1,821</td>
<td>2,785</td>
<td><strong>2,176</strong></td>
</tr>
<tr>
<td>Grower Price/Lb²:</td>
<td>$1.80</td>
<td>$1.77</td>
<td>$1.79</td>
<td><strong>$1.78</strong></td>
</tr>
<tr>
<td>Paid Grower Revenue/Acre³:</td>
<td>$3,030</td>
<td>$3,215</td>
<td>$4,974</td>
<td><strong>$3,874</strong></td>
</tr>
<tr>
<td>Growing Costs/Acre SJ Valley:</td>
<td>$2,700</td>
<td>$2,700</td>
<td>$2,700</td>
<td><strong>$2,700</strong></td>
</tr>
<tr>
<td>Discounted Growing Cost per Acre⁴:</td>
<td>$400</td>
<td>$200</td>
<td>$0</td>
<td><strong>$157</strong></td>
</tr>
<tr>
<td>Net Estimated Grower Cost:</td>
<td><strong>$2,543</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Grower Return/Acre:</td>
<td><strong>$1,331</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Almond Grower ROA Definition

• The yearly return of one bearing acre divided by the market value of one bearing acre

\[
\text{Grower Return $} \quad \frac{\text{Grower Return}}{\text{Market Value $}} = \frac{\$1,331}{\$18,000} = 7.4\%
\]

Grower Return = Revenue - Cost
# Grower Return (ROA) History

## Almond Grower Return - Return on Asset Analysis

**Analysis of the most recent past 10 Years: 2001 - 2010**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Wtd. Avg Yield/Acre</td>
<td>1,810</td>
<td>1,830</td>
<td>2,172</td>
<td>2,200</td>
<td>1,943</td>
</tr>
<tr>
<td>Wtd. Avg Net Return/Acre</td>
<td>$545</td>
<td>$1,854</td>
<td>$981</td>
<td>$1,331</td>
<td>$1,207</td>
</tr>
<tr>
<td>Wtd. Avg Market Value of 1 Acre</td>
<td>$7,675</td>
<td>$13,956</td>
<td>$17,187</td>
<td>$18,000</td>
<td>$13,423</td>
</tr>
<tr>
<td>Pre-Tax Return on Asset</td>
<td>7.1%</td>
<td>13.3%</td>
<td>5.7%</td>
<td>7.4%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Wtd. Avg Asset Appreciation</td>
<td>$669</td>
<td>$1,849</td>
<td>$673</td>
<td>$1,000</td>
<td>$1,131</td>
</tr>
<tr>
<td>Asset Appreciation %</td>
<td>8.7%</td>
<td>13.2%</td>
<td>3.9%</td>
<td>5.6%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Pre-Tax Return on Asset incl Asset Appreciation</td>
<td>15.8%</td>
<td>26.5%</td>
<td>9.6%</td>
<td>12.9%</td>
<td>17.4%</td>
</tr>
</tbody>
</table>

2. ROA = based on weighted average market value of 1 acre of mature almonds for given period.
• Almond Grower ROA Target Range

- 10-20% Yearly Return on Asset (excluding asset appreciation)
- Only 5-10% ROA after taxes, so reasonable
- Supported by the expectations of other growers knowledgeable of the risks associated with Almonds Orchards based on at least a 20-25 year life

1. Grower’s Perspective: As an independent California Almond Grower and Investor, my opinion of an acceptable (“fair and reasonable”) Almond Grower ROA is as follows.
### Projection of Bearing Acreage Increase based Known & Estimated Plantings and Removals

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Actual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forecasted Bearing Acres</td>
<td>760,000</td>
<td>780,000</td>
<td>794,797</td>
<td>803,733</td>
<td>844,733</td>
<td>885,733</td>
<td>926,733</td>
</tr>
<tr>
<td>Acres Planted 3 years prior: (as originally Reported)</td>
<td>22,832</td>
<td>18,623</td>
<td>14,960</td>
<td>35,000</td>
<td>35,000</td>
<td>35,000</td>
<td></td>
</tr>
<tr>
<td>Adj. Planted Acreage: 60% more than Orig. Reported</td>
<td>36,696</td>
<td>29,797</td>
<td>23,936</td>
<td>56,000</td>
<td>56,000</td>
<td>56,000</td>
<td></td>
</tr>
<tr>
<td>Expected Removals (average of 2004-2011)</td>
<td>16,696</td>
<td>15,000</td>
<td>15,000</td>
<td>15,000</td>
<td>15,000</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>Net Increase in Bearing Acres (estimated) vs prior year:</td>
<td>20,000</td>
<td>14,797</td>
<td>8,936</td>
<td>41,000</td>
<td>41,000</td>
<td>41,000</td>
<td></td>
</tr>
</tbody>
</table>

- Acres Planted and are Standing as of 2011 that are more than 20 years old (1990 or earlier planting): 110,337
- Acres Planted and are Standing as of 2011 that are more than 17 to 20 years old (1991-1993 plantings): 38,584

- Average Net Increase in Bearing Acres 2004-2012: 26,250 acres
- Largest Net Increase in Bearing Acres from one crop year to the next: 40,000 acres (in 2008 & 2009 Crop Years).
## California Almond Demand History

### Recent Crop Year Demand Growth Averages

<table>
<thead>
<tr>
<th>Actual Demand Growth</th>
<th>Period when Target ROA Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 Year</td>
</tr>
<tr>
<td>Domestic</td>
<td>'09-'11</td>
</tr>
<tr>
<td>Export</td>
<td>10.2%</td>
</tr>
<tr>
<td>12.1%</td>
<td>14.7%</td>
</tr>
<tr>
<td>Total</td>
<td>11.5%</td>
</tr>
</tbody>
</table>

**Actual 2011 Crop Year Demand Growth = 13.7%**

**Actual 2010 Crop Year Demand Growth = 13.3%**
It Appears Future Demand Growth will be Restricted by Acreage Growth

### 2012 - 2017 Demand Growth based on Projected Bearing Acres

<table>
<thead>
<tr>
<th>Projected Demand Growth</th>
<th>Restricted Growth Based on Projected Bearing Acres @ Random Yield/Acre Averages 2012 - 2017</th>
<th>Unrestricted Conservative Demand Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,400</td>
<td>2,500</td>
</tr>
<tr>
<td>Domestic</td>
<td>1.8%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Export</td>
<td>2.5%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Total</td>
<td>2.0%</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

= Conservative Demand Growth Forecast based on Research & Recent History
= Actual Avg. 2008 - 2010
= Deloitte 2011 Study
= Assumes Industry must carry-out 13% of Total Supply each year.
Acreage Restricted Supply (Available to Ship) vs. Conservative Unrestricted Demand Growth @ 6.3% CAGR

Available Supply at Yield/Acre Scenario

- **Demand**
- @ 2,400
- @ 2,500
- @ 2,600
- @ 2,700

2012 “industry” estimate is 1.90 Billion pounds

Pounds (in 000’s)

Crop Year


Actual Outlook Forecast

Acreage Restricted Supply = Net Edible Production + carry-in supply – (less: required carryout supply)

Required carryout = 13% of Total Supply for a given CY.
Bearing Acreage Required to Meet 6.3% CAGR for the period 2012 – 2017

Acreage at Yield/Acre Scenario

Avg. Yearly Net Increase in Bearing Acres 2012 - 2017

@ Current Projected Acres: 28,000

Yearly Acreage Increase required

- @ 2,400 lbs/acre: 68,000
- @ 2,500 lbs/acre: 60,000
- @ 2,600 lbs/acre: 53,000
- @ 2,700 lbs/acre: 46,000

Model assumes 15% of Total Current Demand must be carried-out each crop year (=13% of Total Supply)
Outlook for 2012-2017

• Optimism for Grower Returns for 2012-2017¹:
  ▪ 10-20% Grower ROAs are possible with projected almond supply and demand fundamentals
  ▪ With new projected tax rates, the ROAs after tax would only be 5-10% for growers
  ▪ Growers need to become informed, aware, and involved to support our capable Almond Handlers
  ▪ Grower should review Monthly information and reports from Almond Board
  ▪ Growers should research and study Almond Market Dynamics and apply principles to practice on regular basis

  ▪ Supply Management is the new “Reserve”

¹. Grower’s Perspective: As an independent California Almond Grower and Investor,
Price Elasticity ($E_d$) measures the change in quantity demanded in response to a change in price.

\[
\frac{\% \Delta \text{Quantity Demanded}}{\% \Delta \text{Price}} = E_d
\]

- A 10% increase in price will likely cause a 10% decrease in quantity.
- A 10% increase in price will likely cause no change in quantity.
Price Elasticities of Select Consumer Goods

Goods that are more essential to everyday living and that have fewer substitutes are typically inelastic.

- **Inelastic**: $-1 < E_d \leq 0$
  - Gasoline (-0.09)
  - Eggs (-0.10)
  - Cotton (-0.67)
  - Almonds (-0.48)
  - Walnuts (-0.25)
  - Coca-Cola (-3.8)

- **Moderately Elastic**: $-2 < E_d \leq -1$
  - Rice (-0.55)
  - Wine (-1.0)
  - TVS (-1.2)
  - Liquor (Spirits) (-1.5)
  - Airline Travel (-2.4)
  - Ford Compact Car (-2.8)

- **Very Elastic**: $E_d \leq -2$
  - Rice (-0.55)
  - Wine (-1.0)
  - TVS (-1.2)
  - Liquor (Spirits) (-1.5)
  - Airline Travel (-2.4)
  - Ford Compact Car (-2.8)

Almond Price Elasticity

Almonds have become more inelastic over the last 40 years.

**Source:** U.C. Davis, Dept of Agriculture and Resource Economics, June 2008 Working Paper
Over last 4 years, both prices and demand (shipments) have gone up!

Proof of inelasticity

US Almond Industry
Actuals 2008-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Shipments</th>
<th>Grower Price</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>1,389</td>
<td>$1.45</td>
<td>$2.0 B</td>
</tr>
<tr>
<td>2009</td>
<td>1,472</td>
<td>$1.65</td>
<td>$2.4 B</td>
</tr>
<tr>
<td>2010</td>
<td>1,668</td>
<td>$1.75</td>
<td>$2.9 B</td>
</tr>
<tr>
<td>2011</td>
<td>1,899</td>
<td>$1.91</td>
<td>$3.6 B</td>
</tr>
</tbody>
</table>

Source: USDA NASS
Key Takeaways

1. 10-20% Grower ROAs (only 5-10% after tax) are possible and can be achieved consistently due to the supply and demand fundamentals in place for the period of 2012-2017 and the price inelasticity of almonds.

2. Effective supply management can reduce price volatility.

3. Growers and handlers need work together to achieve an improved ROA, but need capital and adequate operating lines for Supply Management, the new “Reserve”.

\[
\text{Demand} + \text{Supply Constraint} + \text{Crop Carryout Mgmt} = \text{Improved Return on Assets}
\]
Questions for Panel Discussion

• Thoughts on accuracy of projected acres in presentation on Supply/Demand of Almonds for 2012-2017.
• General Discussion on “Supply Management” issues related to almond production facilities needed for storage, processing, packing, shipping and financing or equity needs of growers and handlers.
• General Discussion on Global Markets for food commodities, especially nuts and specifically almonds.
• General Discussion on Global Population Growth and the fixed amount of arable land.

• QUESTIONS FROM THE AUDIENCE
Questions