Appendix H

Agricultural Sector Market Trends

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The following are Agricultural market trends on the four most significant agricultural products (dairies, almonds, grapes and cattle & calf) by revenue.

Dairies:

- California's dairies produced 42.3 billion pounds of milk, accounting for almost 21 percent of the nation's milk supply in 2015.[1]
- Milk production in California in 2015 was 3 percent below 2014 (fig. 2). In 2015, U.S. production, excluding California, was up 2 percent from 2014.[2]
- Due in part to declining dairy product exports, prices received by California producers have declined significantly from 2014 levels, when prices were at record highs. In 2015, prices averaged below $15.41 per hundredweight, a drop of 30 percent from 2014 levels.[3]
- California has lost approximately 500 dairies from 2008 to 2015.[4]
    - Other states are luring CA dairies with promises of water, stable feed supply and abundant land.[5]
    - A U.S. Department of Agriculture economist said it's not just the drought and high cost of feed that has been hurting California dairy producers but a decline in the dry milk market that's been "a big export market for them. They've taken a disproportionate hit on that market. Strong dollar is contributing and China has retreated from the market." [6]

Almond Growers:

- California almonds make up about 80% of the global and virtually 100% of the U.S. supply.[7]
- Consistent California growth of almond production, even into drought years.[8]

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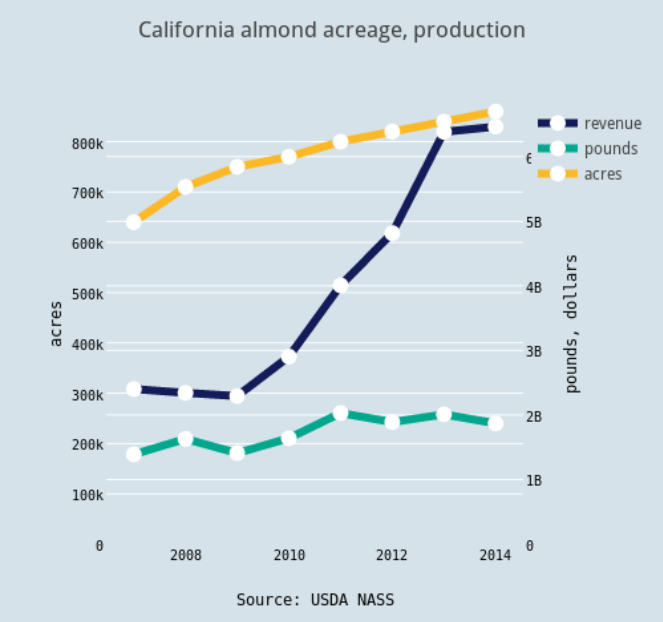
1 California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.
2 *California Drought: Livestock, Dairy, and Poultry Sectors*, United States Department of Agriculture Economic Research Service, as of September 6, 2016.
3 *Id.*
4 Outside states to California dairy farmers: We have water, CNBC, February 10, 2015, **http://www.cnbc.com/2015/02/10/california-drought-states-tempt-california-dairy-farms--we-have-water.html**
5 *Id.*
6 *Id.*
7 California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.
8 *Id.*

Figure 1. California Almond Acreage and Production:[9]



- Bees are important to California agriculture as a majority of the nation's colonies were needed for almond pollination in 2014.[10]

Grapes:

- 85% of U.S. wine comes from California.[11]
- 4,400 = total number of CA wineries.[12]
- Industry initiated the Sustainable Winegrowing Program (SWP) in 2002 to give growers and vintners educational tools to increase adoption of sustainable practices, to measure and demonstrate ongoing improvement and increase adoption of technology solutions.

Cattle & Calf:

- California's total cattle and calve inventory on January 1, 2015 was 5,150 thousand.[13]
- Domestic consumption of chicken increased by 17 percent in 2014.[14]

Segment-Level Market Trends:

Field & Seed Crops:[15]

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9 United States Department of Agriculture, National Agriculture Statistics Service.
10 California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.
11 *California Wine Community Sustainability Report 2015*, California Sustainable Winegrowing Alliance
12 *Id.*
13 California Agricultural Statistics Review, California Department of Food & Agriculture, 2015.
14 *Id.*
15 *Id.*

- Total value of California field crop production is $3.70 billion in 2014, down 14.9% from 2013.
- Dry edible beans, hay (alfalfa and other), fall potatoes, and sunflowers (non-oil) were the only field crops in California whose total value increased from 2013 to 2014.
- Large-to-moderate decreases in most field crop values led to the decrease in total field crop value.

Fruit & Nut Crops:[16]

- The state's total value of all fruits and nuts in 2014 was $21.4 billion.
- In 2014, California accounted for over 57% of the U.S. non-citrus fruit and nut production.
- California accounts for 37 percent of the U.S. citrus production and 56 percent of the national value.
- California is the number one producer of almonds and pistachios in the world, producing over 80 percent of the world's almonds and around 40 percent of the world's pistachios.

Vegetable & Melons:[17]

- The total value of California's 2014 fresh and processing vegetable and melon production was $7.8 billion.
- California led production with 47 percent of the U.S. harvested vegetable acres, 52 percent of the national production, and 60 percent of the value.
- California led the nation in processing vegetable production during 2014, with 28 percent of the U.S. harvested acreage, 74 percent of the national production and 60 percent of the total value.

Livestock & Poultry:[18]

- California's total livestock and livestock products cash receipts were $15.3 billion in 2014, up 20 percent from 2013 (dairy receipts were the primary reason for increase).
- Receipts for hogs and pigs were down 6 percent from the previous year.
- Poultry and egg cash receipts were up 4 percent from 2013.
- Cash receipts for cattle and calves increased 20 percent from 2013.

Floriculture:[19]

- 26% (~$270m) of the U.S. total floriculture wholesale value ($1.05b) in 2014.
- California producers decreased from 732 in 2013 to 582 in 2014.

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[16] *Id.*
[17] *Id.*
[18] *Id.*
[19] *Id.*

- California was the dominant state in cut flower production, accounting for about 77 percent of the total cut flower wholesale value ($275m).

Emerging Segment: Indoor Agriculture (e.g., Cannabis):

- The Indoor Agriculture market is growing, increasing Lighting, Process, and HVAC electricity usage for the Agricultural sector.[20]
- Strong growth in "local food" demand (estimated growth from $1b in 2005 to nearly $7b in 2014) has meant a unique market entry point for indoor farms' higher price point products.[21]
- Since 2011, $52m in venture capital-like funds were invested in indoor agriculture in the U.S., with more than 60% in 2014 alone.[22]
- Newly legal crops in other states have quickly become the most electricity-intensive crop in their Agricultural sector.[23]
- CA indoor marijuana growing is already 3% of total electricity consumption.[24]

<u>Drought Impacts</u>:

- Farmers are requiring more electricity to power deeper wells for pumping groundwater as surface water allocations shrink.[25]
- Farmers in the Central Valley, the state's main agricultural region, may tap groundwater for more than 60 percent of their needs in 2015, up from one-third in a normal year.[26]
    - "We are using about two-and-a-half times more power than we would in a normal year," Fresno ranch owner.[27]
    - The longer the drought lasts, more fields will be fallowed or used for other purposes (photovoltaics - PV); more energy will be needed to extract water from wells.[28]

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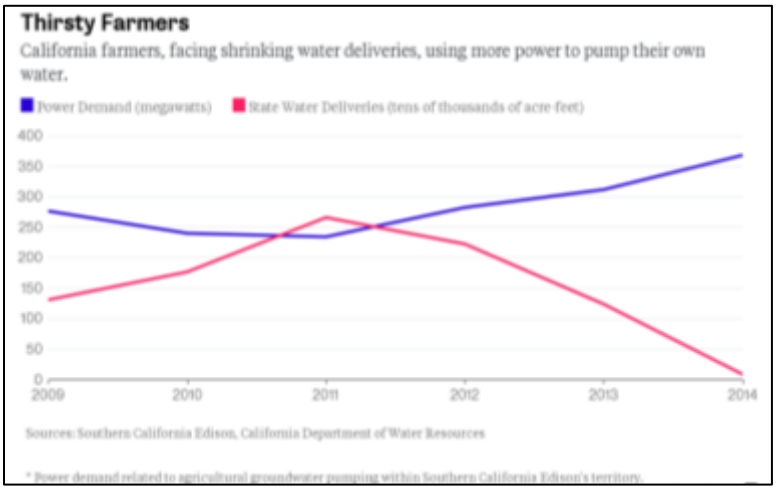
[20] *Indoor Crop Production Feeding the Future,* Newbean Capital, March 2015.
[21] *Id.*
[22] *Id.*
[23] *As Pot Growing Expands, Electricity Demands Tax U.S. Grids*, Bloomberg, Dec. 2015
[24] *Regulating Pot to Save the Polar Bear: Energy and Climate Impacts to the Marijuana Industry*, Gina S. Warren, Columbia Journal of Environmental Law, June 2015.
[25] "In Parched California, a Farmer's Market is Emerging for Power," Bloomberg, September 2, 2015.
[26] *Id.*
[27] *Id.*
[28] Ag Irrigation Overview – SCE Water Energy Summit, November 2014.

Figure 2. Farm Power Demand and State Water Deliveries



- Production/job loss due to reduced acreage.[29]
- Increased conversion of fields to power production (PV). [30]
  - Increase in Net Energy Metering due to increased PV may prevent SCE from providing Ag EE Opportunities such as Pump Testing services, since only kWh sales from SCE's grid can participate in EE programs.
- Increase in acceptance and adoption of technology solutions to sustainability challenges (sub-surface irrigation, greenhouses, photovoltaic systems).[31]
- Trend is towards higher water efficiency irrigation systems (and thus less pumping and electricity requirements).[32]
- Certain crops have a high productivity barrier to more efficient irrigation systems, so transitioning to other crops may be the only water-efficient option.[33]
- Decision to change irrigation systems is complicated, based on dynamic market conditions.[34]
- Generations of farmers have done it a certain way; there may be a barrier to change.[35]
- Need to avoid the perception of a "non-farmer telling a farmer how to farm" issue.[36]

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29 *Id.*
30 *Id.*
31 *Id.*
32 *Id.*
33 *Id.*
34 *Id.*
35 *Id.*
36 *Id.*