

Chapter 14. International Trade and California Agriculture

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Abstract

A large share of California's agricultural supply chain is devoted to international trade. On average, more than 44 percent of California's agricultural output is sold into over 60 foreign markets, making California agriculture more orientated towards export markets, compared to other major agricultural producing states in the USA. This means that California agriculture has a big stake in more liberalized agricultural trade, unlike some other regions in U.S. agriculture. The dynamics of the world market have encouraged California agriculture to be highly competitive and innovative. It has achieved these characteristics by exporting fruits, vegetables, tree nuts, and dairy products.

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Introduction

This chapter summarizes the importance of international trade for California’s agricultural sector. It outlines the trade dimensions, trade environment, challenges, and prospects for the continued role of international trade as a driver of California agriculture. We briefly discuss what it means for California agriculture to be “competitive” in an increasingly globalized marketplace. We review the importance of the state’s key agricultural trading partners, including the role of China as both a market and a competitor. Foreign markets are growing in importance for California agriculture, and increased trade liberalization will be beneficial to most California producers since they competitively supply high-valued specialty products, despite facing some important and, in some cases, growing barriers to trade in important foreign markets.¹

Historically, the major crops in California (i.e., fruits, vegetables, and tree nuts) have not benefitted from federal farm programs and other forms of protectionism provided by U.S. Congress to the main program commodities (such as grains, oilseeds, cotton, sugar, and milk). We, therefore, argue that California agriculture would benefit from reduced subsidies to Midwestern U.S. agriculture and concomitant increased access to markets abroad. Thus, to the extent that the political fallout from the protectionist 2014 U.S. Farm Bill results in a less ambitious World Trade Organization (WTO) agreement, this is costly for the California agricultural sector. The 2017 U.S. withdrawal from the Trans-Pacific Partnership (TPP)—with 11 trading nations in the Pacific Region—has also hurt California agriculture. The future of the North American Free Trade Agreement (NAFTA) is also uncertain, and this is an issue for California agriculture.

Globalization describes the phenomenon of greater integration of international markets, including more cross-border movement of goods, services, and factors of production (such as capital, technology, and labor).

Classical economic theory predicts benefits to economies as a whole from the integration of markets. The benefits arise because factors of production like land, labor, and capital will be allocated more efficiently across international borders, and consumers have access to a wider variety of products at a lower price. Put another way, trade allows a region to shift its pattern of production so that it can produce more with the same endowment of resources—just like technological change, which allows a country to do more with less. Historical examples bear out economists’ predictions; production for international markets rather than the domestic market alone has led to rising average incomes and higher profitability for firms.

Some fear that California’s agricultural future is bleak because of globalization. They even go so far as to claim that without protection, California agriculture will go out of business, because it cannot compete with developing countries. This view emphasizes that agriculture is becoming less important in the state’s economy, and the lower wage rates and weak domestic regulations in developing countries means California growers’ costs will be too high to compete successfully internationally.

However, neither low wage rates nor weak domestic regulations in developing countries mean an end to California agriculture. The fact that California agriculture continues to thrive despite trade barriers in foreign markets underscores the fact that California agriculture remains efficient and competitive.² Productivity growth in California agriculture has been relatively high, holding costs down. California farmers reduce the unit costs of production by substituting capital and technology for land and labor. A recent analysis suggests that California agriculture productivity grew at about 1.7 percent per year from 1980–2004,³ faster than most of U.S. manufacturing.

2 See McCalla and Johnston for an excellent discussion of the booms and busts that California agriculture has experienced.

3 <https://www.ers.usda.gov/data-products/agricultural-productivity-in-the-us/>

1 Beckman et al. report that sanitary and phytosanitary trade barriers and other non-tariff barriers to trade in agricultural products are growing, with increasing international disagreement over the scientific basis for rejecting imports.

Several other trends also work in favor of California agriculture. There is a continuing shift in global food demand towards high-value, differentiated products like those produced in California. For instance, the U.S. Department of Agriculture (USDA) projects U.S. agricultural exports; and the latest projections (2017) support the view that world demand for California agricultural products will continue to expand. The USDA projects that U.S. dairy and horticultural exports will grow by 71 and 38 percent, respectively, from 2015 to 2025. This is a very high growth rate compared to a number of other agricultural products.

Economies of scale and technological “spillovers” in California agriculture, which are not as common in other regions of the world that produce specialty crops, help to keep California’s production costs low. The state has a dependable climate, cutting-edge technology, advanced human capital, productive labor, and world-class marketing networks, institutions, and infrastructure. As a result, agricultural producers using these inputs are likely to compete successfully in an increasingly globalized marketplace. For example, the U.S. (led by California) is the largest exporter of horticultural products in the world,⁴ despite their generally labor-intensive nature. Tree nut exports to Asia have been especially strong. California almond exports were valued at \$5.1 billion in 2015, compared to only \$0.65 billion in 2000—an exceptional growth in production and export sales. In California, (bearing) almond orchards now cover more than 1 million acres, up from 510,000 acres in 2000.

Despite these trends, not all crop and livestock producers in California will benefit from increasing globalization. The cost of production for specific agricultural products may indeed be higher in California than in foreign countries. However, for more than one reason, this information alone gives little guidance as to the competitiveness of California’s agricultural sector. First, comparing the cost of garlic production in California to the cost of garlic production in China, for example, obscures the point that today’s garlic growers need not grow garlic tomorrow. A structural transformation within the sector, towards

products that capitalize on the state’s strengths, will allow California agriculture to most effectively meet the challenges and opportunities of globalization.

Second, marketing costs, including transportation, are often a high share of total delivered costs. This makes foreign suppliers much less competitive during California’s production season for many fresh commodities. Indeed, even for many crops with a high import share, most of the imports enter off-season; the advantage of other countries is not cost, but climate. California firms can and do exploit the state’s climatic advantages by shifting fruit and vegetable production towards fresher rather than processed products. The state has also moved out of field crops towards more and more tree nuts. More generally, increased trade exposes producers to more competition; the most efficient and productive growers and firms will do the best.

4 Defined by three broad categories: i) vegetables, ii) fruits and nuts, and iii) processed vegetables, fruits, and nuts.

California's Agricultural Trade

California's agricultural trade is characterized by: (1) a large and growing share of exports relative to production, (2) a diversity in exports that matches changing global food demand, (3) significant sales to rich-country markets and high-income consumers, despite trade barriers in these markets, and (4) new competition for access to these markets from Mexico, China, and other temperate-zone emerging food exporters.

Compared to agricultural commodity producers in other states, and with some notable exceptions, California agriculture competes largely on its own merits in a complex and dynamic global environment; but managing foreign competition and accessing protectionist markets remains a challenge. California agricultural producers rely on foreign markets for a significant portion of their revenues. Table 1 reports that the value of California agricultural exports total about \$22 billion, or about 44 percent of the value of agricultural commodities produced in California (almost \$50 billion)—based on a five-year 2012–2016 average.⁵ The second largest agricultural

Table 1. Summary Statistics: Top 5 Agricultural States, 2012–2016 Average (\$ million)

State	Agricultural Production	Agricultural Exports	Export Share
CA	\$49,985.0	\$22,076.9	44.2%
IA	\$29,513.1	\$10,682.4	36.2%
NE	\$23,287.2	\$6,637.2	28.5%
MN	\$19,104.8	\$7,256.0	38.0%
TX	\$22,740.6	\$6,173.0	27.1%

Source: compiled from <https://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/> and <https://www.ers.usda.gov/data-products/state-export-data/>

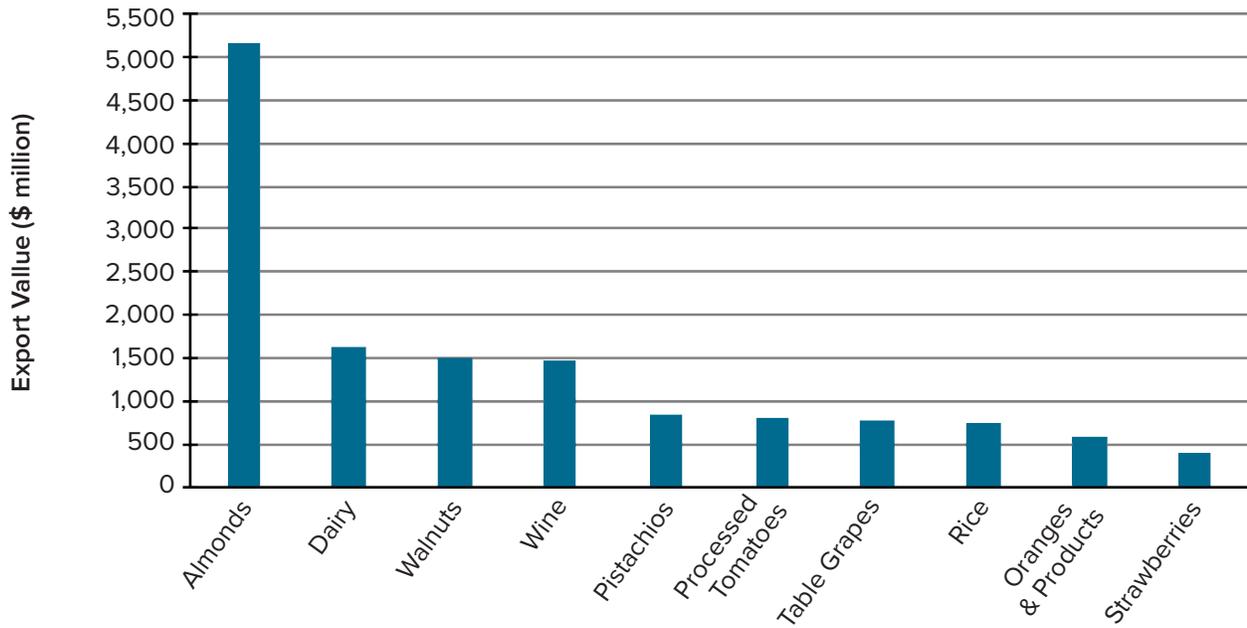
state in the USA, Iowa, produces about \$29 billion in agricultural products per year and exports about 36 percent of that production to international markets. While California generates 13 percent of national farm cash receipts, it accounts for an estimated 16 percent of total U.S. agricultural export revenue.⁶ Keep in mind for some products the share of state output that is exported ranges up to 70 percent, for example in the case of tree nuts.

California exports a wide variety of high-value, specialty food products. As shown in Figure 1, according to the California Department of Food and Agriculture (CDFA), the top six food product exports from California in 2015 (and for most recent years) were almonds, dairy products, walnuts, wine, pistachios, and processed tomatoes. Tree nuts (almonds, walnuts, and pistachios) are the No. 1 agricultural product group exported by California, but the diversity of California's exports is also an important industry characteristic. The top 10 products account for less than 70 percent of California's agricultural exports by value. Even when exports are aggregated into commodity groups, the range of products exported by California is notable (see Figure 2). According to available estimates of state-level trade statistics, fruit exports (excluding wine) comprise 17 percent of the state's agricultural exports, followed by tree nuts (33 percent), vegetables (13 percent), animal products (7 percent), wine (7 percent) and field crops (6 percent).

5 Data analyses in this chapter are constrained by the fact that detailed state-level trade data are very limited. For example, there are no reliable data on California's agricultural imports. Almost all trade data are collected at the national level rather than the state level. However, the California Department of Food and Agriculture (CDFA) and the U.S. Department of Agriculture (USDA) do estimate state-level export values. The USDA method uses state exports based on U.S. farm-cash-receipts data, under the assumption that California's share of U.S. exports for a particular commodity is equal to California's share of national production for that commodity. The CDFA uses a slightly different method and provides a more disaggregate breakdown of the commodities compared to the USDA data. The USDA estimates can be found at: <https://www.ers.usda.gov/data-products/state-export-data/>. The CDFA estimates (in conjunction with the UC Agricultural Issues Center) can be found at <https://www.cdfa.ca.gov/statistics/PDFs/AgExports2015-2016.pdf>. The resulting estimates of aggregate exports are quite similar from the two sources. For instance, for 2015, the CDFA estimated California's agricultural exports to be \$20.69 billion, and the USDA estimate was \$21.4 billion. Both sources estimate that the agricultural industry in California exports about 44 percent of its production, based on value. However, for some specific commodities, the export estimates are substantially different. The CDFA estimated dairy (and products) exports to be \$1.632 billion in 2015, whereas the USDA estimated California dairy product exports to be \$922.7 million in that same year. This discrepancy is not surprising because California is only one of several dairy states and it is difficult to apportion the percent of state production exported overseas. Alternatively, almost all of the U.S. almonds, pistachios, and walnuts are produced in California, so for these products, the estimated California exports are most likely very accurate. Hereafter, when we refer to CDFA export estimates, please note these estimates are published in conjunction with the University of California Agricultural Issues Center.

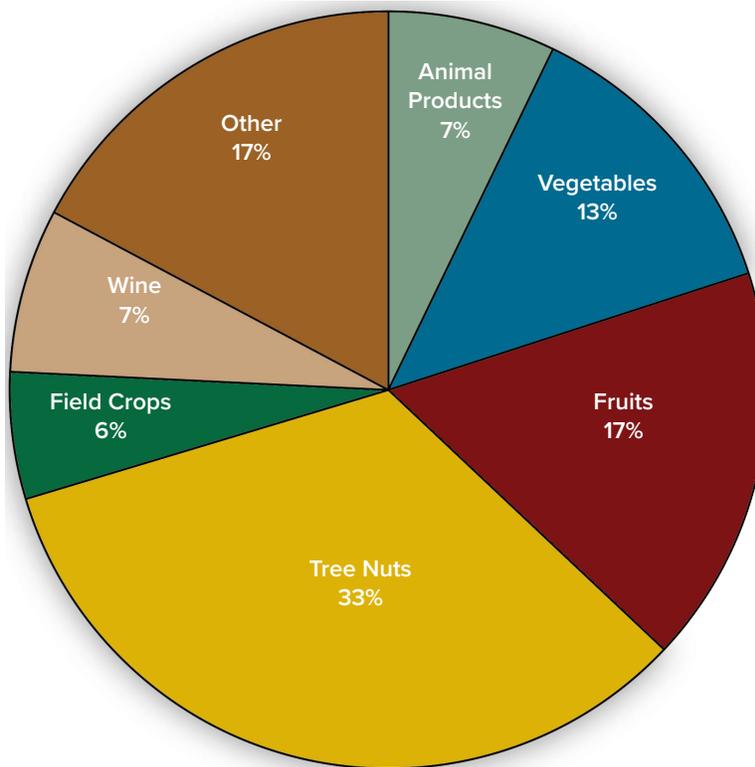
6 <https://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/>

Figure 1. California's Main Agricultural Exports, 2015



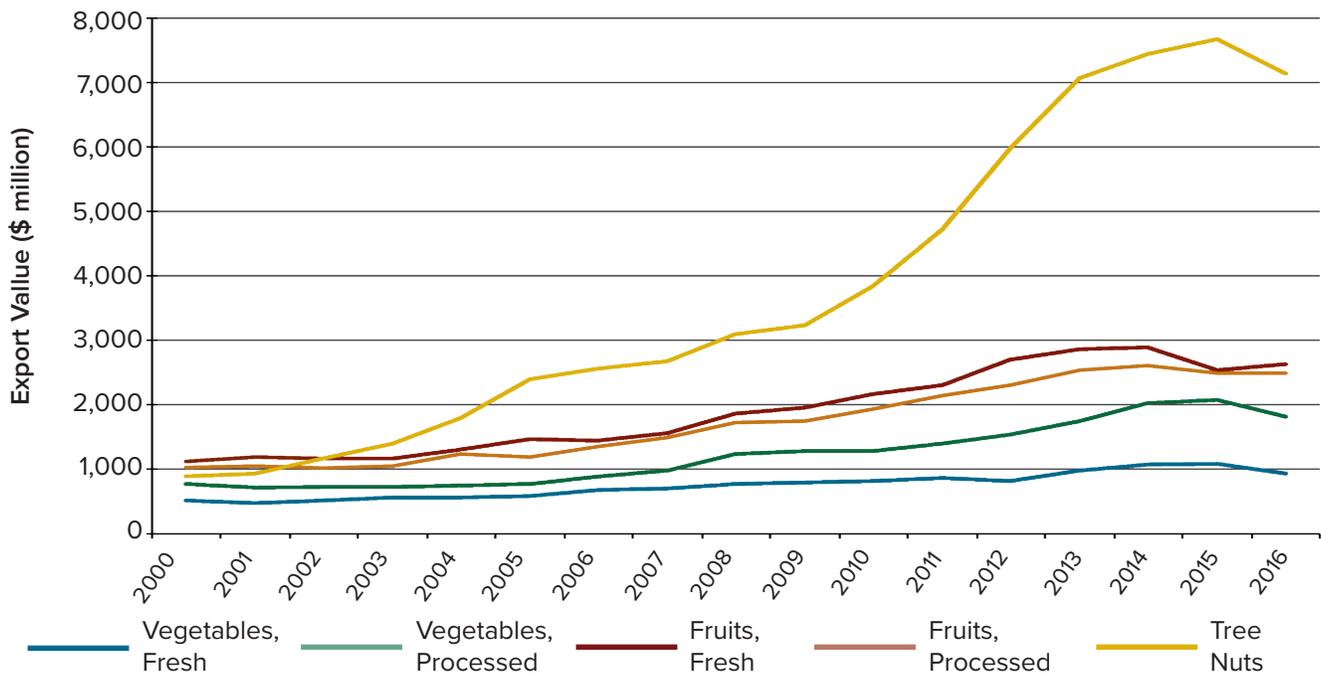
Source: UC Agricultural Issues Center, California Department of Food and Agriculture <https://www.cdfa.ca.gov/statistics/PDFs/AgExports2015-2016.pdf>

Figure 2. California Agricultural Export Values (nominal values), (\$ million)



Source: Compiled from <https://www.ers.usda.gov/data-products/state-export-data/>

Figure 3. California's Main Agricultural Exports, 2015



Source: Compiled from <https://www.ers.usda.gov/data-products/state-export-data/>

There have been significant changes in the make-up of California's agricultural exports in the past 15 years. For instance, in 2002 cotton was the second most important export commodity, and now it does not rank in the top 15. Table grapes moved down from the top four to the top seven. At the same time, exports of dairy (and products), walnuts, and pistachios have moved up the rank of top export commodities. Over the past 15 years, the relative importance of tree nuts as a share of the state's agricultural exports has increased from 15 to 33 percent. In fact, tree nuts are also the nation's third-largest agricultural export, with soybeans and corn No. 1 and No. 2, respectively. The share of (fresh and processed) vegetables in California exports rose from 9 to 13 percent. At the same time, the share of exports accounted for by fruits and products (excluding wine) fell from 25 to 17 percent. There was a dramatic change in the role of field crops, falling from 17 percent of exports in 2002 to only 6 percent in 2017.

Figure 3 further illustrates, these trends in the make-up of the state's agricultural exports. In the early 2000s, the value of tree nut exports began to break away from the value of fruit and vegetable exports, and tree nut export sales rose much more rapidly, from \$2.4 billion in 2005 to \$7.1

billion by 2016. Figure 3 shows that export growth in fresh fruits has outperformed export growth in fresh vegetables. The differential growth rate between processed fruits and processed vegetables is less, but the percentage growth in processed fruit exports has exceeded the growth in processed vegetable exports.

This assortment of agricultural exports from California differentiates the state from other important agricultural states in the U.S., which tend to specialize in only a few commodities. The agricultural sector in Iowa and Illinois is concentrated on just three commodities: corn, soybeans, and hogs, which account for 75 to 85 percent or more of each of those states' farm cash receipts. Nebraska's production of corn and cattle generates over 75 percent of that state's farm receipts. Texas depends on the cattle sector, which produces over 40 percent of its farm cash receipts, with cotton generating another 10 percent.⁷

A notable development for California agriculture has been the dramatically increased dependence on international trade. As shown in Table 2, international exports as a share

⁷ The figures are compiled from <https://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/>

Table 2. California's Growing Dependence on International Trade

	Value of CA Ag Production (\$ billion)	Value of CA Exports (\$ billion)	Export Share
2000	\$27.19	\$6.85	25.2%
2005	\$34.56	\$9.67	28.0%
2010	\$40.68	\$15.37	37.8%
2015	\$52.17	\$22.45	43.0%

Source: Agricultural Production from USDA/ERS Farm finance indicators State ranking: <https://data.ers.usda.gov/reports.aspx?ID=17839>

Value of exports from: <https://www.ers.usda.gov/data-products/state-export-data/>

of California agricultural output rose from 25.2 percent in 2000 to 43 percent in 2015. On the one hand, this is positive because it reveals that California agriculture is dynamic and responsive to changing market conditions. The shift away from field crops into tree nuts is no doubt partially driven by export opportunities. On the other hand, the increased trade dependence exposes California agriculture to the vagaries of the world market, which is more unpredictable than the domestic market. Exchange rates, trade agreements, third market competition, and protectionism in foreign markets all come into play in the international market. Perhaps this is no more evident than in the case of the downturn in the global dairy market that

began in 2013. The USDA estimated the value of California dairy exports fell from \$1.27 billion in 2013 to \$825 million in 2016, a 35 percent drop.⁸ This was partly due to the EU removing its dairy production quotas, a relatively strong U.S. dollar relative to competitor currencies (Australia, New Zealand, and the EU), a drop in China's import demand, and a Russian import embargo.

As of 2015, leading export destinations for California agricultural commodities included the European Union (\$3,896 million), Canada (\$3,446 million), China and Hong Kong (\$1,726 million), Japan (\$1,591 million), Mexico (\$1,059 million), South Korea (\$974 million), and Taiwan (\$305 million). This is not surprising because the top five markets for U.S. agricultural exports are Canada, Mexico, the EU, China, and Japan. Major agricultural products sent to these key markets are summarized in Table 3. This table again shows the diversity of California's exports, but also suggests that products are targeted to different markets; each market is dominated by a different set of products, with little overlap between them.

In 2015, almond exports from California were primarily destined for the EU (38 percent), China/Hong Kong (10 percent), India (10 percent), Japan (6 percent), and Canada (6 percent). Most of the walnuts in 2015 were sold into the

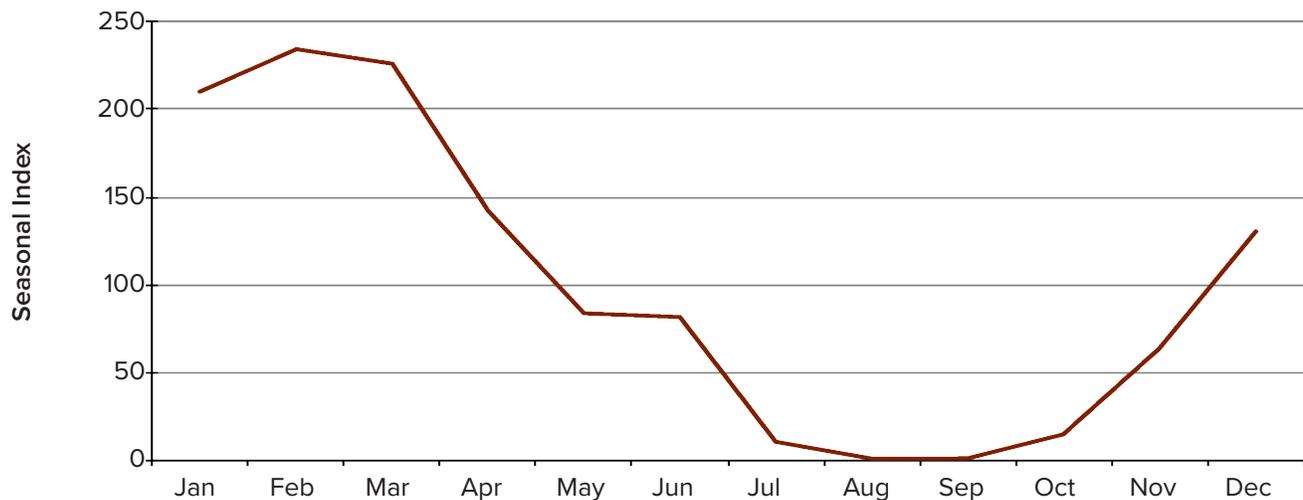
⁸ <https://www.ers.usda.gov/data-products/state-export-data/>

Table 3. California's Major Export Markets, 2015 (\$ millions)

EU	Canada	China/Hong Kong	Japan	Mexico	S. Korea
Almonds (1,977)	Wine (380)	Almonds (529)	Almonds (322)	Dairy (454)	Almonds (214)
Wine (611)	Proc. Tomatoes (305)	Pistachios (178)	Rice (278)	Almonds (105)	Oranges (164)
Walnuts (444)	Almonds (304)	Dairy (154)	Hay (122)	Table Grapes (92)	Rice (132)
Pistachios (429)	Lettuce (280)	Wine (146)	Walnuts (117)	Proc. Tomatoes (91)	Walnuts (114)
Proc. Tomatoes (105)	Strawberries (278)	Walnuts (144)	Beef (102)	Nursery (38)	Beef (72)
Total* (3,896)	Total* (3,466)	Total* (1,726)	Total* (1,591)	Total* (1,059)	Total* (974)

Source: UC Agricultural Issues Center, California Department of Food and Agriculture, <https://www.cdfa.ca.gov/statistics/PDFs/AgExports2015-2016.pdf>

Note: Total dollar value is for all commodities exported to each region, not just those listed in the table.

Figure 4. Seasonality in U.S. Fresh Strawberry Imports

Source: Compiled for *Trade Data Monitor* raw import statistics. HTS 0810.10

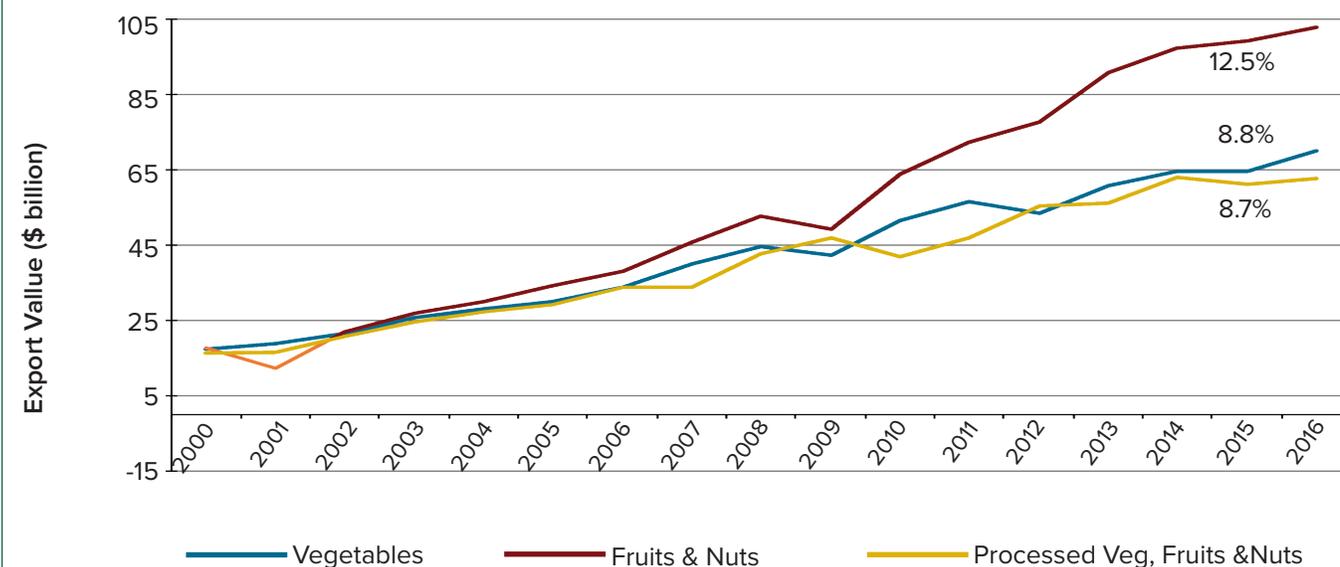
EU, Turkey, China and Hong Kong, Japan, South Korea, Vietnam, and Canada. The EU serves as the major market for California wine, followed by Canada, China/Hong Kong, and Japan. Canada and Mexico imported 42 percent of California's table grapes in 2015, with Canada buying 30 percent alone. The EU, China/Hong Kong, and Canada are the largest importers for California pistachios (accounting for 80 percent of export sales). Processed tomato exports were shipped primarily to Canada (37 percent), the EU (13 percent), and Mexico (11 percent). A large share of the rice exports from California (37 percent) was sold to Japan, with S. Korea and Jordan purchasing 18 and 11 percent of rice exports, respectively.

California's integration into world agricultural markets is not unidirectional. Residents of the state also consume significant amounts of agricultural imports. For commodities not grown in the U.S., such as cocoa, coffee, and bananas, California relies entirely on imports. While data on import value by state is not readily available, we can estimate the sense of the magnitude of import consumption by relying on the proportion of the U.S. population residing in California (12 percent in 2016). In 2016, the U.S. as a whole imported beef and veal worth \$4.8 billion, \$5.1 billion worth of cocoa and related products, \$6.0 billion worth of coffee and related products, \$2.3 billion worth of bananas and plantains, and \$1.8 billion worth of cane sugar. If 12 percent of these products were destined for California, then consumers in this state spend

about \$2.4 billion on imports of these commodities alone.

As mentioned above, there is strong seasonality associated with U.S. exports and imports of agricultural products produced in California. For instance, in the winter months, California's production of some fresh products, such as strawberries, declines due to the relatively cold weather. Figure 4 illustrates the seasonal pattern of U.S. strawberry imports for 2014–2016. We calculate the seasonal index by expressing the average volume of imports for each month as a percentage of the overall monthly average import volume (for all months combined) over the entire time period. For the time period covered in Figure 4, in January the three-year average import volume was 27.421 thousand metric tons. At the same time, the overall monthly average import volume for all months was 13.038 thousand metric tons. Therefore, the January index is $(27.421 / 13.038) * 100 = 210.3$. In other words, the January import volume was 210 percent above the typical monthly import volume over the time period (2014–2016). We see from Figure 4 that U.S. strawberry imports are typically high in December, January, February, and March, when the California harvest is dormant. Imports then drop off to almost zero in the summer months when the California harvest of fresh strawberries is in full swing.

Figure 5. Average Growth in Global Trade in Horticultural Products, 2006–2016



Source: *Trade Data Monitor*. Vegetables HTS 07, Fruits and Nuts HTS 08, and Processed Vegetables, Fruits and Nuts HTS 20

Global Agricultural Trading Environment Relevant to California

Over the last decade (2006–2016), the nominal value of total U.S. agricultural exports grew by about 90 percent, while California’s agricultural exports increased by about 106 percent. The fortunes of California’s commodities have been mixed; exports of some commodities important to California grew more rapidly, while others rose less rapidly than the national average. Over this time period, the nominal value of California dairy exports increased by 135 percent and fresh vegetable exports increased by only 39 percent. On the other hand, tree nut exports expanded by about 180 percent in value.⁹

Figure 5 displays the annual growth in the dollar value in international trade in horticultural products. From 2000 to 2016, trade in vegetables grew from \$17.4 to over \$70 billion per year. At the same time, trade in fruits and nuts increased from \$17.7 to \$102.8 billion, and processed fruits, nuts, and vegetables grew from \$16.3 to \$62.7 billion. The trade growth rate in fruits and nuts was most impressive, increasing by 12.5 percent per year, on average. The other two categories shown in Figure 5 experienced trade growth

close to 9 percent per year, which is very high compared to most non-agricultural products.

California agriculture is suited to supply agricultural products whose markets are experiencing strong demand growth due to international trends in income, urbanization, heightened food safety, and healthy lifestyles. The summary statistics in Table 4 document that the U.S. is the world’s largest export supplier of the combination of fruits, vegetables, and tree nuts, and most of these crops originate in California and Florida. However, Florida does not export tree nuts. Although the state-level export data are imprecise, the USDA estimates that California exports about 38 percent of the nation’s vegetables (fresh and processed) and accounts for 58 percent of the nation’s fruit exports (processed and fresh). The figures for Florida are 6 percent of the vegetable exports and 8.5 percent of the fruit exports.¹⁰

As shown in Table 4, the USA is very dominant in the global fruit and nut market, with annual exports totaling \$14.46 billion, on average, from 2014–2016. Spain ranks second with exports of \$9.12 billion. Alternatively, China is dominant in the exports of vegetables, supplying \$9.27

⁹ <https://www.ers.usda.gov/data-products/state-export-data/>

¹⁰ Compiled from <https://www.ers.usda.gov/data-products/state-export-data/>

Table 4. Major Exporters of Fruits, Vegetables and Tree Nuts (\$ billion) (2014–2016 average)

Exporter	Vegetables	Fruits & Nuts	Processed Vegetables, Fruits & Nuts	Total
USA	\$4.52	\$14.46	\$8.23	\$27.22
China	\$9.27	\$4.99	\$9.81	\$24.06
Spain	\$6.28	\$9.12	\$5.18	\$20.58
Netherlands	\$7.30	\$5.35	\$5.05	\$17.69
Mexico	\$5.94	\$4.75	\$2.40	\$13.09

Source: Compiled from UN Comtrade, Vegetables HTS 07, Fruits and Nuts HTS 08, and Processed Vegetables, Fruits and Nuts HTS 20, <https://comtrade.un.org/data/>

billion in annual exports. In vegetables, the U.S. ranks fifth on the list, behind Mexico. When it comes to processed vegetables, fruits, and nuts the U.S. ranks No. 2 as a world exporter behind China. If we aggregate all three categories in Table 4 (see right most column), the U.S. nudges out China as the largest exporter with annual sales of \$27.22 billion. Spain, the Netherlands, and Mexico rank behind China. These data indicate that California's strongest export competitors in the world horticultural sector are China, European suppliers, and Mexico. However, some of this competition is outside of the California harvest season.

California agriculture faces a complex international trading environment, characterized by import tariffs and tariff-rate quotas (TRQs), non-tariff trade barriers (such as certain phytosanitary requirements), geographical indicators, fluctuating exchange rates, and lost cost competitors. Increasing foreign export competition and import barriers in foreign markets have raised the importance of further trade liberalization. For instance, the California Farm Bureau Federation supported the TPP¹¹ because it would have likely increased state agricultural exports and farm cash receipts.¹² Liberalizing imports in Japan, Vietnam, Malaysia, and other TPP markets would increase gains from trade. Japan would have likely eliminated its high imports tariffs on oranges, cheese, grapes, avocados,

strawberries, raspberries, blueberries, kiwifruit, and watermelon, and TPP would have harmonized wine import tariffs that now favor Australia and others over California. Within the Asian region, trading partners now have regional trade agreements that give non-U.S. exporters advantages in certain markets. Important for California agriculture, the TPP would have leveled this playing field.

The U.S. International Trade Commission (USITC) (2016) has documented certain areas where California agriculture would have benefited from TPP membership. These include:

- Increased dairy exports to Canada and Japan.
- Increased market access to Japan and Vietnam for U.S. exports of fresh fruits, vegetables, and nuts.
- Increased wine exports to Japan resulting from reduced import tariffs.
- Reduction in the impact of sanitary and phytosanitary (SPS) measures on trade as TPP will require that SPS measures are science- and risk-based and not being used as a protectionist non-tariff import barrier
- Reduction in high tariffs on processed foods exported to Japan, Malaysia, and Vietnam.

In the last 15 years, the most significant agricultural import growth in world markets has been in high-valued and processed food products like those exported from California. From 1995–2014, the share of fruits/nuts and vegetables in world agricultural trade declined slightly while the share of high-value, processed agricultural products increased (Beckman et al., 2017). The fact that fruit and vegetable trade did not increase any faster than total agricultural trade is very surprising given the

11 The Trans-Pacific Partnership (TPP) originally had 12 member countries before the U.S. dropped out. The trade agreement will create a platform for economic integration across the Asia-Pacific region, and will encompass existing free trade agreements (FTAs), such as NAFTA. The U.S. does not have FTAs with all TPP nations, and this was a significant reason why the TPP was a good idea for the United States. The U.S. has no FTA with Brunei, Japan, Malaysia, New Zealand, and Vietnam (all TPP members).

12 <http://www.cbf.com/top-issues#trade>

Table 5. U.S. International Trade in Fruits, Vegetables, and Tree Nuts (\$ billion)

Commodity	2000	2005	2010	2015
Exports				
Vegetables	\$1.89	\$2.42	\$3.78	\$4.36
Fruits & Nuts	\$3.98	\$6.39	\$10.14	\$14.46
Processed Vegetables, Fruits & Nuts	\$2.22	\$2.41	\$3.78	\$5.43
Imports				
Vegetables	\$2.65	\$4.32	\$6.49	\$8.66
Fruits & Nuts	\$3.37	\$4.88	\$7.58	\$12.68
Processed Vegetables, Fruits & Nuts	\$2.68	\$3.90	\$5.48	\$7.22
Net Trade (exports – imports)				
Vegetables	-\$0.76	-\$1.90	-\$2.70	-\$4.30
Fruits & Nuts	\$0.61	\$1.51	\$2.56	\$1.78
Processed Vegetables, Fruits & Nuts	-\$0.46	-\$1.49	-\$1.70	-\$1.79

Source: *Trade Data Monitor*, Vegetables HTS 07, Fruits and Nuts HTS 08, and Processed Vegetables, Fruits and Nuts HTS 20

growing per-capita demand in developed and transition countries for fresh fruits and vegetables. The stagnant share of fruit and vegetable trade no doubt reflects the high level of protectionism around the world for these food categories. For instance, two-tiered tariffs known as tariff-rate quotas (TRQs) are commonly used to restrict imports of fruits and vegetables. Worldwide, there are more than 350 TRQs placed on fruits and vegetables, and more than 25 percent of all agricultural TRQs are concentrated in the fruit and vegetable trade (Skully, 2001), which critically affects California agriculture.

As an exporter of high-value food commodities, California must contend with the fact that import tariffs in important markets, such as the EU, are generally higher on processed agricultural products than on the primary commodities. This tariff wedge between a processed commodity (e.g., processed fruit) and its corresponding primary commodity (e.g., fresh fruit) is referred to as tariff escalation, and this poses a significant obstacle to California exports. Tariff escalation produces a trade bias against processed agricultural and value-added products. There is general evidence of tariff escalation in OECD countries (such as Australia, Canada, the EU, and New Zealand), especially for fruits, vegetables, and nuts, which are major California

exports. For many countries, bound¹³ tariffs tend to be higher for processed agricultural products than for unprocessed products, and many importers also practice discriminatory trade behavior, favoring domestic products over imported products. For example, in 2017, the United States launched a trade enforcement action against Canada at the WTO, challenging regulations that discriminate against the sale of U.S. wine in grocery stores. In 2018, Australia initiated a similar WTO case against Canada over trade discrimination in the wine market.

On the import side, the vast majority of U.S. agricultural imports are classified as high-value products, as opposed to bulk commodities. The top horticultural imports by value are legumes, fresh and processed vegetables, processed fruits, nuts, grapes, apples, and citrus. Table 5 shows that the U.S. international trade deficit in vegetables grew (in nominal dollars) from \$760 million in 2000 to \$4.3 billion in 2015. The trade deficit in processed vegetables, fruits, and nuts also grew (from \$460 million to \$1.79 billion), but if we adjust for inflation, the increase is minimal. Turning to fruits and nuts in Table 5, the U.S. trade surplus increased from \$610 million to \$1.78 billion.

¹³ A bound tariff is the maximum import duty allowed by the WTO for imports from any member state.

One way to interpret the trade statistics in Table 5 is to conclude that California's horticultural exports (especially fruits and nuts) have helped to lower the U.S. trade deficit in fruits and vegetables. Although the U.S. share of total world agricultural exports has fallen (Beckman et al., 2017), from 23 percent of global value in 1995 to 12.5 percent in 2013, the agricultural industry in California has lessened the drop.

NAFTA

The North American Free Trade Agreement (NAFTA) has impacted California agriculture in a positive way by reducing agricultural trade barriers on the continent. It has improved competition and facilitated foreign investment by California agribusiness in farm production and food processing in Mexico. The trade agreement was signed by the United States, Canada, and Mexico on January 1, 1994, and this trade pact has benefitted producers and consumers in all three member countries. As a result of NAFTA, the agricultural sectors in North America have become more integrated, leading to more trade in a wide range of agricultural products, substantial levels of cross-border investment, and regional changes in production that have lowered costs (Zahniser et al., 2015).

U.S. farm exports to Canada and Mexico rose from \$8.9 billion in 1993, before NAFTA implementation, to \$38 billion in 2016. In 2016, the U.S. exported \$17.6 billion in agricultural products to Mexico and \$20.4 billion to Canada. Canada is the No. 2 market for California agricultural exports and Mexico ranks fifth. Canada and Mexico account for about 20 percent of California's agricultural exports. On the import side, Mexico and Canada are both large suppliers to the U.S.; in 2016, the U.S. imported \$22.5 and \$21.4 billion in agricultural products from these two countries, respectively.¹⁴

At the outset of NAFTA, there was significant opposition to the agreement from U.S. agriculture. Opposition came from producers of wheat, sugar, peanuts, citrus, and winter fruits and vegetables (Orden, 1996). Some agricultural interests in California opposed NAFTA because of fear of competition from low-wage Mexican agriculture in the

production of labor-intensive crops. Proponents argued that NAFTA would enhance the competitiveness of California's agriculture.

Factor price equalization lay at the root of the debate over the effects of liberalized trade on the competitiveness of California agriculture precisely because a large percentage of California's agricultural production is labor-intensive, using a relatively high proportion of labor relative to other inputs such as land and capital. This includes the production of fruits and vegetables, nuts, and various horticultural crops, where labor costs are a relatively high percentage of total production costs.

Despite protectionism on both sides of the border, NAFTA led to freer trade and more cross-border investment between the U.S. and Mexico.¹⁵ For instance, in 1996 the U.S. opened its market to Mexican avocados for the first time in 82 years. Prior to this ruling, phytosanitary rules banned unprocessed Mexican avocados imports and provided considerable protection to California growers. The U.S. decision to import avocados extended beyond that single market and helped to persuade Mexico to reduce import trade barriers on certain fruits.

While the California dairy industry has experienced strong exports sales to Mexico under NAFTA, some of the fruit and vegetable industry (e.g., asparagus) have faced increased competition from rising imports. This suggests that increasing trade flows will entail both risks and benefits for California agricultural producers.

Other Foreign Markets

Despite the fact that Japanese agriculture receives high levels of government support, Japan is also one of the world's largest net importers of agricultural products. The United States supplies roughly 15 percent of Japan's agricultural imports, and in 2016, Japan's agricultural imports from the U.S. were valued at \$11 billion.¹⁶ About 15 percent of these U.S. exports to Japan originated in California. Japan is California's fourth largest export

¹⁵ <https://www.cfr.org/background/naftas-economic-impact>

¹⁶ <https://www.ers.usda.gov/data-products/foreign-agricultural-trade-of-the-united-states-fatus/calendar-year/>

¹⁴ USDA, ERS, *Outlook for U.S. Agricultural Trade*, AES-102, Nov. 30, 2017.

market for agricultural products, with rice, almonds, and alfalfa hay ranking as the top commodities (see Table 3). The U.S. withdrawal from the Trans-Pacific Partnership (TPP) will mean that U.S. agricultural exporters to Japan will be at a competitive disadvantage vis-à-vis Japan's TPP trading partners who will face lower import duties under the TPP.

Japan continues to restrict imports of horticultural products, livestock products, and processed foods, all of which are important exports for California. Under the appearance of phytosanitary concerns, Japan restricts imports of U.S. fresh fruit, vegetables, and other horticultural crops, keeping Japanese domestic prices of horticultural products artificially high. Government subsidies encourage farmers to divert land out of rice production and into vegetables. Japan also has country-of-origin labeling requirements for agricultural products, which principally affects fruits, vegetables, and animal products and acts as a non-tariff barrier to trade. Japan maintains high tariffs on beef, citrus, and processed foods. In addition, imported, high-quality California rice is strictly controlled and rarely reaches the consumer food table in Japan. The over-quota rice tariff in Japan exceeds 400 percent.

In the case of fresh oranges and lemons, the U.S. (primarily California and Arizona) is the largest supplier to Japan, accounting for over 80 percent of Japan's imports. Other exporters of oranges and lemons of lesser importance in Japan are Australia, Chile, and South Africa. The Japanese government continues to impose a high import tariff on fresh oranges. The tariff rate is 32 percent for imports during the December–May period, (during the marketing season for domestically produced citrus) and 16 percent during June–November.¹⁷ Japan's import tariffs on table grapes are also relatively high—17 percent from March to October. Import tariffs on wine can range up to 57.7 percent. California is a large supplier of processed fruit to Japan (such as raisins, prunes, and frozen strawberries) and California competes directly with China and other Asian exporters in the Japanese market.

An ongoing trade dispute between the U.S. and the EU concerns the use of geographical indicators (GIs),

especially for wine and dairy products. For instance, the EU has over 2,800 wine GI registrations.¹⁸ While some GIs are allowed under WTO rules, the EU wants to extend the list of protected products and prohibit foreign producers of food and beverage products from labeling products with European regional names on hundreds of cheeses, meats, and spirits (e.g., French Champagne and Chablis wine, Italian Parma ham, or French Roquefort cheese). The list of products that will receive this protection is an ongoing subject of negotiations at the WTO.

For California, there is a trade-off associated with GI protection. On the one hand, California would have to stop exporting products using certain names if the EU is successful (e.g., Basmati rice or Feta cheese as these names refer to regions of other countries). This means that U.S. Feta cheese (for example) could not be exported to the EU because any Feta cheese sold in the EU must originate from regions with GI certification. On the other hand, California agriculture could use GI protection to develop niche markets for its food and beverage products, potentially capturing a price premium. In fact, the Napa Valley wine growers support the EU attempt to expand the use of GIs in the U.S. market.¹⁹ The TPP will address the regulation of GIs in the Pacific region. Regional free trade agreements that include GI protections but exclude the U.S. can and will affect U.S. trade with that region.

California's agricultural industry is carefully watching developments in China's agricultural trade. China's land area sown to fruits, nuts, and vegetables has grown rapidly in the past decade and trade is expected to take on a greater importance for China in coming years. China's horticultural exports account for a large share of its agricultural exports. Given China's rich agricultural resources, abundant labor supply, and large population, it has great potential to play a much more prominent role in agricultural trade in the coming years, as both an exporter and an importer.

China uses both tariff and non-tariff barriers to restrict agricultural imports. China has in place import tariffs on certain agricultural commodities currently exported by

18 See R. Johnson, 2017

19 See R. Johnson, 2017

17 USDA, FAS GAIN Report, JA7150, Dec. 2017

California, such as citrus, table grapes, wine, beef, and dairy products. China has import tariffs on citrus and table grapes of approximately 10 percent and maintains a restrictive tariff rate quota (TRQ) on cotton.

Domestic developments in China, not directly related to trade policy but related to rising incomes, present opportunities for California agricultural exports. For example, the growing importance of Western-style supermarkets in Chinese cities may present a new opportunity for California producers to supply pre-packaged or processed products and products that require refrigeration. Another example of the effect of increasing incomes on potential demand for California products is the increasing popularity of wine among China's urban middle class.

China has become a serious export competitor with the U.S. in third markets for horticultural products. This is partly a result of the relative size of the two countries; the harvested area of fruits and vegetables in China is about 22 million hectares, or seven times the U.S. area for these products. As China's agricultural sector moves away from its historical focus on land-intensive grains and concentrates more on labor-intensive cash crops, markets in other parts of Asia will be subject to increased competition from China. The U.S. response to China's production and exports of these products will affect how competition from China impacts California producers.

A skirmish over the garlic market was an example of the policy response to the emergence of China as a competitor. California accounts for over 80 percent of U.S. garlic production but experienced competition from China in the mid-1990s. U.S. imports of Chinese garlic increased from about 3 million pounds a year in 1992 to 64 million pounds by 1994. This raised concerns among California producers. California garlic growers lobbied and won import relief from Chinese imports in 1994, when the U.S. government issued an antidumping order and imposed a 376 percent tariff on garlic imports from China.

Garlic production in California is highly concentrated, with less than 10 producers accounting for about 80 percent of the annual harvest. These growers joined together to seek protection from foreign competition, and they were quite successful at first. China eventually regained its

market share after the antidumping case. In 1994 when the case was initiated, the value of U.S. imports of garlic from China decreased from \$11.9 million to \$4.1 million, a drop of 65.5 percent. However, while China's exports to the United States fell to \$250,000 in 1995, Mexico's exports nearly doubled to \$20 million, and Argentina's exports increased by an additional 19 percent to \$3.9 million. Today, China is once again the No. 1 foreign supplier of garlic to the U.S., and imports from China totaled \$145 million in 2016. Other large suppliers to the U.S. include Spain, Mexico, and Argentina.

After joining the World Trade Organization (WTO) in 2001, China increased its trade dependence on agriculture. As of 2015–2016, it was the third or fourth largest exporter and second or third largest importer of agricultural products in the world, according to WTO trade statistics.²⁰ China's import growth has been driven by a shift in its domestic production mix, and changing consumer diets with rising incomes and urbanization. China's substantial increase in fruit and vegetable production is a major factor behind its agricultural export growth. With imports growing faster than exports during the post-WTO accession years, China reversed its long-time status as a net agricultural exporter to that of a net importing country since 2004. Very strong growth in exports of horticultural products (e.g., garlic, apples, pears, and citrus), semi-processed food products (e.g., animal products, pet food), and aquaculture (e.g., fish fillets) have dominated the changing structure of China's agricultural exports.

China is an emerging competitor for U.S. farmers in some specialty crops and China has a positive trade balance with the U.S. on horticultural crops, although the total dollar value is a relatively small share of total agricultural trade. China's growing demand for almonds, pistachios, and walnuts is a positive development for U.S. agriculture. And per-capita consumption of these specialty crops is still very low in China, as Chinese per-capita consumption of almonds is only 5 percent of U.S. levels.

Impediments to foreign market access are an issue for Chinese agribusiness firms. For instance, China's agricultural exports of horticultural products have been

20 <http://stat.wto.org/StatisticalProgram/WSDBViewData.aspx?Language=E>

adversely affected by antidumping (AD) investigations against them launched by firms in both developing and developed countries. Globally, there have been about 23 AD cases against China’s agriculture since that market opened up in the early 1980s, and many of the AD actions in agriculture targeted horticultural products—resulting in very high tariff rates against Chinese firms. Most antidumping cases are nothing more than hidden protectionism. Under U.S. AD law, China is treated as a “non-market economy” and as a result, its exporters have been assessed tariffs higher than typical AD rates applied

to so-called market economies.²¹ U.S. AD cases against China’s exports have targeted imports of fresh garlic, preserved mushrooms, apple juice concentrate, shrimp, and crawfish tail meat. With the exceptions of honey and shrimp, these cases have had mixed success at keeping out Chinese exports for more than a few years. But in each and every case, the U.S. consumer has paid higher prices as a result of the dumping orders.

21 U.S. Government Accountability Office (GAO) “U.S.-China Trade: Eliminating Nonmarket Economy Methodology Would Lower Antidumping Duties for Some Chinese Companies” (10-JAN-06, GAO-06-231).

Table 6: California Market Access Program Allocations

Trade Organization	FY 2018 Award (\$ millions)
Blue Diamond Growers/Almond Board of California	5.007
California Agricultural Export Council	1.012
California Cherry Marketing and Research Board	0.566
California Cling Peach Growers Advisory Board	0.470
California Fresh Fruit Association	0.405
California Prune Board	2.910
California Strawberry Commission	0.148
California Table Grape Commission	3.285
California Walnut Commission	3.910
Raisin Administrative Committee	2.814
Wine Institute	5.526
Cotton Council International	14.589
Sunkist Growers, Inc	1.720
USA Rice Federation/ U.S. Rice Producers Assoc.	2.488
US Dairy Export Council	4.626
Total	49.47

Source: <https://www.fas.usda.gov/programs/market-access-program-map/map-funding-allocations-fy-2018>

Notes: Payments to cotton, rice, and dairy producers are not limited to California. Sunkist products are grown in Arizona and California.

Federal Government Support for California Agriculture

As previously noted, California agriculture receives relatively few subsidies from the federal government compared to other states. Agricultural producers in California received \$425 million in federal assistance in 2016, of this about \$290 million came as crop insurance subsidies. Disaster programs provided \$66.6 million and commodity programs paid \$62.7 million directly to California farmers. The remainder of government payments to farmers came in the form of conservation programs.²²

California agriculture receives less than 1 percent of federal commodity payments even though the state produces about 13 percent of national farm output (as of 2016). Federal subsidies to California have also been on the decline as the total was around \$800 million in 2001. Farms in California receiving these government payments are growing cotton, rice, and wheat. California has dropped in the national subsidy ranking as cotton production in California has waned.

California also benefits from several smaller government programs designed to either explicitly subsidize exports or promote demand for California specialty products in foreign markets. Government programs that help farmers include marketing and promotion programs, crop insurance and disaster assistance, and trade assistance. In addition to the trade-orientated programs, the USDA purchases fruits, vegetables, and tree nuts for domestic distribution under various subsidized meal programs such as the school lunch program and child nutrition programs. Johnson (2014) reported government purchases of fruits and vegetables totaled \$660 million in 2013.

Among the promotion programs, the most important to California producers is the Market Access Program (MAP), and the Foreign Market Development Program (FMD), both of which subsidize market development activities overseas by trade organizations. In addition, the Technical Assistance for Specialty Crops Program (TASC) funds projects that address technical barriers to the export of specialty crops, such as sanitary and phytosanitary trade barriers.

MAP²³ spends over \$49 million per year promoting California crops such as almonds, citrus, kiwifruit, peaches, pears, pistachios, prunes, strawberries, table grapes, tomatoes, tree fruits, and walnuts (see Table 6). The California dairy industry benefits from the FMD program, which spends funds to expand foreign imports of U.S. dairy products.

Economic theory predicts that programs like the MAP or FMD are not cost-effective uses of public budgets; it is difficult to find economic evidence in favor of the MAP. If the private benefits of marketing efforts exceed their cost, firms should find it profitable to undertake these efforts without government assistance. Government assistance uses taxpayers' money to underwrite marketing efforts with high costs relative to benefits. Well-known arguments are made for government support for investments that have "externalities"; that is, benefits that accrue to many groups whether they pay the cost of the investment or not. However, the marketing of name-brand agricultural products is not likely to be such an investment.

23 <https://www.fas.usda.gov/programs/market-access-program-map>

22 <https://farm.ewg.org/region.php?fips=06000&progcode=total&yr=2016>. Twenty-six states received higher total federal government payments to agriculture than California in 2016. Since these states are smaller than California in both area and population, even this ranking understates the extent to which California receives relatively little federal government subsidy to agriculture.

Conclusion

California's agricultural trading environment holds both new challenges and new opportunities. Established markets in developed countries continue to erect non-tariff barriers against imports of California's specialty crops. The rapidly changing Chinese market holds uncertain benefits, but also the promise of new competition. Further trade liberalization in agriculture is a promising avenue for the expansion of California's agricultural trade. As such, California producers should guard against the temptation to support the expansion of domestic U.S. policies and non-tariff barriers that make far-reaching trade liberalization less likely. Farms in other parts of the U.S. can afford to be protectionist because they are not so dependent on foreign markets; California growers have no such luxury.

Coordinated liberalization does expose California growers to new competition from Mexico and China, especially. Market integration may also lead to new food safety concerns, as with BSE (i.e., mad cow disease). But higher incomes and urbanization abroad should also translate into increased demand for high-value fresh produce and

wine. Product differentiation is an important competitive strategy for California, which has a reputation as a high-quality producer and increasingly, as a producer of value-added agricultural and food products. As the trend toward adding value continues to unfold, agricultural goods will less and less be homogenous. There are new opportunities for business in emerging markets as well as competitive challenges.

Not all California agricultural producers win from increased trade liberalization. Ending government support for agriculture and lowering tariff barriers will inevitably benefit some more than others. Coordinated liberalization that affords California increased access to these markets, even if at the expense of increased competition from China and Mexico, could be an important opportunity. This is all the more true because most of California's agricultural producers have few subsidies to give up. Even the loss of the export-promotion programs would not be very costly; these programs provide little benefit to the industries they support.

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