



PGIM REAL ESTATE

AGRICULTURAL FINANCE & INVESTMENTS

U.S. AGRICULTURE & TIMBER MARKET UPDATE

2023



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EXECUTIVE SUMMARY

The long-term fundamentals and competitiveness of the U.S. agricultural and timber sectors remain strong. Farmers continue to evolve, innovate and adapt in each commodity market despite high farming costs and international demand weakness for some commodities – and some farmland values in areas such as the “corn belt states” have reached unprecedented record highs. Shipping and logistics are also normalizing slowly. At the same time, adverse climatic conditions continue to create challenges for producers around the world, while the economic deceleration of many countries and regions is expected to create near-term headwinds for major agricultural operations.

- The **NCREIF Farmland Index**, an index published by the National Council of Real Estate Investment Fiduciaries (NCREIF), consisted of more than 1,300 farmland properties owned and managed by institutional and private investment funds across the United States as of December 31, 2022. The index had an estimated market value of \$15.3 billion at the end of 2022 and posted total farmland returns of 9.64% last year, which included 6.2% in appreciation and 3.9% in income returns. Total farmland returns were the highest in the past five years. In 2022, permanent plantings and annual cropland posted total returns of 2.61% and 14.43%, respectively. The higher returns in the cropland subcategory were driven by appreciation of 10.40% — the second-highest appreciation figure in the past decade. Higher annual commodity prices continue to incentivize local growers, private investors, private funds and institutional investors to acquire farmland in key growing regions across the United States even at record prices.
- The **NCREIF Timberland Index**, which consists of an estimated 12.4 million acres owned by major institutional organizations, had an estimated market value of \$24.4 billion at the end of 2022 and posted total returns of 12.90% — the highest return in the past 15 years. Similar to the farmland index, appreciation returns drove overall returns higher. Total appreciation in 2022 ended at 9.58%, and EBITDA returns were 3.11%.
- In 2022, major **agricultural future commodities and metals** experienced steep annual declines, although prices remained higher compared with 2021. Last year, lower prices were observed in such markets as lumber (-70%), coffee (-32%), cotton (-25%) and copper (-10%), whereas prices increased for platinum (+15%), live cattle (+14%), cocoa (+8%), corn (+8%), silver (+8%) and soybeans (+8%).
- **U.S. agricultural trade** is forecast to have a negative balance of -\$9 billion in 2023 after two years of positive flows based on total projected agricultural exports of \$190 billion and agricultural imports of \$199 billion, according to the U.S. Department of Agriculture (USDA). In 2022, U.S. agricultural exports grew by 14% over 2021 but are projected to decline 3% in 2023 from the prior year. In the past 10 years, exports of U.S. agricultural products have increased at an annual growth rate of 3.8% from \$141 billion in 2013 to \$196 billion in 2022. Last year, China continued to be the top export market for U.S. agricultural products for the second consecutive year, a trend that is expected to continue into 2023. The value of agricultural exports to China are projected to account for 18% of total U.S. exports, followed by Canada at 14.9%, Mexico at 14.7%, Japan at 8.0% and the European region at 7.6%. Those five countries and regions represent 63% of total U.S. agricultural exports.
- A strong domestic economy and the strength of the U.S. dollar are some of the causes of higher agricultural imports, which grew in 2022 by approximately 19%. The value of agricultural imports has grown at an annual growth rate of 7.2% in the past 10 years, or almost twice the rate of agricultural exports. According to the USDA, imports from Mexico are projected to account for a 23.6% share of total U.S. agricultural imports, with Canada and the European region accounting for 18.7% and 18.1%, respectively. Agricultural imports from Mexico have had the highest

EXECUTIVE SUMMARY (CONTINUED)

annual growth rate (+10.6%) in the past 10 years — a trend that is expected to continue into the future.

- The U.S. Bureau of Labor Statistics' 12-month **Consumer Price Index** rose 6.4% as of the end of January 2023. The indexes for food at home and food away from home have increased on an annual basis by 11.3% and 8.2%, respectively. Cereals and bakery products have increased 15.6%, dairy and related products by 14%, nonalcoholic beverages and beverage materials by 13.1%, meats, poultry, fish and eggs by 8.1% and fruits and vegetables by 7.2%. If food prices remain elevated, consumers' habits could change rapidly by trading down to cheaper alternatives and brands.
- The rapid appreciation of the U.S. dollar against most currencies in 2022 created a ripple effect on the economic conditions of many countries around the world, especially those with high levels of debt. The **strength of the U.S. dollar** has reached a point that could have long-term negative ramifications for many of the U.S. top agricultural commodity exports. Tree nuts, apples, grains and other horticultural products could lose future competitiveness. Major agricultural trading partners continue seeing their currencies devalued against the U.S. dollar. In 2022, several regions experienced further devaluation against the U.S. dollar, including the Japanese yen (-28.5%), the British pound (-18.9%), the euro (-17.6%), the Chinese yuan (-8.4%) and the Indian rupee (-7.3%), among many other currencies around the world.
- **Farm input costs** continue to remain high and to affect many growers' operating margins. Fertilizer prices continue to have elevated prices due to the cost of inputs in making blends as well as the cost of transportation for bulky items.

In addition, the Russia–Ukraine conflict continues to be a factor in higher fertilizer prices. According to the Fertilizer Institute, Russia is responsible for 23% of global exports of ammonia, 21% of potash, 14% of urea and 10% of processed phosphate. Lower global fertilizer supplies are expected to continue affecting farm operators' costs.

- **Shipping and logistics** are normalizing slowly. Even though shipping costs are declining, they continue to remain high compared with historical results. According to the Federal Reserve Board, the Producer Price Index for General Freight Trucking was at 195 at the end of January 2023 after reaching a high of 211 in March 2022. Note that prior to the advent of the COVID-19 pandemic in 2020, the index had ranged from 120 to 140 during the five years prior to the outbreak. In addition, the Baltic Dry Index, which measures the cost of shipping of many kinds of raw materials has trended down in the past year and into early 2023. In early February, the index was at 530 after reaching a high of 5,500 in October 2021.
- **Farmland values** in areas like the corn belt states have reached unprecedented record highs. Although fewer properties are trading in this area of the country, the values of those properties are holding strong and have increased in value, driven significantly by stronger commodity prices. Many of the players seeking to buy farmland with leverage are taking a step back from the market because higher valuations and compressed capitalization rates are affecting their returns. Institutional investors continue to allocate more and more capital in long-term real assets such as farmland and timberland. And competition to acquire farmland will continue intensifying in the future.

- **Extreme climatic conditions** appear to be exacerbating a potential food crisis for many people living in the world's poorest areas, especially in economies that rely heavily on imports of grains and cereals. Drier conditions across key producing regions around the globe, higher fertilizer prices and unfavorable currency exchanges are making basic food ingredients more expensive. Governments subsidizing the costs of main grains and other staple ingredients may continue to be challenged by those rising costs. The war between Russia and Ukraine is still contributing to higher commodity prices. Both countries are projected to account for 60% of global exports of sunflower oilseed, 27% of barley, 26% of wheat and 13% of corn.
- The **farm bill**, which Congress reviews every five years, seeks to set policies to support, enhance and protect domestic agriculture, nutrition, conservation and forestry. The 2023 farm bill is expected to pass at the end of September, and discussions are taking place to address climate change conditions and the support that government must have in order to aid farm operators affected by major adverse weather conditions such as droughts and hurricanes.
- The topic of **regenerative agriculture** has begun to gain more traction in areas of the United States as well as in western Europe among both small and large farm operators as part of new environmental, social and governance (ESG) initiatives. Agricultural practices that used to focus on only maximizing crop yields are expected to coexist with the idea of building in tandem natural ecosystems for biodiversity so as to improve water cycles and soil conditions.



EASTERN REGION

Overview

Hurricanes Ian (Category 4) and Nicole (Category 1) crossed through the state of Florida in September and October 2022, bringing substantial rainfall and wind and causing damage through the entire state estimated at \$1.5 billion. The University of Florida estimates almost 4.7 million acres were affected within the agricultural sector. Many citrus and vegetable operations experienced damage, and production estimates were lowered for 2022/23 by 56% for citrus, with a 32% decrease year over year.¹ Producers are removing damaged trees and replacing tracts of land with new plants, thereby ensuring a stable supply in the long term. The current lack of supply has caused fewer producers and processors to operate, in turn causing prices of processed and fresh oranges to rise.

The sugarcane industry was able to conclude the harvest for the 2021/22 season with an abnormally cold January, resulting in a slight crop-loss slowdown of winter crops throughout the state. Domestic sugar policy continues to prevent massive dumping of foreign sugar into the country, enabling producers to operate in a better pricing environment for both raw and refined sugar.

Florida's population continues to rise, with a 1.9% population increase to 22.49 million in 2022, propagated by the state's perceived livability for incoming residents: Florida's zero income tax, desirable climate and job opportunities. As a result, demand for housing continues to increase, driving land prices upward. The influx has led to a transition in vacant land from rural agricultural uses to more-suburban and industrial uses in major population centers. Utility companies have also been active in acquiring farmland and converting it into solar farms. With the rise in

interest rates and with worries about inflation, few large transactions of note occurred during the year as a result of uncertainty in the land market — with the exception of some closed-end funds that have liquidated some citrus groves. The agricultural real estate market in Georgia continues to exhibit very limited large land transactions.



CITRUS

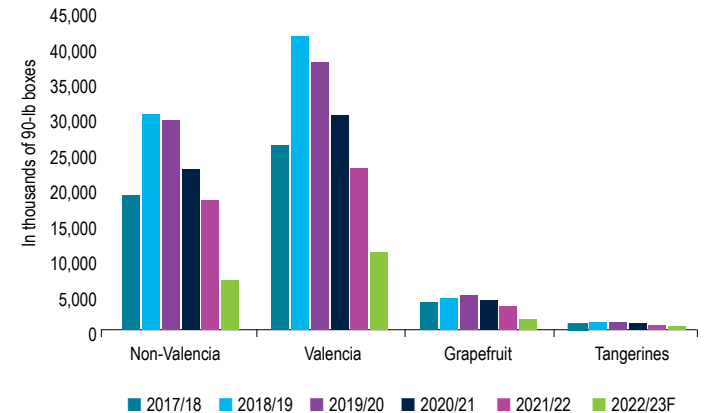
Florida orange production is forecast at 18 million boxes for the 2022/23 crop season, down 56% from the 2021/22 crop season of 41 million boxes and the lowest production since the mid-1930s. An estimated 7 million boxes of non-valencia oranges are expected to be harvested, as are 11 million boxes of Valencia oranges for the 2022/23 season. The decline in production is the result of both citrus greening disease and two late-season hurricanes making landfall in late September (Ian) and early November (Nicole). Citrus greening disease is a bacterial disease which results in weakened trees, which are more prone to "fruit drop" causing lower levels of mature fruit production. Hurricanes bring excess stress to citrus trees in their already weakened state from citrus greening. Hurricane Irma in 2017 showed that hurricanes can have long-lasting impact on both production and internal quality. The U.S. Department of Agriculture (USDA) expects that California will surpass Florida as the largest-producing citrus state in the United States, for the

second consecutive season, with an estimated 46 million boxes of oranges this season.²

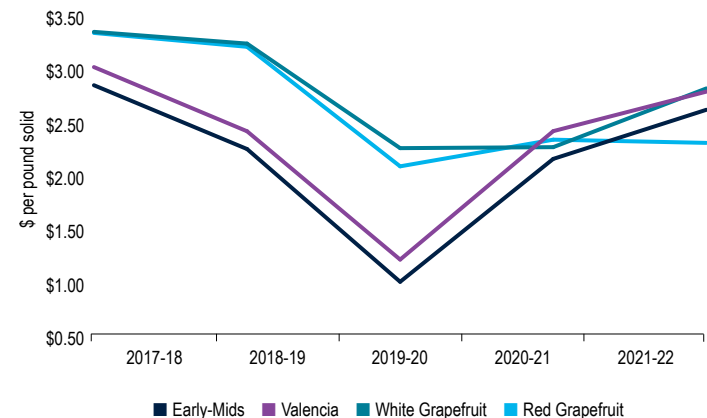
Final juice prices for the 2021/22 season were higher than both the 10- and 5-year averages. Final non-Valencia orange price for the 2021/22 season was \$2.60 per pound solid (pps): 20% above the 5-year average of \$2.16 pps and 26% above the 10-year average of \$2.06 pps. The final Valencia juice prices of \$2.77 pps for the 2021/22 season were 10% and 12% above the 5- and 10-year average prices, respectively. Lower production has created an environment in which citrus processors are offering higher prices, with three-year contracts having floor prices of \$2.60 pps for non-Valencia oranges and \$2.80 for Valencia oranges with price rise provisions. These prices are \$0.15 pps higher than contract prices seen in the 2020/21 season.³

In the ongoing research to fight greening disease, a new treatment with a bactericide known as oxytetracycline hydrochloride (OTC-HCI) has been approved by the U.S. Food and Drug Administration for use on citrus trees. OTC-HCI will be injected into the tree trunk, which could potentially reduce the impact of citrus greening. Field trials of the product have shown positive results on production, quality and tree health.⁴

CITRUS Historical and Projected Florida Citrus Production, 2017/18 to 2022/23F



CITRUS Historical and Projected Florida Citrus Prices, 2017/18 to 2021/22



Sources: PGIM Real Estate Agricultural Research, USDA, Florida Citrus Mutual



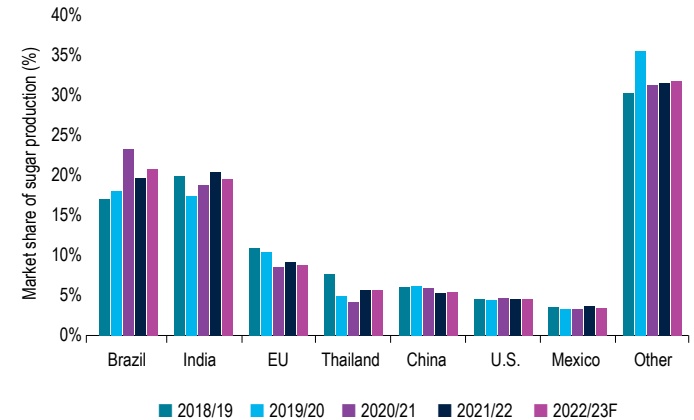
SUGARCANE

Global sugar production for the 2022/23 season is projected to increase to 183 million metric tons (mmt), up 1.6% from the prior season and the second-largest production on record in the past 10 seasons. An estimated 45% of the sugarcane harvested will be processed for sugar, with the remaining 55% allocated to ethanol processing.⁵ Higher production this season is projected to be driven mainly by Russia (+8.3%), Brazil (+7.3%), China (+4.2%) and Thailand (+3.4%), offsetting some of the declines in production in other major producing countries and regions such as India (-2.9%), the European Union (-2.0%) and the United States (-0.5%). Brazil, which is the largest sugar producer in the world, has maintained stable production levels of sugarcane based on increased yields due to favorable weather conditions, and production is expected at 38 mmt, or a 21% share of global production. However, more land allocated

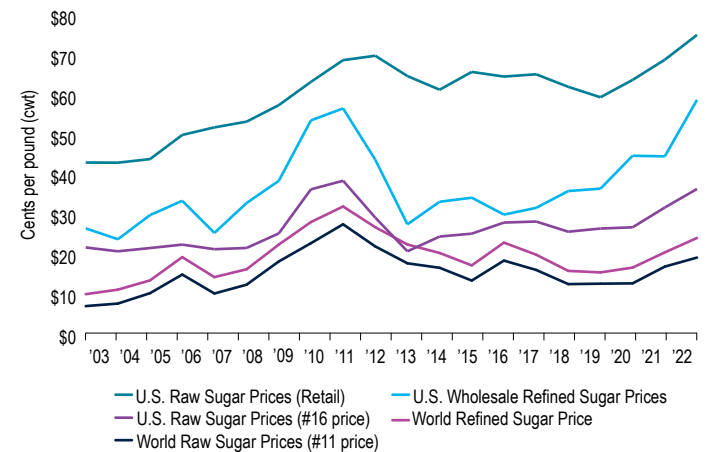
for sugarcane in Brazil has been converted to corn in response to lobbying efforts from the ethanol industry. China's production is up and estimated to rise as COVID-related restrictions ease in the country. Due to the conflict in Ukraine, Russia's production is up to 6.5 mmt as a result of limited imports. World consumption of sugar, which has been growing faster than production during the past five seasons, is projected to reach record levels in the 2022/23 season, at 176 mmt, as consumers demand sugary foods.

U.S. production is estimated at 8.2 mmt and in line with the prior two seasons. The 2022/23 Florida sugarcane season started in October 2022 and is expected to finalize by May 2023. Sugar production is projected for this season at 2.1 mmt raw value (MMTRV) due to favorable growing conditions in Florida that enable producers to attain a better yield of 44.0 tons per acre — higher than the national average of 37.1 tons per acre. The 2022 average price of raw sugar in the United States (sugar no. 16 contracts) was 36 cents per pound versus the world price (sugar no. 11 contracts) of 18 cents per pound due to the strong U.S. domestic policy, which implements marketing allotments, tariff-rate quotas and indirect price supports.² Domestic and global raw sugar prices are projected to rise slightly in 2023, driven by rising consumption.⁶

SUGARCANE Market Share of World Sugar Production by Country and Region, 2018/19 to 2022/23F



SUGARCANE World and U.S. Sugarcane Prices, 2003 to 2022



Sources: USDA Economic Research Service, PGIM Real Estate Agricultural Research



PECANS

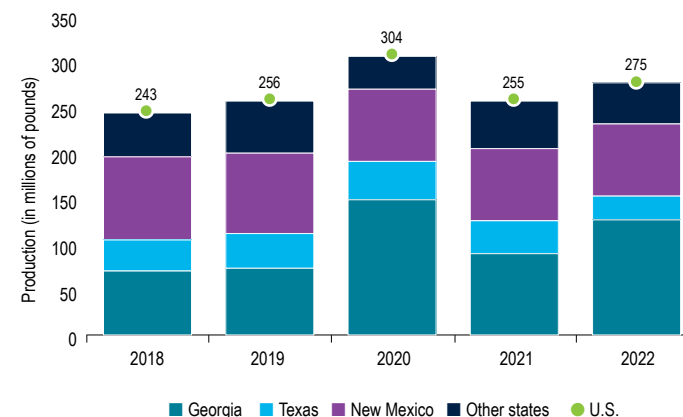
U.S. pecan production in 2022 ended at an estimated 275 million in-shell pounds, up 8% from the prior crop year.⁷ During the past 10 seasons, domestic production has ranged from a low of 243 million to a high of 305 million in-shell pounds. Pecans represent an alternate-bearing nut crop that experiences on-years of strong production followed by off-years of low production. The United States currently has an estimated 407,000 bearing-pecan acres, most of which are located in the southern states of Georgia (144,000 acres), Texas (100,000 acres), Oklahoma (94,000 acres), New Mexico (47,000 acres) and Arizona (22,000 acres).⁸

In 2022, Georgia pecan growers harvested an estimated 125 million in-shell pounds, or 42% more than the prior season but still lower than many

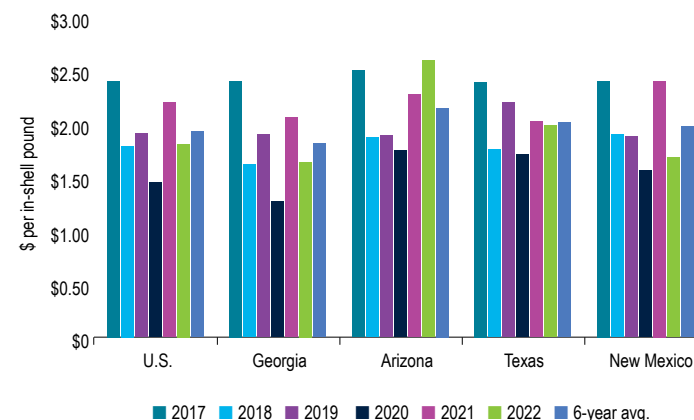
growers had initially forecast, partially due to some heavy winds from Hurricane Ian, which blew off some production of the trees. Nonetheless, Georgia accounted last year for a 46% share of total U.S. pecan production, followed by New Mexico at 29% and Texas at 9%.

Pecan prices have fluctuated significantly in the past year like other tree nut crops. In 2022, U.S. pecan prices are estimated at \$1.81 per in-shell pound, or 18% lower than in 2021. Prices in Georgia have been pressured due to weaker exports to key markets in Southeast Asia — especially China, which imported during the 2021/22 season the lowest number of pounds in the past four seasons (-73%). China's strict COVID policies continue to affect some U.S. agricultural sectors. Varieties that are harvested earlier typically receive higher prices as they make their way overseas in time for the Chinese New Year. At the beginning of the season, spot prices in Georgia were around \$1.66 per in-shell pound, down 19% from the prior year. Traditionally, growers accepted the price that was paid; however, sellers in the United States and Mexico have refused to sell at these prices and are storing pecans in cold facilities in hopes of obtaining better prices as inventories dwindled earlier in the year. Recently, India announced a 70% reduction on pecan tariffs, which could be expected to expand market opportunities for the industry.

PECANS Historical U.S. Pecan Production, 2018 to 2022



PECANS Historical Pecan Prices, 2017 to 2022



Sources: USDA, PGIM Real Estate Agricultural Research, American Pecan Council



BLUEBERRIES

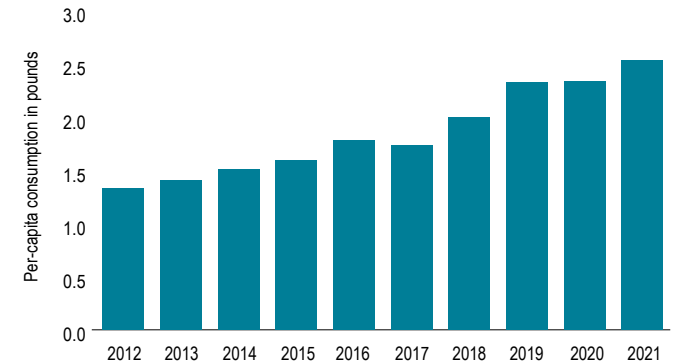
The overall berry category continues to benefit after the COVID-19 pandemic period. Consumer demand for blueberries both at retail outlets and within the food service segment remains strong. The introduction of blueberries in new packaged foods has also contributed to the growth of this produce category. Blueberries are being used in more bakery products such as cakes, pastries, and other sweet goods; juice drinks; dairy products such as yogurts; fruit snacks; snack mixes; and cereal bars. During the 2012 to 2021 period, blueberry per-capita consumption grew by 91%, from 1.33 pounds in 2012 to 2.54 pounds in 2021, and is expected to grow even more in 2022 and beyond. The high antioxidants and health benefits that blueberries provide have aided in blueberries' growing popularity.

As a result of growing demand, imports have also been steadily increasing. In 2022, blueberry imports are projected to reach a new record of more than 640 million pounds, or 12% higher than the prior record of 571 million pounds in 2021. The United States imports most of its blueberries from Peru, Mexico and Chile, which accounted in 2022 for estimated 50%, 23% and 19% shares, respectively, of all blueberry imports.⁹

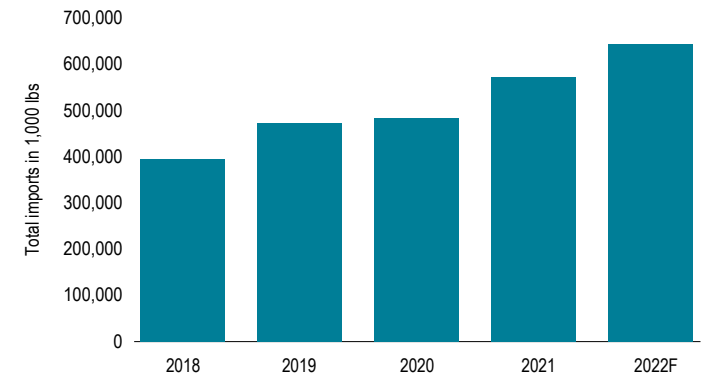
For the 12 months ended in January 2023, an estimated 905 million pounds of blueberries were sold in the United States, with an average free-on-board price of \$2.95 per pound, according to the USDA's Agricultural Marketing Service. Overall year-over-year movement has increased by an estimated 9%.¹⁰ Georgia growers received better prices in 2022, reaching more than \$3.00 per pound due to lower supplies during their harvest window.

Although the United States exports blueberries, the volume shipped is minimal compared with domestic use. In 2022, the United States exported an estimated 50 million pounds of blueberries, up from the 49 million pounds shipped in 2021. The primary market for fresh blueberries continues to be Canada, which received more than 97% of U.S. blueberry exports in 2022. The remaining blueberries are exported to South Korea and some to Mexico, during their off-season.

BLUEBERRIES Per-capita Consumption in Pounds, 2012 to 2021



BLUEBERRIES Historical U.S. Blueberry Imports, 2018 to 2022F



Sources: PGIM Real Estate Agricultural Research, USDA, Economic Research Service



CENTRAL REGION

Overview

The appetite of farmers and institutional buyers to acquire farmland in this region of the United States remained strong even as the historically favorable interest rate environment faded through 2022. Across the corn belt, cropland values continued to increase considerably in 2022, most of it is the result of ample capital and a better commodity-pricing environment. Most farmland sales continued to be smaller tracts, with sellers using the auction method as a preferred option to divest their farm holdings.

Iowa saw the largest increase in the Midwest for the second straight year, as land values increased 19.7% to \$9,350 per acre on average, according to the USDA. High rates of cropland appreciation during two consecutive years total 25% to 35% in much of the corn belt.

In the central region, Iowa had the highest average cash rent per acre, at \$256, followed closely by Illinois, at \$243 per acre.² Farmland in well-located areas with high soil productivity indexes in Illinois is commanding rental rates of more than \$400 per acre, which is similar to the lease rates paid during the most recent commodity boom in the early 2010s.

Cropland values in the Great Plains states also increased considerably, with Nebraska's values increasing by 21% to \$6,000 per acre, and Kansas' increasing by 24.5% to \$2,950 per acre.¹¹ The rates producers pay to rent cropland (cash rents) showed an increase at the national level.

Cropland in the Delta states of Arkansas, Louisiana and Mississippi also increased from 2021 to 2022, although at a slower pace than corn belt cropland did. The highest cropland value per acre across the Delta

states is Mississippi, at \$3,340 per acre, up 6.0% in 2022. Louisiana saw the highest percentage increase in land value for the second consecutive year, at 6.7% to \$3,180 per acre. And Arkansas' cropland values increased 6.1% to \$3,110 according to the USDA.¹²

Average cropland value across the United States jumped to \$5,050 in 2022 — an increase of \$630 per acre over 2021's value of \$4,420 per acre. That average cropland value set a new all-time high, representing the largest annual percentage increase in recorded history. Land sales in the central region continued to be very strong, with land values supported by strong commodity prices and healthy farmer balance sheets.¹³



CORN

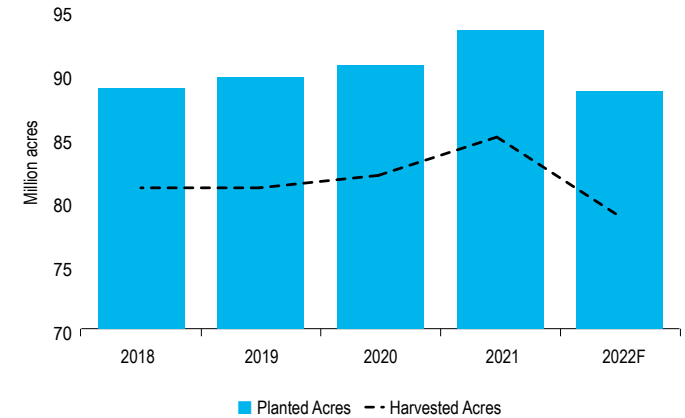
For the 2022/23 crop season, the United States is projected to account for 30% of the corn produced around the world, followed by China at 24% and Brazil at 11%. In 2022, U.S. farmers produced an estimated 13.9 billion bushels of corn on an estimated 79.2 million harvested acres (-4%). Last year's production was down 8% from the 2021 crop season due to lower production per acre coupled with fewer acres harvested than initially projected. Corn harvest yields in 2022 saw a decrease of 3.4 bushels per harvested acre compared with 2021. Average U.S. corn yield is projected at 173.3 bushels per acre, down from the record-breaking 176.7 bushels per acre during 2021.

Projected annual reductions in domestic use (-4%) and exports (-16%) may result in a 2022/23 ending stock of 1.24 billion bushels — a reduction of only 135 million bushels from 2021/22. The 2022/23 average farm price received for corn is projected to be \$6.70 per bushel, up 12% from the average price in 2021/22 and 48% higher than two seasons ago.¹⁴

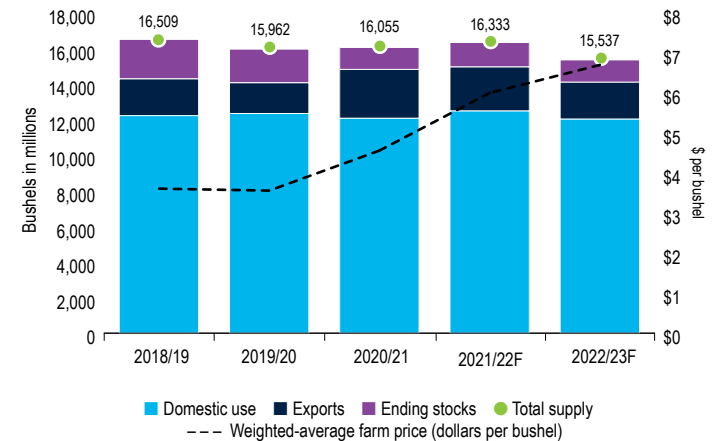
Total global corn exports for the 2022/23 season are projected at 181.6 million metric tons (mmt), down 11% from the prior season. Increased global competition from major corn exporters is also a continuing trend. Exports from major U.S. corn competitors Argentina and Brazil are projected to increase from 82 mmt in 2021/22 to 85 mmt for the 2022/23 crop season. Those two countries are forecast to account for 47% of all global corn exports during the 2022/23 season compared with 40% in the prior year. Production in Brazil and Argentina for the 2022/23 season increased by an estimated 8% and 5%, respectively, compared with the 2021/22 season.

China, which is one of the largest producers and consumers of corn, is projected to increase production slightly (1%) for the 2022/23 season, and its corn imports are projected at 18 mmt, or 18% lower than the prior season and 39% lower compared with two seasons ago.¹⁵

CORN Historical Planted and Harvested Corn Acres in the United States, 2018 to 2022F



CORN Historical Corn Utilization and Prices, 2018/19 to 2022/23F



Sources: PGIM Real Estate Agricultural Research, USDA, Economic Research Service



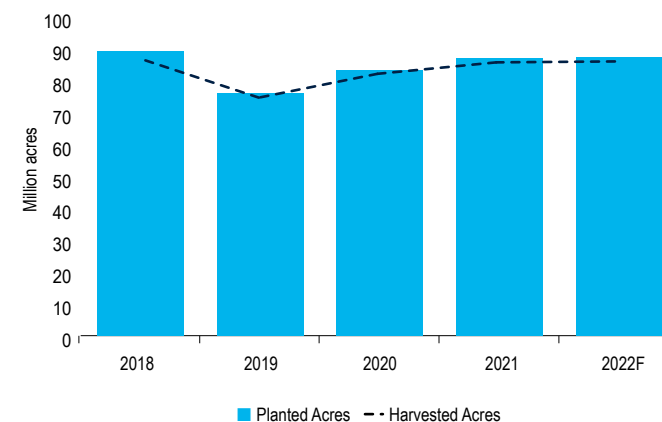
SOYBEANS

The 2022 U.S. soybean crop is estimated at 4.3 billion bushels, reflecting a 3% decrease in production from the 2021 crop. Soybean acreage harvested in the United States increased slightly from 86.3 million acres in 2021 to 86.6 million acres in 2022 — the third-largest number of acres harvested in U.S. history. In addition, 2022 was the third consecutive year that more soybean acres were harvested than planted corn acres. Strong, crushing demand, coupled with higher projected soybean prices, continues to shift acreage from corn to soybeans due to robust global demand from other major economies like China. In fact, China is expected to import 60% of all global soybeans, which is in line with the prior two seasons.

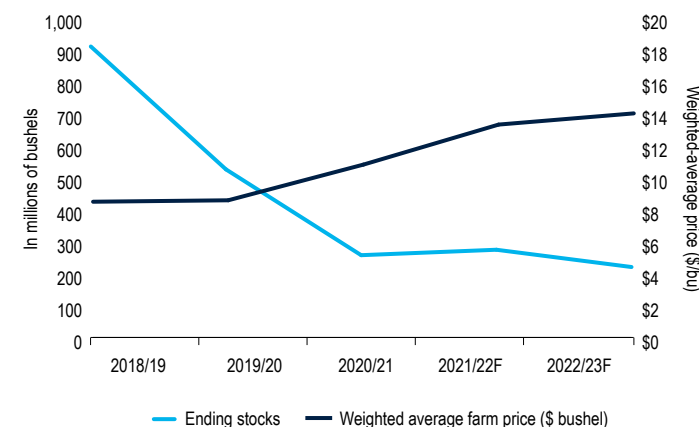
Yield per harvested acre is projected at 49.5 bushels per acre, below the 2021 record of 51.7 bushels per acre. Ending stocks are projected to decrease to an estimated 220 million bushels in 2022 from 274 million bushels in 2021. Strong domestic and export demand resulted in projected ending stocks in the 200-million-to-300-million-bushel range for the third year in a row and well below 2018's near-record high of 909 million bushels.¹⁶

U.S. soybean prices continue to strengthen with the help of continued strong demand. The 2022/23 season's average farm price for soybeans is projected at \$14.20 per bushel, up 6.8% from the 2021/22 season and 31% higher than two seasons ago. In 2022/23, the domestic stocks-to-use ratio is projected to decrease to 4.8%, a slight decrease from 6.1% in 2021/22, which was caused mainly by a decrease in U.S. production as exports and crushing have remained active. U.S. soybean crushing for oil and meal is projected to set a record at 2.25 billion bushels, up 41 million bushels from last year's record. Planted acreage for soybeans in 2023 will be watched closely by the market throughout the coming months as prices hinge on projected supply and anticipated export demand.

SOYBEANS Historical Planted and Harvested Soybean Acres in the U.S., 2018 to 2022F



SOYBEANS Historical U.S. Soybean Ending Inventories Versus Prices, 2018/19 to 2022/23F



Sources: PGIM Real Estate Agricultural Research, USDA, Economic Research Service



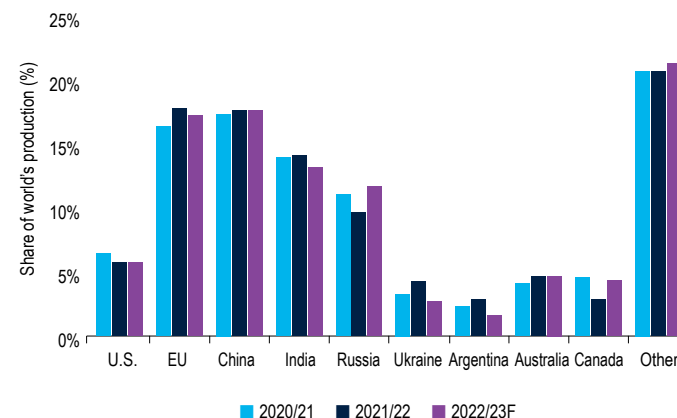
WHEAT

Total global wheat production for the 2022/23 crop season is projected at 781 million metric tons (mmt), which is in line with the prior year's production. The top five wheat-producing regions are projected to supply 65% of total world production. The regions are China (18%), the European Union (17%), India (13%), Russia (12%) and the United States (6%). Ukraine's wheat production is projected at 21 million tons, or 3% of the world's production. Ukraine's wheat production is projected to decrease by 12 million tons from the prior season, likely due to the ongoing war with Russia.¹⁷ Other major declines in production last season were observed in Argentina (-44%), which was offset by gains in Russia (21%) and Canada (52%). The United States was projected to have produced during the 2022/23 season an estimated 45 mmt.

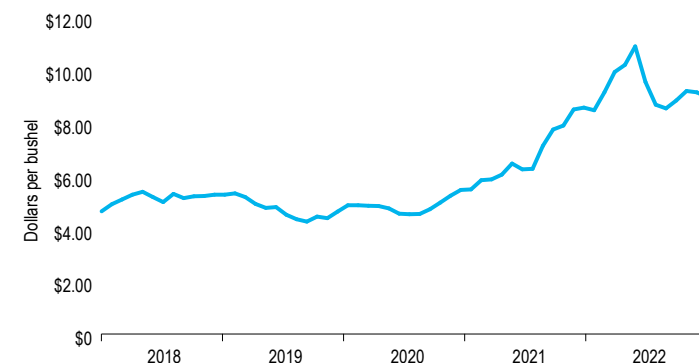
U.S. wheat acreage for 2022 is projected to have decreased by 2% from the prior year from 46.7 million to 45.7 million acres. Wheat production for the 2022/23 crop year is projected to be unchanged from 2021/22 production, at 1.65 billion bushels. Average yields are projected to increase by 5% to 46.5 bushels per acre. Lower-forecast ending inventories are resulting in higher prices, with a projected average farm price of \$9.10 per bushel for the 2022/23 crop, which reflects a 19% increase over the 2021/22 average farm price of \$7.63 per bushel and an 80% increase from two seasons ago.¹⁸

The United States is projected to decrease wheat exports in 2022/23 by 25 million bushels. Total projected production by major exporters in 2022/23 is in line with 2021/22 estimates. Demand for wheat continues to remain strong in China and the United States for domestic use, supporting competitive prices. Global ending stocks are projected to decrease by 3% in 2022/23 to 268.39 million tons compared with the estimated 2021/22 ending stocks of 276.82 million tons.¹⁹ Those global wheat inventories are expected to be at the lowest level in the past five seasons.

WHEAT Historical Share (%) of Wheat Production by Major Producing Region, 2020/21 to 2022/23F



WHEAT Historical Monthly Prices for U.S. Wheat, January 2018 through December 2022



Sources: PGIM Real Estate Agricultural Research, USDA, Economic Research Service



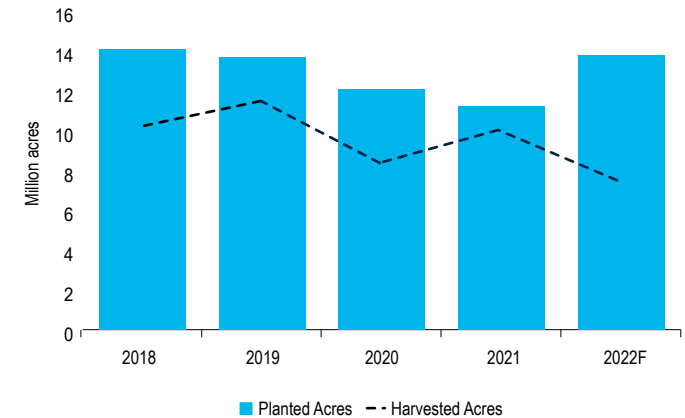
COTTON

Global cotton production ended at an estimated 115 million bales (1 cotton bale is approximately 480 pounds) during the 2022/23 crop year, which saw a marginal reduction compared with last season. The United States accounted for 13% of total global cotton production last season and is projected to have a 33% share of total cotton exports. U.S. cotton exports of 12 million bales projected for 2023 are down 22% from 2022. The global economic slowdown is expected to reduce the use of cotton and will result in higher ending inventories for this commodity, which is projected at 89.9 million bales, up 5% from the prior season.²⁰

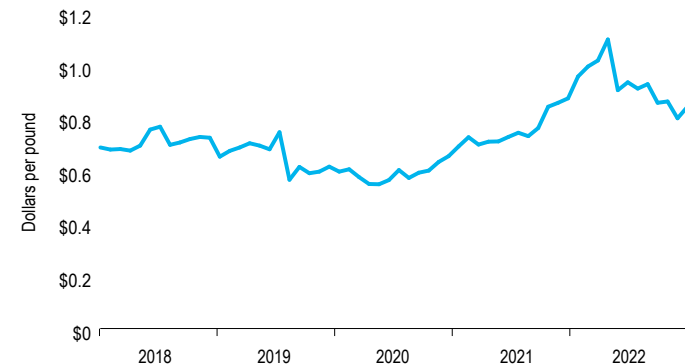
U.S. cotton acreage for 2022 is projected to have finalized at 13.78 million acres, up 22% from the prior season. Although planted acres were higher than the past three seasons, harvested acres decreased by 27% compared with 2021, ending at 7.44 million acres harvested. Most of the decline was driven by lower production in Texas, which is the major cotton state producer in the United States. Drought conditions in this southern state had a major impact on the production and quality harvested. The USDA projects that the United States ended with 14.7 million bales of cotton in 2022, down 16% from the prior season. Final yields for 2022 are projected to be 947 pounds per acre, which is a 15% increase from the 2021 estimate of 819 pounds per acre.^{21,22}

The year-end estimate for 2021/22's upland cotton price was 91.4 cents per pound. U.S. upland cotton prices are projected to decrease 8.4 cents per pound in 2023 to 83 cents per pound due to expected lower demand.²³

COTTON Historical Planted and Harvested Cotton Acres in the United States, 2018 to 2022



COTTON Historical Monthly Prices for U.S. Cotton, January 2018 through December 2022



Sources: PGIM Real Estate Agricultural Research, USDA, Economic Research Service



RICE

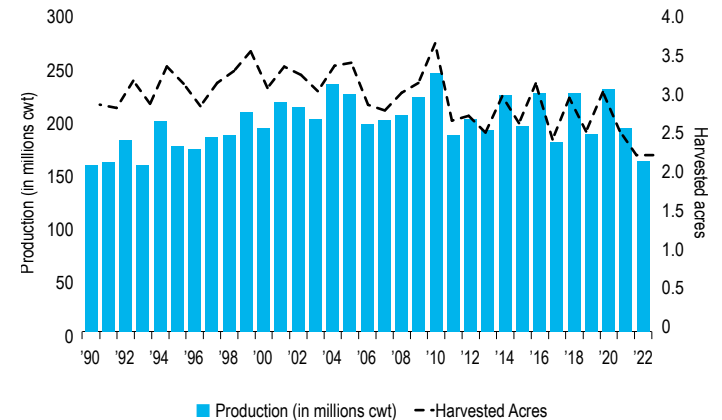
U.S. rice production for the 2022/23 season ended with approximately 160 million hundredweight (cwt), the lowest production since the early 1990s and 16% lower than the 2021/22 season due to lower numbers of planted and harvested acres compared with prior years as well as drought conditions in California, which affected the production of short-grain rice. The USDA projects harvested rice acres ended at 2.17 million acres for 2022, down 15% from 2021's 2.49 million harvested rice acres.²⁴

The U.S. rice outlook for 2023 shows higher domestic use from initial estimates in December, decreased exports and lower ending inventories.

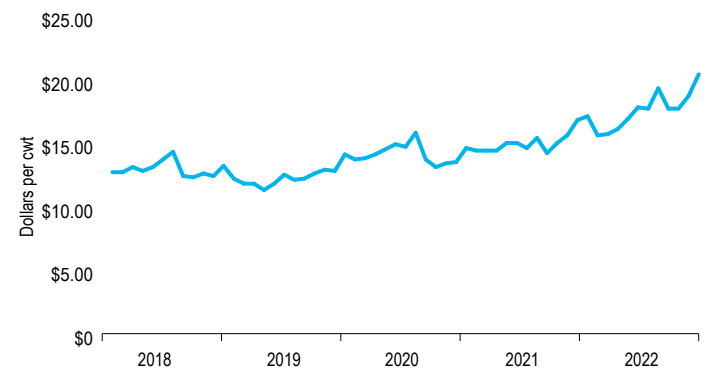
U.S. ending stocks for rice are projected at 32.1 million cwt for 2022/23, which is a decrease of 7.6 million cwt, or 19% from 2021/22 ending rice stocks. Long-grain rice ending stocks are projected at 21.8 million cwt for 2022/23, which is down 11% from the 2021/22 season.

According to the most recent *USDA World Agricultural Supply and Demand Estimates* report, the 2021/22 U.S. all-rice marketing-year average price was \$16.10 per cwt, up 12% from the 2020/21 all-rice marketing price of \$14.40 per cwt. Lower domestic production is driving prices higher this crop-marketing year. For the 2022/23 season, all rice prices are projected to increase to \$19.20 per cwt in 2022/23, up 19% from the prior season and up 33% from two seasons ago. The U.S. long-grain-rice price is projected at \$16.70 per cwt for 2022/23, which is an annual increase of 23%. U.S. medium-grain and short-grain-rice prices are also projected to be 27% higher in 2022/23, up to \$17.60 per cwt compared with \$13.90 per cwt in 2021/22.²⁵

RICE Historical Planted and Harvested Rice Acres in the United States, 2018–22



RICE Historical Monthly Prices for U.S. Rice, January 2018 through December 2022



Sources: PGIM Real Estate Agricultural Research, USDA, Economic Research Service



WESTERN REGION

Overview

The 2022 farmland real estate market in the western region was very quiet for the first half of the year and active in the second half. Sellers and buyers alike were watching commodity prices, inflation rates, interest rates, the strengthening of the U.S. dollar, climatic conditions and general micro- and macroeconomic recovery conditions as the region shifted and adapted to a post-COVID era.

The year 2022 was the third consecutive year of drought, with water being restricted to zero or near-zero surface water allocations and some groundwater sustainability agencies initiating their sustainable groundwater management plans. Land in areas with more senior surface water rights and within groundwater basins that have greater access to water have held their value despite continued downward

pressure on almond and walnut pricing. The 2022/23 water outlook is positive, with above-average rainfall and snowpack through February. Although soil profiles are filled, water allocations have not been set, but many forecasters are optimistic that allocations will be significantly higher than the previous three years and could exceed historical averages.

Apple, avocado, citrus and stone-fruit growers enjoyed a year of strong commodity prices. Wine grape growers are also benefiting from wineries' locking in more-profitable long-term contracts. Almond and walnut growers are starting a third year of near- or below-breakeven commodity prices.

China continues to be absent from the commodities market; India has imposed tariffs that more than double the market prices of nuts; and the war between Russia and Ukraine is affecting the purchasing power

of European consumers. As almond, pistachio and walnut supplies continue to near and surpass all-time production highs, landowners are opting to either sell in lieu of continuing to wait out the current lull or redevelop their orchards.

Higher interest rates are shrinking the pool of potential buyers, and if prices do not rebound, land values in even the strongest water districts could soften in the coming year for properties developed to tree nuts. There will be opportunities in 2023 for land acquisitions, but the bulk of properties transacted will be in areas with weaker water rights or older trees that are no longer economically viable in today's market conditions.



WINE GRAPES

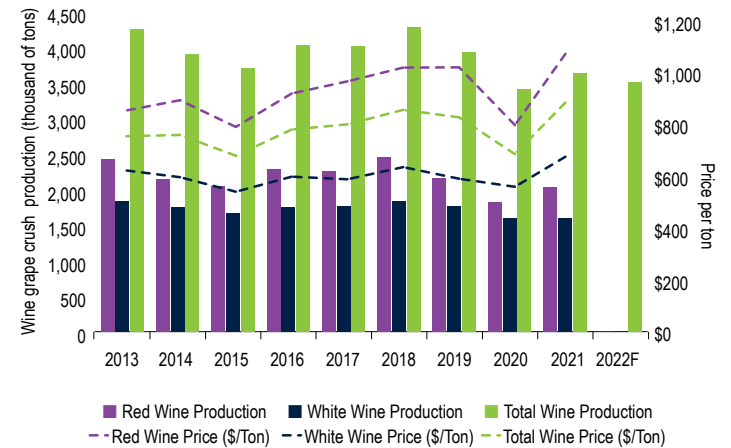
The 2022 California grape crush totaled an estimated 3.5 million tons, a 4% decrease from the 2021 harvest.²⁷ Washington wine grapes are forecast at 230,000 tons, up 28% from last year.²⁸ The season in California began with severe frost events, primarily in the Lodi–Clarksburg region and along the east side of the Central Valley. The white varietal grapes, Pinot Noir and a few other early red varietals, which were more advanced at this stage, were affected the most. The end of the season weathered abnormal heat waves in late August and early September, followed by cooler periods and three inches of rain in some regions.

Two consecutive years of a short crop have produced healthier and more-balanced grape and wine markets, which gave producers time to balance supply. The statewide average yield was 7 tons per acre from 2012 through 2021; however, the estimated average decreased by nearly 10% in the past two years. Smoke exposure and rejection affected the market as well; however,

lighter yields drove the balance in the market. Through 4-million-tons crushed, year over year will push that over the supply boundary if there is no increase in wine shipments. The demand for bottles less than \$11 per bottle is declining, and consumers are buying higher-priced wines at more than \$20 per bottle.²⁹

Allied Grape Growers indicate overall acreage is balanced, as the industry is planting and pulling at similar rates. However, acreage in the Central Valley may decrease as vineyards are fallowed due to high water costs and changing consumer trends. The industry is not overplanting or oversupplying but needs to grow the market and increase consumption.³⁰ The balance of supply and demand has been maintained by consecutive short years without consumption growth. Overall, prices remained stable — near 2021's levels.

WINE GRAPES Historical and Projected Wine Production and Prices in California, 2013 to 2022F



-4%
FROM 2021

CALIFORNIA WINE GRAPE CRUSH PRODUCTION

The California wine grape crush is forecast at 3.5 million tons in 2022.

80%
FOR 2022

CALIFORNIA'S CERTIFIED WINE PRODUCTION

More than 80% of California wine is made in certified-sustainable California wineries.

Sources: PGIM Real Estate Agricultural Research, USDA, California Department of Food and Agriculture



TABLE GRAPES

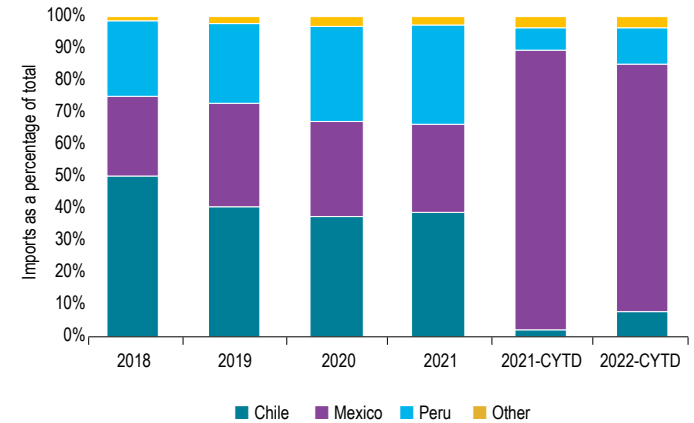
The California Table Grape Commission estimated 2022 volume at 95 million boxes of table grapes — in line with the 2021 production season. The 2022 California growing season was difficult due to extremely hot weather, which created challenging growing conditions and added to already high production costs.³¹

Higher freight costs and certain shipping constraints are pushing marketers to focus more on the domestic market and other more-local export markets such as Canada, Mexico and Central America, which tend to be easier to access.

Mexican and Peruvian growers continue to target the U.S. market. Growers in Mexico are facing the same higher input costs, droughts and labor constraints that are being felt in California.³¹ Mexican grape imports for the 2022/23 season to date have increased by 10% from the prior season, and imports from Peru have doubled during the same period. Peru's farming and production techniques continue to improve and are expected to continue gaining market share for this commodity in the United States. Southern Hemisphere fruit tends to enter the U.S. market in November and will sustain consumer demand through May, when early U.S. and Mexican fruit begins harvest.

The number of table grape planted acres in the United States has been relatively stable during the past 10 years, at approximately 90,000 standing acres. The market for this commodity continues to evolve as more and new grape varieties are being grown and imported from the Southern Hemisphere to meet domestic demand.

TABLE GRAPES Historical U.S. Table Grape Imports, 2018–22 Crop Season to Date



+15%
FROM 2021

TABLE GRAPE IMPORTS

Table grape imports from May to November 2022 were 21% higher than in the same period in 2021.

+7.5%
FROM 2021/22

TABLE GRAPE IMPORTS FROM MEXICO

For the 2022/23 season to date, imports from Mexico have increased in terms of volume by 7.5% from the previous season.



AVOCADOS

The 2022/23 California avocado crop is projected at 257 million pounds, down 6% from the 276 million pounds produced in the prior season and also down 9% from the prior six-year average of 289 million pounds. Note that avocados produce on an alternate bearing cycle, and the 2022/23 crop season is projected to be an off year in terms of production.^{31,32} The avocado market has fully recovered demand from the food service sector that suddenly halted during the COVID-19 pandemic. The increased demand has caused pricing to recover from the lows experienced during the 2019/20 and 2020/21 crop years. In addition, a shorter-than-expected crop from Mexico propelled pricing during the 2021/22 season, ending the

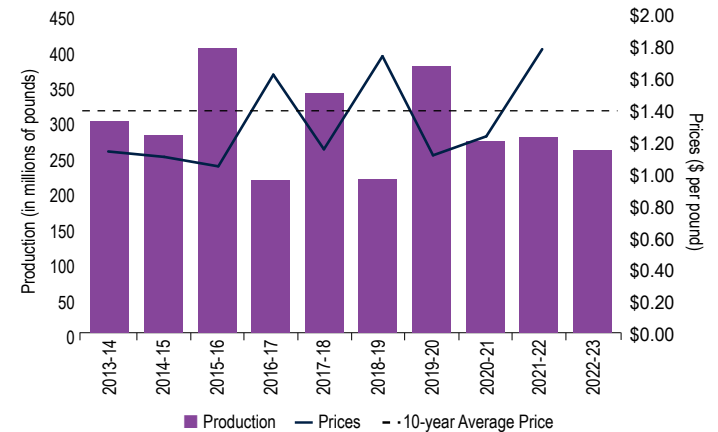
season with the highest prices in the past decade. The small Mexican avocado crop is widely considered an anomaly, not the new normal. Although this record-high pricing is not expected to continue indefinitely, it is an encouraging signal that the avocado market is robust, and demand is healthy and continues to grow in both the retail and food service segments.

Avocado-bearing acres in California have mostly stayed the same year over year — still in the mid-40,000-acre range. California avocado producers still face many challenges — from drought and adverse weather events to inflationary pressures that hit labor and input costs.³³ As with most crops in California, water availability is of utmost concern for future production growth.

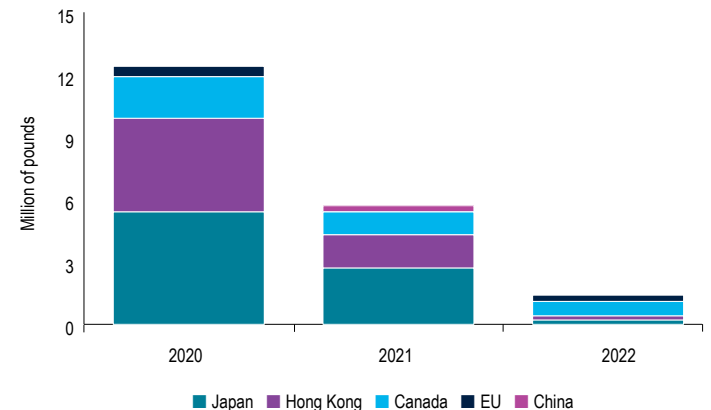
The United States generally exports a small portion of the avocado crop, primarily to Asian countries. Japan and Hong Kong account for the majority, followed by small amounts to Canada and the European Union. Exports halted almost entirely in 2022 due to the smaller crop overall.

In 2022, an estimated 1.8 billion pounds of avocados were imported into the United States, with Mexico continuing to be the major supplier of this highly popular produce item. Mexico accounts for more than 80% of the avocado market share in the United States.

AVOCADOS Historical Avocado Production and Prices in California, 2013/14 to 2022/23



AVOCADOS Historical U.S. Avocado Exports, 2020 to 2022



Sources: PGIM Real Estate Agricultural Research, Hass Avocado Board, California Avocado Commission, USDA



CITRUS

LEMONS. The 2022/23 U.S. lemon crop is forecast to be 22 million 80-pound boxes, a decrease of 11.6% from the prior year.³⁴ California accounts for 95% of total production, with Arizona making up the other 5%. Pricing has trended lower than the previous year, as imports competed with domestic markets earlier in the season. However, as of the new year, imports are virtually done, and the crop harvested from groves in District 1 of California's Central Valley is in full swing. Quality is good, and fruit size is expected to increase due to multiple extended early rain events throughout the major growing regions.³⁵

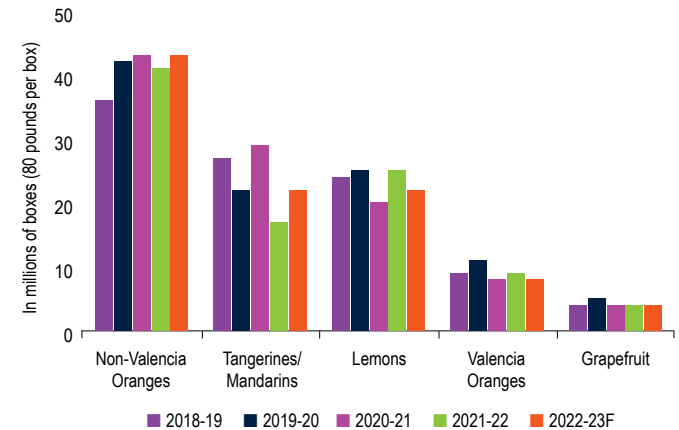
VALENCIA ORANGES. Valencia production in California is forecast at 8.1 million 80-pound boxes for the 2022/23 season, down 6% from the prior crop season.³⁶ The decline in production is attributed to warmer temperatures and lower precipitation levels throughout the year. Prices of Valencia oranges are expected to increase due to lower production than anticipated in Florida. Florida, the top U.S. producer of Valencia oranges, is expected to produce the lowest number of boxes since the early

1930s³⁷ due to disease pressure and the impact of hurricanes in 2022. Those factors are expected to benefit California citrus growers, as demand for fresh oranges remains strong even after the pandemic period.

NAVEL ORANGES. The 2022/23 California navel orange production is estimated to be 38 million 80-pound boxes, up almost 20% from the prior year.³⁸ The larger crop is expected after a shorter crop in the prior year in addition to the more-normal growing conditions for the 2022/23 crop. Small fruit sizing has been an issue early in the season, with larger sizes commanding a 20% increase in pricing from the previous year. Sizing is still hoped to increase with the multiple extended rain events in California. Fruit quality has been good to excellent, leading to overall average pricing for California navels to be up high single digits for most of the season to date.³⁹

MANDARINS. The USDA reports California bearing mandarin acreage up 2.8% year over year at 69,000 acres.⁴⁰ The California Citrus Mutual Marketing Committee estimates that the 2022/23 mandarin crop will be 22 million 80-pound boxes, or 26% higher than the 2021/22 season, which finalized at 17.4 million 80-pound boxes; however, this season's production would still be 24% below the record crop of 28.8 million 80-pound boxes in 2020/21.⁴¹ The crop quality is expected to be much better than the previous season, with better utilization.

CITRUS Historical and Projected California Citrus Production, 2018/19 to 2022/23F



+19.5%
FROM 2021/22

NAVEL PRODUCTION IN CALIFORNIA

Production for this variety is projected to be at 38 million boxes for the 2022/23 season.

+26%
FROM 2021/22

MANDARIN PRODUCTION IN CALIFORNIA

Mandarins and tangerines grown in California are expected to increase for the 2022/23 season. The 2022/23 crop season is projected at 22 million boxes.

Sources: PGIM Real Estate Agricultural Research, USDA, California Department of Food and Agriculture



ALMONDS

The 2022 California almond spring crop estimate was set at 2.6 billion pounds, down 11% from the 2.92-billion-pound crop in 2021.⁴³ Nonetheless, almond crop receipts for this season-to-date period of August 2022 to January 2023 are 2.47 billion pounds. Recurring drought conditions created a lighter nut set for the 2022 crop, resulting in a 14% annual decrease in yield per acre.⁴⁴ The almond industry is experiencing another large carryover crop, with 837 million pounds, which is a 38% increase from the prior season. According to the Almond Board of California, total marketable supply for the 2022/23 season is projected at 3.2 billion pounds.

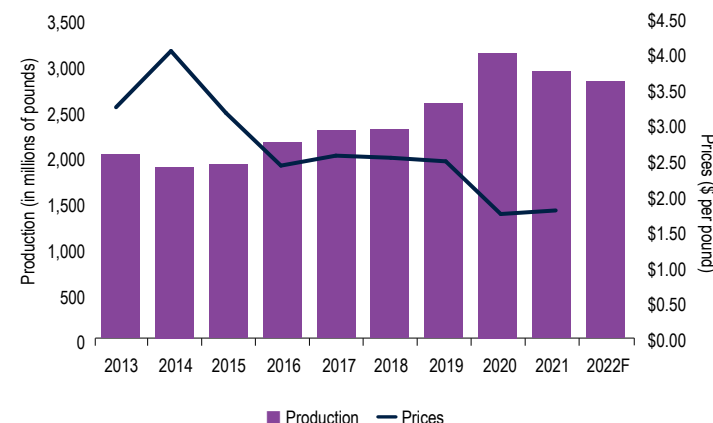
Despite the challenges that the 2022 growing season presented, California remains at the top of global production for almonds, producing nearly 80% of the world's supply. Total almond exports are 7% higher this season to date — from August to January

compared with the same period in the 2021/22 season. Export demand for California has seen an increase, even with a strong U.S. dollar, the reopening of markets in China after COVID restrictions relaxed and efforts on the part of the Almond Board of California to drive global demand. The board is running advertisement campaigns in 10 different international markets that help promote the health benefits of almonds.

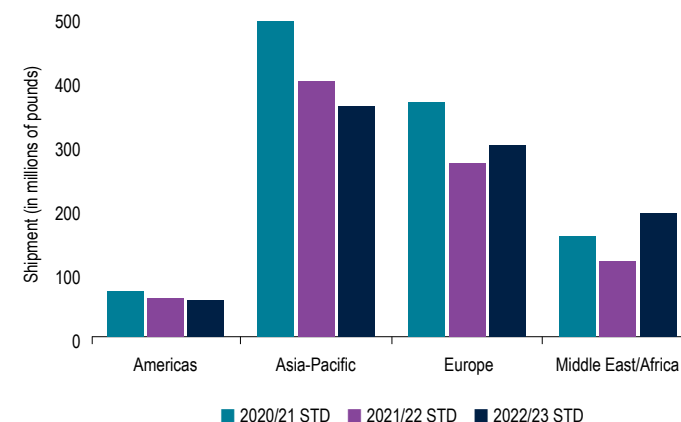
Inflationary pressures remain a significant factor in the volume of domestic sales in the United States, with increased grocery prices reducing consumers' purchasing power for nonstaple foods, thus resulting in domestic demand for almonds decreasing 7.3% crop year to date (August to January) compared with the same period in 2021/22.⁴⁵

Although total almond production is down 12% from 2021, the total marketable supply is only 3.5% lower than in 2021, due primarily to a 38% year-over-year increase in the carryover product. The increase in marketable supply will likely cause continued downward pressure on almond prices in the near term.

ALMONDS Historical Almond Production and Prices, 2013 to 2022F



ALMONDS Historical Season-to-Date Almond Exports by Region, 2020/21 to 2022/23 (August–January)



Sources: PGIM Real Estate Agricultural Research, USDA, NASS, Almond Board of California



WALNUTS

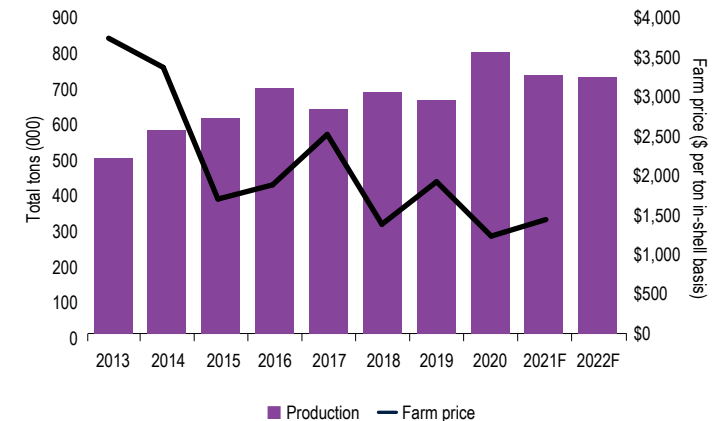
The 2022 California walnut production was forecast at 720,000 tons, down 1% from the production of 725,000 tons in 2021, according to the *California Walnut Objective Measurement Report*. The forecast is based on 400,000 bearing acres, which is up 3% from the estimated bearing acreage of 390,000 in 2021.⁴⁶ The 2022 production estimate makes it California's third largest since at least 2013. Heavy precipitation at the end of 2021 benefited farmers; however, poor weather conditions in 2022, including excessive heat and a drought, affected crop quality.⁴⁷ In addition, Sacramento Valley growers reported frost damage caused by freezing temperatures for several nights in February 2022. According to the USDA, grower prices in 2021/22 increased to \$1,410 per ton (\$0.705 per pound) due to low stock levels and low supply compared with \$1,220 per ton (\$0.61 per pound) the previous year.⁴⁸ In October 2022, the Walnut Bargaining Association recommended a

minimum price that would return at least \$0.65 per pound back to growers, based on in-shell Chandlers Jumbo/Large with average quality.⁴⁹

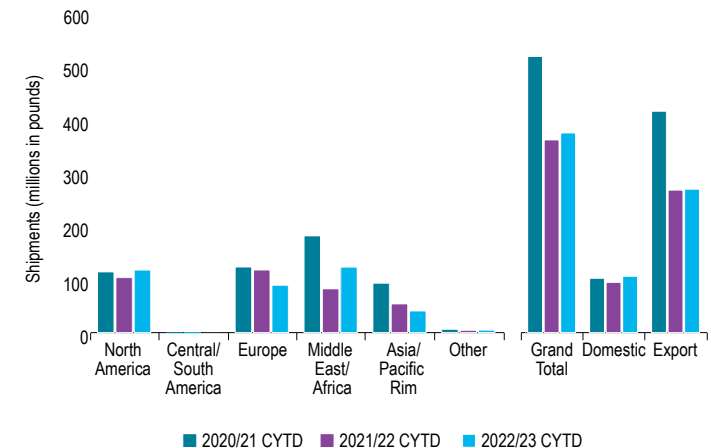
California grows about 30% of the world's walnuts and nearly all U.S. production, making California the largest global shipper and second-largest grower, after China. The United States consumes a third of California's production, and the remaining is exported to such countries as Germany, Japan, South Korea and Turkey. Farmers started the marketing year with a significant backlog of supply driven by supply chain bottlenecks. According to the California Walnut Board's Monthly Shipment Reports, domestic shipments for the season to date are 12% higher than the same period last season, but exports are relatively the same year over year.⁵⁰ In an effort to support the industry and remove a backlog of lower quality walnuts, the USDA announced a program to purchase \$90 million of walnuts for domestic food assistance programs.

Recent studies have shown that walnut consumption is positively associated with improvements in self-reported mental health and stress. Walnuts contain melatonin, omega-3 fatty acids and other vitamins and nutrients associated with gut and mental health.

WALNUTS Historical Walnut Production and Prices, 2013 to 2022F



WALNUTS Historical Season-to-Date Walnut Shipments by Region, 2020/21 to 2022/23 (September–January)



Sources: PGIM Real Estate Agricultural Research, California Walnut Board



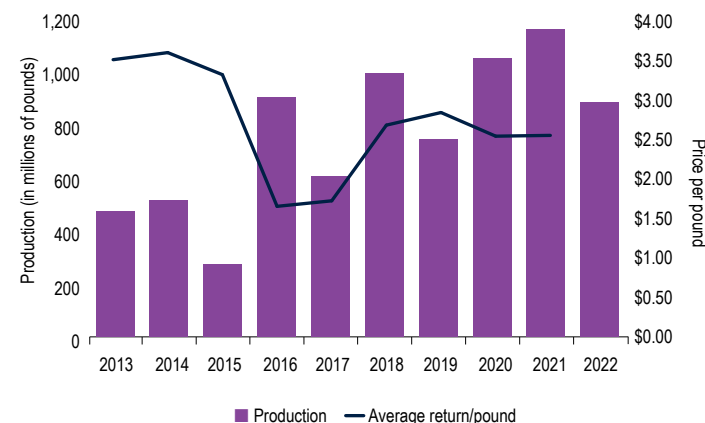
PISTACHIOS

The 2022 California pistachio crop ended with approximately 880 million pounds, down 24% from the prior season's record of 1.15 billion pounds. The decline is due to the industry's experiencing an off year because of the alternate bearing nature of pistachios as well as the impact of drought conditions throughout the state. Last year, California had an estimated 554,000 acres planted with pistachio trees, or five times larger than just two decades ago. An estimated 23% of the acres are nonbearing, which suggests that production could reach more than 1.5 billion pounds in the next few years. Nonbearing acreage increased in 2022 for the first time in five years by approximately 15% (17,000 acres), and bearing acreage increased by 4% (18,000 acres) from 2021.⁵² Carryover from the 2021 crop totaled 354 million pounds, up 25% from the prior season. The resulting gross inventory totaled 1.24 billion pounds, and the estimated total marketable inventory was 827 million as of December 31, 2022.

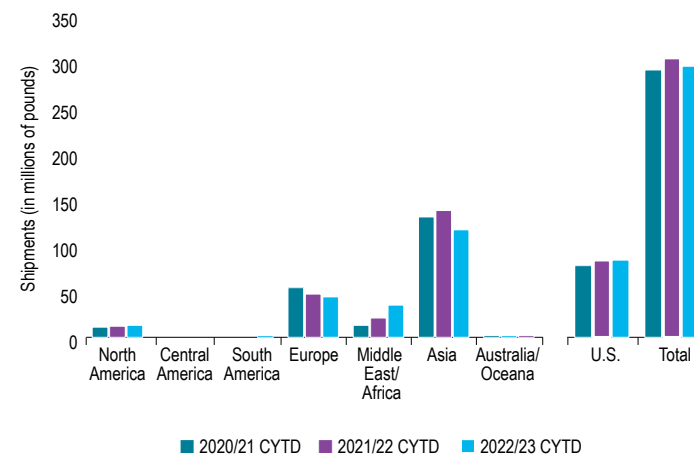
Overall pistachio shipments for this season to date (September–December 2022) were 295 million pounds, down just 3% from the same period last year. Domestic shipments are 7% higher this season to date, whereas exports are down 4%. Shipments to Asia and Europe are down 15% and 6%, respectively, on an annual basis due to weaker economic conditions in those regions. Higher exports have been observed to the Middle East, which have increased 69% year over year this season. In addition, exports to Mexico continue to grow. U.S. pistachios continue to gain market share around the world. Domestic marketing companies continue to expand the use of pistachios through food manufacturers, the food service industry and retail products. Per-capita consumption of pistachios has been trending up since the mid-2010s, as consumers continue to learn about the benefits from eating this tree nut and as a result of the strong demand for pistachio kernels as healthy snack options.

Pistachio prices have been relatively stable compared with other tree nuts this season. In 2021, pistachio prices ended at \$2.52 per pound, and prices for the 2021/22 season are relatively the same. Future pistachio prices will be highly dependent on improving economic conditions in international markets, as close to 65% to 70% of pistachios are exported to major consumers mainly in Asia and Europe.

PISTACHIOS Historical Pistachio Production and Prices, 2013 to 2022F



PISTACHIOS Historical Season-to-Date Pistachio Shipments by Region, 2020/21 to 2022/23 (August–January)



Sources: PGIM Real Estate Agricultural Research, Administrative Committee for Pistachios, USDA, NASS



APPLES

According to the USDA, total U.S. apple production in 2022 is forecast at 10.1 billion pounds, or 2.9% higher than 2021's production of 9.8 billion.⁵³ Washington State, the top apple producer in the country, reported a 6.5-billion-pound harvest, or 3.8 percent less than last year. Apple orchards in Washington suffered hail damage in early April and extreme heat during July and August, affecting productivity. On the contrary, ideal weather conditions in Michigan and New York contributed to record-high yields in those states.

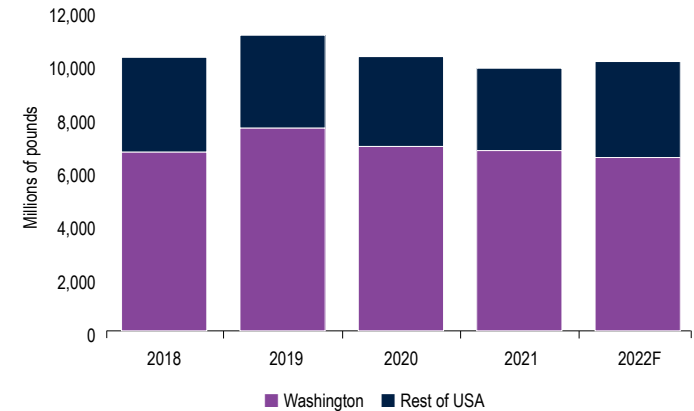
The average apple price per pound received by growers was down during the second half of 2022, from \$0.74 last year to \$0.69, or 6% lower. According to the U.S. Apple Association, that price decrease is attributed to higher production and fresh apple holdings' being 16% higher than the previous season. Prices are expected to strengthen at

the beginning of 2023, thanks to strong consumer demand and lower apple stocks in Washington.

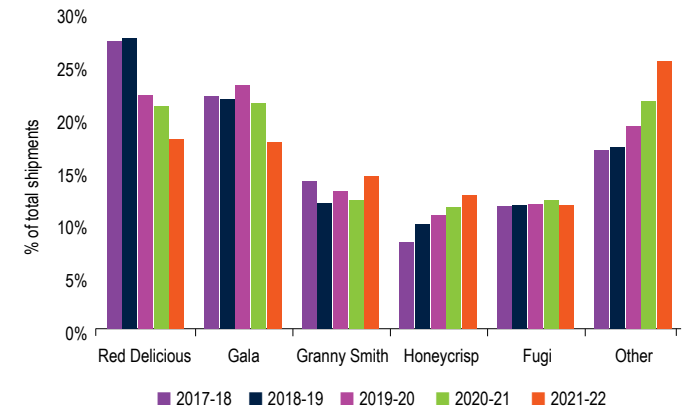
The Red Delicious variety continues to be the most-produced apple in Washington, accounting for 18% of total shipments, followed by Gala (17.7%), Granny Smith (14.5%), Honeycrisp (12.7%) and Fuji (11.7%).⁵⁴ Despite its popularity, Red Delicious market share has decreased by 12% since 2016. International apple shipments are expected to decline by 7.3% compared with last year, from 1.44 billion pounds to 1.34 billion pounds.⁵⁵ Tariffs imposed by India continue to affect total U.S. apple exports. Exports to India have weakened, but Canada and Taiwan are projected to increase U.S. apple imports.

Apples continue to be the most-consumed fruit in the United States, and it is expected that this industry will continue to grow domestically and internationally.

APPLES Historical Apple Production in the United States, 2018 to 2022F



APPLES Historical Apple Shipments by Variety as a Percentage of Total, 2017/18 to 2021/22



Sources: PGIM Real Estate Agricultural Research, USDA, FAS, USApple



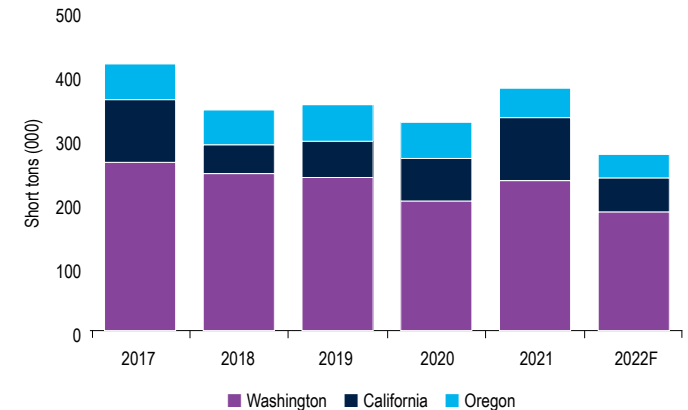
CHERRIES

Cherries are part of the prune family and are widely consumed in the United States. There are two main types of cherries: sweet and sour. Sweet cherries are used primarily in the fresh market. The production of sweet cherries is concentrated in California, Oregon and Washington State. Sour or tart cherries are used for processing and are produced primarily in Michigan.⁵⁷

U.S. sweet cherry production in 2022 is forecast to be the lowest since 2008, at 550 million pounds, or 27.3% lower than the previous year.⁵⁸ California experienced early freezes, which affected the bloom significantly. The decrease in production in the Pacific Northwest states was due to hail events, wet weather and colder weather conditions in April, affecting pollination rates. Crop insurance for cherry growers is expected to help mitigate the impact of production this past season.

The prices of U.S. cherries increased by \$1.8 per pound, or 49% from the previous year.⁵⁹ International shipments were also affected by lower domestic production, which reached its lowest point since 2002, at 84 million pounds, or 45% lower than the previous year.⁶⁰ Strong domestic demand for cherries increased the need for imports, mainly from Chile. Increasing consumption per capita has incentivized growers to invest heavily in the development of new varieties that will help mitigate this commodity's susceptibility to late freezes and diseases.

CHERRIES Historical Cherry Production in the United States, 2017 to 2022F



-27%
FROM 2021

U.S. SWEET CHERRY PRODUCTION

Production of this commodity is projected to be 550 million pounds in 2022.

+49%
FROM 2021

U.S. SWEET CHERRY PRICE

The average price of sweet cherries peaked at \$5.4 per pound in 2022.



HAZELNUTS

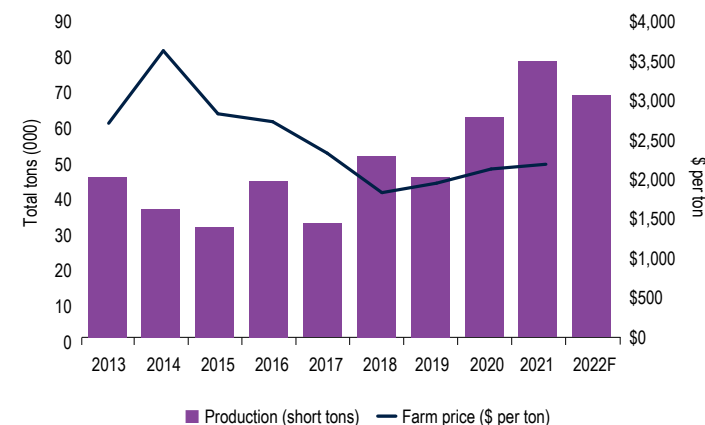
After a record hazelnut crop in 2021 of 75,500 tons, the 2022 crop is expected to be 68,000 tons, or 12% lower than the prior season.⁶¹ Similar to other tree nuts, hazelnuts produce on an alternate bearing cycle. The majority of trees in Oregon, where most U.S. hazelnuts are grown, reached the top of their biannual production cycle in 2021, hence the lower crop in 2022. Bearing acreage increased to 68,000 acres, or 11.5% higher than the previous year.

According to the Hazelnut Growers Bargaining Assoc. (HGBA), hazelnut prices in 2021 ranged from \$0.97 to \$1.17 per pound depending on the variety.⁶² However, the price range in 2022 dropped to a range of \$0.40 to \$0.53 per pound. Hazelnut prices have declined as a result of (1) higher production in Turkey, which is the top global producer of this tree nut; (2) devaluation of the Turkish lira against the U.S. dollar; and (3) China's current COVID

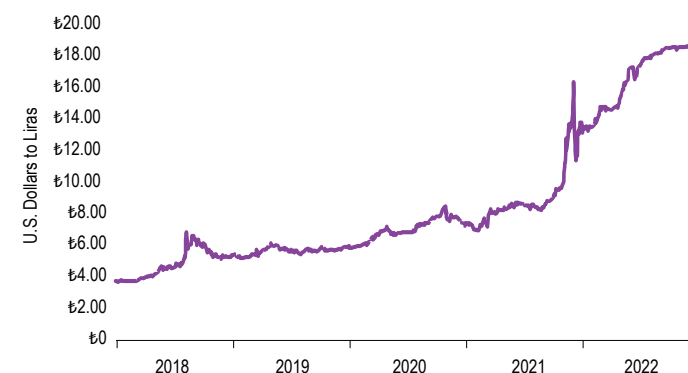
restrictions. The Turkish government announced that its hazelnut production would reach 765,000 tons in 2022, up 12% from last year, thereby increasing the world's supply.⁶³ In addition, the Turkish lira (TRY) devaluated against the U.S. dollar at an accelerated rate, from \$1 to 13.32 liras in December 2021 to \$1 to 18.69 liras at the end of 2022, or a 40% increase, augmenting downward pressure against hazelnut prices as it makes this commodity less expensive to international buyers.⁶⁴ Furthermore, China, which has historically purchased 70% of U.S. hazelnuts, according to the HGBA, has decreased its imports by more than 10% since the COVID pandemic started.

Hazelnut growers in the United States face challenging times. Nevertheless, many producers' and growers' associations are optimistic and anticipate that lower prices will increase this commodity's popularity and consumption in the United States.

HAZELNUTS Historical Hazelnut Production and Prices, 2013 to 2022F



HAZELNUTS Historical Turkish Lira Versus U.S. Dollar, 2018 to 2022



Sources: PGIM Real Estate Agricultural Research, USDA, NASS, MINTEC, WSJ



DATES

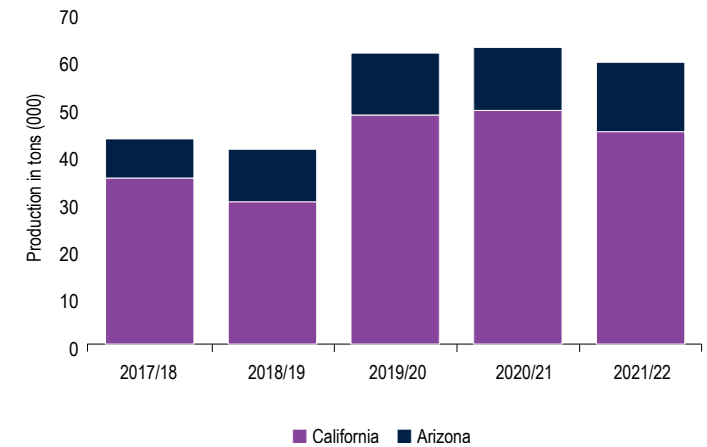
The entire U.S. date sector is cultivated mostly in the Sonoran Desert region of Southern California, in Riverside and Imperial Counties, and southwestern Arizona, in Yuma County, which are currently the homes of more than 15,500 bearing acres of date palm trees, representing a 5.5% decrease year over year.⁶⁵ USDA-reported bearing acres in California declined 7.2% and remained the same in Arizona from 2020/21 to 2021/22. The variance in bearing acres is driven by rising farming costs, reductions in water supplies and increased global competition.⁶⁶

The 2021/22 grower prices received were 32.3% higher in California and 11.0% higher in Arizona year over year. Price increases were offset by rising farming and transportation costs. The strong U.S. dollar and increased global production in lower-cost producing countries could create headwinds for the current crop year.

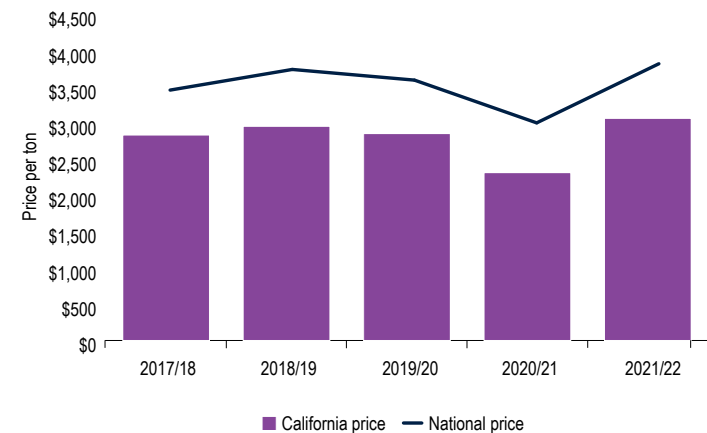
According to the Food and Agriculture Organization of the United Nations (FAO), domestic production of dates constitutes only approximately 0.5% of the global market supply, which is estimated at 1.26 tons for the 2021/22 season. The FAO estimates that Egypt is the leading producer of dates, followed by Saudi Arabia, Iran, Algeria and Iraq, each respectively responsible for 17.8%, 16.0%, 13.3%, 12.1% and 7.6% of global date production.⁶⁷ Producers in the United States compete on quality and have developed a reputation for being premium fresh date producers, which enables growers to capitalize on higher prices relative to other producers.

Season to date, U.S. exports are down 42.3%. Lower commodity prices, a strong U.S. dollar relative to the currencies of other major date-producing countries and higher farming costs are the headwinds growers faced in 2022 and into early 2023.

DATES Historical U.S. Date Production and Prices, 2017/18 to 2021/22



DATES Historical Date Prices in California, 2017/18 to 2021/22



Sources: PGIM Real Estate Agricultural Research, USDA, PASS



TIMBER

Overview

The timberland and forest products industry in 2022 was characterized by the anticipation of an economic recession heading into 2023 as the U.S. Federal Reserve has continued to raise rates in an effort to bring rising inflation under control. As a result, demand for housing has slowed down from the pandemic peaks and has stabilized to yearly averages in a combination with supply chain issues, which have helped push end-use forest product prices upward across the United States.

Housing starts are primary indicators of demand because forest products are major inputs for single-family and multifamily construction. The Housing Market Index hit new highs in 2020, at a score of 90, a level not seen before as demand shifted out of cities and into suburbs. The 12-month rolling average

for 2022 has softened to 59, in line with the 10-year average of 61.⁶⁸ The sector is in the stage of a cyclical lull due to higher mortgage rates affecting affordability and anticipation of an economic recession. Despite those fears, 2022 saw 1.4 million single-family home starts, down 19.3% from the 1.71 million starts in 2021.

During the past decade, southern pine plantations have experienced strong inventory growth fueled by a strong regional housing market in the South. Inventories are expected to increase to 346 billion board feet, with steady demand at 20.1 billion board feet for 2022. The continued growth of existing inventory is expected to be met by increased demand, as additional new mill construction and existing mill expansion projects are taking place.

Nationwide, there were approximately 2.7 million acres of timberland transactions in 2022. The average sale price per acre in the U.S. South was \$2,653.

Numerous large timberland transactions included packages of more than 50,000 acres, as institutional managers continue to pursue strategic acquisitions to harvest timber in prime mill markets, producing durable returns for their investors. The combination of rising demand for wood products and limited supply of usable land continues to keep upward pressure on land prices in this sector.



TIMBER

The southern timber markets have continued to rise in tandem with pent-up demand in the region. Stumpage prices for all five major products were up year over year, with an average price increase of 9% for 2022. Pine sawtimber averaged more than \$26 per ton for the first time since 2010, at \$26.85 southwide average. Southwide pricing trends from 2021 to 2022 were as follows: pine chip-n-saw was up \$1.58 (9%) to \$19.98 as the average price per ton, pine pulpwood was up \$0.53 (5%) to \$10.15 as the average price per ton, hardwood sawtimber was up \$2.01 (6%) to \$33.35 as the average price per ton and hardwood pulpwood was up \$1.75 (19%) to \$11.08 as the average price per ton.⁶⁹

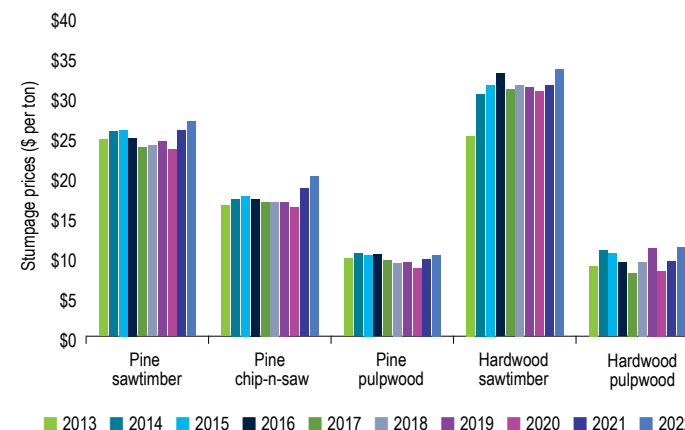
The supply overhang in the South continues to keep price growth modest. Supply in the U.S. South continues to grow at a steady rate of 20 billion board feet per year, with an expected total ending inventory

of 335 billion board feet available for harvest in the South.⁷⁰ The abundance of supply is from a combination of lack of mature harvest during the Great Recession and subsequent slow recovery, along with increased productivity due to improved genetics and silvicultural practice.

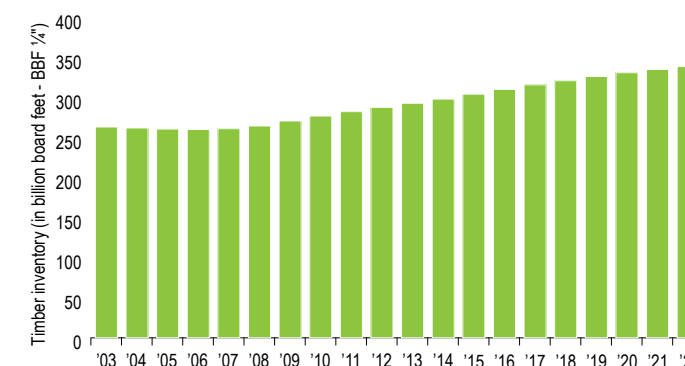
The strong product markets in 2022 could be attributed to steady demand at more than 20.1 billion board feet in the South for softwood products, as softwood lumber capacity expands with newer, more-efficient mill construction. Demand remains strong in the region due to favorable timber procurement prices, proforest products industry government policy and central location to high-growth residential areas.

For 2022, more than 1.8 million acres of timberland transactions occurred in the South, with the average price per acre lower than the national average, at \$1,610; however, values are in line with the 15-year average of \$1,620 per acre.⁷¹ Sales indicate that institutional and private buyers continue to pursue a strategy of investing in prime timberlands, with stable mill market demand ensuring stable cash flow.

TIMBER Historical Southwide Average Timber Stumpage Prices (\$ per ton) for Five Major Product Categories, 2013 to 2022



HOUSING UNITS Historical Softwood Sawtimber Inventory in the U.S. South, 2003 to 2022



Sources: PGIM Real Estate Agricultural Research, Timber Mart-South, Forest Economic Advisors



TIMBER

In 2022, Douglas fir delivered prices reached \$915 per million board feet, up 15% from 2021. Hemlock delivered prices also increased to \$596 per million board feet, up 9% from 2021.⁷² The West Coast sawtimber harvest was approximately 6.56 billion board feet for 2022 and has remained fairly stable during the past 10-year period, averaging 6.7 billion board feet.

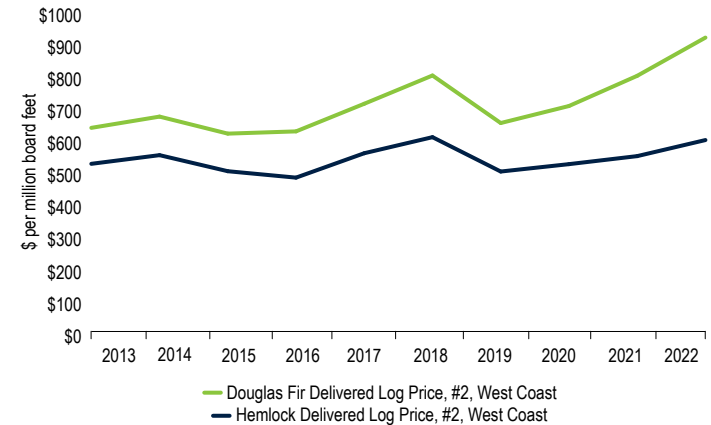
Export markets saw a decline in demand, at 0.65 billion board feet, a 23% decrease from the 0.85 billion board feet in 2021 as a result of weaker demand from China, rising logging costs, continued tariffs on log imports from the United States and competition from other regional suppliers.⁷³

The 2022 western wildfire season resulted in 7.5 million acres burnt, on par with the 10-year average of 7 million acres burnt from 2011 to 2021.⁷⁴

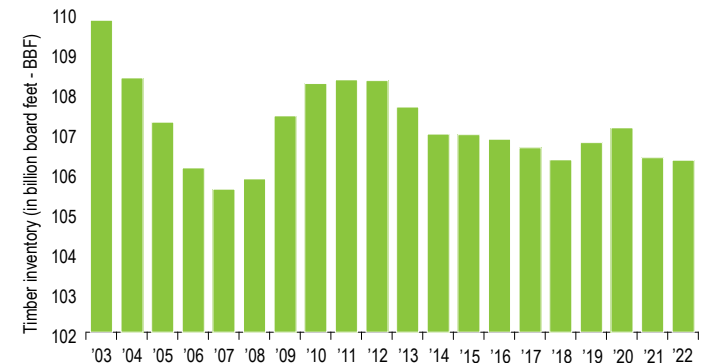
Availability of timber for harvest in the western region has been limited due to the impact of wildfires during the 2020–21 period, which has created upward pressure on the prices of sawtimber. Drought conditions continue to persist in the western United States. Salvage operations on private timberlands have been mostly completed in 2022, with harvests of softwoods expected to outpace growth for the near future. The constrained supply will support higher-pricing trends.

Transactions of note for 2022 in the Pacific Northwest included the acquisition of 47,751 acres of timberland in Oregon and Washington state by an Institutional Investor from Green Crow. These types of sales also indicate that institutional investors continue to pursue long-term strategies of investing in prime timberlands in this region of the United States.

TIMBER Historical Western Timber Prices from 2013 to 2022



TIMBER Historical Softwood Sawtimber Inventory in the West Coast, 2003 to 2022



Sources: PGIM Real Estate Research, Forest Economic Advisors

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Reference: 007824

REFERENCES

- ¹ Preliminary assessment of agricultural losses resulting from Hurricane Ian, October 17, 2022.
- ² January Citrus Forecast. USDA NASS. January 12, 2023. Chrome extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.nass.usda.gov/Statistics_by_State/Florida/Publications/Citrus/Citrus_Forecast/2022-23/cit0123.pdf.
- ³ Postseason price estimate. FDOC. Florida Citrus Mutual. Accessed January 17, 2023.
- ⁴ Brian W. Bahder and Ericka E. Helmick. "ENY998/IN1240: Oxytetracycline Hydrochloride (OTC-HCl) Application for Control of Palm Phytoplasmas." University of Florida.
- ⁵ FAS, U. November 2020. "Sugar: World Markets and Trade." Retrieved from Global 2020/21 Sugar Production Is Estimated Higher: <https://apps.fas.usda.gov/psdonline/circulars/Sugar.pdf>.
- ⁶ Andrew Sowell and Ronald Lord. January 2021. Sugar and Sweeteners Outlook. Retrieved from Economic Research Service | Situation and Outlook Report, <https://downloads.usda.library.cornell.edu/usda-esmis/files/pv63g024f/9k420694p/8g84nd75f/SSSM389.pdf>.
- ⁷ Statistics by Subject. National Statistics for Pecans. USDA National Agricultural Statistics Service. Accessed January 17, 2023.
- ⁸ Pecan Bearing Acreage, Yield, Production, Price and Value – States and United States. USDA Economic Research Service. extension://efaidnbmnnnibpcajpcglclefindmkaj/https://downloads.usda.library.cornell.edu/usda-esmis/files/zs25x846c/4q77gv96p/t722jd76c/ncit0522.pdf. Accessed January 17, 2023.
- ⁹ USDA. 2022. Blueberries: U.S Imports by value (\$1,000). Data by Commodity: Imports and Exports, usda.gov. Accessed January 17, 2023.
- ¹⁰ U.S. Highbush Blueberry Council. Data and Insights Center. Analytics Dashboard USHBC (blueberry.org). Accessed January 31, 2023.
- ¹¹ USDA Economic Research Service. August 2022. https://www.nass.usda.gov/Publications/Todays_Reports/reports/land0822.pdf.
- ¹² Ibid.
- ¹³ USDA NASS Highlights. 2022 Agricultural Land. Land Values and Cash Rents. October 2022. https://www.nass.usda.gov/Publications/Highlights/2022/2022LandValuesCashRents_FINAL.pdf.
- ¹⁴ USDA. 2022. "World Agricultural and Supply Demand Estimates." <https://www.usda.gov/oce/commodity/wasde/wasde0123.pdf>. Accessed January 17, 2023.
- ¹⁵ Ibid.
- ¹⁶ Ibid.
- ¹⁷ USDA. January 2023. "World Agricultural Supply and Demand Estimates." extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.usda.gov/oce/commodity/wasde/wasde0123.pdf Web accessed January 13, 2023.
- ¹⁸ Ibid.
- ¹⁹ Ibid.
- ²⁰ Ibid.
- ²¹ Ibid.
- ²² USDA Economic Research Service. December 2022. "Cotton and Wool Outlook: December 2022." extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ers.usda.gov/webdocs/outlooks/105429/cws-22k.pdf?v=7026.9. Accessed January 13, 2023.
- ²³ USDA. January 2023. "World Agricultural Supply and Demand Estimates." extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.usda.gov/oce/commodity/wasde/wasde0123.pdf Web accessed January 13, 2023.
- ²⁴ Ibid.
- ²⁵ Ibid.
- ²⁶ WINEGRAPES: "USDA Forecasts 3.5 million-ton California Crush." Wine Business, August 12, 2022. <https://www.winebusiness.com/news/article/261731#:~:text=The%20U.S.%20Department%20of%20Agriculture%27s,California%20crop%20in%20three%20years>. Accessed January 23, 2023.
- ²⁷ WINEGRAPES: USDA. 2022. Press release: Fruit Production. https://www.nass.usda.gov/Statistics_by_State/Oregon/Publications/Fruits_Nuts_and_Berries/2022/FR08_1.pdf. Accessed January 13, 2023.
- ²⁸ WINEGRAPES: California Ag Network. 2022. "State of the Central Valley Wine Industry and Harvest Report." <https://californiaag.net.com/2022/12/01/state-of-the-central-valley-wine-industry-and-harvest-report/>. Accessed January 13, 2023.
- ²⁹ WINEGRAPES: Allied Grape Growers. 2022. "Winter Report – 2022." extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.alliedgrapegrowers.org/pdfs/AGG%20Report%20Winter%202022.pdf. Accessed January 17, 2023.
- ³⁰ WINEGRAPES: California Ag Network. 2022. "2022 California Wine Grape Crop & Market Update." <https://californiaag.net.com/2022/06/29/2022-california-wine-grape-crop-market-update/#:~:text=2022%20California%20Wine%20Grape%20Crop%20%26%20Market%20Update,impacting%20some%20grape%20growing%20regions%20of%20the%20state>. Accessed January 13, 2023.

REFERENCES

- ³¹ AVOCADOS: California Avocado Commission. 2022-23. Current Crop Estimates. <https://www.californiaavocadogrowers.com/industry/crop-statistics/current-crop-estimates>. Accessed January 10, 2023.
- ³² AVOCADOS: September 22, 2022. Index Fresh. “Index Fresh Wraps Up a ‘Phenomenal’ California Avocado Season.” PerishableNews.com. <https://www.perishablenews.com/produce/index-fresh-wraps-up-a-phenomenal-california-avocado-season/#:~:text=More%20than%20275%20million%20pounds,gate%20with%20good%20quality%20avocados>. Accessed January 10, 2023.
- ³³ AVOCADOS: California Avocado Growers. Fall 2022. From the Grove. <https://www.californiaavocadogrowers.com/sites/default/files/2022-Fall-FTG-Final.pdf>. Accessed January 11, 2023.
- ³⁴ CITRUS, LEMONS: USDA. 2022. Citrus December Forecast. www.nass.usda.gov/Statistics_by_State/Florida/Publications/Citrus/Citrus_Forecast/2022-23/cit1222a.pdf. Accessed January 11, 2023.
- ³⁵ CITRUS, LEMONS: California Citrus Mutual. 2022. “California Citrus Mutual Memo” 45(45). Accessed January 11, 2023.
- ³⁶ CITRUS, VALENCIA ORANGES: USDA NASS and CDFA. March 9, 2022. 2021-22 California Valencia Orange Objective Measurement Report. https://www.nass.usda.gov/Statistics_by_State/California/Publications/Specialty_and_Other_Releases/Citrus/index.php. Accessed January 21, 2023.
- ³⁷ CITRUS, VALENCIA ORANGES: USDA NASS. 2022. Citrus December Forecast. https://www.nass.usda.gov/Statistics_by_State/Florida/Publications/Citrus/Citrus_Forecast/index.php. Accessed January 21, 2023.
- ³⁸ CITRUS, Navel ORANGES: USDA NASS. 2022. Citrus December Forecast. www.nass.usda.gov/Statistics_by_State/Florida/Publications/Citrus/Citrus_Forecast/2022-23/cit1222a.pdf. Accessed January 11, 2023.
- ³⁹ CITRUS, Navel ORANGES: California Citrus Mutual. 2023. “California Citrus Mutual Memo” 46(01).
- ⁴⁰ CITRUS, MANDARINS: USDA. 2022. Citrus Fruits 2022 Summary. extension://efaidnbmnnnibpcajpcglclefindmkaj/<https://downloads.usda.library.cornell.edu/usda-esmis/files/j9602060k/pn89ff24k/zp38xm24q/cfrt0922.pdf>. Accessed January 23, 2023.
- ⁴¹ CITRUS, MANDARINS: Fresh Fruit Portal.com. 2022. “California citrus industry set to see rise in navel orange and mandarin production.” <https://www.freshfruitportal.com/news/2022/10/13/california-citrus-industry-set-to-see-rise-in-navel-orange-and-mandarin-production/>. Accessed January 23, 2023.
- ⁴² ALMONDS: Almond Board of California. 2022. Almond Almanac 2021/22. https://www.almonds.com/sites/default/files/2022-12/2022_Almanac.pdf. Accessed January 13, 2022.
- ⁴³ ALMONDS: Almond Board of California. December 2022. Almond Industry Position Report. https://www.almonds.com/sites/default/files/2023-01/2022.12_PosRpt_9284.pdf. Accessed January 13, 2023.
- ⁴⁴ ALMONDS: RPAC. July 8, 2022. NASS 2022 Almond Objective Estimate. <https://www.rpacalmonds.com/marketnews/objective2022/>. Accessed January 17, 2023.
- ⁴⁵ ALMONDS: RPAC. January 12, 2023. Almond Market Update – January 2023. <https://www.rpacalmonds.com/marketnews/202301/>. Accessed January 13, 2023.
- ⁴⁶ WALNUTS: USDA. September 1, 2022. 2022 California Walnut Objective Measurement Report. <https://walnuts.org/report/crop-estimate-report-2022/>. Accessed January 13, 2023.
- ⁴⁷ WALNUTS: Farm Progress. September 2, 2022. “California walnut farmers struggle to reach global markets.” <https://www.farmprogress.com/marketing/california-walnut-farmers-struggle-to-reach-global-market>. Accessed January 19, 2023.
- ⁴⁸ WALNUTS: USDA. 2022. “Fruit and Tree Nuts Outlook: September 2022.” <https://www.ers.usda.gov/webdocs/outlooks/104877/fts-375.pdf?v=6496.8>. Accessed January 12, 2023.
- ⁴⁹ WALNUTS: Walnut Bargaining Association. 2022. Press release. Walnut Bargaining Association Recommends Minimum Grower Price. <https://walnutbargainingassociation.com/wp-content/uploads/2022/12/Walnut-Bargaining-Association-Recommends-Minimum-Grower-Price.pdf>. Accessed January 23, 2023.
- ⁵⁰ WALNUTS: California Walnut Board. September 27, 2022. Monthly Shipment Report. <https://walnuts.org/report/shipment-report-august-2022-preliminary/>. Accessed January 11, 2023.
- ⁵¹ WALNUTS: Neuroscience News. December 16, 2022. “Walnuts the New Brain Food for Stress.” <https://neurosciencenews.com/walnuts-stress-22098/>. Accessed January 13, 2023.
- ⁵² PISTACHIOS: Administrative Committee for Pistachios. 2022. December 2022 Pistachio Industry Inventory Shipment Report. Accessed January 16, 2023.
- ⁵³ APPLES: USDA. 2022. “Fruit and Tree Nuts Outlook: September 2022.” <https://usda.library.cornell.edu/concern/publications/h989r3203?locale=en>. Accessed January 20, 2023.

REFERENCES

- ⁵⁴ APPLES: Washington State Tree Fruit Association. 2022. "A Statistical Review of Washington State Fresh Apple Crops 2021/22," p. 2.
- ⁵⁵ APPLES: FAS. December 13, 2022. Fresh Apples, Grapes, and Pears: World Markets and Trade. <https://www.fas.usda.gov/data/fresh-apples-grapes-and-pears-world-markets-and-trade>. Accessed January 20, 2023.
- ⁵⁶ APPLES: USApple. 2022. "Industry Outlook 2022," p. 13.
- ⁵⁷ CHERRIES: USDA. 2022. "Noncitrus Fruits and Nuts 2021 Summary." <https://usda.library.cornell.edu/concern/publications/zs25x846c>. Accessed January 20, 2023.
- ⁵⁸ CHERRIES: USDA, 2022. "Fruit and Tree Nuts Outlook: September 2022." <https://usda.library.cornell.edu/concern/publications/h989r3203?locale=en>. Accessed January 20, 2023.
- ⁵⁹ CHERRIES: Alice Witchalls. June 8, 2022. "US cherry prices forecast to remain elevated in 2022 amid unfavorable weather." Mintec. Accessed January 20, 2023.
- ⁶⁰ CHERRIES: USDA. September 2022. Fresh Peaches and Cherries: World Markets and Trade. <https://apps.fas.usda.gov/psdonline/circulars/StoneFruit.pdf>. Accessed January 20, 2023.
- ⁶¹ HAZELNUTS: USDA NASS. 2022. "Hazelnut Forecast 2022." https://www.nass.usda.gov/Statistics_by_State/Oregon/Publications/Fruits_Nuts_and_Berries/index.php. Accessed January 21, 2023.
- ⁶² HAZELNUTS: HGBA. 2022. Breaking News – Executive Director's Message. <https://www.hazelnutbargaining.com/breaking-news>. Accessed January 21, 2023.
- ⁶³ HAZELNUTS: Jara Zicha. July 26, 2022. "Turkish 2022 hazelnut production forecast announced." Mintec. <https://www.mintecglobal.com/top-stories/turkish-2022-hazelnut-production-forecast-announced>. Accessed January 21, 2023.
- ⁶⁴ HAZELNUTS: WSJ. 2022. "WSJ Markets – USDTRY." <https://www.wsj.com/market-data/quotes/fx/USDTRY/historical-prices>. Accessed January 21, 2023.
- ⁶⁵ DATES: USDA. 2023. NASS Quick Stats. <https://quickstats.nass.usda.gov/#70324E4B-DFA4-3E9F-A63F-099C91269491>. Accessed January 20, 2023.
- ⁶⁶ DATES: Tom Coulter. Desert Sun. August 7, 2022. "Coachella Valley date farmers try to chart a future amid inflation and historic drought." <https://www.desertsun.com/story/news/local/2022/08/07/california-drought-and-inflation-hitting-coachella-valley-date-farmers/10087118002/>. Accessed January 20, 2023.
- ⁶⁷ DATES: Food and Agriculture Organization of the United Nations. 2023. Crop and Livestock Products. <https://www.fao.org/faostat/en/#data/QCL>. Accessed January 20, 2023.
- ⁶⁸ National Association of Home Builders. Table 2: NAHB/Wells Fargo National Housing Market Index - History. <https://www.nahb.org/news-and-economics/housing-economics/indices/housing-market-index>. Accessed on January 13, 2023.
- ⁶⁸ TimberMart–South. 2021. "U.S. South Annual Review: 2021 Timber Prices 7 Markets," p. 5. Forest Economic Advisors. 2022 "Timber Quarterly Forecast." FEA Timber QF 22Q4.pdf. Accessed on January 13, 2023.
- ⁶⁹ TimberMart–South. 2022 "4Q2022 News," p. 29.
- ⁷⁰ Forest Economic Advisors Data Center. <https://getfea.com/data-center>. Accessed January 13, 2023.
- ⁷¹ Forest Economic Advisors. 2022. "Timber Quarterly Forecast." FEA Timber QF 22Q4.pdf. Accessed on January 13, 2023.
- ⁷² National Interagency Fire Center. Wildfires and Acres. National Interagency Fire Center (nifc.gov). Accessed March 22, 2022.
- ⁷³ Forest Economic Advisors, 2022 "Timber Quarterly Forecast". HYPERLINK "file:///C:/Users/x225830/AppData/Local/Temp/MicrosoftEdgeDownloads/91be18c7-bdb6-4eab-879b-d0893ea47ec/FEA%20Timber%20QF%2022Q4.pdf" FEA Timber QF 22Q4.pdf Accessed on January 13 2023.
- ⁷⁴ National Interagency Fire Center. "Statistics Wildfires and Acres" HYPERLINK "https://www.nifc.gov/fire-information/statistics/wildfires" Wildfires and Acres | National Interagency Fire Center (nifc.gov) Accessed March 22, 2022.