



PGIM REAL ESTATE

AGRICULTURAL FINANCE & INVESTMENTS

U.S. AGRICULTURE & TIMBER MARKET UPDATE

2022



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EXECUTIVE SUMMARY

- **Inflationary pressures** can create challenges for most industries in the economy. Real assets like farmland are expected to be good hedges against future inflation, and as a result, more and more institutional investors continue favoring this asset class. The National Council of Real Estate Investment Fiduciaries (NCREIF) reported that its NCREIF Farmland Index ended 2021 with a new record value of \$13.8 billion, which consisted of 61% in annual cropland and 39% in permanent cropland. The index posted in 2021 a total return of 7.83% for row crop and permanent plantings. On a longer-term basis, the farmland index has had total returns of 9.68% and 12.38% over the past 10 and 20 years, respectively.
- As of March 2022, the U.S. Bureau of Labor Statistics' 12-month **Consumer Price Index** increased by 8.5%. During the same period, the Consumer Price Index for food increased 8.8%, with the food-at-home index higher by 10% on an annual basis. The biggest increase was observed in the meats, poultry, fish and eggs category at 13.7%, followed by cereals and bakery products (9.4%), fruits and vegetables (8.5%), nonalcoholic beverages and beverage materials (8%), and dairy (7%).
- The **conflict between Russia and Ukraine** has exacerbated the costs of many key agricultural commodities worldwide. Russia and Ukraine are major grain exporters, and many of these grain commodities are indispensable to developing countries in Northern Africa (i.e., Algeria, Egypt, Libya, Morocco, Tunisia) as well as countries in the Middle East, such as Lebanon, Syria, and Turkey. The higher commodity costs of corn, wheat and oilseeds could create multiple challenges for their governments, which subsidize these commodities, and lead to reduced economic growth. In 2021/22, Russia and Ukraine have been projected to account for a significant amount of global exports of sunflower oil (76%), barley (30%), wheat (25%) and corn (14%). These exports are likely to be negatively impacted by the war.
- **U.S. agricultural trade** is projected to have a positive net balance of \$11 billion in 2022 — up 23.6% from the prior fiscal year, according to the U.S. Department of Agriculture (USDA). During the past 10 seasons, agricultural exports have grown at an annual rate of 3% compared with 5.8% for agricultural imports. Total U.S. agricultural exports are projected to increase to \$183.5 billion, an increase of 6.6% from 2021. China is projected to account for 19.6% of those exports, followed by Mexico (14.7%), Canada (14.2%), Japan (8.1%) and the European region (6.3%). Together those five countries/regions are projected to receive 63% of U.S. agricultural exports. On the other hand, total U.S. agricultural imports are forecast to increase to \$172.5 billion in 2022, up 5.6% from 2021. An estimated 61% of the value of U.S. agricultural imports is projected to originate in Mexico (22.8%), Canada (19.3%) and the European region (19%).
- **Farmland valuations** in the central region (i.e., corn belt, delta states) and western region of the United States, such as California, continue to post higher-than-historical averages as local growers and investors remain bullish about the long-term performance of this asset class in an inflationary environment. The eastern region remains an attractive place to invest, although few large transactions have occurred there in past years.
- The **strong U.S. dollar** could limit the ability of U.S. agricultural exporters to build new agricultural markets faster — especially markets for commodities that are heavily dependent on exports (e.g., almonds, apples, pistachios, soybeans). The volatility in currency rates against the dollar could become intensified based on the new Fed's interest rate strategy. Major agricultural trading partners continue seeing their currencies devalued against the U.S. dollar. And even though the currencies of Mexico and Canada, two of the largest U.S. trade partners, have been relatively stable, Japan saw the yen devalue by 9% from March 2021 (¥110.2 per U.S. dollar) to March 2022 (¥122 per U.S. dollar). The euro also weakened against the dollar, to €0.85 per U.S. dollar in March 2022 from €0.90 per U.S. dollar in March 2021, and has continued to trend down.
- The **supply chain bottlenecks** created by the COVID-19 pandemic continue to negatively affect the costs and availabilities of supplies and materials for agricultural production (e.g., costs of fertilizer, polyvinyl chloride pipes, agricultural chemicals). Farm budgets are projected to increase in 2022 (10% to 25%).
- U.S. federal and state efforts to increase the **minimum wage** are having major economic impacts on agribusinesses'

EXECUTIVE SUMMARY (CONTINUED)

labor costs. Many agricultural producers are beginning to invest in more technology and to accelerate ways of automating portions of their operations in order to offset the impacts of that high cost as well as the future availability of labor.

- Higher **transportation costs** and reduced availability of drivers are causing significant financial stress on agricultural producers because they have to move perishable commodities to market very quickly after harvest.
- The food supply chain is accelerating **sustainability efforts** all the way to the farm. Environmental, social and governance issues are becoming more and more

predominant in most agricultural businesses, such as water conservation, precision farming and clean energy.

- **Health trends** continue encouraging consumers to buy fresh products. Demand for certain commodities such as citrus and berries is winning consumers' wallet share in the produce department. The pandemic has helped increase the consumption of large numbers of produce items.
- **Technological advances** in the agricultural sector continue to expand at a faster pace. Allocation of private capital to this sector is growing for a wide variety of agricultural technologies (e.g., drone imagery, autonomous tractors, automatic harvesters, mobile agronomical applications).



EASTERN REGION

Overview

Farmland real estate transactions in the Southeast were limited in 2021, and that trend continued in the early part of 2022. Consolidation of the agricultural industry has led to less-frequent land trading between parties. Parties interested in acquiring farmland are hesitant to move in an environment of rising interest rates and are also concerned about the compression of cap rates across row crops and vegetable farmland.

In Florida, the market for agricultural properties has been reduced, except for recreational land or farmland located in areas with alternative uses, such as for residential or commercial developments. In addition, large, medium and small developers and construction companies in Florida continue pushing into inland areas that are more affordable for future construction. Both transitional opportunity and limited supply of land for development in Florida continue driving farmland values upward.

The impact of rising amounts of imports in the Florida vegetable industry continues to reduce production in areas of the state (e.g., Homestead, Ruskin) that were very important during the winter months. Growers in that sector have become consolidated to the point that future land acquisitions may not be necessary for their operations as long as the market stays oversupplied, and that may affect future land values for this subsector. Acquisitions of groves in the citrus industry are almost nonexistent, as the impact of the greening disease has pushed growers and other investors to the sidelines. Citrus groves owned by smaller growers may become available more often in the near future, as the economics of citrus commodities becomes negatively affected by lower yields and lower quality of the fruit being harvested, coupled with upward cost pressures for most inputs, including fertilizer, chemicals, and labor.

The agricultural real estate market in Georgia, too, has been extremely inactive with regard to large transactions. Institutional investors and local growers continue looking for opportunities in the vegetable and row crop sectors, as well as in pecan orchards, but growers are hesitant to sell because farmland is expected to provide a hedge to inflationary pressures observed throughout the world.



CITRUS

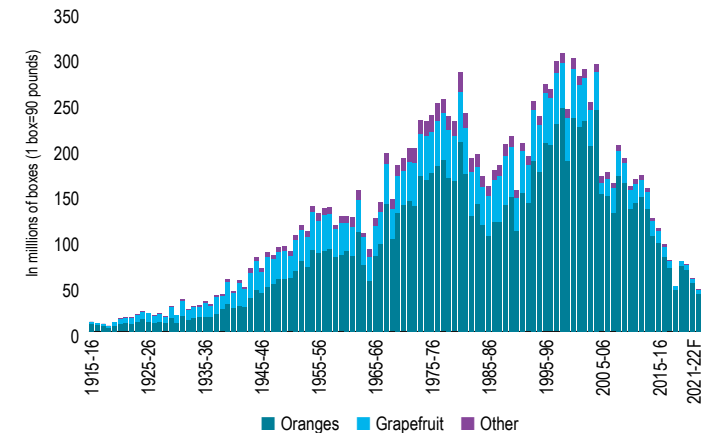
Florida's orange juice production for the 2021/22 crop season is projected at 42 million boxes: down 22% from last season's harvest of 52.8 million boxes, 39% lower than two seasons ago (59 million boxes) and the lowest production since the mid-1940s.¹ Colder weather conditions this past winter coupled with already weakened trees affected by the citrus greening disease had substantial impact on fruit drop as well as the quality of fruit sent for juice processing. For the current 2021/22 season, non-Valencia orange production is forecast at 18.2 million boxes (43% of total), and Valencia orange production is forecast at 23 million boxes, down 20% and 24%, respectively, from the 2020/21 harvest.

This season's lower production has had a positive impact on pricing. Early midseason varieties generated a \$2.52-per-pound solid (pps) this season, or 18% higher than the \$2.14 pps received in the prior year. Based on early internal estimates, Valencia orange prices are projected to be at \$2.70 pps or higher depending on the volume harvested in the remainder of the season. That Valencia orange price would represent an at least 13% increase from the \$2.40 pps in 2020/21.²

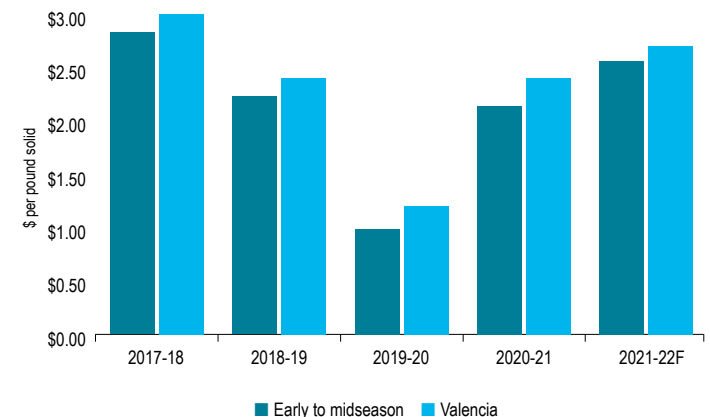
In 2021, total orange juice imports were up 30%, to 390 million single-strength-equivalent gallons from 301 million single-strength-equivalent gallons in 2020. Brazil and Mexico accounted for 56% and 36% of all imports, respectively.³ Despite the increased imports, both the single-strength-orange-juice inventories and the from-concentrate-orange-juice inventories ended 18% and 23% lower, respectively, than in 2020 because of the demand pull generated by the pandemic.

Grapefruit production is forecast at 3.9 million boxes for the 2021/22 season, down 5% from last season's 4.1 million boxes. Growers could expect 30% price increases from the \$2.20 pps of last season. Both the single-strength-grapefruit-juice and the from-concentrate-grapefruit-juice inventories were down 10% and 32%, respectively, for 2021 compared with 2020.

CITRUS Historical and Projected Orange, Grapefruit, and Other Citrus in Florida, 1915–16 to 2021–22F



CITRUS Historical and Projected Orange Juice Prices by Variety, 2017–18 to 2021–22F



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



SUGARCANE

Sugar production derived from cane and beet fields in the United States is projected at 9.3 million short tons raw value for the 2021/22 season. The volume is projected to be 1.6% higher than that of the prior season. And although sugar production is projected to be down 3.5% this season — as Florida and Louisiana growers harvest smaller crops than initially forecast — sugar from beet producers is projected to increase by 5.8%.

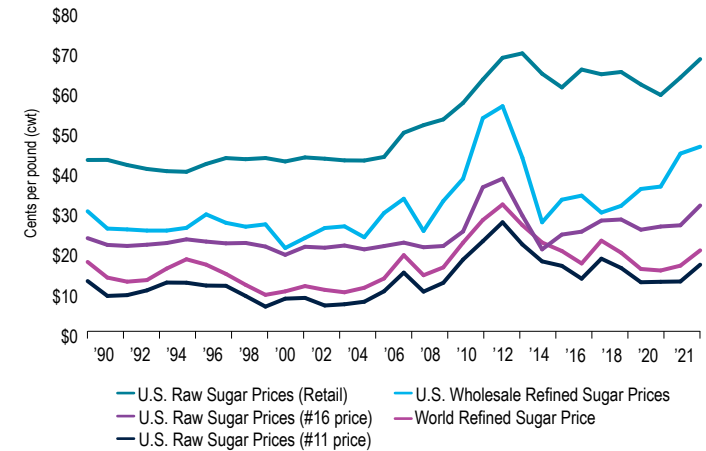
The 2020/21 Florida sugarcane crop was beset with many harvesting challenges, including record rainfall for the season, labor shortages, and supply chain problems associated with a staggered recovery from the COVID-19 pandemic. And even though those issues have not been completely resolved, growers in Florida continue to harvest sugarcane this season, which started in November 2021 and is projected to be completed by the second quarter of 2022. An

estimated 392,000 acres of sugarcane are expected to be harvested in Florida, 4% less than the prior season because of impacts from early January freezes in the state and as other acres in the Everglades agricultural area get rotated to produce vegetable crops or sod instead.⁴ Sugarcane yield this season is projected at 42 short tons per acre, which will be relatively in line with the past five seasons' average yields.

The current farm bill and the Mexican suspension agreements are yielding stable domestic sugar prices, which is enabling operators to move their product without the threat of dumping. The prices of raw sugarcane and refined sugar (wholesale) for 2021 were \$31.42 per hundredweight and \$46.10 per hundredweight, respectively.

Global production for the 2021/22 marketing year is forecast at 181 million metric tons raw value (MMTRV) based on higher production in the European Union (EU), India and Thailand. Brazil's production is expected at 36 MMTRV, down 14% from the prior year because of unfavorable, dry weather conditions. Despite reductions in overall growing areas, the EU is forecast to grow 7% more sugar at 16.6 MMTRV, due to less-than-projected impacts from the beet yellow virus. Consumption in those regions continues to grow as consumers demand sugary foods.⁵

SUGARCANE Historical World and U.S. Sugar Prices, 1990–2021



392K

ACRES FOR 2021/22F

FLORIDA SUGARCANE ACRES

Harvested acres of sugarcane in Florida are projected to be 4% fewer than in the 2020/21 crop season.

181M

METRIC TONS RAW VALUE
FOR 2021/22F

GLOBAL SUGARCANE PRODUCTION

World sugar production is projected at a record 181 million metric tons raw value, or 3% higher than the 10-year average.



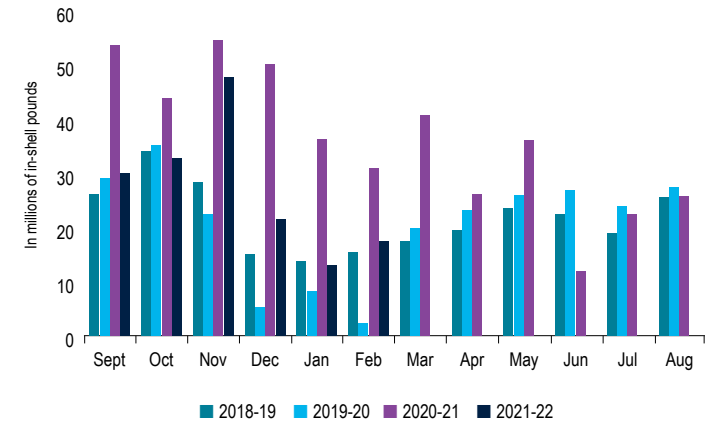
PECANS

Georgia's pecan production for the past crop harvest, which ended in December 2021, is projected to fall below 50 million pounds for the first time in 15 years, based on preliminary reports.⁶ Final crop figures are expected to be released during the second quarter of 2022. Last season, Georgia growers experienced a significant reduction in sunlight during the kernel-filling stage because of higher-than-normal precipitation levels throughout the season. In addition, last year was an off year for this tree nut in the state. Note that pecan trees produce on an alternate bearing cycle.⁷ In March of this year, some freezing temperatures damaged some of the early budbreak of the 2022 crop. Temperatures were in the low 20s in many pecan-growing areas in Georgia, and some crop loss may be expected.

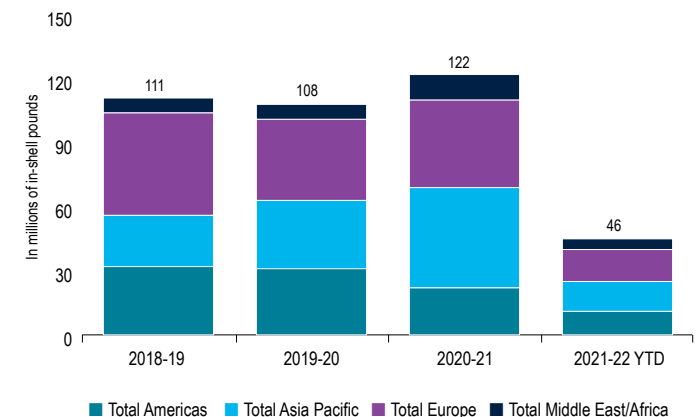
At the beginning of the 2020/21 season, PGIM Real Estate Agricultural Investments observed pecan prices in Georgia ranging from \$1.80 to \$2.25 per in-shell pound, but as lower volumes became recognized during harvest, prices trended upward to \$2.30 to \$2.45 per in-shell pound. Those prices were 50 to 70% higher than the prior season. Prices started lower because of a late harvest, which affected growers' ability to export to China in time for Chinese New Year, which came 10 days earlier in 2022 versus 2021. The smaller crop had an impact not only on prices but on inventory and exports as well. After commitments to ship, inventory on hand at the end of December was down 50%, to 7 million pounds from last season's inventory of 14 million pounds. Total shipments both domestic and international are down 35% to 132 million pounds from last season's inventory of 202 million pounds.

Imports were also down this season for the period September 2021 through December 2021 compared with that same period last season, as Mexican pecan growers encountered smaller crops. Total imports are down 41% to 97 million pounds from last season's 163 million pounds.⁸

PECANS Historical Monthly Shipments for U.S. Pecans by Season, 2018–19 to 2021–22 Year to Date



PECANS Seasonal Pecan Exports by Region, 2018–19 to 2021–22 Year to Date (September to February)



Sources: PGIM Real Estate Agricultural Research, American Pecan Council



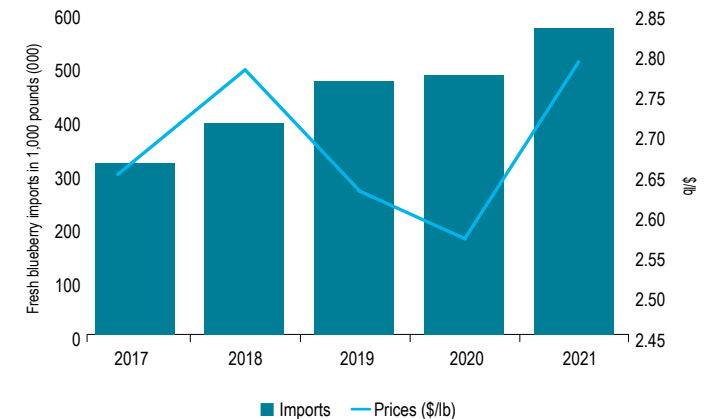
BLUEBERRIES

The U.S. blueberry season runs from March to early October, with Florida starting in March and running through May and with Georgia beginning in April, followed by other states across the United States. An estimated 93% of blueberry production is harvested in eight states: California, Florida, Georgia, Michigan, New Jersey, North Carolina, Oregon, and Washington. Severe-freeze events were reported in Alabama, Georgia and North Carolina during March of this year. Production in Florida has been relatively normal, and prices have been reported to be stronger than this time last season. Georgia growers are expected to have lighter-than-expected crops because the early bloom was affected by cold temperatures earlier in the year.

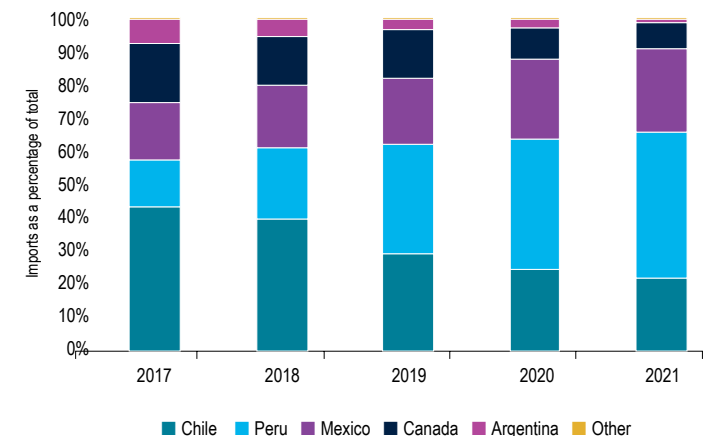
Imports of fresh blueberries into the United States continue to grow steadily because demand remains robust. In 2021, fresh blueberry imports were up 18% to 571 million pounds from 482.9 million pounds in 2020. In the past five years (2017–21), the annual growth rate in blueberry imports has been 15.6%. Argentina, Canada, Chile, Mexico and Peru account for 99% of all blueberry imports into the United States. Chile, once the largest supplier of blueberries to the United States, has been surpassed by Peru, and in 2021, Peru accounted for 44% of all imported blueberries. The United States itself also saw a slight increase of 2% in exports, to 49.2 million pounds in 2021 compared with 48.4 million pounds in 2020. Canada is the primary market for U.S. exports and in turn received 97% of all exports in 2021.⁹

The average imported-blueberry prices in 2021 ended at \$2.79 per pound, 9% higher than the 2020 price and 4% higher than the five-year average price of \$2.68 per pound. Prices this winter are higher than those in prior seasons as demand picks up and because lower supplies are available in the market until Georgia begins the harvest season.¹⁰

BLUEBERRIES Historical Imports and Prices of Blueberries, 2017–21



BLUEBERRIES Historical U.S. Blueberry Imports by Country of Origin, 2017–21



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



CENTRAL REGION

Overview

Large farmland transactions in most of the central region of the United States have been very few in general, as growers have experienced much better commodity prices compared with prior years, even though the costs of production continue to increase. Those sales that have occurred have been very strong, with land values supported by recent rises in crop prices. The appetite of farmers and institutional buyers to acquire farmland in this region of the United States has remained strong even though cap rates have been at some of the lowest levels in years, and cash rents are lagging the rapid growth in appreciation levels. The historically favorable interest environment that supported acquisitions in this region may begin to fade based on changes in the cost of capital borrowed for land acquisitions.

In 2021, appreciation rates for agricultural properties owned by institutional investors were at the highest levels in the past 10 years, according to the NCREIF Farmland Index. Across the corn belt, land values increased considerably in 2021, and annual appreciation rates were as high as 15%. Based on the latest farmland values data from the USDA, Iowa saw the largest increase in the Midwest as land values increased 9.5% to \$7,740 per acre. Land values in the Great Plains states also increased considerably, with Nebraska's land values increasing by 11.1% to \$3,100 per acre, and Kansas' land values increasing by 10.5% to \$2,100 per acre. The rates producers pay to rent cropland (cash rents) showed a slight increase at the national level. In the central region, Iowa had the highest average cash rent per acre, at \$233, followed closely by Illinois, at \$227 per acre.¹¹

Institutional properties in the delta states also had strong annual appreciation returns, at 6.7% in 2021.¹² That increase is significantly different from the increases stated in USDA reports, which estimated in 2021 that land values in Arkansas, Louisiana and Mississippi held fairly constant from 2020 to 2021, increasing only 1 or 2%. According to the USDA, the highest value per acre across delta states remains in Arkansas, at \$3,390 per acre, up 1.2% in 2021. Louisiana saw the highest increase in land value, at 1.9%, to \$3,220, with Mississippi land values increasing 1.4% to \$2,860. Note that these are general values that tend to be underweighted to actual transactions taking place in the market.¹³



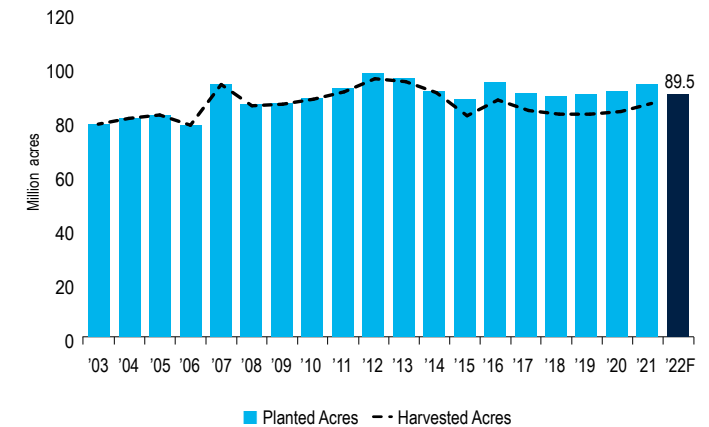
CORN

For 2022, total acres planted to corn in the United States are projected at 89.5 million acres, down 4.1% from the prior year and 1% below the five-year average.¹⁴ The 2021 corn harvest yields saw an increase of 5.6 bushels per harvested acre compared with 2020. Average corn yield for 2021 is projected at a record-breaking 177.0 bushels per acre, up from 171.4 in 2020 and above 2017's record yield of 176.4 bushels per acre. In 2021, slightly increased planted acreage of 93.4 million acres contributed to total production of an estimated 15.12 billion bushels, above the 14.11 billion bushels produced in 2020. Ending stocks, because of record production, are expected to increase to 1.44 billion bushels for 2021/22,

an increase from the 1.24 billion bushels that began the 2021 marketing year. Exports in 2021 increased an estimated 976 million bushels from 2020 to 2.75 billion bushels. The 2021/22 average farm price received for corn is projected to be \$5.45 per bushel, an increase of \$0.92 per bushel (20%) above the average price in 2020/21.¹⁵

Global competition from major exporters is also a continuing trend. Exports from major competitors, including Argentina and Brazil, increased from 2.43 billion bushels in 2020/21 to a projected 3.23 billion bushels in 2021/22. Production in both countries increased in 2021, resulting in the higher exports in 2021. The 2021 projected production in Argentina and Brazil is estimated to have increased by 1.2 billion bushels compared with 2020 from 5.45 billion bushels in 2020 to 6.57 billion bushels in 2021. This is anticipated to cause continued competition against the United States because exports from Argentina and Brazil are projected to be 3.23 billion bushels in the year ahead. China has been projected to decrease imports by 256 million bushels, to 904 million bushels in 2021/22.¹⁶

CORN Historical and Projected Planted and Harvested Corn Acres in the United States, 2003–22F



CORN Historical Monthly Prices for U.S. Corn, January 2003 through January 2022



Sources: PGIM Real Estate Agricultural Research, USDA



SOYBEANS

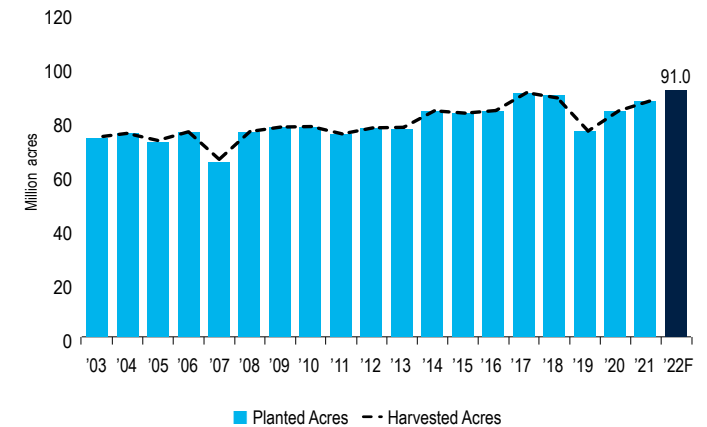
U.S. projected soybean-planted acres in 2022 are estimated at 91.0 million acres, up 4.3% from the prior year. That figure is expected to exceed corn-planted acres for only the second time in the past two decades. Expectations for larger numbers of acres planted to corn around the world (+7%) versus the past season, coupled with higher projected soybean prices, are potentially shifting these acres from corn to soybeans.

The 2021 soybean crop is estimated to finalize at 4.44 billion bushels, reflecting a 5% increase over the 2020 crop. Soybean acreage increased from 83.4 million acres in 2020 to 87.2 million acres in 2021, partly as a result of favorable weather during

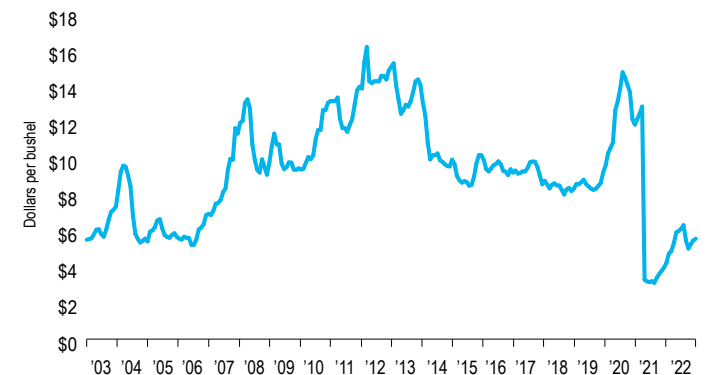
the planting season and strong prices at the time of planting. Yield per harvested acre is projected at a record 51.4 bushels per acre, slightly above the new 2020 record of 51.0 bushels per acre. Ending stocks increased to an estimated 285 million bushels in 2021 from 257 million bushels in 2020. Despite record production, strong domestic and export demand resulted in projected ending stock well below 2018's near-record high of 909 million bushels.¹⁷

U.S. prices have strengthened significantly with the help of strong demand. The 2021/22 season's average farm price for soybeans is projected at \$13.25 per bushel, an increase of \$2.45 from the 2020/21 average farm price of \$10.80 per bushel. In 2021/22, the domestic stocks-to-use ratio is projected to increase to 6.8%, a slight increase from 5.7% in 2020/21, which was caused mainly by an increase in production as exports and crushing have remained active. U.S. soybean crushing for oil and meal is projected to set a record at 2.22 billion bushels, up 74.0 million bushels from last year's near record. Planted acreage for soybeans will be watched closely by the market throughout the spring because prices hinge on projected supply and anticipated export demand.

SOYBEANS Historical and Projected Planted and Harvested Soybean Acres in the United States, 2003–22F



SOYBEANS Historical Monthly Prices for U.S. Soybeans, January 2003 through January 2022



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



WHEAT

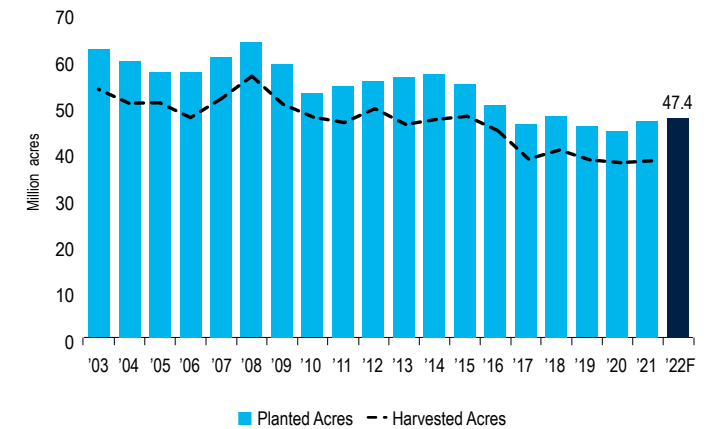
U.S. planted acres to wheat are projected to increase from 46.7 million to 47.4 million acres, or a 1.4% annual increase. Production for the 2021/22 crop year is projected at 1.65 billion bushels — a 9.9% decrease from the estimated 2020/21 production of 1.83 billion bushels — as a result of lower average projected yields. Average yields are projected to decrease by 10.9% to 44.3 bushels per acre. Lower production estimates, combined with uncertainty in the global market and broad strength in the commodities market, are resulting in higher prices.

An average farm price of \$7.60 per bushel is projected for the 2021/22 crop, which reflects a 50% increase over last year's average farm price of \$5.05 per bushel and a 66% increase from two seasons ago.¹⁸

Wheat production globally is projected to be 28.6 billion bushels in 2021/22, an increase of 0.2 billion bushels over the 2020/21 estimate. The top five wheat-producing regions are projected to supply 65% of total world production. The regions are China (18%), the European Union (18%), India (14%), Russia (10%) and the United States (6%). Ukraine's wheat production is projected at 1.21 billion bushels, or 4% of the world's production. Even with the current war between Russia and Ukraine, Ukraine's wheat production is projected to increase by 30% from the prior season and to be 22% higher than average production in the past five seasons.

The United States is projected to decrease exports in 2021/22 by 191 million bushels, largely because of lower production. The 2021/22 total projected production by major exporters is in line with 2020/21 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 443 million bushels in 2021/22 to 10.22 billion bushels compared with the estimated 2020/21 ending stocks of 10.66 billion bushels with increased production.

WHEAT Historical and Projected Planted and Harvested Wheat Acres in the United States, 2003–22F



WHEAT Historical Monthly Prices for U.S. Wheat, January 2003 through January 2022



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



COTTON

U.S. cotton acres are projected at 12.2 million acres in 2022, up 9% from the prior season. The number of American Pima cotton acres, grown mostly in California, is estimated to be 39% higher than the prior season, at 176,000 acres. Global cotton acres are estimated at 79.6 million acres in 2022, or 2% higher than in 2021.

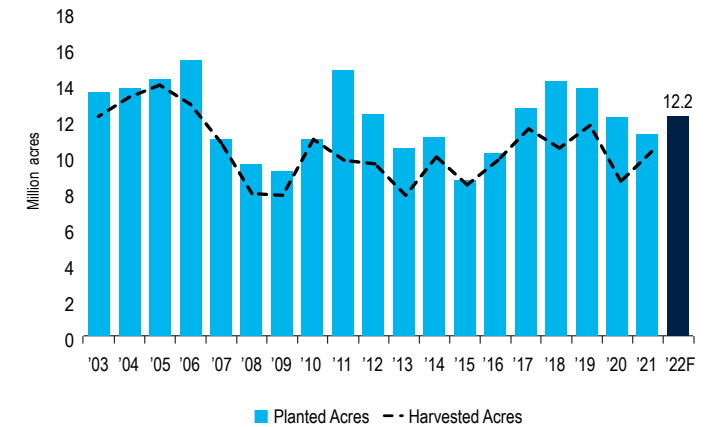
Global production is projected to reach 120 million bales of cotton in 2022, up from 111.8 million bales in 2021. The USDA projects U.S. cotton production will be higher in 2022 compared with 2021. With regard to total production, the USDA projects that the United States will produce 17.6 million bales of cotton

in 2022, which is up 20.6% from the 2021 crop season estimation. Cotton yields are projected to be relatively constant from 2021 to 2022, with the USDA projecting the 2022 average cotton yield will be 849 pounds per acre in the United States, up 0.2% from 2021's estimated yield.¹⁹

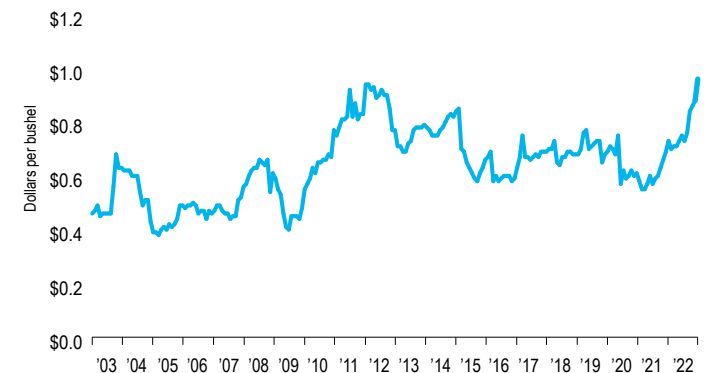
The year-end estimate for the 2021 upland cotton price is 66.3 cents per pound. U.S. upland cotton prices are projected to increase 23.7 cents per pound from 2021 to March 2022 as a result of a projected decline in production.

The latest 2022 U.S. balance sheet for cotton stocks shows a beginning stock projection of 3.15 million bales, which is down 56% from the 2021 beginning cotton stocks estimation as a result of high production in 2020. The 2022 stocks-to-use ratio for cotton is projected at 20.4%, which is up from 16.8% in 2021. U.S. cotton exports of 14.7 million bales projected for 2022 are down 10% from 2021. Global cotton ending stocks are estimated to be 87.32 million bales at year-end 2021, which is 5.7% higher than the projected 2022 global cotton ending stocks of 82.57 million bales.²⁰

COTTON Historical and Projected Planted and Harvested Cotton Acres in the United States, 2003–22F



COTTON Historical Monthly Prices for U.S. Cotton, January 2003 through January 2022



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



RICE

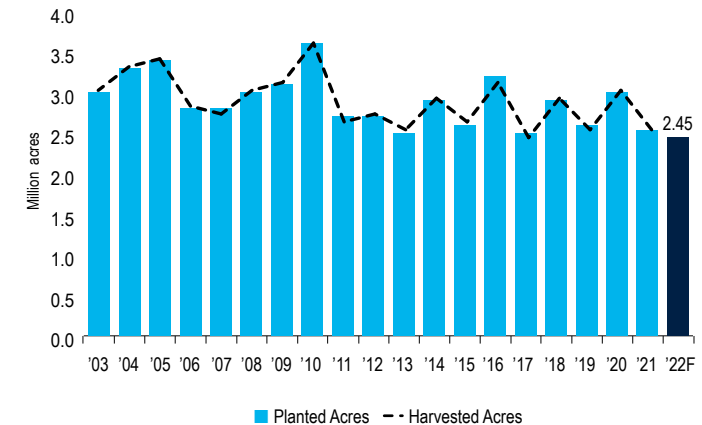
U.S. rice growers are projected to plant 2.45 million acres in 2022, down 3% compared with the prior year.²¹ Global rice acres are projected to stay relatively in line with the prior season, at an estimated 411 million acres.

According to the USDA's most recent *Rice Outlook* report, harvested rice acres are projected at 2.4 million acres for 2022, down 16.7% from 2021's 2.99 million harvested rice acres. The total U.S. rice production forecast for 2022 is 191.8 million hundredweight (cwt), down 15.7% from 2021. Average rice yields across the United States are projected to be up 1.2% in 2022 compared with average U.S. rice yields in 2021.²²

U.S. ending stocks for all rice are projected at 34.5 million cwt for 2021/22, which is a decrease of 10.2 million cwt, or 23.3%, from 2020/21 ending rice stocks. Long-grain rice ending stocks are projected at 19.4 million cwt for 2021/22, which is down 34% from 2020/21 and which marks the second-lowest ending stocks for long-grain rice in the past five marketing years. Rice total use in 2020/21 increased from 238.6 million cwt in 2019/20 to 246.6 million cwt in 2020/21.²³

According to the most-recent *USDA World Agricultural Supply and Demand Estimates* report, the 2020/21 U.S. all-rice marketing-year average price is estimated at \$14.40 per cwt, up 5.9% from the 2019/20 all-rice marketing price at \$13.60 per cwt. Prices are projected to increase to \$15.70 per cwt in the 2021/22 season. The U.S. long-grain-rice price is projected at \$13.80 per cwt for 2021/22 compared with \$12.60 per cwt in 2020/21, which is an increase of 9%. U.S. medium-grain and short-grain rice prices are also projected to be higher this season (+7%), up to \$21.50 per cwt compared with \$20.10 per cwt in 2020/21.

RICE Historical and Projected Planted and Harvested Rice Acres in the United States, 2003–22F



RICE Historical Monthly Prices of U.S. Rice, January 2003 through January 2022



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



WESTERN REGION

Overview

Overall farmland transactions in the western region have been steady. Sellers have realized that dire water conditions in California will result in future land maybe having to go fallow that was previously planted with commodities. Land valuations remain very high despite recent lower-than-usual prices for commodities such as almonds, walnuts and lemons.

Lingering drought, the COVID-19 pandemic and port issues are three topics that had notable impacts on California's agricultural market in 2021 and early 2022. With yet another year of below-average rainfall in the 2020/21 water year, concerns about water availability increased. Growers in the Central Valley experienced marginal federal and state water allocations, which led to difficult decisions for many growers because of a combination of both high water

expenses and increasing cultural costs across all crop types. Growers throughout California's critical to high-overdraft basins are becoming increasingly aware of the pending 20-year Groundwater Sustainability Plan (GSP) as a result of the Sustainable Groundwater Management Act, which is affecting the replant strategies of specialty crops, especially in the Southern and Central San Joaquin Valley farming regions. In early 2022, many of those implemented GSPs were found to be insufficient after review by the Department of Water Resources, and they were sent back to the residing General Services Administrations to correct the deficiencies. Those factors were evident in land value trends, with buyers showing increasing interest in areas with multiple sources of water — primarily surface water and well water — in reliable irrigation districts.

The effects of the pandemic are still present, but some agricultural markets such as lemons and fresh vegetables, began recovering from the initial lockdowns of 2020 at the advent of the reopening of the restaurant and foodservice sectors. A growing issue since 2021, is the backlog of shipments at ports throughout the United States. The backlog especially impacts California at the ports of Long Beach and Oakland, where processors and distributors face continued challenges in exporting their commodities to offshore markets.



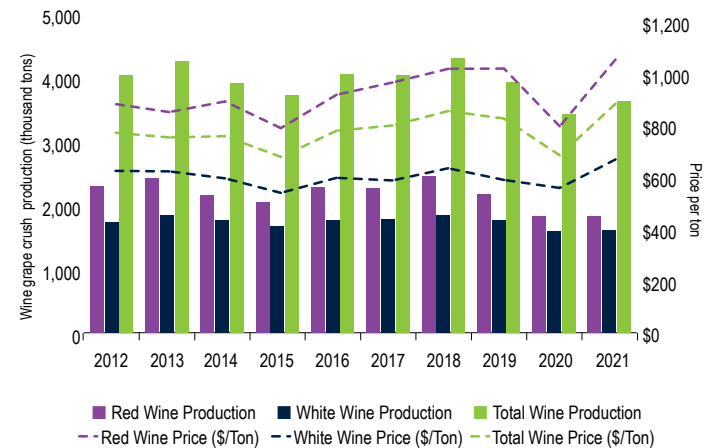
WINE GRAPES

The 2021 California grape crush totaled 3.85 million tons, an 8.7% increase from the prior harvest. Crushed tonnage comprises red-wine grapes, white-wine grapes, raisins, and table grapes. Although total crushed tons increased year over year, this was the second consecutive year that harvest has fallen below the industry's five-year historical grape crush average of 3.93 million tons.²⁴ Lighter yields are the results of challenging climate conditions experienced throughout the state. Specifically, drought conditions across Napa and Sonoma County led to lower cluster weights. Monterey County vineyards also saw decreased yield because of colder temperatures, and Paso Robles' yields were affected by lower rainfall this season. However, growers are noting increases in quality, as smaller berries produced at lower yields typically have more structure, more flavor concentration and higher tannin levels. Similarly, growers in Oregon and Washington have reported smaller-yielding, high-quality 2021 harvests.²⁵

Bulk wine supply peaked in 2019, exceeding the previous supply peak of 22 million gallons in 2015. With the light harvests of 2020 and 2021 because of the drought conditions and smoke-tainted-wine issues, the bulk-wine market experienced a seasonal peak of 10 million gallons in 2021 and is currently at 8 million gallons.²⁶ With the current bulk wine shortage, wineries are beginning to more aggressively contract for fruit in the field. The decrease in supply caused 2021 grape prices to increase to a record \$884 per ton, up 29% from 2020.

The supply-and-demand balance is considered delicate. Allied Grape Growers indicates there is potential for oversupply based on the producing, planted acreage in California, and the firm suggests that either grape growers reduce planted acreage or the industry will have to see an increase in consumption.²⁷ With the reopening of the hospitality industry, wine experts are cautiously optimistic, estimating that direct-to-consumer sales will continue to grow, but they also encourage wineries to expand their e-commerce.

WINE GRAPES Historical Wine Grape Crush Production and Prices, 2012–21



+6%
FROM 2020

CALIFORNIA WINE GRAPE CRUSH PRODUCTION

The California wine grape crush was 3.85 million tons in 2021.

+29%
FROM 2020

CALIFORNIA WINE GRAPE PRICES

The average price of all varieties was \$884 per ton in 2021.



TABLE GRAPES

Recent assessments by the California Table Grape Commission estimate 2021 volume at 102.5 million boxes, down 2.3% from 2020's production season. Although production is slightly lower than the previous year's, retail labor constraints, supply chain challenges and increased Peruvian imports are affecting grower returns.²⁸

Retail and warehouse operations are under stress given the lack of available labor. Ultimately, the lack of labor is limiting the amount of fruit that can be moved through the system.

On the West Coast, port challenges are forcing importers to move product to the East Coast,

and high fuel costs are restricting the volume movements. Shipping challenges are affecting marketers' ability to move grapes in a timely manner.

The United States continues to be the market of choice for Peruvian growers and marketers. As they continue increasing their production, they compete directly with the late-season California crop. It is estimated that the Peruvian crop is 10% higher than last year, at 60 million pounds. With ongoing supply chain constraints, Peru's second-largest market, Asia, is becoming less viable as containers are delayed more than 40 days. Peruvian marketers may choose to ship product to the United States rather than risk losing shipments because of delays.²⁹

Although numbers of planted acres of table grapes in the United States have been relatively stable in the past 10 years, the market for this commodity continues to evolve, as more and new grape varieties are being grown and imported from the Southern Hemisphere. There are indications that the market is slightly saturated and compounded by labor and supply chain challenges, and therefore, U.S. producers may continue facing lower-than-expected returns.³⁰

TABLE GRAPES Historical Table Grape Acreage, 2012–21

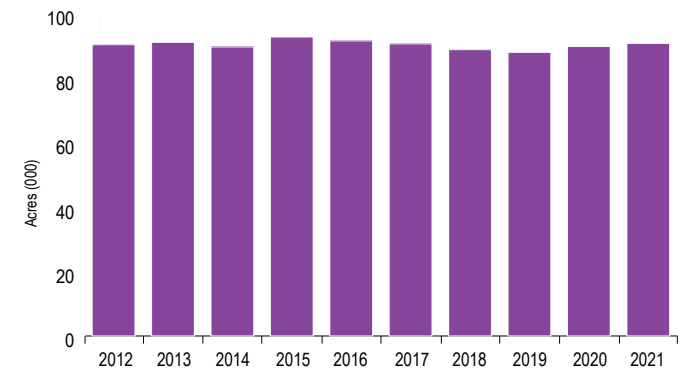
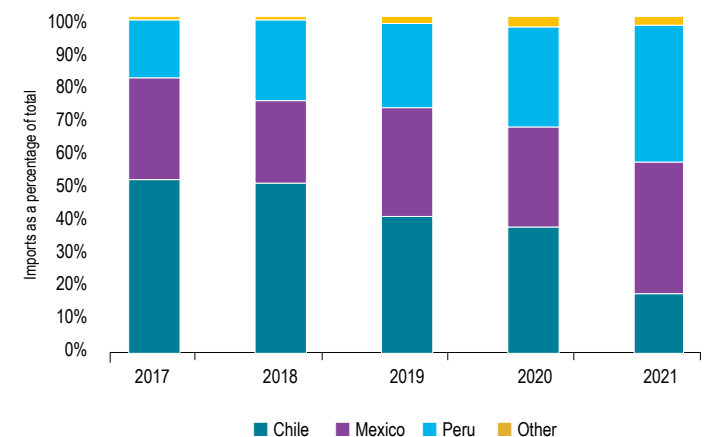


TABLE GRAPES Historical Imports of Table Grapes by Country, 2017–21
Year to Date



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



AVOCADOS

The 2021/22 California avocado crop year is considered to be an on-year and is estimated to be 306 million pounds,³¹ representing an increase of 14% from the 2020/21 off-year crop and a decrease of 18% from the 2019/20 on-year crop. In the past two years, the avocado market has faced multiple headwinds—chief among them the COVID-19 pandemic, which uprooted the supply-and-demand balance. With demand from foodservice virtually cut off, consumption shifted to grocery stores, with prices falling from \$1.70 per pound in 2019 to \$1.10 per pound in 2020. Still, consumers continue to show strong desire for avocados, and prices inched their way back up to \$1.20 per pound in the 2021 season. As the

economy has fully opened back up and foodservice has gone back online, prices are expected to continue rising higher as the season progresses, aided additionally by the projected shorter crop in the 2021/22 season compared with two seasons ago.³²

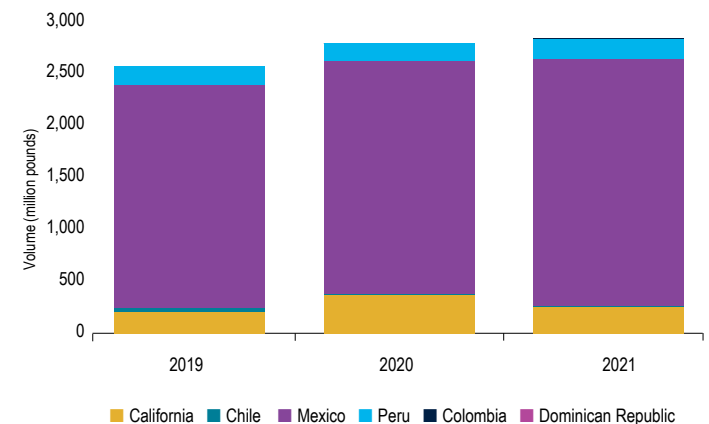
Historically, Mexico accounts for the majority of avocado imports, with a market share of more than 80%, with Chile, Colombia, the Dominican Republic, Peru, and others making up the rest. Lately, however, Peru has been increasing its share, accounting for 7% in 2020 and 14% in 2021.³³ Peru does not account for a substantial amount of imports, but it is a noteworthy increase considering Peruvian avocados enter the market at the same time as domestic avocados and therefore vie for market share.

Bearing acres in California have fluctuated in the previous 50 years they have been tracked. More recently, in the past 15 years, bearing acres of avocados decreased from more than 65,000 acres to just over 46,000 acres in 2021, a 30% decrease. Water costs and availability in California are expected to limit production growth in future years.

AVOCADOS Historical Production and Prices of Avocados from California, 2011–12 to 2021–22F



AVOCADOS Historical Domestic and Import Volumes for Avocados in the United States, 2019–21



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



CITRUS

LEMONS. The 2021/22 U.S. lemon crop is expected to be 23 million 80-pound boxes, an increase of 14% from the prior year. California accounts for 94% of total production, with Arizona making up the balance.³⁴ In addition to the larger domestic crop, imports have also come online. Even with foodservice demand making a comeback and other demand shocks from the pandemic appearing to be in the rearview mirror, lemon prices have dropped as much as 25% from the prior year.

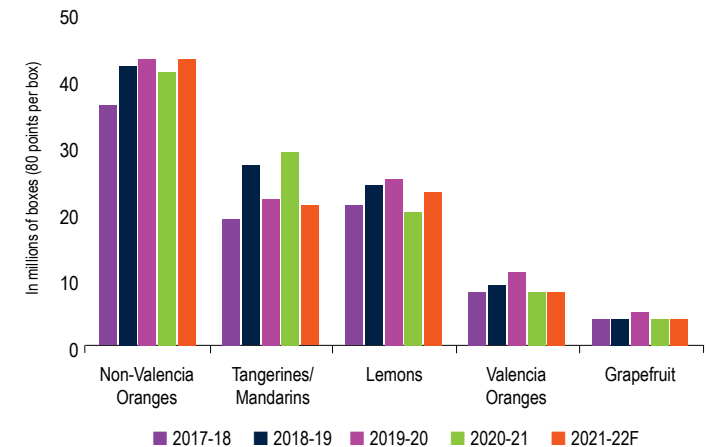
VALENCIA ORANGES. The 2021/22 California Valencia orange crop is projected to be down 8% from the prior season, at 8.3 million 80-pound boxes. Florida continues to be the leading Valencia orange producer and is expected to account for approximately 70% (20 million boxes) of total U.S. output, which is projected to be 28.4 million boxes, with California making up the remaining 29.2%.³⁵ The majority of the Valencia orange crop grown in California is used for fresh consumption, whereas Florida's crop is generally used for juice. There are minimal direct imports of Valencia oranges into the United States, with the main competition being

imports of other navel varieties. The California Valencia orange harvest concluded at the end of October 2021 with prices slightly lower than the prior year.³⁶

NAVEL ORANGES. California accounts for the majority of the nation's navel production, with an estimated 39.0 million 80-pound boxes, down almost 4% year over year. A heavier crop in the previous year, as well as warmer-than-expected temperatures during bloom, contributed to the slightly lighter crop. As expected, prices have risen with the drop in supply to approximately \$36 per box, a year-over-year increase of 13%.³⁷

MANDARINS. The 2021/22 mandarin crop is forecast at approximately 21 million utilized boxes, according to the USDA. That forecast estimates a 27% decrease in production compared with the prior crop year (28.8 million boxes). However, reports from growers in California have stated that the decrease in annual production is projected to be down 40 to 50%. That notable decrease in yield is reportedly due to the trees' stress after the large crop produced in 2020/21 — which was in itself up 25% from the prior season — coupled with marginal rainfall and early summer heat through the 2020/21 season. Fruit size is reported to be smaller on average, but the low supply has been met with strong demand as pack outs are being reported near 96%. Imports from Chile, Peru and South Africa were near the same levels experienced in the 2020/21 season. Logistical delays at U.S. ports have also caused imports to linger for longer durations into the California crop window.

CITRUS Historical and Projected Production for California Citrus, 2017–18 to 2021–22F



-4%
FROM 2020/21

NAVEL PRODUCTION IN CALIFORNIA

Production for this variety is projected to be at 39 million boxes for the 2021/22 season.

-27%
FROM 2020/21

MANDARIN PRODUCTION IN CALIFORNIA

This year's crop season is projected to decline significantly from the prior year based on a variety of factors such as adverse weather conditions.

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



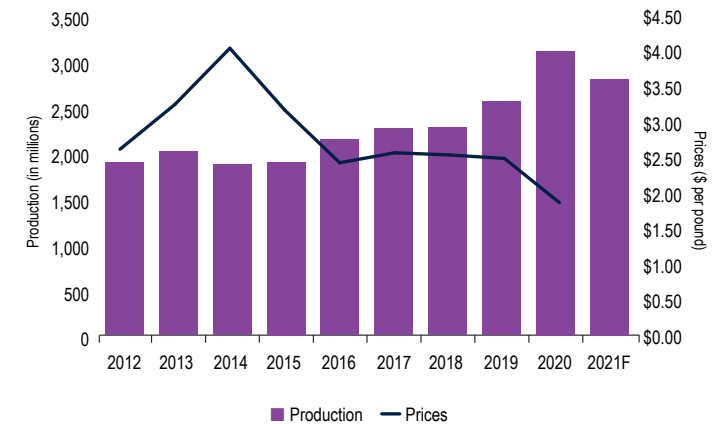
ALMONDS

California is the only state in the United States that produces almonds at the commercial level, and it dominates the global market, producing more than 80% of the global supply.³⁸ The 2021 growing season was characterized by high temperatures, limited water availability and reduced nut sizes. Citing those headwinds, the USDA lowered its initial May 2021 subjective forecast by minus 13% to 2.8 billion pounds in the July objective report. The objective report appears to be on target based on the most-recent, March 2022 position report reflecting season-to-date crop receipts of 2.84 billion pounds.³⁹ Although crop receipts indicate a 6% decline in production compared with last season, the industry is facing another sizable carry-in crop of 608 million pounds, up 35% from the 2020/21 crop season and bringing the total marketable supply to 3.4 billion pounds.

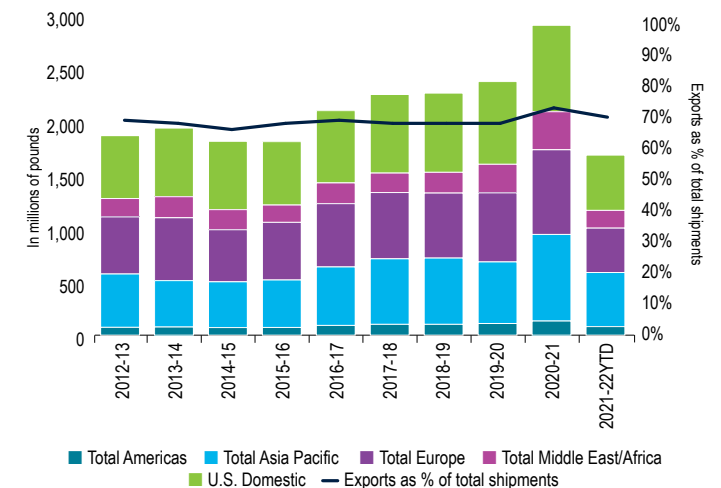
With the 2022 almond season under way, the sector can expect some much-needed shipping relief because the USDA recently announced a new partnership with the Port of Oakland that will ease port congestion and restore disrupted shipping services to U.S. grown agricultural commodities. Given the sharp supply growth in the almond industry, the project provides a vehicle to improve shipment performance, propel export momentum and meet rising global demand for almonds.

As expected with increased production, grower returns continued to form a divergence with the rising supply. Almond prices continue to be lower than the five-year average, based on higher supplies coupled with shipment issues and a strong dollar. Total exports for the 2021/22 season to date (August 2021 to March 2022) were around 1.16 billion, down 20% from the same period last season. Most of the almond shipments through March 2022 were sent to the Asia Pacific region, with 43% of total exports, followed by Europe (36%), Middle East/Africa (14%) and the Americas (7%). Domestic shipments for the same period are just 2%, down from last season to date, at approximately 517 million pounds.

ALMONDS Historical Almond Production and Prices in the United States, 2012–21F



ALMONDS Historical Domestic and Export Shipments for U.S. Almonds, 2012–13 to 2021–22YTD



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



WALNUTS

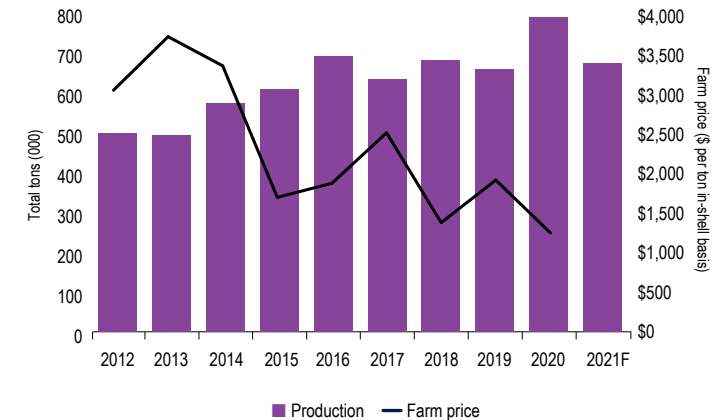
The 2021 California walnut production is forecast at 670,000 tons, down 15% from 2020's record production of 785,000 tons, according to the *2021 California Walnut Objective Measurement Report*. In the past 10 years, U.S. walnut production has grown at an annual rate of 3.5%. Growers reported overall good quality despite climate-related challenges such as frost damage and drought conditions throughout the growing season. The USDA reports a smaller crop this season because in-shell weight was down from 2020's average of 32.2 grams to 22.2 grams in 2021.⁴¹

According to the California Walnut Board's *Monthly Shipment Report*, 2021/22 season-to-date shipments (September 2021 – March 2022) of in-shell walnuts totaled 196,000 in-shell pounds and 298,000 shelled pounds. Export shipments are 44% lower than those in the same period last year for in-shell pounds and just minus 2.5% for shelled walnuts, which takes into

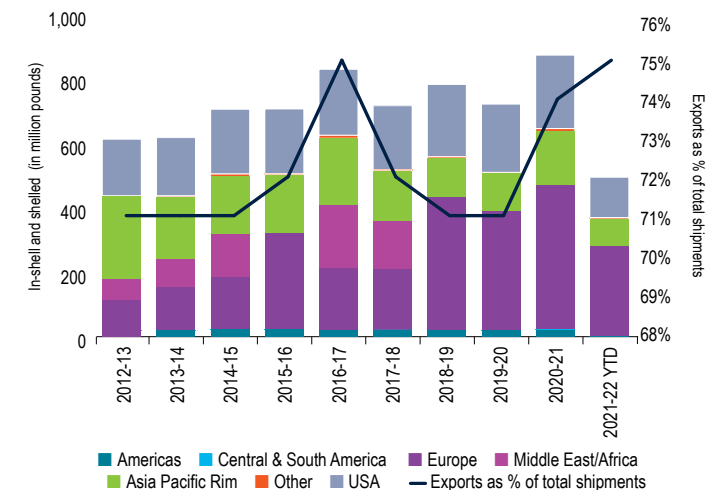
consideration the lower marketable crop compared with the prior season. Although in-shell exports to Europe, one of the main export markets for U.S. walnuts, are 13% lower year to date, shelled walnuts are 11% higher than in the prior season. Italy is the largest importer of in-shell U.S. walnuts; Germany imports the majority of shelled U.S. walnuts. Season-to-date domestic shipments are also down 12% for in-shell and 7% for shelled pounds.

California walnut shipments have been affected by supply chain bottlenecks and other logistical issues. To alleviate such market disruptions, the California Walnut Board voted to suspend enforcement of USDA outbound inspections of California walnuts for six months, starting September 1, 2021. Competitive prices from other markets, like China, have also created challenges. In 2020/21, China accounted for 47% of the world's share, an increase from the previous year, in which China accounted for 37%.⁴² Industry experts are hopeful that healthy snacking trends and walnuts' nutritional benefits will continue to drive global consumer demand.⁴³

WALNUTS Historical Walnut Production and Prices in the United States, 2012–21F



WALNUTS Historical Domestic and Export Shipments for U.S. Walnuts, 2012–22 YTD



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



PISTACHIOS

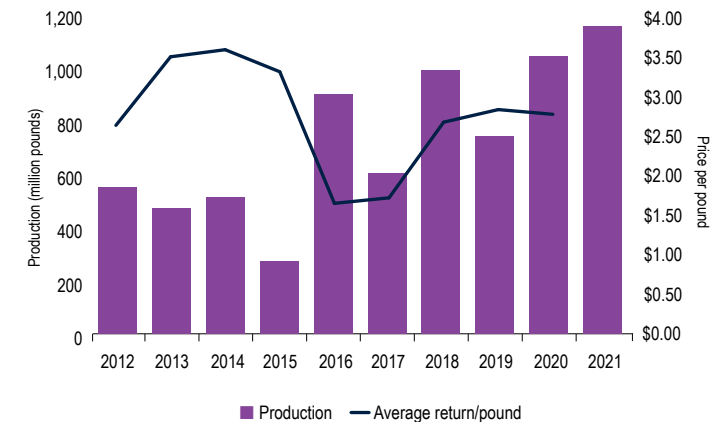
The 2021 U.S. pistachio crop became the largest crop on record, finishing at 1.15 billion pounds, up 11% from the prior season's record production and 109% higher than production just 10 years ago (551,000 pounds).⁴⁴ With concerns about drought and the record crop in 2020, the industry initially projected the 2021 off year to be 850 million to 900 million pounds, roughly 15 to 20% below prior-year results.⁴⁵ The increase in production came as a bit of a surprise to the industry and was attributed to new acreage coming into production, increasing yields on younger producing acreage and, to some extent, higher-than-anticipated yields from existing mature orchards.

Since 2018, pistachio prices have found support above \$2.00 per pound. Although growers' returns for the 2021 crop year will not be finalized until the third quarter of 2022, the increasing supply and bearing acreage could be early indicators of

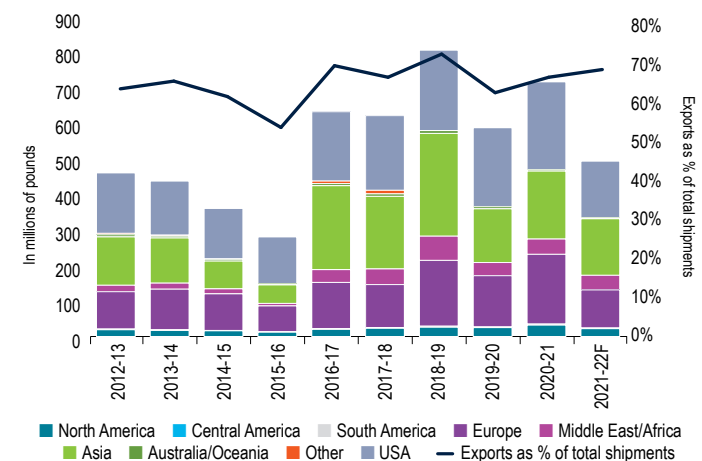
lower-than-expected pricing. To mitigate the negative impact of increased production, industry leaders such as the American Pistachio Growers association plan to focus on (1) building consumer demand so as to reduce price sensitivity, (2) expanding into new export markets and (3) going deeper into existing key markets such as India, which possesses the market conditions necessary for growth: rising population, growing per-capita income and increasing consumption of pistachios.⁴⁶ Demand in Canada is also expected to continue to grow because U.S.-origin pistachios have the advantage of proximity at a time when shipping costs are increasing exponentially.

Shy of 250 million pounds in 2020/21, the domestic market continues to be the largest for U.S. pistachios.⁴⁷ China remained the strongest export market, with 126 million pounds shipped, a 50% increase compared with last year but a 9% decline from 2018. However, with less availability and increased prices of Iran and Turkey's pistachios, both China and Hong Kong currently show strong interest in more-direct business, with the 2021/22 season-to-date shipments already surpassing 2021 totals.⁴⁸

PISTACHIOS Historical Pistachio Production and Prices in the United States, 2012–13 to 2021–22F



PISTACHIOS Historical Domestic and Export Shipments of U.S. Pistachios, 2012–13 to 2021–22F



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



APPLES

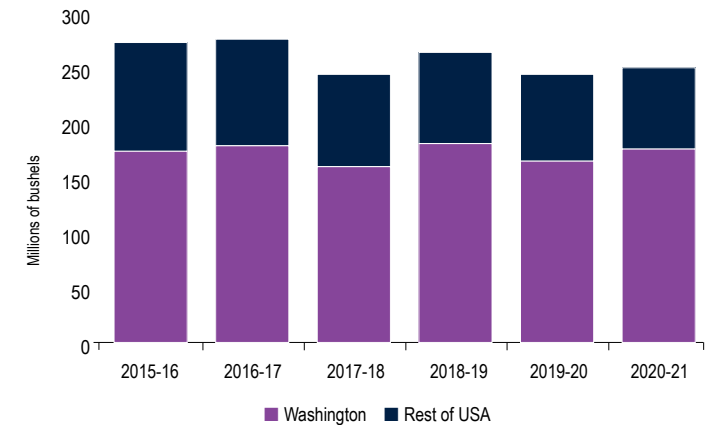
According to the USDA, 2021's U.S. apple production totaled 250.6 million bushels, up 2.7% from the 2020 harvest of 244.2 million bushels.⁴⁹ Washington State, which accounted for approximately 67% of the country's apple production and 95% of U.S. apple exports, totaled 176.1 million bushels, up 7% from the 2020 harvest. Apple growers were challenged by early frost, summer drought and excessive heat. Specifically, in the Northwest, growers experienced production uncertainty as high temperatures peaked at more than 110 degrees, or 29 degrees above normal.

During the 2020/21 season, FOB prices of apples were, on average, \$28.23 per box, or 19% higher than in the prior season (\$23.67 per box) and just 2% higher than two seasons ago, according to the Washington State Tree Fruit Association. The increase in price can be attributed to a decrease in fresh-

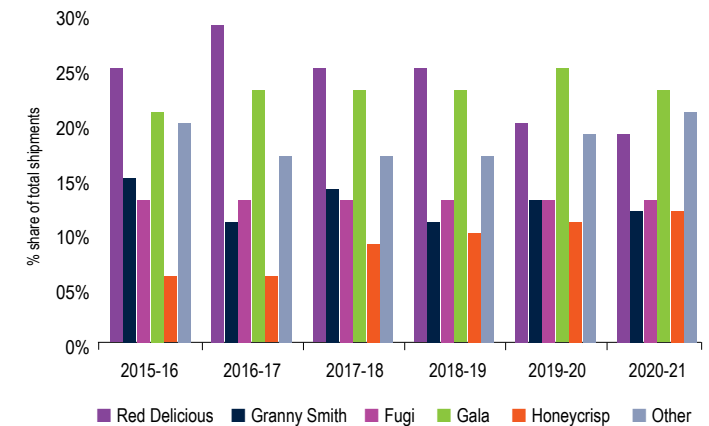
market apple holdings and strong consumer demand, according to the U.S. Apple Association. The top varieties as percentages of total shipments in 2020/21 were Gala (23%), Red Delicious (19%), Fuji (13%), Granny Smith (12%) and Honeycrisp (12%). The Gala variety continues to be the highest-producing variety. Shipments of organic apples as percentages of total movement continue to increase, although at a slower pace than in prior years. In 2020/21, organic apples accounted for 12.7% of total shipments compared with 8.1% just five seasons ago.

Retaliatory tariffs imposed by China and India on U.S. apples, in addition to challenging overseas shipping conditions, have affected export sales.⁵⁰ According to the *Yakima-Wenatchee Apple Export Report*, exports are down 13.6% from the 2020/21 season, and organic apple exports are down 20% from the 2020/21 season. Although the industry faces challenges, apples are secure in their market share because they continue to be the number-one-consumed fruit sold in the United States and because the United States is the second-largest apple producer worldwide.⁵¹

APPLES Historical Production of Apples in the United States, 2015–16 to 2020–21



APPLES Historical Apple Shipments by Variety as Percentages of Total, 2015–16 to 2020–21



Sources: PGIM Real Estate Agricultural Research, USDA, Washington State Tree Fruit Association



HAZELNUTS

The 2021 hazelnut crop was substantially higher than original estimates. Final reports indicate a 75,000-ton crop, 21% larger than the 2020 crop. The Hazelnut Growers Bargaining Association negotiated a starting price of \$0.90 per pound for kernel varieties, the same minimum payment guaranteed in 2020. The 2020 crop price growers received finished from \$0.97 to \$1.17 per pound.⁵²

Although the negotiated minimum price will not change, global economic conditions have limited processors' ability to pay additional bonuses. Growers are expected to receive \$0.90 to \$1.05 per pound for the 2021 crop.

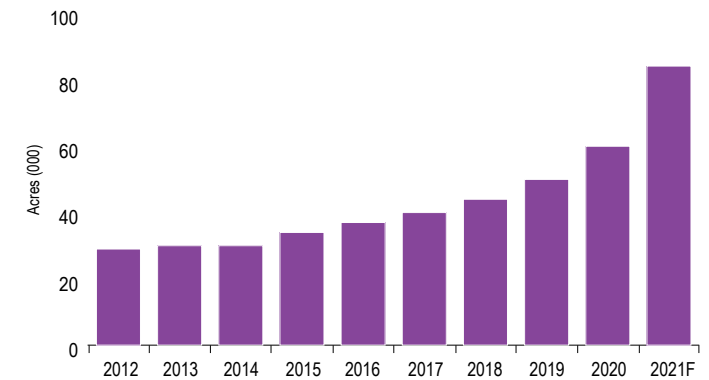
Oregon growers are facing additional headwinds this season because China has imposed a 35% tariff on all hazelnuts. Buyers in China are attempting to renegotiate prices for product that has been

shipped but not received, given the increased tariff. Processors would normally redirect their shipments; however, given the global supply chain challenges, they are unable to do so. In the interim, growers and processors are working through those challenges while considering future implications should China increase the tariff to 81% in the second quarter of 2022.⁵³ In addition, increased production in Turkey and a weaker Turkish lira have generated uncertainty in the market. Processors are continuing to adapt, to shell additional product and to redirect to kernel markets when possible.

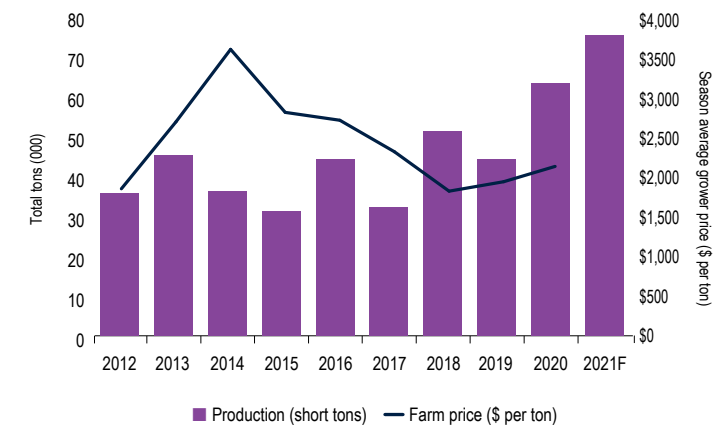
In-shell shipments through December 2021 were 3% ahead of the same period in 2020. Through December, buyers in China continued to be the leading purchasers, accounting for 94% of all in-shell purchases. Shelled product or kernel shipments were down 21% through December. Domestic consumption is down 25%, and kernel exports are down 18%. Kernel shipments are being affected directly by the larger crop and lower prices in Turkey.

Hazelnuts are unique in that they pollinate in the winter and the buds remain dormant through early summer, when they become nuts. Growers are anticipating a mild winter, which could yield a record 2022 crop.⁵⁴

HAZELNUTS Historical Hazelnut Acreage in Oregon, 2012–21F



HAZELNUTS Historical Production and Prices for U.S. Hazelnuts, 2012–21F



Sources: PGIM Real Estate Agricultural Research, USDA, Hazelnut Marketing Board



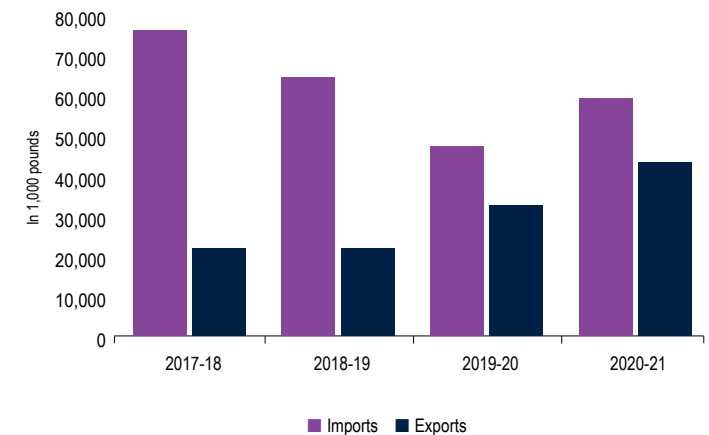
DATES

The entire U.S. date sector is cultivated mostly in the Sonoran Desert region of Southern California (Riverside and Imperial Counties) and southwestern Arizona (Yuma County), which are currently the homes of more than 16,500 bearing acres of date palm trees, representing a 7.1% increase year over year. The region is characterized by an ideal climate to grow high-quality dates based on high summer temperatures, low rainfall and abundant water from the Colorado River.

The 2020 date crop was characterized by slightly lower prices given the impacts of the COVID-19 pandemic. Although the final grower prices for the 2021 marketing year are still pending, the USDA's parity price index gives an optimistic indication for dates based on an average monthly price received of \$6,700 per ton from January through December 2021, up 14% from the same period in 2020.

Domestic production of dates constitutes only approximately 5% of the global market supply, which is estimated at 1.11 million metric tons for the 2021/22 season. The International Nut and Dried Fruit Council reported that Saudi Arabia produced 20% of the global date supply for the 2021/22 season followed by Egypt (13%), the United Arab Emirates (UAE) (13%), Iran (12%), Tunisia (11%) and Algeria (10%). However, the leading exporters were the UAE (17%), Iraq (15%), Saudi Arabia (15%), Iran (12%) and Tunisia (8%). There is high demand for good-quality dates grown in the western states because of high demand by developed nations that view U.S. fresh dates as a luxury product. That enables the United States to command the highest prices by wide margins and maintain its competitive advantage in the marketplace. U.S. exports doubled from 2017 to 2021, and the 2021/22 crop will likely continue that trend. Season to date, U.S. date exports of 33 million pounds from September 2021 to January 2022 already exceeded the 2017, 2018 and 2019 marketing years and are on pace to outperform the 43.3 million pounds exported in 2020/21.⁵⁶

DATES Historical Imports and Exports Volume for Dates, 2017–18 through 2020–21 crop season



DATES Historical Value of Imports and Exports for Dates, 2017–18 through 2020–21 crop season



Sources: PGIM Real Estate Agricultural Research, USDA, National Agricultural Statistics Service



TIMBER

Overview

The timberland and forest products industry in 2021 was characterized by a recovery from the COVID-19 pandemic, supply chain issues, poor harvesting conditions and a strong western wildfire season. Steady demand for forest products in combination with supply chain issues 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 both single-family and multifamily construction. The average annual National Association of Home Builders Housing Market Index hit new highs in 2021, with a score of 81 compared with a five-year average of 66.⁵⁷ Those figures are attributable largely to tightening of buildable lots, declining house size and lack of contractor availability. Despite rising lumber prices

and supply chain shortages, 2021 saw 1.6 million single-family-home starts, a 15.6% annual gain from 2020's 1.38 million starts. This was the first double-digit increase experienced since 2015.

During the past decade, strong inventory growth was observed in southern pine plantations, increasing to 335 billion board feet and with steady demand rising to 19.9 billion board feet fueled by a strong regional housing market in the South. 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.

The 2021 NCREIF Timberland Index, which encompasses 13.2 million acres with an estimated value of \$24 billion, had a positive total return of 9.17%, composed of a 3.45% EBITDDA return and a 5.58% appreciation return, which was the largest total return since 2014. On a regional basis, the index's returns were positive across the board, with the

Northwest region at 14.42% followed by the Northeast (13.22%), the Lake States (7.41%) and the South (7.06%).⁵⁸ The combination of rising demand for wood products and limited supply of usable land continues to keep upward pressure on land prices.

Nationwide, there were approximately 2.1 million acres of timberland transactions in 2021, of which 815,000 acres occurred in the U.S. South. The average sale price per acre in the U.S. South for 2021 was \$1,791 versus \$2,653 in the rest of the country. Numerous large timberland transactions included packages of more than 50,000 acres as institutional managers continue to pursue strategic acquisitions with a view to the harvesting of timber in prime mill markets that produce durable returns to investors.



TIMBER

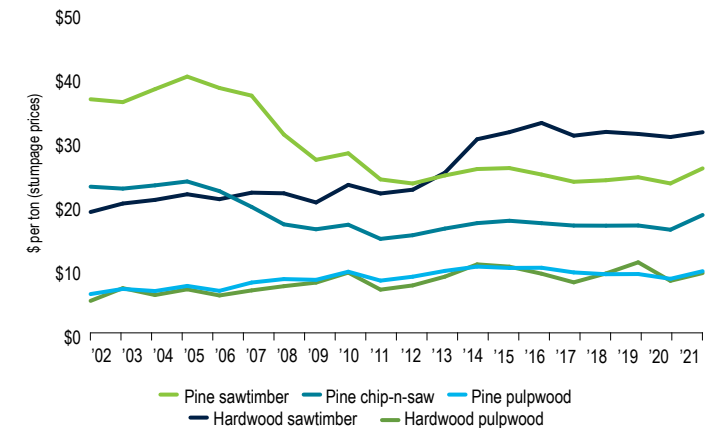
The southern timber markets have continued to rise with recovery from the pandemic. Stumpage prices for all five major products increased by 11% for 2021 compared with the prior year. The largest annual price increase was for hardwood pulp, at 14.9%, followed by pine chip-n-saw (14.3%), pine pulpwood (14.1%), pine sawtimber (10.1%) and hardwood sawtimber (+2.5%). Although timber prices experienced increases, the 10-year average annual growth rate remains at 1% for all product categories.⁵⁹

The strong product markets in 2021 could be attributed to (1) steady demand, at more than 21 billion board feet in the South for softwood products, and (2) reduced harvest, attributed to inclement weather, most of which was in the form of heavy precipitation levels. Demand remains strong in the region because of favorable timber procurement prices, pro forest products industry government

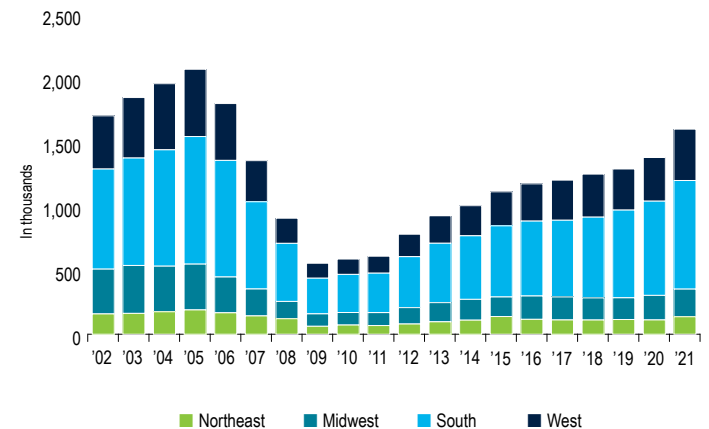
policy and central location to high-growth residential areas. Reduced harvest in the beginning of the first quarter of 2022 was attributed to record freezing-weather events rolling across the Southeast along with higher rainfall levels through the Gulf Coast states.

The supply overhang in the U.S. South continues to keep price growth modest. Supply in the South continues to grow at a steady rate of 25 billion board feet per year, with an expected total ending inventory of 335 billion board feet available for harvest in the South.⁶⁰ The abundance of supply has resulted from a combination of lack of mature harvest during the Great Recession and subsequent slow recovery, along with increased productivity based on improved genetics and silvicultural practices. The construction of six new sawmills and expansion projects for existing softwood mills will add 2 billion board feet of additional demand to match the current growth rate of existing timberlands.

TIMBER Historical South-Wide Average Timber Stumpage Prices (\$/Ton) for Five Major Product Categories, 2002–21



HOUSING UNITS Historical New Privately Owned Housing Units Started, 2002–21



Sources: PGIM Real Estate Agriculture Research, TimberMart-South



TIMBER

In 2021, Douglas fir delivered prices reached \$757 per million board feet, up 8% from the end of 2020. Hemlock delivered prices at \$546 per million board feet, up 5% from 2020.⁶¹ West Coast sawtimber demand was for approximately 6 billion board feet in 2021 and has remained fairly stable during the 10-year period, averaging 6.7 billion board feet.

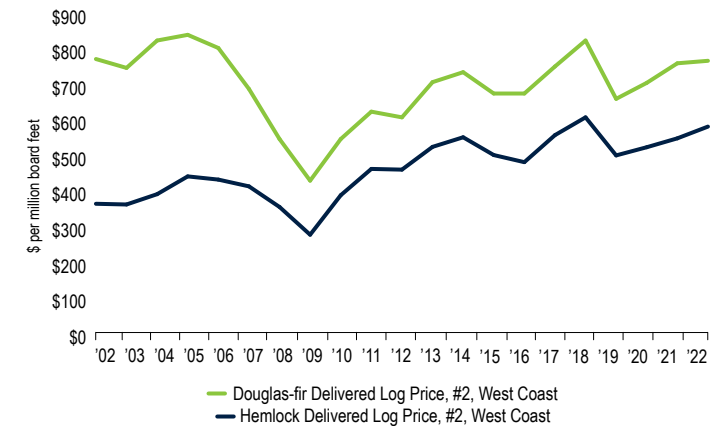
Export markets saw a decline in demand, at 0.8 billion board feet, a 32% decrease from 2020's 1.17 billion board feet, as a result of weaker demand from China and rising logging costs, continued tariffs on log imports from the United States, and competition from other regional suppliers.⁶²

Wildfires continue to be very active in the West, with more than 7.7 million acres burnt on par with the five-year average of 8 million acres burnt from 2017 to 2021. California, Oregon and Washington

account for 52% of the total acres burnt in 2021, at 3.7 million acres. Wildfires are causing limits on the availability of timber for harvest, creating upward pressure on the prices of sawtimber in the western United States. Drought conditions continue to persist in the western United States, and salvage operations on private timberlands were mostly completed in 2021, with harvesting of softwoods expected to outpace growth for the near future. The constrained supply will support higher pricing trends.

From 2011 through 2021, more than 4.9 million acres of timberland transactions occurred in the Pacific Northwest. Transactions of note for 2021 included the Sierra Pacific Industries acquisition of 175,000 acres of timberland in Oregon from Seneca Sawmill. Other large transactions were Hampton Lumber's acquiring 145,000 acres of timberland located in the Northern Cascades in Washington from Weyerhaeuser for \$266 million (\$1,835 per acre). The sales indicate that institutional buyers continue to pursue a strategy of investing in prime timberlands, with stable mill markets demand ensuring stable cash flow.

TIMBER Western Timber Prices, 2002–22



800M
BOARD FEET

WESTERN LOG EXPORTS

Amount of timber products exported from the United States.

1.3B
BOARD FEET FOR 2021

SAWTIMBER AVAILABILITY

Amount of timberland that was burned and is available for salvage harvest in the western states.



AGRICULTURAL FINANCE

CORPORATE

JESS JARRATT
Atlanta, GA
 Head of PGIM Agricultural Finance
 & Investments
 404.704.8971
jess.jarratt@pgim.com

RACHELLE SCHLESINGER
Roseville, CA
 Head of Agriculture Finance and
 Chief Credit Officer
 916.789.4073
rachelle.schlesinger@pgim.com

SETH PALMER
Memphis, TN
 Head of Agricultural Finance
 Originations
 901.473.7821
seth.palmer@pgim.com

EASTERN REGION

JOSH CULPEPPER
Orlando, FL
 Executive Director
 407.649.2197
josh.culpepper@pgim.com

SHANE HUTCHINSON
Jonesboro, AR
 Executive Director
 870.217.6365
shane.hutchinson@pgim.com

CHARLIE HURST
Orlando, FL
 Vice President
 407.235.7930
charlie.hurst@pgim.com

CENTRAL REGION

JOHN NITZ
Lisle, IL
 Executive Director
 630.829.4679
john.nitz@pgim.com

TED CYBULARZ
Champaign, IL
 Executive Director
 636.544.9472
ted.cybularz@pgim.com

HOWIE HECKENLIVELY
Lisle, IL
 Executive Director
 404.206.5031
howie.heckenlively@pgim.com

WESTERN REGION

WILLIAM BEYER
Roseville, CA
 Executive Director
 916.789.4070
william.beyer@pgim.com

STEVE GARLAND
Roseville, CA
 Vice President
 916.789.4026
steven.garland@pgim.com

FRANK OBERTI
Fresno, CA
 Executive Director
 559.437.3262
frank.oberti@pgim.com

BILL SCIACQUA
Fresno, CA
 Executive Director
 559.437.3265
bill.sciacqua@pgim.com

JON DOMINGUEZ
Fresno, CA
 Executive Director
 559.437.3264
jon.dominguez@pgim.com

CLAY POPKO
Roseville, CA
 Executive Director
 707.503.8004
clayton.popko@pgim.com

WESTERN REGION (continued)

ALEX MENDRIN
Fresno, CA
 Associate
 559.437.3269
alex.mendrin@pgim.com

ANTHONY MORENO
Fresno, CA
 Associate
 559.437.3261
anthony.moreno@pgim.com

PACIFIC NORTHWEST REGION

LUKE MCCARTHY
Hood River, OR
 Executive Director
 559.399.4371
lucas.mccarthy@pgim.com

TIMBERLAND CAPITAL

DOUG MOORE
Memphis, TN
 Vice President
 478.357.0213
doug.moore@pgim.com



AGRICULTURAL EQUITY INVESTMENTS

CORPORATE

JESS JARRATT
Atlanta, GA
 Head of PGIM Agricultural Finance
 & Investments
 404.704.8971
jess.jarratt@pgim.com

JAMIE K. SHEN
San Francisco, CA
 CIO and Head of Agricultural
 Equity Investments
 415.291.5025
jamie.shen@pgim.com

CHRISTOPHER JAY
Lisle, IL
 COO/CFO
 630.829.4689
christopher.jay@pgim.com

SARAH ANGUS
Nashville, TN
 Assistant Portfolio Manager
 615.476.2447
sarah.angus@pgim.com

JUAN D. CASTRO-ANZOLA
Orlando, FL
 Vice President – National
 Underwriting, Research and
 Technology
 407.319.7267
juan.castroanzola@pgim.com

EASTERN REGION

ED LASSITER
Orlando, FL
 Executive Director
 407.649.9601
ed.lassiter@pgim.com

CENTRAL REGION

JON MARK ERSTINE
Memphis, TN
 Executive Director
 901.758.3340
jon.erstine@pgim.com

WESTERN REGION

JASON PUCHEU
Fresno, CA
 Executive Director
 901.473.3254
jason.pucheu@pgim.com

FENDLEY RAGLAND
Fresno, CA
 Vice President
 901.473.7822
fendley.ragland@pgim.com

SIM BATTH
Fresno, CA
 Vice President
 559.437.3242
sim.batth@pgim.com

DEVON KIZIRIAN
Fresno, CA
 Senior Investment Associate
 559.824.9009
devon.kizirian@pgim.com

FARM MANAGEMENT

EASTERN REGION

DAN BOTT
Orlando, FL
 Vice President
 772.633.9273
daniel.bott@pgim.com

CENTRAL REGION

ROYCE BRYANT
Memphis, TN
 Vice President
 901.758.3351
royce.bryant@pgim.com

SCOTT JOHNSON
Champaign, IL
 Farm Manager
 217.359.3336
christopher.johnson@pgim.com

SCOTT MASON
Jonesboro, AR
 Farm Manager
 870.333.1468
scott.mason@pgim.com

TIM HARRIS
Princeton, IL
 Farm Manager
 815.875.7418
timothy.a.harris@pgim.com

WESTERN REGION

KENNETH PETERS
Fresno, CA
 Vice President
 559.437.3245
ken.peters@pgim.com

JUSTIN WYLIE
Fresno, CA
 Farm Manager
 559.577.9667
justin.wylie@pgim.com

MICHAEL BLAINE
Bakersfield, CA
 Farm Manager
 661.201.1020
michael.blaine@pgim.com

JASON SCHLAGEL
Pasco, WA
 Farm Manager
 509.942.8628
jason.schlagel@pgim.com

HEATHER JOHNSON
Fresno, CA
 Farm Manager
 559.260.7789
heather.johnson@pgim.com

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