



 USApple

# Industry Outlook 2021

Sponsored by **AgroFresh**

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USApple would also like to extend a special thanks to AgroFresh for sponsoring this important industry publication.

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# Foreword



Americans love apples, in all their forms, more than any other fruit. In fact, the USDA estimates that Americans each consume on average nearly 26 pounds of apples and apple juice per year, making apples America's favorite fruit!

Getting here has not been easy. The U.S. apple industry has worked hard to innovate, creating new and exciting varieties that meet the needs of a demanding consumer. We've invested in cutting-edge technologies to ensure that only the highest quality apples are picked, packed and shipped to farm stands, grocery stores, school cafeterias, military commissaries and food service providers across the country and around the world. We've adapted to every challenge that has been thrown at us, from pandemics to erratic climate, and come out stronger.

This resilience would not be possible if we did not love what we do. We are passionate about our orchards, our people and our communities. Ours is a business where, in thousands of cities and towns from coast to coast, we've, quite literally, put down roots and made a long-term commitment to improve the land, create jobs and generate economic productivity.

And we are serious about our business. The U.S. apple industry supports more than 140,000 jobs, generating more than \$6.7 billion in total wages. When accounting for the total downstream effects, the industry is responsible for almost \$21 billion in economic output!

The following report is a critical resource for the more than 26,000 apple farmers in the U.S. who need to keep up on the latest trends and forces shaping the production, utilization and trade of the nation's favorite fruit. Our industry relies on these data to make informed decisions and efficiently allocate limited resources to ensure our survival in a dynamic and competitive global marketplace.

But this report's usefulness is not limited to industry insiders. Perhaps as important are the legislators and regulators who are in the position to either help or harm this industry, which does so much good for so many. By understanding and appreciating the opportunities and threats we are facing, it is hoped that these policy makers will make every effort to consistently support the U.S. apple industry and the many Americans who have come to rely on us.

A handwritten signature in black ink that reads "Mike B. Preacher". The signature is fluid and cursive.

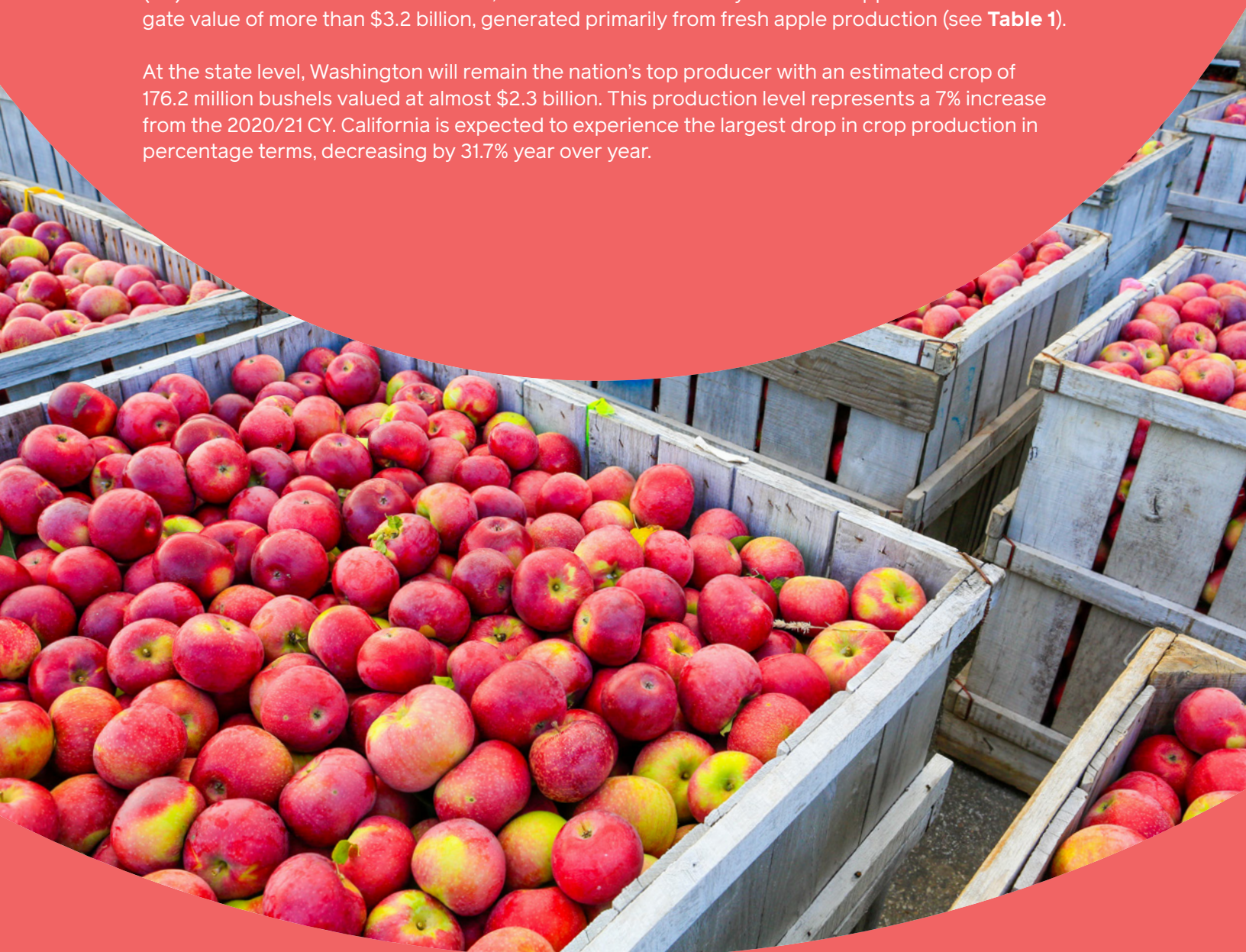
**MIKE PREACHER**  
Chairman, USApple



# Core Findings

Based on the most recent estimate from the USDA, U.S. apple production for the 2021/22 crop year (CY) will exceed 265.4 million bushels, a 2.7% increase from last year! These apples will have a farm-gate value of more than \$3.2 billion, generated primarily from fresh apple production (see **Table 1**).

At the state level, Washington will remain the nation's top producer with an estimated crop of 176.2 million bushels valued at almost \$2.3 billion. This production level represents a 7% increase from the 2020/21 CY. California is expected to experience the largest drop in crop production in percentage terms, decreasing by 31.7% year over year.



<sup>1</sup>This figure has been adjusted by USApple to include "Other" states, a category no longer reported by USDA. For more information on the adjustment, refer to the U.S. Apple Production section in the body of this report.

**Table 1: U.S. Apple Production & Utilization Summary**

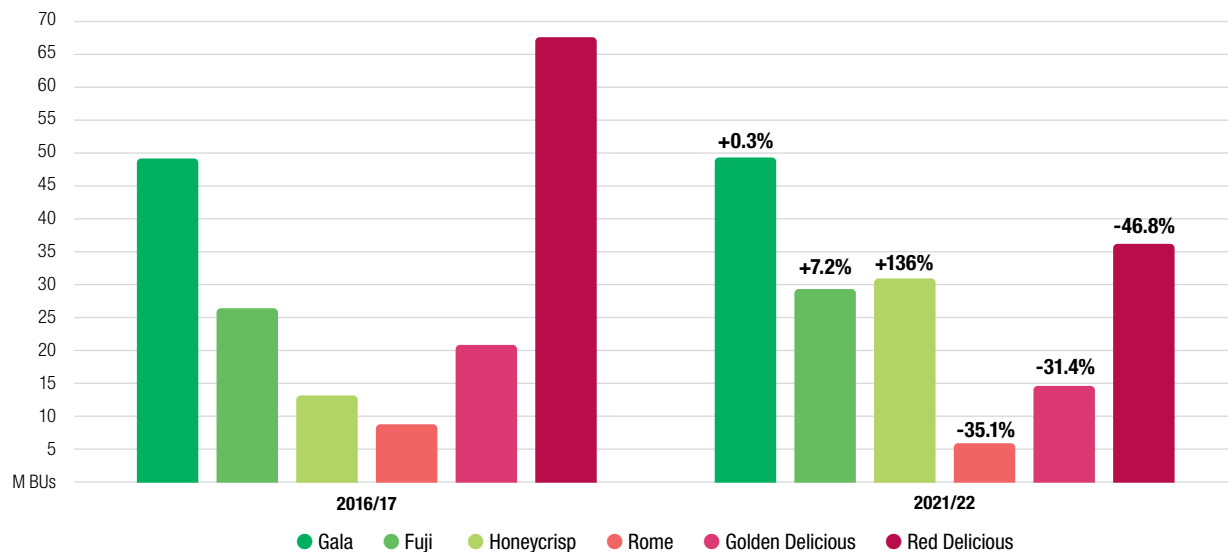
2021/22 (F)	LEVELS	VALUE	YR-OVER-YR % CHANGE
<b>Total Production</b>	<b>265,424,378</b>	<b>\$3,209,848,752</b>	<b>2.7%</b>
Fresh	178,155,738	\$2,858,937,972	3.4%
Processing	78,016,455	\$350,910,780	1.0%
Not Sold	9,252,184	\$ -	3.7%
BY STATE			
Washington	176,190,476	\$2,260,937,313	7.0%
New York	32,142,857	\$318,080,513	-2.5%
Michigan	18,095,238	\$212,873,384	-18.0%
Pennsylvania	10,952,381	\$97,842,818	10.3%
Oregon	4,523,810	\$50,785,558	8.6%
California	4,404,762	\$48,757,672	-31.7%
Virginia	4,285,714	\$36,026,503	10.4%
Other	14,829,140	\$184,544,992	2.7%

At the varietal level, Gala is expected to retain the top spot with almost 49.3 million bushels produced, accounting for around 19% of the U.S. apple market. Rounding out the top five are Red Delicious (35.7 m bu), Honeycrisp (31 m bu), Fuji (29.1 m bu) and Granny Smith (27.2 m bu).

Over the last five years, Gala, Fuji and Honeycrisp have been on the rise largely at the expense of Red Delicious. Other varieties on the decline relative to 2016/17 CY production levels include Rome and Golden Delicious. **Figure 1** highlights these top varieties along with current production estimates and 5-year growth rates.

Sources: USDA, National Agricultural Statistics Service; USApple  
 Notes: Production levels are in 42-pound bushels.  
 Utilization shares and value data are based on five-year averages: 2016-2020.  
 Year-over-year changes are calculated on levels.

**Figure 1: U.S. Apple Production, Varietal Summary**



Sources: USApple; Washington State Tree Fruit Association

With respect to fresh apple imports and exports, the U.S. still retains a healthy positive trade balance. In the 2020/21 CY (July to June), the U.S. exported almost 41 million bushels of fresh apples while only importing around 5.2 million bushels. These net exports (35.6 m bu) are valued at almost \$773.8 million (see **Table 2**).

On a year-over-year basis, while the balance of trade has declined with respect to quantity, it has increased in value. This is primarily being caused by a rapid decline in the value of imports from the 2019/20 CY, but is also due to some resilience in export values which have not decreased as much relative to export quantities.

As for global supply, China will continue to dominate the world market, producing and estimated 2.4 billion bushels in 2021/22. This represents a 2.6% increase over 2020/21 production levels. Europe is expected to significantly increase production, growing by 9.6% year over year to almost 616 million bushels. South America is thought to have increased its year-over-year production to almost 161 million bushels. Given the poor production that Mexico had last year, it's expected to increase by 9% from 2020/21 levels to around 38.8 million bushels. Finally, Canada is expected to decrease production this year by 9.3% to almost 19 million bushels (see **Table 3**).<sup>2</sup>

Additional data and analyses regarding estimates for 2021/22 U.S. and global apple crop production, utilization and trade are contained in the following report.

**Table 2: U.S. Fresh Apple Trade Summary**

	2020/21	2019/20	YR-OVER-YR % CHANGE
<b>LEVELS</b>			
<b>U.S. Balance of Trade</b>	<b>35,593,102</b>	<b>38,499,872</b>	<b>-7.6%</b>
Total Exports	40,806,902	44,887,145	-9.1%
Total Imports	5,213,800	6,387,272	-18.4%
<b>VALUE</b>			
<b>U.S. Balance of Trade</b>	<b>\$773,778,000</b>	<b>\$733,385,000</b>	<b>5.5%</b>
Total Exports	\$899,276,000	\$913,151,000	-1.5%
Total Imports	\$125,498,000	\$179,766,000	-30.2%

Sources: USDA, Foreign Agricultural Service; USApple  
 Note: Trade levels are in 42-pound bushels.

**Table 3: Global Apple Production Summary**

	2021/22 (F)	2020/21	YR-OVER-YR % CHANGE
<b>United States</b>	<b>265,424,378</b>	<b>258,564,955</b>	<b>2.7%</b>
China	2,374,249,874	2,313,276,271	2.6%
Europe	615,981,326	561,915,645	9.6%
South America	160,596,069	157,131,666	2.2%
Mexico	38,777,424	35,574,161	9.0%
Canada	18,886,589	20,825,278	-9.3%

Sources: USDA, National Agricultural Statistics Service and Foreign Agricultural Service; USApple; United Nations, Food and Agricultural Organization; World Apple and Pear Association; Canadian Horticultural Council  
 Notes: Production levels are in 42-pound bushels.  
 South American crop year is earlier than northern hemisphere countries by approximately six months.

<sup>2</sup>The estimates for China and Mexico were both derived using an exponential smoothing model developed to generate a long-range forecast for U.S. apple production. The European total represents the production from 21 select countries. The South American total represents the production from three select countries. For more information about the forecasting model or the countries included, refer to the U.S. Apple Production and Global Apple Production sections in the body of this report.



# Introduction

The U.S. apple industry is alive and well in 2021 despite the challenges of the past 18 months. While the COVID-19 pandemic has tested the industry up and down the supply chain, it has also presented unique opportunities. Given that this situation is far from resolved, it will be critical moving forward to learn from the challenges and to take advantage of the opportunities whenever possible. To assist in that endeavor, the following report provides users with the most up-to-date data and analysis on U.S. and global apple production, utilization and trade. The remainder of this section is intended to provide those data and analyses with relevant context.





## U.S. Macroeconomic Conditions

As a whole, the U.S. economy has recovered well since the depths of the downturn in Q2 2020. Although the U.S. officially met the definition of a recession by posting two consecutive quarters of negative GDP growth (Q1 and Q2 2020), the economy roared back in Q3 with a 33.8% gain, due largely to unprecedented levels of stimulus spending. Since that time, growth has remained strong with quarterly rates ranging from 4.5% to 6.5%.<sup>3</sup> Barring any COVID-19 variants that send the country back into lockdown, the consensus estimate from Federal Reserve Board members is that 2021 annual GDP growth will be around 7%, slowing to 3.3% in 2022 and 2.4% in 2023.<sup>4</sup>

By most measures, the U.S. economy is back at, or above, pre-COVID-19 levels – with one notable exception – employment. From February to April 2020, the U.S. lost 20.7 million nonfarm jobs and the unemployment rate rose from 3.5% to 14.8%. As of July 2021, the country has gained back 16.2 million of those jobs but is still shy of the February 2020 mark with an unemployment rate of 5.4%.<sup>5</sup>

Despite these higher levels of unemployment, personal income has remained relatively stable through Q1 2021 thanks mainly to the \$5.3 trillion in stimulus funding that has been pumped into the U.S. economy. This stability in personal income has translated directly into spending, which is up considerably on a seasonally adjusted basis. Unfortunately, in Q2 2021, disposable income decreased by 26.1% from the prior quarter in a sign that the stimulus money has largely been allocated.

In the absence of further rounds of stimulus, personal consumption (a.k.a. spending) may decrease in the short term until the job market has time to return to full employment.

## U.S. Apple Market Conditions

While the (un)employment data above is focused on nonfarm labor, any assessment of the U.S. apple industry must consider the agricultural employment situation as well. By all accounts, domestic agricultural labor has been getting harder and harder to find. From 2014 to 2020, average annual crop production employment fell by 3% and, in apple orchards specifically, it declined by 20%.<sup>6</sup>

Some attribute those decreases to the combination of an aging existing workforce and immigration policies that do not prioritize individuals with agricultural backgrounds. That is, we are losing domestic workers faster than we can replace them. And so, increasingly, the U.S. agricultural sector has had to turn to seasonal migrant labor (H-2A visas) to meet its needs. In fiscal-year 2011 (October through September), there were 77,100 certified H-2A positions. That figure ballooned to more than 275,000 certifications in 2020 – a 257% increase over the decade.<sup>7</sup>

<sup>3</sup> U.S. Department of Commerce, Bureau of Economic Analysis. Gross Domestic Product, Second Quarter 2021 (Advance Estimate) and Annual Update: July 29, 2021.

<sup>4</sup> Board of Governors of the Federal Reserve System. Summary of Economic Projections: June 16, 2021.

<sup>5</sup> U.S. Department of Labor, Bureau of Labor Statistics. Current Employment Statistics and Current Population Survey: July 2021.

<sup>6</sup> U.S. Department of Labor, Bureau of Labor Statistics. Quarterly Census of Employment and Wages: 2014-2020.

<sup>7</sup> U.S. Department of Labor, Employment and Training Administration. Office of Foreign Labor Certification: 2011-2020.

This is a critical issue for the U.S. apple industry because this source of labor is expensive and getting more so. In the Pacific Northwest, for example, the Adverse Effect Wage Rate (AEWR), the minimum compensation rate for H-2A labor, has been increasing by more than 5% annually for the last 10 years. As of 2021, the top three AEWRs in the U.S. were in apple producing states: Oregon and Washington at \$16.34 per hour and California at \$16.05 per hour (versus the U.S. median AEWR at \$14.72 per hour).<sup>8</sup>

These trends are particularly challenging for the tree fruit industry which cannot utilize automation in the same way as many other crops. Apple harvesting and much of the packing are done by hand. By some estimates, labor accounts for between 60%-70% of variable costs for apple growers.<sup>9</sup>

Unfortunately, while the price of labor has been increasing, the price that growers are receiving for apples has not. From 2011-2015, the five-year average farm-gate price for all apples was \$0.31 per pound. From 2016-2020, that price had dropped one penny to \$0.30 per pound – not accounting for inflation.<sup>10</sup> **Table 4** highlights the year-over-year and year-over-five-year trends for prices and value by use.

This is not to say that retail prices for apples have also been flat. The latest consumer price indexes show that from June 2020 to June 2021, the average price that urban consumers paid for fresh apples in the U.S. increased by 6.5%. This is significantly higher than the increase for a basket including all

**Table 4: U.S. Farm-Gate Prices & Values, by Use**

	2021/22 (F)	2020/21	5-YR. AVERAGE
<b>PRICE PER UNIT</b>			
<b>Total</b>	<b>\$0.30</b>	<b>\$0.30</b>	<b>\$0.30</b>
Fresh	\$0.38	\$0.39	\$0.38
Processing	\$0.11	\$0.10	\$0.11
<b>VALUE OF PRODUCTION</b>			
<b>Total</b>	<b>\$3,209,848,752</b>	<b>\$2,937,521,000</b>	<b>\$3,149,627,200</b>
Fresh	\$2,858,937,972	\$2,628,276,000	\$2,805,052,200
Processing	\$350,910,780	\$309,245,000	\$344,575,000
Juice & Cider	\$114,417,959	\$100,832,416	\$112,352,115
Canned	\$146,424,387	\$129,038,525	\$143,780,659
Dried	\$24,466,003	\$21,561,005	\$24,024,264
Frozen	\$25,636,532	\$22,592,550	\$25,173,658
Fresh Slices	\$31,731,582	\$27,963,897	\$31,158,660
Other	\$8,234,317	\$7,256,606	\$8,085,644

Sources: USDA, National Agricultural Statistics Service; USApple  
 Notes: Five-year averages do not include 2021/22 (F) data.  
 2021/22 (F) data are based on five-year-average prices: 2016-2020.  
 Sub-processing value data are based on 2017 price ratios and five-year average shares: 2013-2017.

fresh fruits and vegetables (3.8%), but not as high as the fresh fruits only basket (7.3%).<sup>11</sup>

Unfortunately, higher retail prices do not necessarily translate to higher grower prices/revenues. While some of the price hike may be due to retailers passing along higher farm-gate prices, it is more likely that they are an attempt by the retailer to recoup higher expenses incurred along their own supply chains and/or to maintain benchmark margins.

With increasing expenses and stagnant revenues, the U.S. apple industry has had to get more efficient. From 2007 to 2020, the number of apple bearing acres in the U.S. fell by around 16%. At the same time, production increased by around 13%. **Figure 2** charts the rise in U.S. apple yield as a calculation of bushels produced per acre.

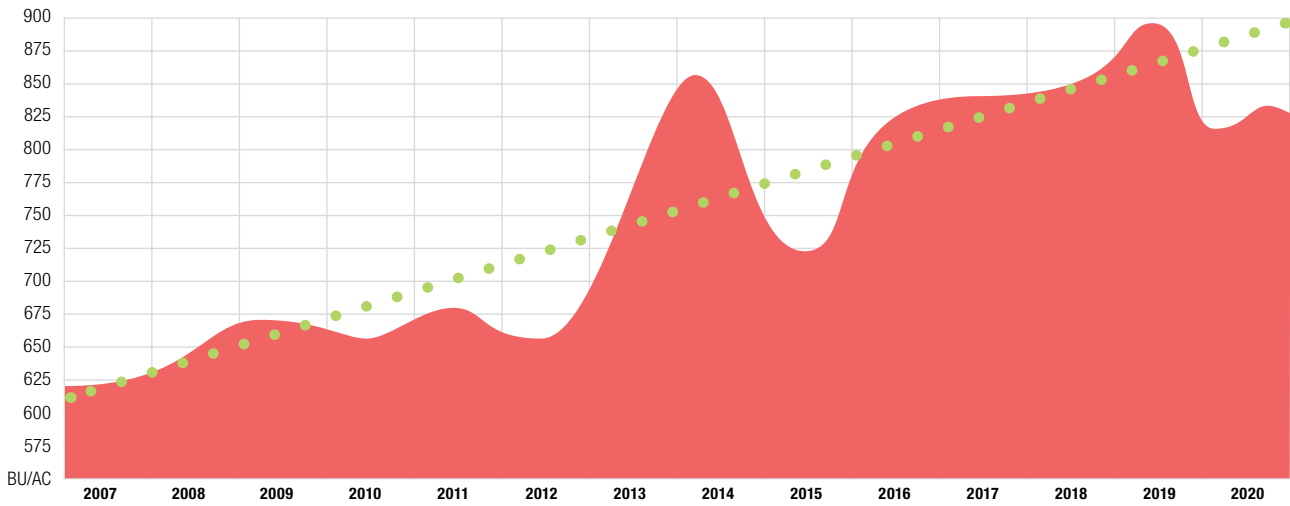
<sup>8</sup> U.S. Department of Labor, Employment and Training Administration. Adverse Effect Wage Rates: 2021.

<sup>9</sup> This figure was quoted by several industry members with in-depth knowledge of apple cultivation expenses. According to USDA's Economic Research Service which reports income and expense data for a limited number of crop types, labor accounted for 46% of all variable expenses for specialty crops (fruits, vegetables and nuts) in 2019.

<sup>10</sup> USDA, National Agricultural Statistics Service. Price Received, All Apples: 2011-2020.

<sup>11</sup> U.S. Department of Labor, Bureau of Labor Statistics. Consumer Price Index: June 2020-June 2021.

**Figure 2: U.S. Apple Yield**



Sources: USDA, National Agricultural Statistics Service; USApple

● Current Trend

While there may be some relatively low-cost technologies and techniques to modestly increase yield, it is likely that the majority of these gains are due to significant reinvestments to develop higher density orchards. The funds needed to make such improvements are increasingly being provided by public companies, pension funds and/or private equity firms (rather than debt). As is always the case in challenging and uncertain times, the rate of consolidation and influx of outside capital is expected to continue and may even accelerate in the years to come.

Adding greatly to this uncertainty are concerns around climate change and the extent to which adverse weather events are increasing in frequency and magnitude. Based on data from USDA's Risk Management Agency, the administrator of the Federal crop insurance program, the number of apple crop insurance claims has increased by 175% over the last 30 years. Of course, during that time, the program has expanded dramatically, improving access

and adding entirely new products. With claim counts growing more or less along with policy counts (up 146% from 1989/90 to 2019/20), the frequency of adverse events does not appear to a primary concern.

However, from a magnitude perspective, when adjusted for inflation, the average claim amount rose from around \$92,500 in 1989/90 to \$148,500 in 2019/20 – a 60% increase.<sup>12</sup> While this does appear to be significant, additional analysis is required to disaggregate the data according to cause of loss.<sup>13</sup>

The major environmental issue leading up to the 2021/22 CY has been the unprecedented heat wave in the Pacific Northwest. Extreme temperatures in June 2021 may lead to a loss of up to 10% of the region's apples and could reduce sizes and storability of the remaining crop.<sup>14</sup> A full accounting of the damage will not be known for some time.

<sup>12</sup> These growth rates were derived by averaging policy counts, claim counts and indemnity totals for 1989–1990, 1999–2000, 2009–2010 and 2019–2020.

<sup>13</sup> USDA, Risk Management Agency. Cause of Loss Historical Data Files and State/County/Crop Summary of Business: 1989–2020.

<sup>14</sup> Based on discussions with regional industry experts.



Up to this point, the discussion of U.S. apple market conditions has primarily concerned factors impacting the supply of apples, but there are a number of demand-side factors also deserving consideration.

Although considerable space has been dedicated to this topic in a later section of this report, the importance of export markets to U.S. apple growers cannot be understated. Trade disputes that negatively affect those markets can have real and lasting damage to the industry. Perhaps the most significant of these disputes occurred only recently when, in response to U.S. tariffs on Indian steel and aluminum, India placed a retaliatory tariff on U.S. apples (among other products). In 2018, India was the second largest export market valued at more than \$157 million. By 2020, they had fallen to fifth, costing U.S. apple growers almost \$120 million in export value.<sup>15</sup>

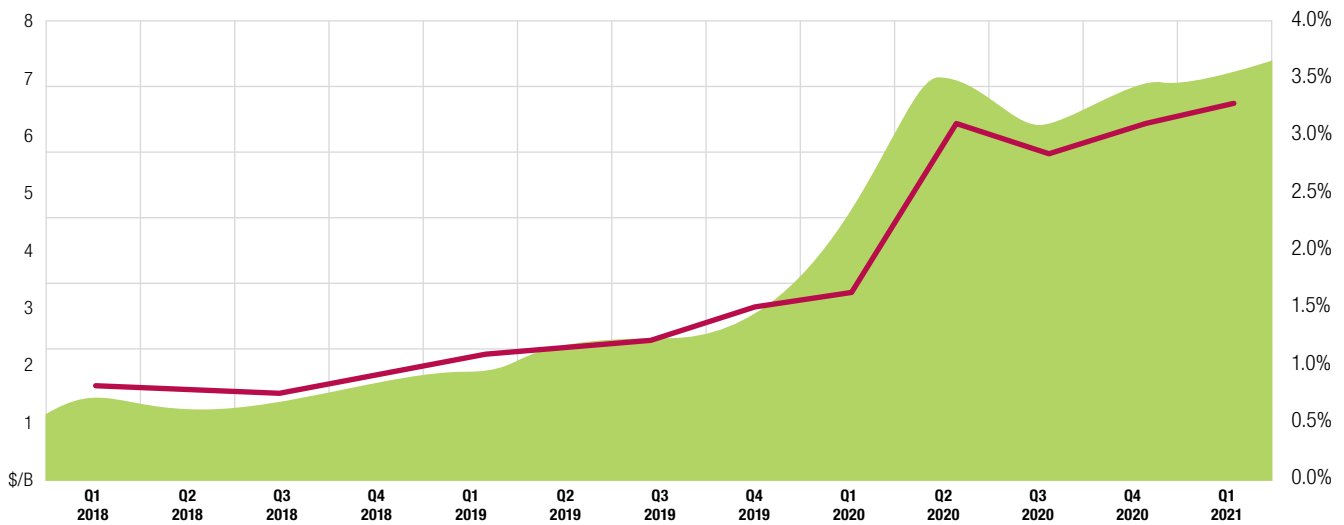
Fortunately, throughout the disruptions brought on by COVID-19, the U.S. apple industry has not seen any considerable decrease in domestic

demand. On the commercial side, the temporary shuttering of the food service industry did not have any significant impact as apples are not heavily utilized by that sector.

On the personal consumption side, grocers quickly instituted programs allowing for curbside pickup and/or at-home delivery giving shoppers uninterrupted access to essential items including fresh fruit. Packers and marketers were also quick to respond by offering bagged apples that gave consumers added peace of mind by reducing the handling needed to stock and pick the fruit.

Perhaps the most significant consumer trend to come out of the pandemic was the rate at which shoppers embraced e-commerce grocery shopping. In the first quarter of 2018, e-commerce accounted for only 1.3% of food and beverage store sales (\$1.5 billion). By the first quarter of 2021, e-commerce had grown to account for 3.5% of food and beverage store sales (\$6.9 billion) – an increase of more than 377% (see **Figure 3**).

**Figure 3: U.S. Food & Beverage Store E-Commerce Sales**



Sources: U.S. Census Bureau; USApple

● F&B Store E-Commerce Sales  
● E-Commerce Sales as a % of Total F&B Store Sales

<sup>15</sup> USDA, Foreign Agricultural Service. Global Agricultural Trade System: Apple Exports: 2018-2020.

To put that in context, from Q1 2018 to Q1 2021, total e-commerce sales grew from \$111.7 billion to \$196.7 billion – an impressive, but significantly lower growth rate of 76%.

While it seems clear that online grocery shopping is here to stay, it is less clear what that means for the apple industry in the long term. Some have speculated that it will shrink store sizes and display space causing supermarkets to limit the varieties in store. On the other hand, the endless aisle of the online grocer could


accommodate any number of varieties exposing adventurous consumers to apples never before offered in store. The industry will have to wait and see how these counteracting forces play out as the market evolves.

From H-2A labor force issues to online grocery shopping, the trends and forces detailed above are helping to shape the U.S. apple industry in real time. Users of this report should keep these factors in mind as they evaluate the production, utilization and trade data that follow.



# U.S. Apple Production

According to a USApple analysis of USDA data, total U.S. apple production for the 2021/22 CY will exceed 11.1 billion pounds or 265.4 million bushels.<sup>16</sup> This represents a 2.7% increase compared to last year's production figure and is 1.3% less than the five-year production average.

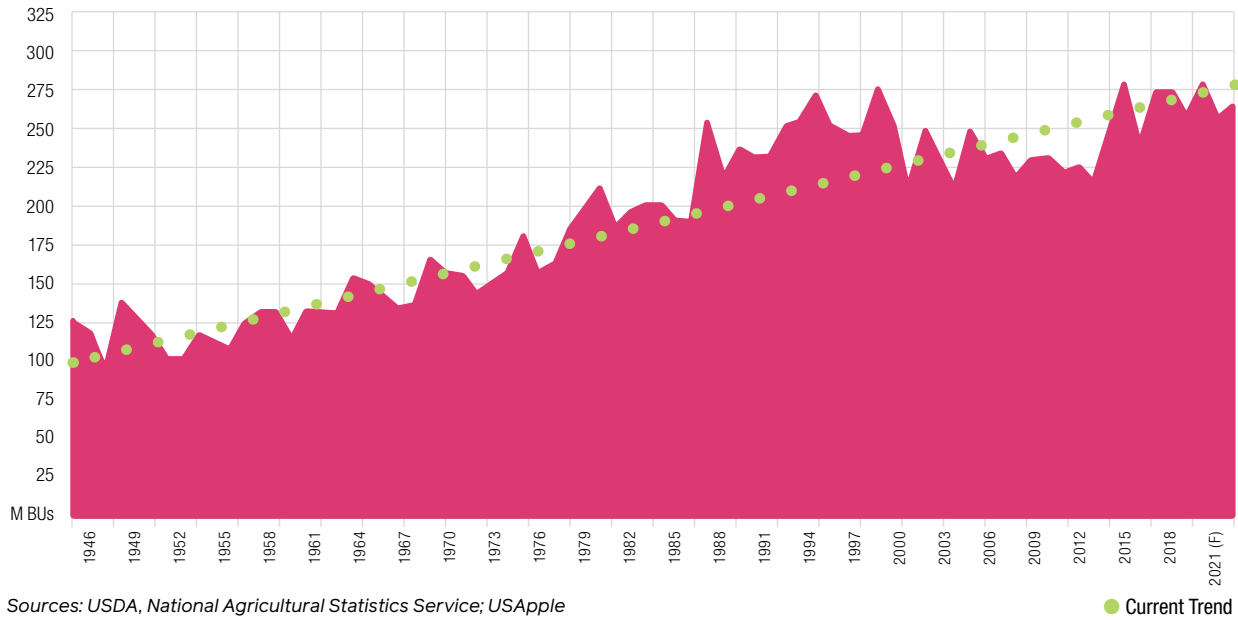


**265.4**  
MILLION BUSHELS  
PRODUCED

<sup>16</sup> Each August, USDA releases an estimate of apple production by state for the coming crop year. In 2018, it limited the number of estimates to only the top seven apple producing states: California, Michigan, New York, Oregon, Pennsylvania, Virginia and Washington. This means that, from 2018 onward, USDA's total national production figure only represents a sum of the seven states. Prior to 2018, USDA's total national production figure included data for a far greater number of states – 20 in 2017. In an effort to maintain continuity of the dataset, USApple has estimated production for the "Other" states from 2018-2021 and added it back to USDA's national production figures to arrive at a new, more comprehensive USApple production estimate.



**Figure 4: U.S. Apple Production: 1946-2021(F)**

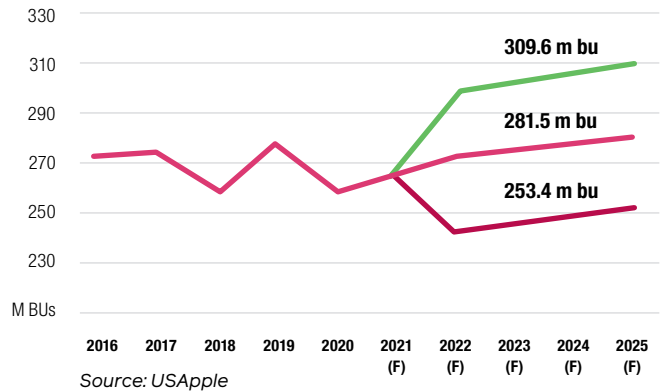


As shown in **Figure 4** above, U.S. apple production has been steadily growing over the last 75 years. While there was a slowdown in the 2000s following a boom in the 1990s, the industry has recovered and is once again testing all-time highs.

Going one step further, USApple has utilized this latest data point to develop an apple production forecast through 2025.<sup>17</sup> That outlook, as well as upper and lower “95% confidence intervals<sup>18</sup>”, is shown in **Figure 5**.

Based on this analysis, USApple estimates that, independent of extraordinary positive or negative events, production will continue its gradual upward trend increasing by 6.1% by 2025. In terms of the confidence intervals: on the low end, 2025 production could decrease by as much as 4.5%; on the high end, by 2025 it could increase by 16.7%.

**Figure 5 U.S. Apple Production Extended Forecast**



<sup>17</sup> This forecast was generated using an internally developed two-factor exponential smoothing model. As such, it uses historical production levels and trends (2007 forward) to predict future production quantities. The model is designed to minimize the errors between known historical values and those predicted by the model. In this case, that error metric, known as the Mean Absolute Percentage Error (MAPE), was 4.6%. Please note, this model cannot, and is not intended to, account for extraordinary impacts resulting from climate/weather events, pest infestations, etc.

<sup>18</sup> Confidence intervals provide users with a range of values that are more likely than not to contain the true mean. In this case, the model is 95% confident that the true mean will fall within these bounds of plus or minus 27.8 million bushels. Once again, extraordinary events may result in production quantities that deviate significantly from the norm – this model does not make any attempt to account for such deviations.

At the state level for the 2021/22 CY, Washington is expected to produce 176.2 million bushels<sup>19</sup>, followed by New York (32.1 m bu) and Michigan (18.1 m bu). As noted above, for the first time since USDA discontinued reporting “Other” state data in 2018, USApple has estimated those missing production data. Perhaps surprisingly, when taken as a group, the “Other” states are the fourth largest producer at 14.8 million bushels – ahead of Pennsylvania’s 11 million bushels. Rounding out the top eight states (including “Other”) are Oregon (4.5 m bu), California (4.4 m bu), and Virginia (4.3 m bu) (see **Table 5**).

With respect to year-over-year changes, Michigan’s production is estimated to fall the most in absolute terms, down 4 million bushels. USDA attributed this decline to early crop development in the spring, leaving buds vulnerable to frost damage in April. Additionally, it noted that pollination was hampered by cold weather in early May. USDA further mentioned that, despite record-high temperatures in June, Washington state is expected to see the largest absolute rise in production volume, increasing by more than 11.5 million bushels.

**Table 5: U.S. Apple Production, by State**

	2021/22 (F)	2020/21	5-YR. AVERAGE
<b>LEVELS</b>			
<b>United States</b>	<b>265,424,378</b>	<b>258,564,955</b>	<b>269,030,516</b>
Washington	176,190,476	164,642,857	171,595,238
New York	32,142,857	32,976,190	31,904,762
Michigan	18,095,238	22,071,429	24,747,619
Pennsylvania	10,952,381	9,928,571	11,461,905
Oregon	4,523,810	4,166,667	4,121,905
California	4,404,762	6,452,381	6,014,286
Virginia	4,285,714	3,880,952	4,580,952
Other	14,829,140	14,445,907	14,603,849
<b>PERCENT CHANGE (VS. 2021/22)</b>			
<b>United States</b>	<b>-</b>	<b>2.7%</b>	<b>-1.3%</b>
Washington	-	7.0%	2.7%
New York	-	-2.5%	0.7%
Michigan	-	-18.0%	-26.9%
Pennsylvania	-	10.3%	-4.4%
Oregon	-	8.6%	9.8%
California	-	-31.7%	-26.8%
Virginia	-	10.4%	-6.4%
Other*	-	2.7%	1.5%
<b>MARKET SHARE</b>			
<b>United States</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
Washington	66.4%	63.7%	63.8%
New York	12.1%	12.8%	11.9%
Michigan	6.8%	8.5%	9.2%
Pennsylvania	4.1%	3.8%	4.3%
Oregon	1.7%	1.6%	1.5%
California	1.7%	2.5%	2.2%
Virginia	1.6%	1.5%	1.7%
Other	5.6%	5.6%	5.4%



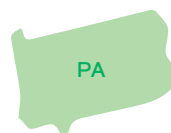
**176M**  
BUSHELS

UP  
7% YOY



**18M**  
BUSHELS

DOWN  
18% YOY



**11M**  
BUSHELS

UP  
10% YOY

Sources: USDA, National Agricultural Statistics Service; USApple  
Notes: Production levels are in 42-pound bushels.  
Five-year averages do not include 2021/22 (F) data.  
USDA U.S. total revised to include imputed production from “Other” states.  
“Other” states’ production calculated based on 2017 share of U.S. total.

<sup>19</sup> WSTFA also releases an annual estimate for apple production in Washington. Those estimates are based solely on fresh apples so they are not equivalent to the USDA figure, but an adjustment can be made based on historical utilization shares to allow for a reasonable comparison. Using the state’s five-year average fresh apple utilization rate of 75.3%, the USDA’s figure can be revised down to 132.6 million bushels. The 2021/22 WSTFA fresh apple forecast is 118.9 million bushels – a difference of 13.7 million bushels or 10.4%. As noted in the **Introduction** above, the consensus estimate from Washington growers was that the record-high temperatures in June would ultimately reduce the apple crop by around 10% or more.

In percentage terms, California is projected to shed almost 32% of its 2020/21 apple production (2 million bushels). Virginia production is anticipated to grow by more than 10% in the coming crop year (405,000 bushels).

In terms of changes in market share, Michigan and California are decreasing compared to the five-year average, falling by 2.4 and 0.5 percentage points respectively. Those shares have largely been ceded to Washington which increased its 2021/22 market share by 2.6 percentage points compared to the five-year average.

In terms of varietal mix, in 2021/22, Galas are expected to hold on to the top spot at almost 19% of total U.S. apple production followed by Red Delicious (13%) and Fuji (12%). **Table 6** details the expected 2021/22 production by variety and highlights the shifts in composition as compared to the 2020/21 CY and the five-year average.<sup>20</sup>

**Table 6: U.S. Apple Production, by Variety**

	2021/22 (F)		2020/21		5-YR. AVERAGE	
<b>Total Varieties</b>	<b>265,424,378</b>		<b>258,564,955</b>		<b>269,030,516</b>	
Gala	49,257,377	18.6%	51,417,512	19.9%	51,449,367	19.1%
Red Delicious	35,670,593	13.4%	38,938,648	15.1%	52,809,209	19.6%
Honeycrisp	30,972,047	11.7%	27,145,369	10.5%	20,615,110	7.7%
Fuji	29,090,994	11.0%	28,479,692	11.0%	27,740,339	10.3%
Granny Smith	27,236,375	10.3%	22,170,525	8.6%	25,479,517	9.5%
Others	24,619,811	9.3%	24,580,669	9.5%	18,915,730	7.0%
Golden Delicious	14,525,011	5.5%	14,689,232	5.7%	19,372,595	7.2%
Pink Lady/Cripps Pink	12,591,268	4.7%	10,233,302	4.0%	9,742,261	3.6%
Idared	6,944,088	2.6%	7,471,620	2.9%	7,263,418	2.7%
Rome	5,793,310	2.2%	6,012,876	2.3%	8,111,245	3.0%
McIntosh	5,530,903	2.1%	5,826,648	2.3%	6,658,287	2.5%
York	4,832,857	1.8%	4,417,754	1.7%	4,398,484	1.6%
Cosmic Crisp	4,657,017	1.8%	2,076,061	0.8%	508,010	0.2%
Empire	4,069,832	1.5%	4,272,219	1.7%	4,945,606	1.8%
Ambrosia	3,014,803	1.1%	3,143,109	1.2%	2,466,472	0.9%
Cortland	1,908,831	0.7%	1,947,332	0.8%	1,733,557	0.6%
Newtown Pippin	1,637,514	0.6%	2,368,593	0.9%	1,677,475	0.6%
Mutsu/Crispin	1,149,037	0.4%	1,170,574	0.5%	1,432,104	0.5%
Jonathan	690,366	0.3%	812,336	0.3%	930,751	0.3%
Braeburn	519,126	0.2%	673,830	0.3%	1,704,103	0.6%
Spartan	311,532	0.1%	318,518	0.1%	336,282	0.1%
Stayman	234,007	0.1%	215,047	0.1%	254,178	0.1%
Rome Sport	167,681	0.1%	183,490	0.1%	486,415	0.2%

Sources: USApple; Washington State Tree Fruit Association

Notes: Production levels are in 42-pound bushels.

Five-year averages do not include 2021/22 (F) data.

<sup>20</sup> The U.S. totals were derived as the sum of the state-level data shown in **Table 7**.



**Table 7** details 2021/22 estimated production by variety, by state.<sup>21</sup>

**Table 7: U.S. Apple Production, by Variety, by State**

2021/22 (F)	U.S.	CA	MI	NY	OR	PA	VA	WA	OTHER
<b>Total Varieties</b>	<b>265,424,378</b>	<b>4,404,762</b>	<b>18,095,238</b>	<b>32,142,857</b>	<b>4,523,810</b>	<b>10,952,381</b>	<b>4,285,714</b>	<b>176,190,476</b>	<b>14,829,140</b>
Gala	49,257,377	2,208,134	2,876,521	2,075,253	1,138,780	443,258	745,561	37,115,014	2,654,855
Red Delicious	35,670,593	-	1,467,952	2,263,585	896,819	669,812	443,791	27,518,737	2,409,897
Honeycrisp	30,972,047	-	2,144,920	1,329,903	557,604	121,955	67,157	24,696,302	2,054,206
Fuji	29,090,994	-	1,054,645	1,547,899	1,008,973	860,460	130,168	22,579,476	1,909,372
Granny Smith	27,236,375	-	-	468,523	447,707	288,237	36,582	24,414,059	1,581,267
Others	24,619,811	-	3,080,799	3,609,509	35,607	1,178,501	351,135	15,241,147	1,123,113
Golden Delicious	14,525,011	-	2,171,049	1,926,501	201,529	2,634,482	396,219	6,350,478	844,753
Pink Lady/Cripps Pink	12,591,268	520,085	99,764	156,016	198,686	93,308	182,251	10,584,130	757,029
Idared	6,944,088	-	2,080,786	4,248,111	-	297,724	55,312	-	262,154
Rome	5,793,310	-	1,133,031	3,264,783	-	516,191	627,810	-	251,494
McIntosh	5,530,903	-	881,246	4,377,186	-	39,131	24,656	-	208,684
York	4,832,857	-	-	185,413	-	3,446,312	972,481	-	228,651
Cosmic Crisp	4,657,017	-	-	-	-	-	-	4,657,017	-
Empire	4,069,832	95,419	432,309	3,217,471	-	125,170	51,389	-	148,073
Ambrosia	3,014,803	-	-	152,977	6,158	8,930	-	2,681,313	165,425
Cortland	1,908,831	-	-	1,777,016	-	18,439	42,512	-	70,865
Newtown Pippin	1,637,514	1,581,123	-	-	31,946	1,565	9,765	-	13,115
Mutsu/Crispin	1,149,037	-	-	1,056,518	-	41,919	9,164	-	41,436
Jonathan	690,366	-	558,202	81,598	-	21,938	181	-	28,448
Braeburn	519,126	-	30,879	50,616	-	42,383	641	352,804	41,803
Spartan	311,532	-	-	295,372	-	-	3,703	-	12,457
Stayman	234,007	-	-	17,517	-	67,160	135,234	-	14,096
Rome Sport	167,681	-	83,136	41,091	-	35,506	-	-	7,948

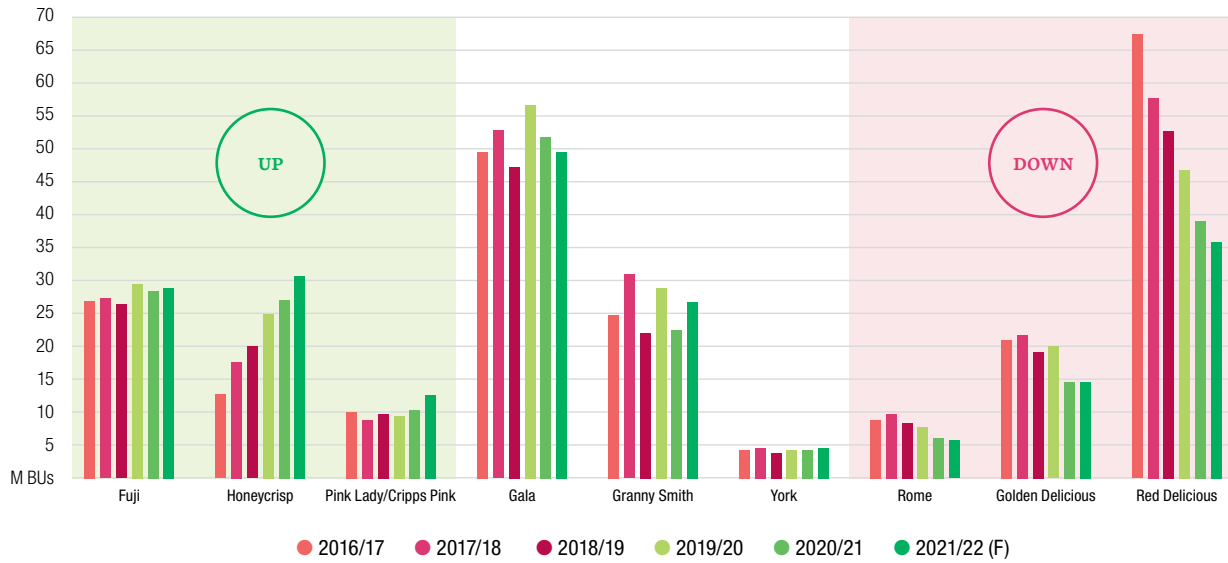
Sources: USApple; Washington State Tree Fruit Association  
 Note: Production levels are in 42-pound bushels.

In general, the varieties on the rise include Fuji, Honeycrisp and Pink Lady/Cripps Pink. Gala, Granny Smith and York varieties have remained relatively consistent compared to 2016 production volumes. Varieties on the decline include Rome, Golden Delicious and Red Delicious.

On the positive side, Honeycrisp production has increased by 136% or 17.8 million bushels in the past five years. Conversely, Red Delicious decreased by almost 47% or 31.3 million bushels during the same period. **Figure 6** charts the yearly production growth or decline for select top varieties.

<sup>21</sup>For California, Michigan, New York, Oregon, Pennsylvania and Virginia, the 2021/22 production values by variety were derived using USApple's state-specific December 1, 2020 storage ratios – the percentage of total storage by variety at that point in time. The values for the "Other" states were calculated using U.S. national December 1, 2020 storage ratios by variety (excluding Cosmic Crisp). Washington's estimated varietal shares were provided by WSTFA. Users should be aware that estimates made using the December storage shares may tend to undercount certain varieties: on the high end, growers/marketers may want to sell the newer, more valuable varieties quickly and so those may move before the December 1 report; on the low end, processing apples may not be worth the cost of storage and so are moved quickly or may have never gone through storage facilities at all.

**Figure 6: U.S. Apple Production Trends, by Select Varieties**



Sources: USApple; Washington State Tree Fruit Association

When viewed alongside retail price data, there is a clear correlation with these varietal shifts. **Table 8** lists the weighted average price, sorted in descending order, of 11 varieties tracked by USDA nationwide. The most expensive varieties at the top of the list – greater than the median price – are those experiencing production growth. The least expensive varieties – below the median price – are those in decline.

In the case of Honeycrisp, the 136% rise in production from 2016–2021 is undoubtedly related to its relative price premium – \$2.19 per pound versus the median for the varieties shown at \$1.29 per pound. That \$0.90 per pound differential is even widened slightly to \$0.92 per pound when considering organics.

**Table 8: U.S. Apple Retail Prices, by Select Varieties**

2020/21	REGULAR	ORGANIC	DIFFERENCE
<b>Median</b>	<b>\$1.29</b>	<b>\$1.99</b>	<b>\$0.72</b>
Honeycrisp	\$2.19	\$2.91	\$0.72
Pink Lady/Cripps Pink	\$1.44	\$2.02	\$0.58
Granny Smith	\$1.39	\$1.99	\$0.60
Gala	\$1.34	\$1.89	\$0.55
Braeburn	\$1.33	\$1.84	\$0.51
Fuji	\$1.29	\$1.97	\$0.68
Red Delicious	\$1.25	\$2.09	\$0.84
Golden Delicious	\$1.19	\$2.06	\$0.87
Jonagold	\$1.15	\$1.99	\$0.84
Rome	\$1.13	\$1.99	\$0.86
McIntosh	\$1.11	\$1.98	\$0.87

Sources: USDA, Agricultural Marketing Service; USApple  
 Note: Prices represent national averages in dollars per pound.

**CORE INSIGHTS**

From **Table 8**, it is clear that organic apples fetch a significant premium over their non-organic counterparts. For these select varieties, on average, organically grown apples are priced 56% above conventional apples. What is less clear is where in the marketing chain those benefits are accruing. According to USDA data, in the 2020/21 CY, the weekly U.S. average shipping point price for a cartons tray pack of non-organic apples (all varieties, sizes and grades) was \$28.77. The organic price was \$30.93 – a difference of \$2.16 or not quite 8%



Understandably, the decision to grow certain varieties or organic versus non-organic apples depends in large part on topography, climate, operational sophistication, etc. and so not every grower could or should move their operations towards producing solely organic Honeycrisp. But the regions and growers that can take advantage of these premium apples are able to reap oversized rewards.

**Table 9** shows the market share by state when calculated on production quantities versus value. By bushels produced, Washington has a 66.4% market share. By value, that share increases to 70.4% – a 4 percentage point gain. That gain is realized by drawing market share from every other state (excluding “Other”) – 2.2 percentage points from New York; 1.1 from Pennsylvania; and so on.

It should be noted, however, the varietal mix and availability of organics are not the only factors driving this shift in market share. As important, if not more so, is how the apples are ultimately utilized. Will they be used for fresh consumption, or will they be processed? The

following section takes a closer look at apple utilization in the U.S., providing additional detail at the state and varietal levels.

**Table 9: U.S. Apple Market Shares, by State**

2021/22 (F)	PRODUCTION		VALUE	
<b>United States</b>	<b>265,424,378</b>		<b>\$3,209,848,752</b>	
Washington	176,190,476	66.4%	\$2,260,937,313	70.4%
New York	32,142,857	12.1%	\$318,080,513	9.9%
Michigan	18,095,238	6.8%	\$212,873,384	6.6%
Pennsylvania	10,952,381	4.1%	\$97,842,818	3.0%
Oregon	4,523,810	1.7%	\$50,785,558	1.6%
California	4,404,762	1.7%	\$48,757,672	1.5%
Virginia	4,285,714	1.6%	\$36,026,503	1.1%
Other	14,829,140	5.6%	\$184,544,992	5.7%

Sources: USDA, National Agricultural Statistics Service; USApple  
Notes: Production levels are in 42-pound bushels.

USDA U.S. total revised to include imputed production from “Other” states.  
“Other” states’ production calculated based on 2017 share of U.S. total.  
Value data are based on five-year averages: 2016-2020.



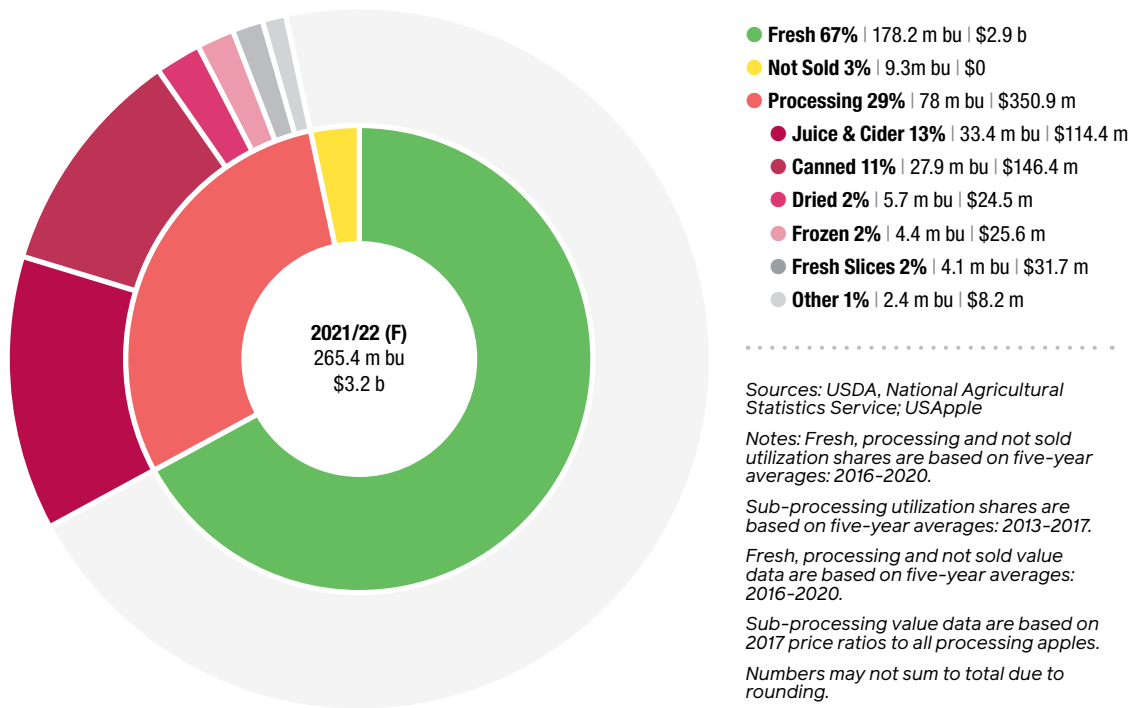
# U.S. Apple Utilization

The ratio of fresh to processing apples has remained remarkably consistent over the last decade (or more). In 2020, fresh apples made up around 67% of total apples produced while processing apples accounted for around 30%. The remaining 3% of apples produced went unsold.



**67%**  
FRESH

**Figure 7: U.S. Apple Utilization**



These shares are nearly identical to the five-year average utilization patterns. Given that USDA's August forecast does not estimate utilization, the five-year averages were applied to the 2021/22 CY production forecast to approximate values for fresh, processing and not sold apples. **Figure 7** displays these estimated utilization shares, quantities and values along with a breakout of processing apple usage.<sup>22</sup>

At the state level, the ratios of fresh to processing apples can vary dramatically. In Oregon, for example, fresh apples make up almost 82% of total estimated production for the 2021/22 CY. California, on the other hand, has a fresh utilization ratio of less than 30%. The majority of the balance of production goes towards processing apples, but there are some apples that remain unsold.



Not all processing apples are created equally. In 2017, USDA stopped collecting data on the quantities and values of the various types of processing apples. **Figure 7** was created using five-year average shares of production weight. The shares of sub-processing apples would look quite different if they were calculated based on value.

Fresh slices had the highest price premium over processing apples in general at \$0.21 per pound versus \$0.12 per pound in 2017. Conversely, juice was considerably less expensive at \$0.09 per pound – a 24% discount. Based on 2017 values, canned apples would account for the largest share of processors at 12% (\$146.4 million) followed by juice and cider apples at 10% (\$114.4 million) and fresh slices at 3% (\$31.7 million).

<sup>22</sup> In 2018, USDA discontinued the collection of data on specific processed apple products. The processor utilization data in **Figure 7** represent a five-year average from 2013-2017 and are applied to the 2021/22 CY forecast.

In terms of market share for fresh and processing apples, Washington still dominates due to the scale of that state's production. In the 2021/22 CY, almost 75% of fresh apples and 45% of processing apples will be grown there. **Table 10** details utilization levels, shares of production and shares of use by state.

Just as the utilization shares vary by state, so too do they vary by type. As shown in **Table 11**, a number of apple varieties like Ambrosia, Braeburn and Gala, for example, are primarily utilized as fresh while other varieties like

Idared, Rome and Stayman are primarily utilized for processing.<sup>23</sup>

As noted above, the differentiation between fresh and processing apples is a key driver of value. Understanding this is central to appreciating how U.S. apple growers and processors engage with the global community through trade. The following section examines U.S. apple imports and exports, detailing how they have changed over time and what that means for the balance of trade.

**Table 10: U.S. Apple Utilization, by State**

2021/22 (F)	UTILIZATION	% OF STATE PRODUCTION	% OF NATIONAL USE TYPE
<b>FRESH</b>			
<b>United States</b>	<b>178,155,738</b>	<b>67.1%</b>	<b>-</b>
Washington	132,645,688	75.3%	74.5%
New York	17,237,617	53.6%	9.7%
Michigan	9,194,025	50.8%	5.2%
Pennsylvania	4,893,985	44.7%	2.7%
Oregon	3,702,133	81.8%	2.1%
Virginia	1,859,622	43.4%	1.0%
California	1,282,294	29.1%	0.7%
Other	7,340,375	49.5%	4.1%
<b>PROCESSING</b>			
<b>United States</b>	<b>78,016,455</b>	<b>29.4%</b>	<b>-</b>
Washington	34,827,947	19.8%	44.6%
New York	14,661,387	45.6%	18.8%
Michigan	8,880,749	49.1%	11.4%
Pennsylvania	6,011,574	54.9%	7.7%
California	3,078,416	69.9%	3.9%
Virginia	2,386,425	55.7%	3.1%
Oregon	796,044	17.6%	1.0%
Other	7,373,914	49.7%	9.5%

Sources: USDA, National Agricultural Statistics Service; USApple  
Notes: Utilization levels are in 42-pound bushels.  
Fresh and processing production shares are based on five-year averages: 2016-2020.  
The sum of fresh, processing and not sold apples equals total production.

**Table 11: U.S. Apple Utilization, by Variety**

2016-2020 AVERAGE	FRESH	PROCESSING
<b>Total Varieties</b>	<b>72.9%</b>	<b>27.1%</b>
Ambrosia	80.8%	19.2%
Braeburn	84.9%	15.1%
Cortland	46.3%	53.7%
Cosmic Crisp	77.8%	22.2%
Empire	76.5%	23.5%
Fuji	79.9%	20.1%
Gala	82.4%	17.6%
Golden Delicious	55.3%	44.7%
Granny Smith	77.0%	23.0%
Honeycrisp	64.7%	35.3%
Idared	8.0%	92.0%
Jonathan	46.1%	53.9%
McIntosh	75.6%	24.4%
Mutsu/Crispin	20.1%	79.9%
Newtown Pippin	30.8%	69.2%
Pink Lady/Cripps Pink	82.0%	18.0%
Red Delicious	84.1%	15.9%
Rome	11.0%	89.0%
Rome Sport	49.1%	50.9%
Spartan	96.7%	3.3%
Stayman	20.9%	79.1%
York	1.6%	98.4%
Other	70.3%	29.7%

Source: USApple  
Note: Shares do not match those in **Table 10** as December storages are inclusive of "not sold" apples.

<sup>23</sup>The data in **Table 11** were derived using USApple's December 1, 2016-2020 average storage ratios – the percentage of total storage by variety at that point in time. Just as with **Tables 6** and **7**, users should be aware that estimates made using the December storage shares may tend to undercount certain varieties at the high- or low-end of the spectrum.



# U.S. Apple Trade

According to USDA trade data, fresh apple exports totaled 42.1 million bushels in 2020 – a 3% decline over 2019 levels. Fortunately, however, from 2019 to 2020 fresh apple imports fell faster, declining by almost 25% to 5.7 million bushels. These counteracting forces resulted in a slight, 500,000-bushel increase in the year-over-year balance of trade.

While this is a positive sign, the U.S. fresh apple market and policy makers have a lot of work to do to get back to the high-water mark set in 2018. In that year, total exports were 48.5 million bushels and the net positive trade balance was 41.6 million bushels. That represents a decline in net exports of more than 5.1 million bushels in just two years with an estimated value of almost \$120 million.



**42.1**

MILLION BUSHELS  
EXPORTED



The vast majority of this impact was due to the reduction in fresh apple exports to India. From 2018 to 2020, U.S. exports to India declined by 5.7 million bushels – 90% of the total 6.3-million-bushel decline. In 2018, the value of these exports was more than \$157 million. In 2020, the value was less than \$38 million – a nearly

\$120 million loss to U.S. apple farmers. **Table 12** provides five years of fresh apple trade levels for select export/import partners as well as the value of those exchanges in 2020.

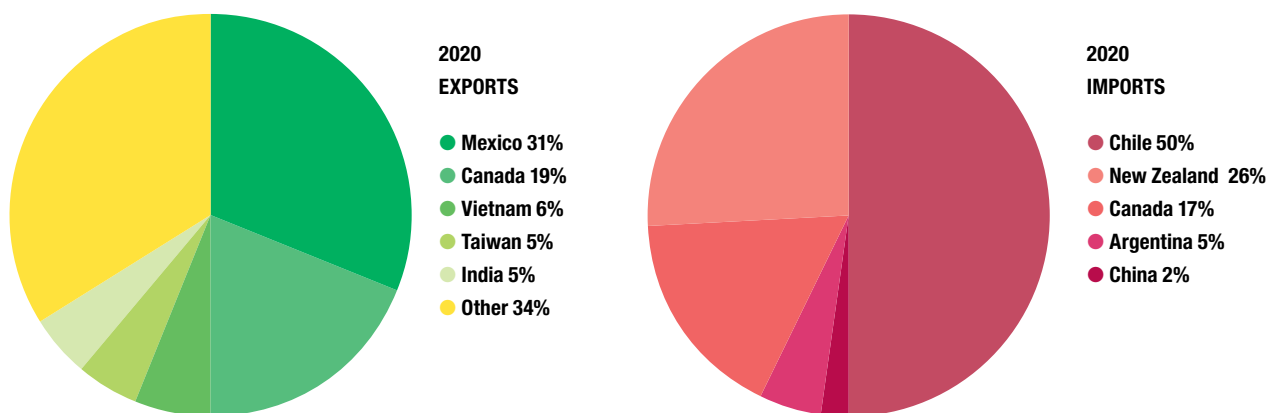
**Figure 8** highlights the primary export and import markets for U.S. apples in 2020.

**Table 12: U.S. Fresh Apple Trade**

	2020	2019	2018	2017	2016	2020 \$
<b>Total United States Exports</b>	<b>42.1</b>	<b>43.5</b>	<b>48.5</b>	<b>47.5</b>	<b>40.4</b>	<b>\$848.7</b>
Mexico	13.2	12.9	14.8	14.8	11.2	\$240.6
Canada	7.9	7.3	7.8	7.6	7.5	\$155.8
Vietnam	2.5	2.8	2.0	1.4	1.3	\$63.2
Taiwan	2.2	4.0	2.3	3.1	3.0	\$54.1
India	2.2	2.9	7.9	5.3	3.0	\$37.5
Indonesia	1.5	1.7	1.3	1.7	2.1	\$30.1
Dominican Republic	1.1	1.1	1.1	1.0	1.0	\$22.0
Hong Kong	1.1	1.4	1.3	1.8	1.7	\$22.8
Saudi Arabia	0.9	1.0	1.0	1.1	0.9	\$16.6
Thailand	0.8	1.1	0.8	0.8	0.8	\$19.0
Other	8.8	7.3	8.1	9.0	7.8	\$187.0
<b>Total United States Imports</b>	<b>5.7</b>	<b>7.5</b>	<b>6.9</b>	<b>8.7</b>	<b>10.2</b>	<b>\$157.9</b>
Chile	2.8	4.1	3.3	4.6	5.5	\$72.1
New Zealand	1.5	1.7	2.1	1.9	2.5	\$55.9
Canada	1.0	1.1	1.0	1.4	1.3	\$21.2
Argentina	0.3	0.6	0.3	0.5	0.6	\$5.8
China	0.1	0.1	0.2	0.2	0.2	\$2.4
Other	0.0	0.0	0.0	0.0	0.1	\$0.4
<b>United States Balance of Trade</b>	<b>36.5</b>	<b>36.0</b>	<b>41.6</b>	<b>38.9</b>	<b>30.2</b>	<b>\$690.8</b>

Sources: USDA, Foreign Agricultural Service; USApple  
 Notes: Trade levels are in millions of 42-pound bushels.  
 Trade values are in millions of dollars.

**Figure 8: U.S. Fresh Apple Trading Partners**

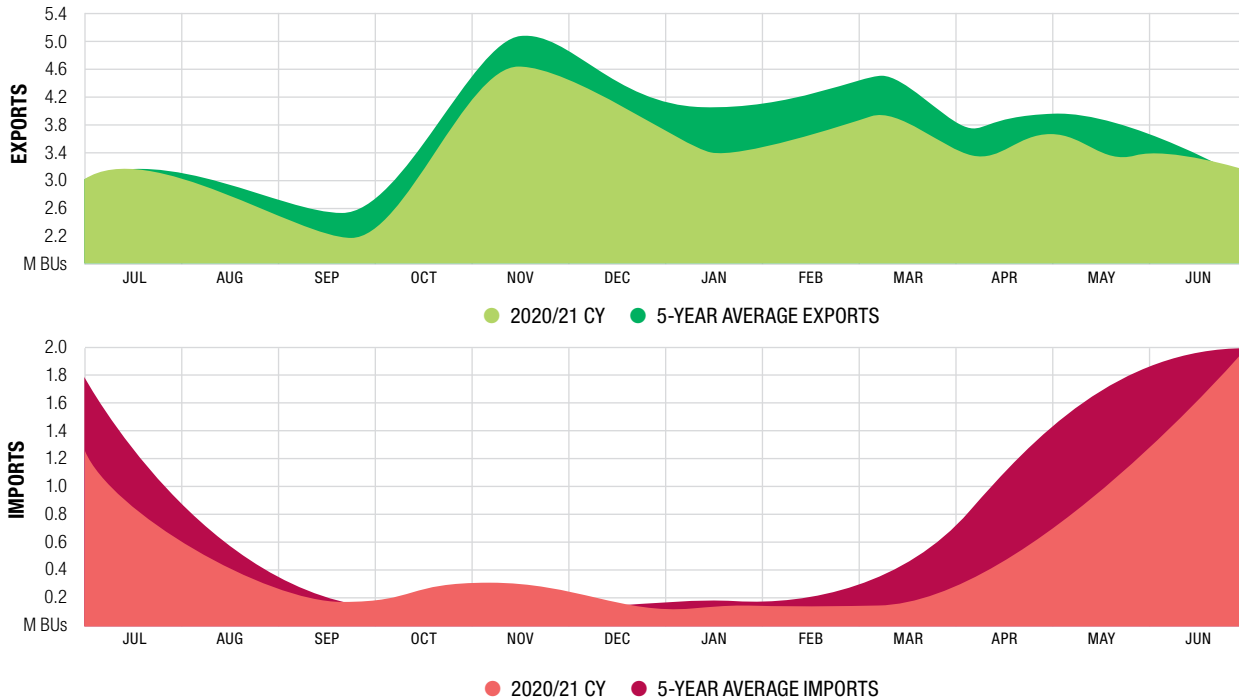


Sources: USDA, Foreign Agricultural Service; USApple

On a monthly basis, the 2020/21 CY (July to June) continued the calendar year trends mentioned above: both exports and imports are down compared to the five-year average.

As shown in **Figure 9**, this differential becomes even more pronounced beginning in January 2021 for exports and in April 2021 for imports.

**Figure 9: U.S. Monthly Fresh Apple Trade**



Sources: USDA, Foreign Agricultural Service; USApple



There are a few countries not included in **Table 12** and **Figure 8** that warrant an honorable mention: Israel and the United Kingdom. They are both deserving as they pay extremely well for U.S. fresh apples at \$0.69 per pound versus the average \$0.48 per pound for all exports.

This means that, while Israel does not crack the top ten in terms of volume, it does in terms of value. In 2020, U.S. fresh apple exports to Israel (721,000 bushels) were valued at almost \$20.8 million – larger than both Thailand and Saudi Arabia.

In the case of Israel, this premium may be tied in with other political considerations. As for the U.K., the disproportionate share of organic apples is most certainly the cause. Organic apples make up more than 37% of those shipped to the U.K. as compared to 8.6% for all U.S. exports.

When compared to the 2019/20 CY, both exports and imports are also down by 9% and 18% respectively. Given that exports are so much larger than imports, this led to a net decline in the balance of trade by 8% or 2.9 million bushels. However, due to the relative costs of imports compared to exports, the “savings” incurred by reducing imports more than offset the “expense” of the exports, leading to a positive \$40.4 million in net trade value (see **Table 2** in the **Core Findings** section at the beginning of this report).

Given the value discrepancy between fresh and processing apples, a focus on the fresh market is certainly warranted, but it leaves out a huge sector of apple-related trade: apple juice concentrate – a sector dominated by overseas competitors.

In 2020, the U.S. imported almost 430 million gallons of apple juice concentrate. At a conversion rate of 8.35 pounds per gallon, the conversion weight for water, which is likely low, that equates to almost 3.6 billion pounds. U.S. fresh market exports weigh in at less than 1.8 billion pounds (42.1 million bushels). What the processing market loses in price, it makes up for in quantity. The value of these imports – more than \$415 million.

For the most part, U.S. processors don't compete in this market globally. Exports of apple juice concentrate are less than 3% of imports leading to a massive negative balance of trade (417 million gallons) valued at almost \$370 million. Fortunately, given the strength of the fresh export market, the net trade balance for fresh and apple juice concentrate is still a positive \$322 million.<sup>24</sup>

On a year-over-year basis, imports of apple juice concentrate are down almost 4%, but what little the U.S. does export is also down by almost 9%. Given the enormity of the import market, this has caused net trade to decrease by tens of millions of gallons and dollars (see **Table 13**).

It takes a lot of apples to create 430 million gallons of apple juice concentrate. That market is dominated by China, the world's largest producer of apples by far. China accounts for more than 37% of the value of apple juice concentrate imports (\$155 million) and an even larger share by volume (53%). This means that its juice is prevalent, and cheap – a troubling combination for U.S. juice producers. For additional details on U.S. apple juice concentrate import trading partners, see **Appendix A**.

The following section explores global apple production more closely, highlighting a number of international 2021/22 apple crop forecasts and completing the picture of worldwide apple supply in the year to come.

**Table 13: U.S. Apple Juice Concentrate Trade**

	2020	2019	YR -OVER- YR % CHANGE
<b>LEVELS</b>			
<b>Unites States Balance of Trade</b>	<b>(416,702,615)</b>	<b>(432,607,275)</b>	<b>-3.7%</b>
Total Exports	12,148,187	13,300,558	-8.7%
Total Imports	428,850,802	445,907,833	-3.8%
<b>VALUE</b>			
<b>Unites States Balance of Trade</b>	<b>\$(368,704,000)</b>	<b>\$(388,554,000)</b>	<b>-5.1%</b>
Total Exports	\$46,362,000	\$51,414,000	-9.8%
Total Imports	\$415,066,000	\$439,968,000	-5.7%

Sources: USDA, Foreign Agricultural Service; USApple  
Note: Trade levels are in gallons.

<sup>24</sup> There are other apple-related products that are traded like purees, preserves and dried apples that are more heavily imported than exported which further erode the trade balance. However, even accounting for these, the U.S. has net positive apple-related trade valued at almost \$162 million in 2020.

# Global Apple Production

Global apple production has been steadily increasing since 1961. In 2019, the most recent year for which the UN has data, worldwide apple production totaled almost 4.6 billion bushels. These apples were grown on slightly less than 11.7 million acres resulting in an average yield of about 393 bushels per acre.



**4.6**

BILLION BUSHEL  
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Despite the steady increase in production, the number of acres harvested reached its pinnacle in 1995. As a result, global average apple yield has been rapidly increasing since that time. From 1995 to 2019, apple production has increased by 79%, acres harvested has fallen by 25% and average yield has increased by 138%.

In 2019, China alone was responsible for producing 2.2 billion bushels or around 49%. The U.S. was the world's second largest producer at 262.3 million bushels (5.7%). Rounding out the top five were Turkey (4.1%), Poland (3.5%) and India (2.7%). A complete list of apple production by country is shown in **Appendix B**.

In terms of area harvested, China still tops the list at more than 5 million acres, but by this metric, the U.S. falls to sixth in the world with slightly less than 294,000 acres. India moves into the number two spot, followed by Russia, Turkey and Poland.

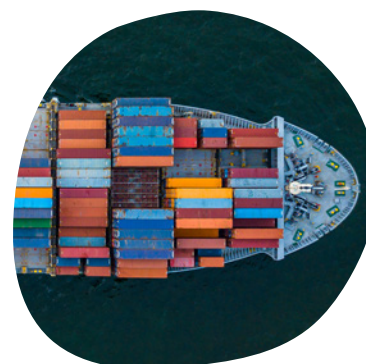
This effectively means that the U.S. is far more efficient at growing apples than these other producers. In terms of yield, the U.S. is producing more than 893 bushels per acre compared to 442 for China or 160 for India, for example. By this measure, the U.S. is also in sixth place. New Zealand tops the list at 1,205 bushels per acre followed by Switzerland, Chile, Belgium and the Netherlands. For reference, the global average is 393 bushels per acre.

The remaining portion of this section provides details on the 2021/22 CY production forecasts for select countries and regions.

## China

Typically, USAApple has access to regional specialists who visit the various growing regions of China to assess how the coming year is shaping up relative to previous years and to make a more nuanced approximation of production volumes. Unfortunately, due to COVID-19-related travel restrictions, no such estimates could be made this year.

Given the importance of this country from a global supply standpoint, USAApple has chosen to estimate China's production with the same model that was used for the U.S. long-range forecast shown in **Figure 5**. Based on that method, USAApple projects that China will produce 2.374 billion bushels in 2021/22 – a 2.6% increase from 2020/21 CY production levels of 2.313 billion bushels.<sup>25</sup>



### CORE INSIGHTS

In June 2021, USDA revised its 2020/21 world apple production estimate downward by 189 million bushels to around 4 billion bushels due primarily to lower production in China. If compared to the UN's final 2019 world apple production figure, this would represent a fairly significant 13% year-over-year decline in global production.

<sup>25</sup>In the case of the China model, 20 years (2001-2020) of historical data were used versus 14 years for the U.S. Given the relatively larger and less volatile production figures, the MAPE for the China estimate was considerably lower than that for the U.S. at 3.4%. The 95% confidence intervals were plus or minus 200 million bushels. *Just as with the U.S. model, this method simply uses historical production as a predictor of future production and cannot, nor is it intended to, account for extraordinary impacts resulting from climate/weather events, pest infestations, etc.*

## Europe

Taken as a group, Europe would be the second largest apple producing region behind China. According to the World Apple and Pear Association (WAPA), the major European apple-growing countries listed in **Table 14** will produce almost 616 million bushels in the 2021/22 CY. This is almost 10% above 2020/21 production levels and more than 5% higher than the five-year average.

Within Europe, Poland is the largest apple-producing country, followed by Italy, France,

Germany and Spain. On a year-over-year basis, Poland gained nearly four percentage points of market share from Italy, France and Germany, among others.

On a varietal basis, Golden Delicious accounts for more than 18% of all European apples. The next largest varieties include Gala, Idared, Red Delicious and Champion. The estimated 2021/22 production by varieties is featured in **Table 15**.

**Table 14: European Apple Production, by Select Countries**

	2021/22 (F)		2020/21		5-YR. AVERAGE	
<b>European Total</b>	<b>615,981,326</b>		<b>561,915,645</b>		<b>586,292,444</b>	
Poland	218,887,271	35.5%	178,994,148	31.9%	189,334,865	32.3%
Italy	107,396,489	17.4%	111,490,783	19.8%	109,811,072	18.7%
France	72,175,060	11.7%	70,180,403	12.5%	77,718,104	13.3%
Germany	56,690,229	9.2%	53,698,244	9.6%	49,729,928	8.5%
Spain	28,502,587	4.6%	22,308,655	4.0%	25,521,101	4.4%
Hungary	27,295,295	4.4%	18,371,833	3.3%	27,421,274	4.7%
Romania	21,521,290	3.5%	20,418,980	3.6%	17,825,927	3.0%
Portugal	16,324,686	2.7%	14,592,485	2.6%	15,495,329	2.6%
Netherlands	13,122,738	2.1%	11,548,010	2.1%	13,689,640	2.3%
Greece	10,603,172	1.7%	14,697,467	2.6%	14,141,063	2.4%
Belgium	10,078,263	1.6%	8,818,480	1.6%	10,109,757	1.7%
United Kingdom	10,025,772	1.6%	10,288,227	1.8%	11,191,071	1.9%
Czech Rep	6,613,860	1.1%	6,193,932	1.1%	6,372,402	1.1%
Austria	6,036,460	1.0%	6,613,860	1.2%	5,910,481	1.0%
Croatia	3,411,912	0.6%	2,887,002	0.5%	3,170,454	0.5%
Lithuania	1,679,710	0.3%	3,149,457	0.6%	2,582,555	0.4%
Slovakia	1,627,220	0.3%	1,574,729	0.3%	1,480,245	0.3%
Sweden	1,417,256	0.2%	1,679,710	0.3%	1,280,779	0.2%
Slovenia	997,328	0.2%	2,414,584	0.4%	1,805,689	0.3%
Denmark	944,837	0.2%	1,259,783	0.2%	1,112,808	0.2%
Latvia	629,891	0.1%	734,873	0.1%	587,899	0.1%

Sources: World Apple and Pear Association; USApple

Notes: Production levels are in 42-pound bushels.

Five-year averages do not include 2021/22 (F) data.

**Table 15: European Apple Production, by Select Varieties**

	2021/22 (F)		2020/21		5-YR. AVERAGE	
<b>European Total</b>	<b>615,981,326</b>		<b>561,915,645</b>		<b>586,292,444</b>	
Golden Delicious	111,280,819	18.1%	103,302,194	18.4%	115,144,153	19.6%
Gala	82,043,359	13.3%	75,796,935	13.5%	71,734,136	12.2%
Idared	35,956,302	5.8%	32,964,318	5.9%	41,898,278	7.1%
Red Delicious	33,594,210	5.5%	34,644,029	6.2%	34,276,592	5.8%
Shampion	24,355,802	4.0%	22,203,673	4.0%	24,880,711	4.2%
Red Jonaprince	22,151,182	3.6%	23,148,510	4.1%	15,631,806	2.7%
Jonagold	21,941,218	3.6%	16,377,177	2.9%	22,518,619	3.8%
Elstar	17,951,906	2.9%	16,377,177	2.9%	17,678,953	3.0%
Granny Smith	15,799,777	2.6%	19,159,198	3.4%	19,705,104	3.4%
Fuji	15,694,795	2.5%	16,429,668	2.9%	16,156,715	2.8%
Ligol	14,697,467	2.4%	11,023,100	2.0%	14,099,070	2.4%
Jonagored	13,070,247	2.1%	13,122,738	2.3%	20,293,002	3.5%
Cripps Pink	12,650,320	2.1%	14,330,030	2.6%	14,256,543	2.4%
Braeburn	12,650,320	2.1%	13,175,229	2.3%	14,560,990	2.5%
Other	182,143,605	29.6%	149,861,669	26.7%	143,457,773	24.5%

Sources: World Apple and Pear Association; USApple  
 Notes: Production levels are in 42-pound bushels.  
 Five-year averages do not include 2021/22 (F) data.

## South America

In 2019, the UN reported that Argentina, Brazil and Chile together made up almost 95% of South American apple production (4% of world production). According to USDA and WAPA<sup>26</sup>, in the 2021/22 CY, Argentina, Brazil and Chile have produced a combined 160.6 million bushels, up 2.2% from last year.<sup>27</sup>

This growth was spurred by Brazil's production which increased by 9% year over year to more than 61 million bushels. Both Chile (68.7 m bu) and Argentina (30.9 m bu) were down 0.8% and 3% respectively, shrinking production by a combined 1.5 million bushels.

## Mexico

While Mexico only produces around 1% of the world's apples, it is an exceedingly important export market for the U.S. (see **Figure 8**). Given that supply is such an important factor in determining price, it is critical that U.S. growers and marketers have some understanding of its domestic production levels that go towards satisfying internal demand.

According to USApple, Mexico's 2021/22 crop will be 9% larger than last year's with production totaling almost 38.8 million bushels.<sup>28</sup> This represents a return to 2019/20 CY levels after a particularly difficult 2020/21 season.

<sup>26</sup> Both USDA and WAPA produce production forecasts for this region. Rather than select one over the other, USApple has averaged the two to arrive at the final estimate.

<sup>27</sup> Given South America's position in the southern hemisphere, the crop year begins approximately six months earlier than in northern hemisphere countries. As such, South America's 2021/22 crop has already been harvested and the remaining apples are in storage. The estimates from USDA and WAPA represent revisions to earlier estimates made in late-2020.

<sup>28</sup> In the absence of other sources of information, Mexico's 2021/22 apple production was modeled in a similar fashion to China's estimate using 20 years (2001-2020) of historical data. The MAPE for the Mexico estimate was 11.6%. The 95% confidence intervals were plus or minus 9.4 million bushels. Just as with the U.S. and China models, this method simply uses historical production as a predictor of future production and cannot, nor is it intended to, account for extraordinary impacts resulting from climate/weather events, pest infestations, etc.

## Canada

Just as was the case for Mexico, U.S. growers and marketers must pay close attention to the Canadian production situation given its importance as an export market. Canada, however, is also an important import market (see **Figure 8**). According to the Canadian Horticultural Council, Canadian production will decrease to 18.9 million bushels – a 9.3% decline from 2020/21 levels (see **Table 16**). This represents a 4.1% increase from the five-year production average.

At the sub-national level, Ontario, the nation's largest apple-growing province is expected to decrease year-over-year production by more than 925,000 bushels or 11.3%. Nova Scotia, on the other hand, is expected to increase production year over year by 4%, or almost 80,000 bushels.

On a varietal basis, Gala is the number one apple grown in Canada with an expected 2021/22 production volume of more than 3.5 million bushels, almost 19% of total production. Rounding out the top five are McIntosh, Ambrosia, Honeycrisp and Cortland (see **Table 17**).

In total, the estimates for the U.S., China, Europe, South America, Mexico and Canada represent approximately 75% of total world apple production. By understanding the outlook for these key nations and regions, U.S. growers and marketers will be well positioned to maximize their current opportunities both at home and abroad.

**Table 16: Canadian Apple Production, by Province**

	2021/22 (F)	2020/21	5-YR. AVERAGE
<b>LEVELS</b>			
<b>Canada</b>	<b>18,886,589</b>	<b>20,825,278</b>	<b>18,143,133</b>
Ontario	7,258,376	8,184,000	7,209,800
Quebec	5,239,000	5,636,000	5,598,200
British Columbia	4,147,620	4,880,952	3,585,510
Nova Scotia	2,054,093	1,974,226	1,740,600
New Brunswick	187,500	150,100	163,372
<b>PERCENT CHANGE (VS. 2021/22)</b>			
<b>Canada</b>		<b>-9.3%</b>	<b>4.1%</b>
Ontario		-11.3%	0.7%
Quebec		-7.0%	-6.4%
British Columbia		-15.0%	15.7%
Nova Scotia		4.0%	18.0%
New Brunswick		24.9%	14.8%
<b>MARKET SHARE</b>			
<b>Canada</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
Ontario	38.4%	39.3%	39.7%
Quebec	27.7%	27.1%	30.9%
British Columbia	22.0%	23.4%	19.8%
Nova Scotia	10.9%	9.5%	9.6%
New Brunswick	1.0%	0.7%	0.9%

Source: Canadian Horticultural Council  
Notes: Production levels are in 42-pound bushels.  
Five-year averages do not include 2021/22 (F) data.

**Table 17: Canadian Apple Production, by Variety, by Province**

2021/22 (F)	CANADA	BRITISH COLUMBIA	NEW BRUNSWICK	NOVA SCOTIA	ONTARIO	QUEBEC
<b>Total Varieties</b>	<b>18,886,589</b>	<b>4,147,620</b>	<b>187,500</b>	<b>2,054,093</b>	<b>7,258,376</b>	<b>5,239,000</b>
Gala	3,507,091	1,766,032	9,000	80,714	1,542,345	109,000
McIntosh	3,140,844	135,042	60,000	208,095	925,707	1,812,000
Ambrosia	2,394,478	1,629,679	5,000	76,798	668,001	15,000
Honeycrisp	1,890,744	168,365	40,000	664,567	920,812	97,000
Cortland	1,494,418	-	41,000	113,763	257,655	1,082,000
Spartan	1,155,393	173,610	3,000	7,652	101,131	870,000
Empire	1,059,871	-	3,000	13,716	715,155	328,000
Spy	896,998	-	-	389,012	507,986	-
Red Delicious	661,583	54,301	-	43,467	563,815	-
Others	2,685,169	220,591	26,500	456,309	1,055,769	926,000

Source: Canadian Horticultural Council  
Note: Production levels are in 42-pound bushels.



# Appendix

## Appendix A: U.S. Apple Juice Concentrate Imports, by Top Countries

2020	LEVELS		VALUES		YR-OVER-YR % CHANGE
<b>APPLE JUICE CONCENTRATE</b>					
<b>World Total</b>	<b>379,797,654</b>		<b>\$362,430,000</b>		<b>-5%</b>
China	199,910,153	53%	\$132,483,000	37%	154%
Turkey	68,590,463	18%	\$92,812,000	26%	-18%
Argentina	30,982,673	8%	\$34,012,000	9%	110%
Chile	24,402,545	6%	\$30,344,000	8%	61%
Poland	19,396,961	5%	\$18,974,000	5%	-79%
<b>APPLE JUICE CONCENTRATE - FROZEN</b>					
<b>World Total</b>	<b>39,994,848</b>		<b>\$30,872,000</b>		<b>-7%</b>
China	24,717,544	62%	\$16,938,000	55%	-2%
Brazil	12,525,081	31%	\$10,823,000	35%	-6%
South Africa	1,731,780	4%	\$1,646,000	5%	N/A
Hungary	825,670	2%	\$1,002,000	3%	N/A
Turkey	113,145	0%	\$220,000	1%	-96%
<b>APPLE JUICE CONCENTRATE - BRIX &lt; 20</b>					
<b>World Total</b>	<b>8,036,350</b>		<b>\$20,625,000</b>		<b>167%</b>
Canada	2,846,955	35%	\$8,309,000	40%	138%
China	2,259,093	28%	\$4,867,000	24%	1865%
Ukraine	1,117,712	14%	\$2,994,000	15%	132%
Turkey	879,138	11%	\$1,926,000	9%	48%
Mexico	362,470	5%	\$1,084,000	5%	-15%
<b>APPLE JUICE CONCENTRATE - FROZEN, ORGANIC</b>					
<b>World Total</b>	<b>1,021,949</b>		<b>\$1,139,000</b>		<b>-8%</b>
Argentina	302,368	30%	\$337,000	30%	N/A
China	272,759	27%	\$304,000	27%	5097%
Turkey	207,261	20%	\$231,000	20%	-74%
New Zealand	138,174	14%	\$154,000	14%	-26%
Austria	82,546	8%	\$92,000	8%	59%

Sources: USDA, Foreign Agricultural Service; USApple

Notes: Trade levels are in gallons.

Year-over-year changes are calculated on levels.

Levels by country for organic frozen apple juice concentrate have been calculated based on the value shares.

**Appendix B: Global Apple Production, by Country: 2019**

World Total		4,579,112,322	
1	China	2,227,011,485	48.6%
2	United States of America	262,332,983	5.7%
3	Turkey	189,951,739	4.1%
4	Poland	161,703,628	3.5%
5	India	121,569,046	2.7%
6	Italy	120,922,882	2.6%
7	Iran	117,638,733	2.6%
8	Russia	102,399,350	2.2%
9	France	92,042,885	2.0%
10	Chile	85,104,683	1.9%
11	Brazil	64,195,332	1.4%
12	Ukraine	60,572,984	1.3%
13	Uzbekistan	59,000,723	1.3%
14	Germany	52,042,155	1.1%
15	South Africa	46,820,827	1.0%
16	Morocco	42,505,179	0.9%
17	Democratic People's Republic of Korea	42,305,870	0.9%
18	Mexico	39,970,968	0.9%
19	Egypt	38,150,109	0.8%
20	Japan	36,827,652	0.8%
21	Spain	33,533,320	0.7%
22	Republic of Moldova	32,067,825	0.7%
23	Algeria	29,333,519	0.6%
24	New Zealand	29,059,306	0.6%
25	Argentina	28,278,031	0.6%
26	Republic of Korea	28,099,667	0.6%
27	Serbia	26,223,325	0.6%
28	Pakistan	26,218,706	0.6%
29	Hungary	26,157,816	0.6%
30	Romania	25,862,292	0.6%
31	United Kingdom and Northern Ireland	23,956,871	0.5%
32	Canada	19,837,853	0.4%
33	Portugal	18,671,032	0.4%
34	Belarus	17,673,546	0.4%
35	Azerbaijan	15,365,991	0.3%
36	Syrian Arab Republic	15,042,017	0.3%
37	Greece	14,545,768	0.3%
38	Netherlands	14,330,030	0.3%
39	Australia	13,917,976	0.3%
40	Belgium	13,639,249	0.3%
41	Afghanistan	13,139,745	0.3%
42	Tajikistan	12,750,997	0.3%
43	Austria	12,556,361	0.3%
44	Lebanon	11,383,240	0.2%
45	Kazakhstan	11,366,391	0.2%
46	Switzerland	9,958,898	0.2%
47	Kyrgyzstan	7,936,999	0.2%

48	Peru	7,468,623	0.2%
49	Tunisia	6,290,778	0.1%
50	Albania	5,560,524	0.1%
51	Israel	5,459,059	0.1%
52	Czechia	5,222,850	0.1%
53	Bosnia and Herzegovina	5,158,023	0.1%
54	North Macedonia	4,656,000	0.1%
55	Armenia	4,287,146	0.1%
56	Iraq	3,980,441	0.1%
57	Croatia	3,587,757	0.1%
58	Turkmenistan	3,491,961	0.1%
59	El Salvador	3,411,754	0.1%
60	Slovenia	2,848,684	0.1%
61	Georgia	2,325,349	0.1%
62	Bulgaria	2,289,655	0.1%
63	Uruguay	2,221,522	0.0%
64	Slovakia	1,847,157	0.0%
65	Lithuania	1,683,385	0.0%
66	Nepal	1,647,481	0.0%
67	Guatemala	1,324,137	0.0%
68	Denmark	1,323,297	0.0%
69	Sweden	1,165,824	0.0%
70	Yemen	1,151,966	0.0%
71	Jordan	1,104,987	0.0%
72	Ireland	1,043,520	0.0%
73	Norway	818,491	0.0%
74	Latvia	545,381	0.0%
75	Libya	442,394	0.0%
76	Finland	424,652	0.0%
77	Madagascar	374,628	0.0%
78	Zimbabwe	338,094	0.0%
79	Colombia	265,237	0.0%
80	Ecuador	244,503	0.0%
81	Bhutan	226,813	0.0%
82	Malawi	156,318	0.0%
83	Bolivia (Plurinational State of)	153,851	0.0%
84	Luxembourg	101,308	0.0%
85	Estonia	97,108	0.0%
86	Cyprus	96,583	0.0%
87	Montenegro	78,212	0.0%
88	Saint Vincent and the Grenadines	77,792	0.0%
89	Palestine	49,184	0.0%
90	Kenya	36,849	0.0%
91	Grenada	24,933	0.0%
92	Paraguay	21,784	0.0%
93	Honduras	9,816	0.0%
94	Malta	525	0.0%

Sources: United Nations, Food and Agriculture Organization; USA Apple  
 Note: Production levels are in 42-pound bushels.

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