USApple

Industry Outlook 2023

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Foreword

To find work that brings purpose to one's life is a privilege, and having built a career in the apple industry, it is an honor to experience that gift season after season.

The passion, tenacity and nimbleness of apple farmers is an inspiration. Nearly 26,000 U.S. apple growers commit their lives, talent and energy to an industry that delights consumers with high quality, safe and delicious apples.

Bringing an apple crop to market and returning a profit to the farmer is no easy feat. In addition to weather impacts, America's apple growers depend upon diverse and complex network of scientists, engineers, nurseries, packaging suppliers, transportation companies, storage and packing operations, processors, marketers, food safety experts, retailers, wholesalers, food service operators, state and federal agencies, and elected officials (to name a few). Smart, collaborative work is critical to ensuring the health of our apple growers for generations to come and safeguarding our national food supply.

Apples are America's favorite fruit with 26 pounds of apples and apple juice consumed per person per year! Apples are enjoyed as snacks, salads, desserts, drinks and as ingredients in a vast array of products. Continual innovation and advancements in specialized rootstocks help to resist damage from pests and disease. High-density cultivation systems have been engineered to increase yield. Dozens of new varieties have been created to surprise and delight an increasingly discerning consumer. Beyond the orchard, innovations in sorting, packing and storage technologies ensure that consistent, high-quality U.S. apples are shipped across the country and around the world year-round. The swift changes in shopping options enable consumers to choose their favorite apples, applesauce, and juice by shopping in grocery stores, ordering online and choosing pick-up or delivery. It's not hard to believe that U.S. apple growers are responsible for creating 150,000 jobs, generating more than $8 billion in total wages and $2 billion in tax revenues. When accounting for the total downstream effects, the industry is responsible for almost $23 billion in economic output!

At its core, farming is not for the faint of heart. A resilient and agile industry, we deliver delicious apples each year while facing a gamut of challenges that threaten a prosperous future. In addition to weather from frost to heat to severe storms, growers' livelihoods are impacted by bureaucratic labor programs, regulations, inflation, and world events that impact trade, and yet, most find a way through. This past year has been much of the same. Holding our breath as the spring temperatures and pollination periods cooperate, weathering the temperatures and air quality, and finding ways to lessen the impact of record inflation on both our growers and customers. These issues will continue to be at the forefront of our business as we look beyond this year's crop.

The following report is a critical resource for U.S. apple farmers 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 this data to make informed decisions and efficiently allocate limited resources to ensure our survival in a dynamic and competitive global marketplace.

At the center of the U.S. apple industry, we have one common goal: to collectively feed people. To feed them something simple, delicious, attainable, and affordable. We are only able to do this with the support of our legislators and regulators. It is my sincere hope that, as a united and transparent U.S. Apple industry, we can continue this humble and noble endeavor for years to come.

Brenda Briggs

BRENDA BRIGGS
Chairwoman, USApple

Core Findings

Based on the most recent estimate from the U.S. Department of Agriculture (USDA), U.S. apple production for the 2023/24 crop year (CY) will be 250 million bushels, a 1.5% increase from last year.[1] These apples will have a farm-gate value of almost $3 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 160 million bushels valued at more than $2 billion. This production level represents a 9% increase from the 2022/23 CY. Following their largest ever recorded crop last year, Michigan is projected to decrease production by more than 15% to 27.4 million bushels. It is expected, however, that they will hold on to the number two spot ahead of New York as that state was hit with a late-season frost causing production to fall by almost 19% to 26.2 million bushels.

[1] 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

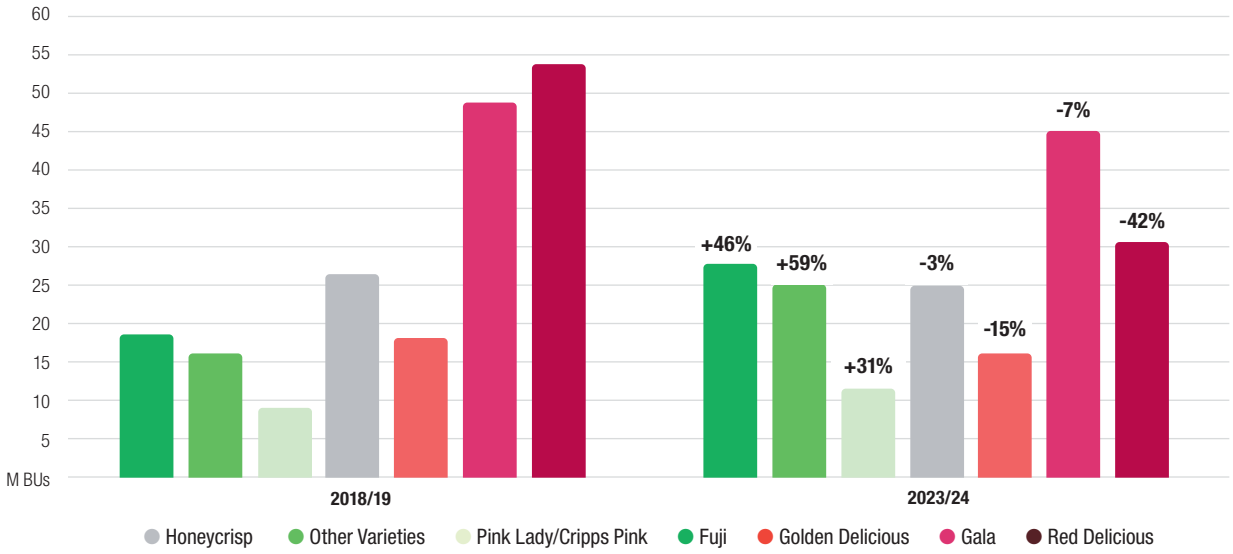
2023/24 (F)	LEVELS	VALUE	YR-OVER-YR % CHANGE
Total Production	**249,915,020**	**$2,992,902,342**	**1.5%**
Fresh	166,423,164	$2,635,644,174	2.9%
Processing	75,315,340	$357,258,167	-2.5%
Not Sold	8,176,517	$ -	13.4%
BY STATE			
Washington	159,523,810	$2,019,706,446	9.1%
Michigan	27,380,952	$343,347,224	-15.4%
New York	26,190,476	$249,450,625	-18.8%
Pennsylvania	10,476,190	$101,073,333	6.5%
California	4,761,905	$57,050,511	13.3%
Virginia	4,642,857	$49,504,642	5.7%
Oregon	2,976,190	$27,849,788	-8.1%
Other	13,962,639	$144,919,772	1.5%

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: 2018-2022.
Year-over-year changes are calculated on levels.

At the varietal level, Gala is expected to retain the top spot with more than 45 million bushels produced, accounting for around 18% of the U.S. apple market. Rounding out the top five are Red Delicious (31 m bu), Honeycrisp (28 m bu), Other Varieties (25 m bu) and Fuji (25 m bu).

Over the last five years, Honeycrisp, Pink Lady/Cripps Pink and Other Varieties have been on the rise largely at the expense of Red Delicious. Varieties on the decline relative to 2018/19 CY production levels include Golden Delicious and Gala. **Figure 1** highlights these top varieties along with current production estimates and 5-year growth rates.

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



Sources: USApple; California Apple Commission; 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 2022/23 CY (July to June), the U.S. exported more than 32 million bushels of fresh apples while only importing around 5 million bushels. These net exports (27 m bu) are valued at more than $613 million (see **Table 2**).

On a year-over-year basis, the balance of trade has declined with respect to both quantity and value. On the quantity side, imports have declined by 19% over 2021/22 CY levels while exports have fallen by around 16%. On the value side, exports are also down around 14% while imports are down by around 8%.

As for global supply, China will continue to dominate the world market, producing and estimated 2 billion bushels in 2023/24. This represents a 3% increase compared to 2022/23 production levels. Europe is expected to decrease production, shrinking by 3.2% year over year to almost 612 million bushels. South America, already well into their season, was expected to grow 2% compared to last year's crop, producing around 151 million bushels. Mexico is predicted to have a slight decrease in the coming crop year, with production falling to 42 million bushels down 1.1% from 2022/23. Finally, Canada is expected to decrease production by 5.2% to fewer than 19 million bushels (see **Table 3**).[2]

Additional data and analyses regarding estimates for 2023/24 U.S. and global apple crop production, utilization and trade are contained in the following report.

Table 2: U.S. Fresh Apple Trade Summary

	2022/23	2021/22	YR-OVER-YR % CHANGE
LEVELS			
U.S. Balance of Trade	**27,049,029**	**32,102,858**	**-15.7%**
Total Exports	32,135,554	38,377,043	-16.3%
Total Imports	5,086,526	6,274,186	-18.9%
VALUE			
U.S. Balance of Trade	**$613,330,000**	**$726,137,000**	**-15.5%**
Total Exports	$791,409,000	$919,424,000	-13.9%
Total Imports	$178,079,000	$193,287,000	-7.9%

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

Table 3: Global Apple Production Summary

	2023/24 (F)	2022/23	YR-OVER-YR % CHANGE
United States	**249,915,020**	**246,258,342**	**1.5%**
China	1,951,193,682	1,894,345,980	3.0%
Europe	611,572,086	631,833,594	-3.2%
South America	151,436,398	148,517,901	2.0%
Mexico	41,992,762	42,465,180	-1.1%
Canada	18,661,891	19,687,324	-5.2%

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

[2]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 countries included, refer to the **Global Apple Production** section in the body of this report.

Introduction

In 2023, the U.S. apple industry continued to perform well despite persistent and significant economic and political headwinds. The lingering effects of the COVID-19 pandemic, recession and recovery are still being felt three and a half years later, mostly in the form of higher interest rates and rapid inflation. Fortunately, the supply chain disruptions that characterized the post-pandemic era have largely abated and the country has, until now, avoided a follow-on recession. While these issues have put pressure on operating margins, the apple industry continues to adjust, learning from challenges and taking advantage of opportunities as they arise. 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

It has been a wild ride since the early days of the COVID-19 pandemic in the beginning of 2020. At the time, in response to widespread job losses and negative economic growth, U.S. officials rolled out a series of fiscal and monetary polices aimed to stimulate growth and encourage investment. On the fiscal side, unprecedented levels of federal stimulus monies were injected into the economy, spurring consumer spending. On the monetary side, the Federal Reserve slashed already-low interest rates to (near) zero and kept them there for two years as a way of incentivizing borrowing/investment.

These policies managed to avert a longer and potentially deeper recession at the time, but they also set the stage for rampant inflation in the years to come. By March 2022, employment was back to pre-pandemic levels and the Federal Reserve began to worry about the widespread rise in prices. To combat this, they began to raise interest rates.[3] As of July 2023, there have been 11 separate increases putting the target rate between 5.25% and 5.5%.

For now, the policies appear to be having their intended effect. Inflation has come down considerably but is still above the 2% target level. In June, the consumer price index (CPI) for "All Items" grew by 3.1% over last June's levels.[4] Given this, it is expected that the Federal Reserve will raise interest rates by another quarter point this year.

At risk, of course, is the possibility of raising rates too high and sending the economy back into another recession. The latest data from the Bureau of Economic Analysis suggest the Federal Reserve is managing to walk that narrow line with four consecutive quarters of positive economic growth.[5]

The labor markets are also sending encouraging signs. A year ago in June, the U.S. had gained back 22 million jobs from April 2020 lows and returned to pre-pandemic levels. Over the last year, nonfarm employment has continued to rise, adding almost 4 million more jobs and lowering the unemployment rate to 3.6%.

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 2017 to 2022, average annual crop production employment fell by 1.4% and, in apple orchards specifically, it declined by 22%.[7]

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, the U.S. is losing domestic workers faster than it 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 2013, there were 116,406 certified H-2A positions. That figure ballooned to almost 372,000 certifications in 2022 – a 219% increase over the decade.[8]

[3] The Federal Reserve's maximum targeted Effective Federal Funds Rate.
[4] U.S. Department of Labor, Bureau of Labor Statistics. Consumer Price Index: January 2020-June 2023.
[5] U.S. Department of Commerce, Bureau of Economic Analysis. Gross Domestic Product, Second Quarter 2023 (Advance Estimate) and Annual Update.
[6] U.S. Department of Labor, Bureau of Labor Statistics. Current Employment Statistics and Current Population Survey: January 2020-June 2023.
[7] U.S. Department of Labor, Bureau of Labor Statistics. Quarterly Census of Employment and Wages: 2017-2022.
[8] U.S. Department of Labor, Employment and Training Administration. Office of Foreign Labor Certification: 2013-2022.

This is a critical issue for the U.S. apple industry because this source of labor is expensive and getting more so. Over the last five years, the U.S. average Adverse Effect Wage Rate (AEWR) – the minimum compensation rate for H-2A labor – has increased by 33% to $16.17 per hour. For the top-seven apple-producing states, that average is $17.19 per hour. In 2023, the top three AEWRs in the U.S. were in apple producing states: Oregon and Washington at $17.97 per hour and California at $18.65 per hour. This year, another apple-producing state, Michigan, was tied for the largest year-over-year increase at $1.97 – a nearly 13% increase over last year's mandated minimum labor rates.[9]

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.[10]

Beyond labor, U.S. apple producers have been facing mounting inflationary pressures in other areas as well. Due in large part to Russia's invasion of Ukraine, the prices for fertilizers and chemicals, the second largest category of variable costs for U.S. apple growers, have also been growing.

Add to this the rising costs for fuel, vehicles, and other inputs to production, it's easy to see why the producer price index for apples – the cost to grow apples – has risen by almost 31% over the last year. Fortunately, those pressures have been easing somewhat since February 2023, but the fact remains that the cost of growing apples is significantly more now that it was just a year or two ago.[11]

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

	2023/24 (F)	2022/23	5-YR. AVERAGE
PRICE PER POUND			
Total	**$0.30**	**$0.32**	**$0.29**
Fresh	$0.39	$0.42	$0.38
Processing	$0.12	$0.13	$0.11
VALUE OF PRODUCTION			
Total	**$2,992,902,342**	**$3,054,412,000**	**$2,913,355,400**
Fresh	$2,635,644,174	$2,669,883,000	$2,565,207,400
Processing	$357,258,167	$384,529,000	$348,148,000
Juice & Cider	$116,487,588	$125,379,515	$113,517,127
Canned	$149,072,959	$160,452,247	$145,271,563
Dried	$24,908,552	$26,809,914	$24,273,378
Frozen	$26,100,254	$28,092,583	$25,434,691
Fresh Slices	$32,305,553	$34,771,555	$31,481,754
Other	$8,383,262	$9,023,187	$8,169,487

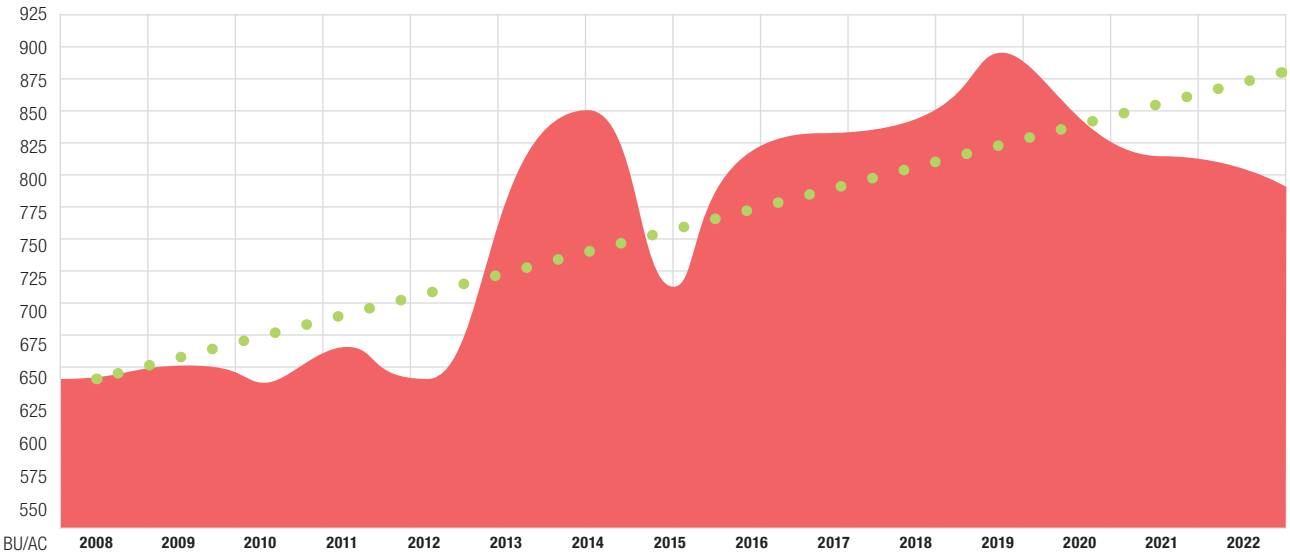
Sources: USDA, National Agricultural Statistics Service; USApple
Notes: Five-year averages do not include 2023/24 (F) data.
2023/24 (F) data are based on three-year-average prices: 2020-2022.
Sub-processing value data are based on 2017 price ratios and five-year average shares: 2013-2017.

Unfortunately, while the prices of labor, fertilizer and fuel have been increasing, the price that growers are receiving for apples has not. From 2013-2017, the five-year average farm-gate price for all apples was $0.31 per pound. From 2018-2022, that price had dropped two cents to $0.29 per pound – not accounting for inflation.[12] **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 2022 to June 2023, the average price that urban consumers paid for fresh apples in the U.S. increased by 4.5%. Over the same period, food in general increased by 5.7% and fresh fruit increased by 0.3% – making apples seem either more or less affordable relative to substitute goods.[13]

[9] U.S. Department of Labor, Employment and Training Administration. Adverse Effect Wage Rates: 2018-2023.
[10] 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 44% of all variable expenses for specialty crops (fruits, vegetables and nuts) in 2021.
[11] Federal Reserve Bank of St. Louis. FRED Economic Data: January 2020-June 2023.
[12] USDA, National Agricultural Statistics Service. Price Received, All Apples: 2013-2022.
[13] U.S. Department of Labor, Bureau of Labor Statistics. Consumer Price Index: January 2020-June 2023.

Figure 2: U.S. Apple Yield



Sources: USDA, National Agricultural Statistics Service; USApple

It should be noted, however, that 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 2008 to 2022, the number of apple-bearing acres in the U.S. fell by around 17%. At the same time, production increased by roughly 2%. **Figure 2** charts the rise in U.S. apple yield as a calculation of bushels produced per acre.

While there may be some relatively low-cost technologies and techniques to modestly increase yield, it is likely that most 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 91% over the last 30 years. Of course, during that time, the program has expanded dramatically, improving access and adding entirely new products. Given that the number of policies sold also grew significantly over the period (+117% from 1992), the frequency of adverse events does not appear to be the primary concern.

However, from a magnitude perspective, when adjusted for inflation, the average claim amount rose from around $34,300 in 1993 to around $179,500 in 2022 – a 423% increase.[14] While this does appear to be significant, additional analysis is required to disaggregate the data according to cause of loss.

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 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 2022, they had fallen out of the top 15 trading partners with fresh apple exports valued at less than $5 million – an annual loss of $152 million. From January 2019 through June 2023, it is estimated that the loss of the Indian market has cost U.S. apple growers around $658 million.[15]

In June 2023, India announced that they would be removing the retaliatory tariffs on U.S. apples within 90 days – just in time for the 2023/24 apple crop. While this is certainly welcome news, it remains to be seen if U.S. growers can recapture that market that has since been claimed by low-cost providers like Iran and Turkey.

Fortunately, despite inflationary pressures and the disruptions brought on by COVID-19, the U.S. apple industry has not seen any considerable decrease in domestic demand. In fact, the pandemic supercharged a trend that may have taken years to evolve – online grocery shopping.

[14] USDA, Risk Management Agency. Summary of Business: National Summary by Crop: 1989-2022.
[15] USDA, Foreign Agricultural Service. Global Agricultural Trade System: Apple Exports: January 2018-June 2023.

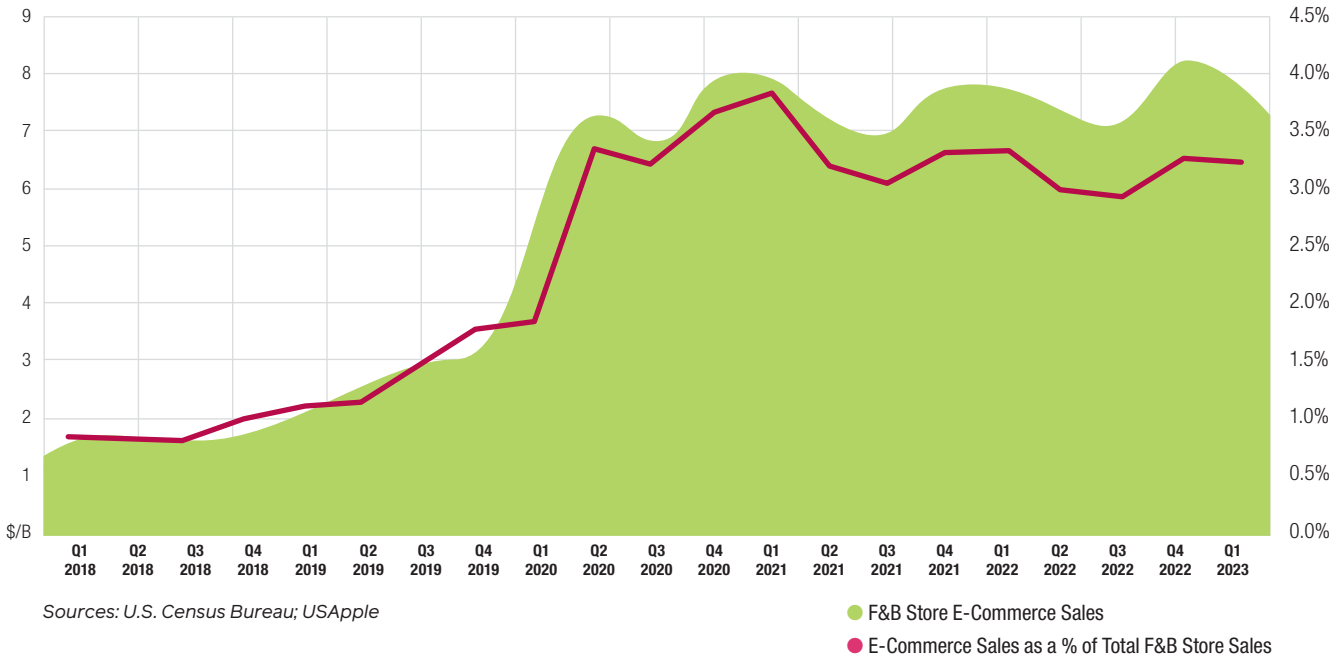
In the first quarter of 2018, e-commerce accounted for only 0.8% of food and beverage store sales ($1.4 billion). By the first quarter of 2021, e-commerce had grown to account for 3.8% of food and beverage store sales ($7.9 billion) – an increase of 447% (see **Figure 3**).

To put that in context, from Q1 2018 to Q1 2021, total e-commerce sales grew from $112 billion to $215 billion – an impressive, but significantly lower growth rate of 92%.

While e-commerce sales have come down somewhat from those highs, the share of total food and beverage sales has leveled off to around 3% through Q1 2023. With this, it seems clear that online grocery shopping is here to stay. What is less clear are the implications 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.

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



Sources: U.S. Census Bureau; USApple

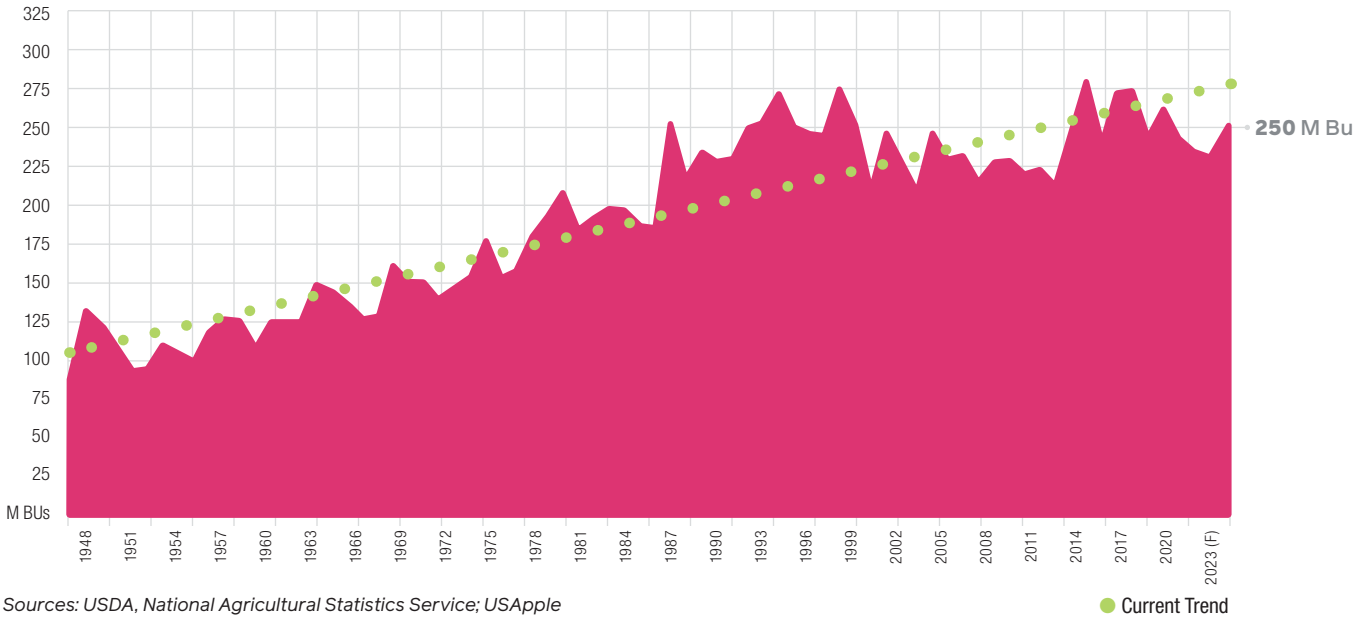
U.S. Apple Production

According to a USApple analysis of USDA data, total U.S. apple production for the 2023/24 CY will be around 10.5 billion pounds or 250 million bushels.[16] This represents a 1.5% increase compared to last year's production figure and is 3.4% less than the five-year production average.

250
MILLION BUSHELS PRODUCED

[16] 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 2018-2023 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: 1948-2023(F)



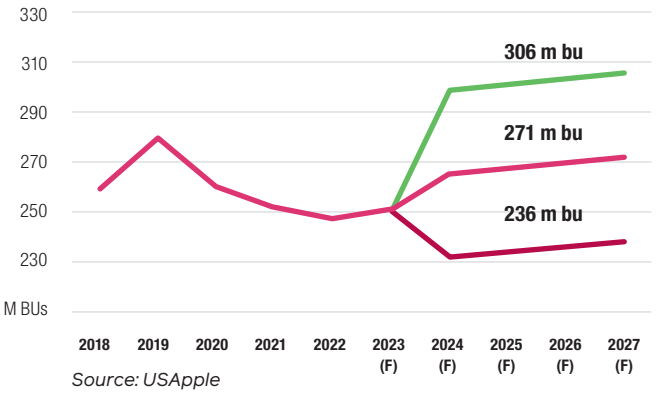
Sources: USDA, National Agricultural Statistics Service; USApple

As shown in **Figure 4**, 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 returning to the long-term trendline.

Going one step further, USApple has utilized this latest data point to develop an apple production forecast through 2027.[17] That outlook, as well as upper and lower "95% confidence intervals[18]", 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 8.6% by 2027. In terms of the confidence intervals: on the low end, 2027 production could decrease by as much as 5%; on the high end, by 2027 it could increase by around 23%.

Figure 5 U.S. Apple Production Extended Forecast



Source: USApple

[17] 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 5.1%. *Please note, this model cannot, and is not intended to, account for extraordinary impacts resulting from climate/weather events, pest infestations, etc.*

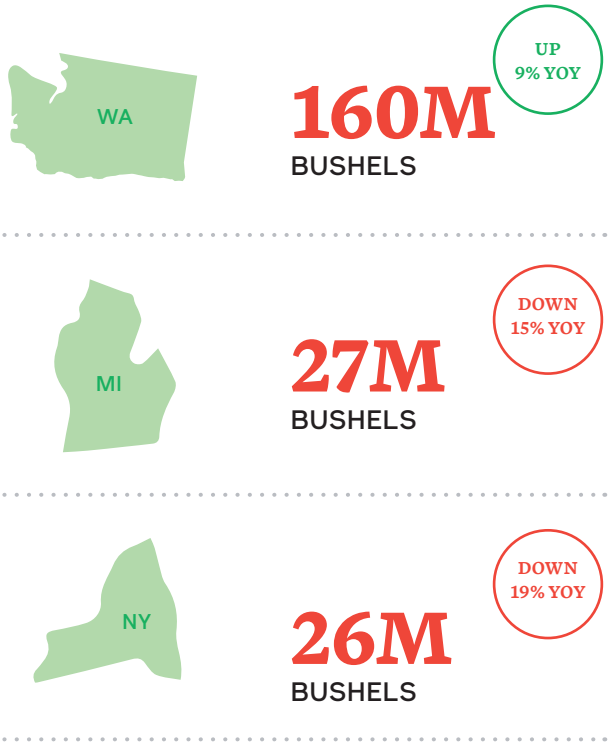
[18] Confidence intervals provide users with a range of values that are more likely than not to contain the true mean. In this case, the model is 95% confident that the true mean will fall within these bounds of plus or minus 35 million bushels. *Once again, extraordinary events may result in production 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 2023/24 CY, Washington is expected to produce 159.5 million bushels[19], followed by Michigan (27.4 m bu) and New York (26.2 m bu). As noted above, USDA discontinued reporting "Other" state data in 2018 and so USApple has estimated those missing production data. Perhaps surprisingly, when taken as a group, the "Other" states are the fourth largest producer at 14 million bushels – ahead of Pennsylvania's 10.5 million bushels. Rounding out the top eight states (including "Other") are California (4.8 m bu), Virginia (4.6 m bu) and Oregon (3 m bu) (see **Table 5**).

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

	2023/24 (F)	2022/23	5-YR. AVERAGE
LEVELS			
United States	**249,915,020**	**246,258,342**	**258,784,356**
Washington	159,523,810	146,190,476	162,857,143
Michigan	27,380,952	32,380,952	24,680,952
New York	26,190,476	32,261,905	32,119,048
Pennsylvania	10,476,190	9,833,333	11,342,857
California	4,761,905	4,202,381	5,300,000
Virginia	4,642,857	4,392,857	4,292,857
Oregon	2,976,190	3,238,095	3,733,333
Other	13,962,639	13,758,342	14,458,165
PERCENT CHANGE (VS. 2022/23)			
UNITED STATES		**1.5%**	**-3.4%**
Washington		9.1%	-2.0%
Michigan		-15.4%	10.9%
New York		-18.8%	-18.5%
Pennsylvania		6.5%	-7.6%
California		13.3%	-10.2%
Virginia		5.7%	8.2%
Oregon		-8.1%	-20.3%
Other		1.5%	-3.4%
MARKET SHARE			
UNITED STATES	**100.0%**	**100.0%**	**100.0%**
Washington	63.8%	59.4%	62.9%
Michigan	11.0%	13.1%	9.5%
New York	10.5%	13.1%	12.4%
Pennsylvania	4.2%	4.0%	4.4%
California	1.9%	1.7%	2.0%
Virginia	1.9%	1.8%	1.7%
Oregon	1.2%	1.3%	1.4%
Other	5.6%	5.6%	5.6%

With respect to year-over-year changes, Washington's production is expected to grow by more than 9% – an increase of around 13 million bushels. USDA attributed this gain to significantly improved weather conditions compared to last year. In New York, USDA notes "a mild winter that weakened the cold hardiness of the apple crop followed by a very warm spring has caused the expected production to be the lowest since 2012."[20] That state's crop is projected to be down almost 19% compared to last year, falling to 26.2 million bushels. In Michigan, USDA commented that "there were no widespread spring frost damage events, and July precipitation enhanced fruit sizing." Despite these favorable conditions, it is estimated that Michigan's production will fall by more than 15% to 27.4 million bushels coming off last year's record production levels.



Sources: USDA, National Agricultural Statistics Service; USApple
Notes: Production levels are in 42-pound bushels.
Five-year averages do not include 2023/24 (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.

[19] 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 75.2%, the USDA's figure can be revised down to 120 million bushels. The 2023/24 WSTFA fresh apple forecast is 128 million bushels – a difference of more than 8 million bushels or 7%.

[20] USDA, National Agricultural Statistics Service. Crop Production. Released August 11, 2023. www.nass.usda.gov/Publications.

In terms of varietal mix, in 2023/24, Galas are expected to hold on to the top spot at around 18% of total U.S. apple production followed by Red Delicious (13%) and Honeycrisp (11%). **Table 6** details the expected 2023/24 production by variety and highlights the shifts in composition as compared to the 2022/23 CY and the five-year average.[21]

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

	2023/24 (F)		2022/23		5-YR. AVERAGE	
Total Varieties	**249,915,020**		**246,258,342**		**258,784,356**	
Gala	45,115,169	18.1%	46,631,802	18.9%	49,401,079	19.1%
Red Delicious	31,114,490	12.5%	32,177,553	13.1%	41,981,742	16.2%
Honeycrisp	27,704,032	11.1%	22,041,926	9.0%	22,929,532	8.9%
Others	25,325,855	10.1%	27,250,641	11.1%	22,823,887	8.8%
Fuji	25,162,023	10.1%	24,321,992	9.9%	26,735,386	10.3%
Granny Smith	24,692,055	9.9%	22,088,733	9.0%	24,062,425	9.3%
Golden Delicious	15,711,298	6.3%	15,397,947	6.3%	16,953,024	6.6%
Pink Lady/Cripps Pink	12,300,161	4.9%	11,845,811	4.8%	10,480,764	4.0%
Cosmic Crisp	9,378,167	3.8%	7,761,073	3.2%	3,090,460	1.2%
Rome	7,032,993	2.8%	7,638,063	3.1%	8,981,686	3.5%
McIntosh	5,215,475	2.1%	6,180,045	2.5%	6,585,914	2.5%
Idared	4,716,310	1.9%	5,552,954	2.3%	6,488,084	2.5%
Empire	4,498,325	1.8%	5,423,368	2.2%	4,660,474	1.8%
York	4,074,668	1.6%	3,920,851	1.6%	4,575,135	1.8%
Ambrosia	3,353,785	1.3%	2,900,517	1.2%	2,824,084	1.1%
Cortland	1,506,503	0.6%	1,744,153	0.7%	1,758,349	0.7%
Mutsu/Crispin	886,265	0.4%	1,071,900	0.4%	1,160,569	0.4%
Jonathan	632,141	0.3%	740,294	0.3%	853,098	0.3%
Spartan	449,195	0.2%	524,114	0.2%	495,226	0.2%
Newtown Pippin	423,226	0.2%	390,484	0.2%	524,833	0.2%
Rome Sport	276,552	0.1%	297,156	0.1%	286,241	0.1%
Stayman	245,995	0.1%	242,033	0.1%	414,346	0.2%
Braeburn	100,338	0.0%	114,931	0.0%	718,021	0.3%

Sources: USApple; California Apple Commission; Washington State Tree Fruit Association
Notes: Production levels are in 42-pound bushels.
Five-year averages do not include 2023/24 (F) data.

[21] The U.S. totals were derived as the sum of the state-level data shown in **Table 7.**

Table 7 details 2023/24 estimated production by variety, by state.[22]

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

2023/24 (F)	U.S.	CA	MI	NY	OR	PA	VA	WA	OTHER
Total Varieties	**249,915,020**	**4,761,905**	**27,380,952**	**26,190,476**	**2,976,190**	**10,476,190**	**4,642,857**	**159,523,810**	**13,962,639**
Gala	45,115,169	2,346,806	5,773,970	2,386,861	672,613	752,810	57,858	31,577,120	1,547,132
Red Delicious	31,114,490	-	3,762,611	2,042,319	564,756	1,032,898	675,501	20,845,647	2,190,758
Honeycrisp	27,704,032	-	2,246,803	1,239,634	372,832	132,432	3,269	23,386,062	322,999
Others	25,325,855	-	4,206,590	3,428,537	36,616	684,970	948,418	15,040,681	980,043
Fuji	25,162,023	580,427	2,134,687	1,301,921	545,702	1,077,485	80,506	18,637,623	803,672
Granny Smith	24,692,055	1,025,507	-	566,818	482,183	247,476	42,203	21,961,531	366,338
Golden Delicious	15,711,298	164,673	3,107,854	1,473,032	7,659	2,313,220	1,116,784	5,603,158	1,924,919
Pink Lady/Cripps Pink	12,300,161	331,951	98,662	239,590	242,528	204,923	224,019	9,971,722	986,766
Cosmic Crisp	9,378,167	-	-	-	-	-	-	9,378,167	-
Rome	7,032,993	-	1,334,180	2,123,297	-	1,202,141	568,368	-	1,805,009
McIntosh	5,215,475	-	1,208,610	3,260,884	-	19,627	5,930	-	720,425
Idared	4,716,310	-	1,921,667	2,194,121	-	160,297	169,030	-	271,195
Empire	4,498,325	36,968	939,531	3,291,352	-	30,932	9,106	-	190,436
York	4,074,668	-	-	153,189	-	2,293,938	631,174	-	996,367
Ambrosia	3,353,785	-	-	113,192	27,862	74,799	-	3,122,099	15,833
Cortland	1,506,503	-	-	1,061,685	-	15,597	31,361	-	397,859
Mutsu/Crispin	886,265	-	-	814,829	-	39,594	9,235	-	22,607
Jonathan	632,141	-	515,733	67,416	232	20,334	226	-	28,199
Spartan	449,195	-	-	336,142	-	24,997	4,648	-	83,408
Newtown Pippin	423,226	275,573	-	-	23,208	2,191	12,262	-	109,991
Rome Sport	276,552	-	96,420	27,082	-	22,284	-	-	130,766
Stayman	245,995	-	-	29,653	-	120,369	52,150	-	43,823
Braeburn	100,338	-	33,635	38,924	-	2,876	806	-	24,096

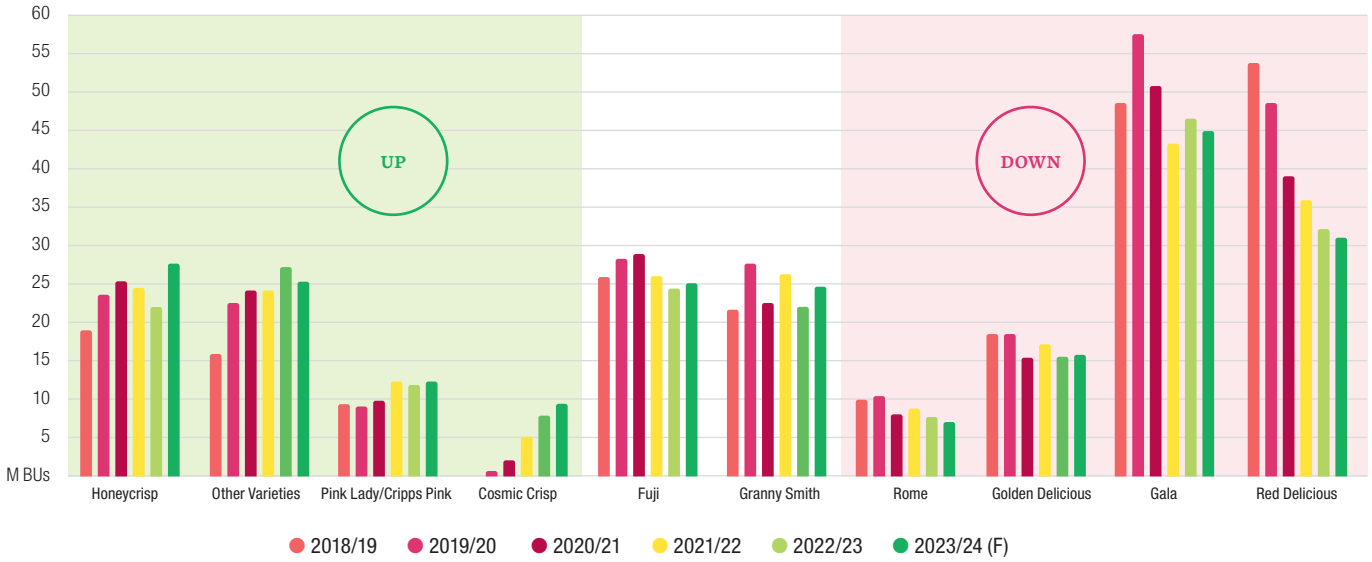
Sources: USApple; California Apple Commission; Washington State Tree Fruit Association
Note: Production levels are in 42-pound bushels.

In general, the varieties on the rise include Honeycrisp, Pink Lady/Cripps Pink and Cosmic Crisp and Other Varieties. Fuji and Granny Smith varieties have remained relatively consistent compared to 2018/19 production volumes. Varieties on the decline include Rome, Golden Delicious, Gala and Red Delicious.

On the positive side, Honeycrisp production has increased by 46% or almost 9 million bushels in the past five years. Conversely, Red Delicious decreased by 42% or 23 million bushels during the same period. **Figure 6** charts the yearly production growth or decline for select top varieties.

[22] For Michigan, New York, Oregon, Pennsylvania and Virginia, the 2023/24 production values by variety were derived using USApple's state-specific December 1, 2022 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, 2022 storage ratios by variety (excluding Cosmic Crisp). CAC provided estimates for the fresh varieties in California, while December 1, 2022 storage ratios in the state were used to estimate processing varieties. 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; California Apple Commission; Washington State Tree Fruit Association

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

In the case of Honeycrisp, the 46% rise in production from 2018-2023 is undoubtedly related to its relative price premium – $2.24 per pound versus the median for the varieties shown at $1.49 per pound. That $0.75 per pound differential is even widened slightly to $0.97 per pound when considering organics.

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

2022/23	REGULAR	ORGANIC	DIFFERENCE
Median	**$1.49**	**$2.39**	**$0.72**
Honeycrisp	$2.24	$3.36	$1.12
Granny Smith	$1.71	$2.41	$0.70
Fuji	$1.65	$2.37	$0.72
Gala	$1.63	$2.39	$0.76
Pink Lady/Cripps Pink	$1.60	$2.46	$0.86
Red Delicious	$1.49	$2.04	$0.55
Braeburn	$1.39	$1.94	$0.55
Rome	$1.39	N/A	N/A
Golden Delicious	$1.38	$2.79	$1.41
McIntosh	$1.36	N/A	N/A
Jonagold	$1.27	$1.99	$0.72

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

CORE INSIGHTS

The price premium shown in **Table 8** has incentivized hundreds of operators to move into organic production over the last decade. From 2011 to 2021, organic acreage increased from 13,000 to 31,000 acres (+132%); organic production increased from 7.1 million bushels to 23.4 million bushels (+230%); and inflation-adjusted organic sales increased from $166 million to $709 million (+327%). Washington enjoys the lion's share of this valuable production. Despite only having 35% of the companies selling organic apples, Washington's growers account for 88% of the acreage and 95% of production (by weight). By variety, Galas make up around 29% of organic production (6.7 m bu), followed by Honeycrisp with 17% (4 m bu), and Fuji with 16% (3.8 m bu). Unsurprisingly, the fastest growing varieties are among those with the highest price differential between conventional and organic. Over the decade, organic Honeycrisp production was up 887% with organic Pink Lady/Cripps Pink up 425%.

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, for example. 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 64% market share. By value, that share increases to 68% – a 4 percentage point gain. That gain is realized by drawing market share from almost every other state except Michigan and Oregon.

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

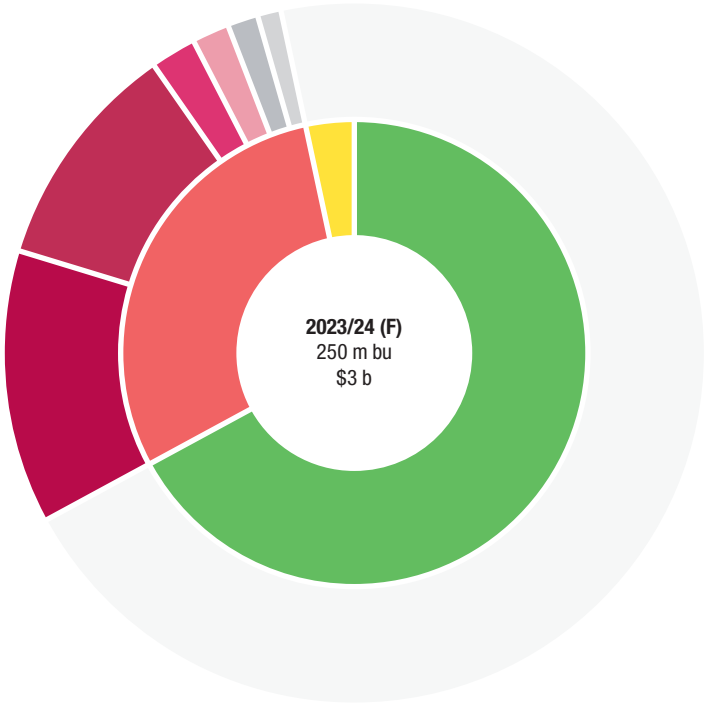
2023/24 (F)	PRODUCTION		VALUE	
United States	**249,915,020**		**$2,992,902,342**	
Washington	159,523,810	63.8%	$2,019,706,446	67.5%
New York	26,190,476	10.5%	$249,450,625	8.3%
Michigan	27,380,952	11.0%	$343,347,224	11.5%
Pennsylvania	10,476,190	4.2%	$101,073,333	3.4%
Oregon	2,976,190	1.2%	$57,050,511	1.9%
California	4,761,905	1.9%	$49,504,642	1.7%
Virginia	4,642,857	1.9%	$27,849,788	0.9%
Other	13,962,639	5.6%	$144,919,772	4.8%

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: 2018-2022.

U.S. Apple Utilization

The ratio of fresh to processing apples has remained remarkably consistent over the last decade (or more). In 2022, fresh apples made up around 66% of total apples produced while processing apples accounted for around 31%. The remaining 3% of apples produced went unsold.

Figure 7: U.S. Apple Utilization



- **Fresh 67%** | 166.4 m bu | $2.6 b
- **Not Sold 3%** | 8.2 m bu | $0
- **Processing 30%** | 75.3 m bu | $357.3 m
  - **Juice & Cider 13%** | 32.2 m bu | $116.5 m
  - **Canned 11%** | 27 m bu | $149.1 m
  - **Dried 2%** | 5.5 m bu | $24.9 m
  - **Frozen 2%** | 4.3 m bu | $26.1 m
  - **Fresh Slices 2%** | 4 m bu | $32.3 m
  - **Other 1%** | 2.4 m bu | $8.4 m

Sources: USDA, National Agricultural Statistics Service; USApple

Notes: Fresh, processing and not sold utilization shares are based on five-year averages: 2018-2022.

Sub-processing utilization shares are based on five-year averages: 2013-2017.

Fresh, processing and not sold value data are based on five-year averages: 2018-2022.

Sub-processing value data are based on 2017 price ratios to all processing apples.

Numbers may not sum to total due to rounding.

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 2023/24 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.[23]

At the state level, the ratios of fresh to processing apples can vary dramatically. In Oregon, for example, fresh apples make up almost 84% of total estimated production for the 2023/24 CY. California, on the other hand, has a fresh utilization ratio of only 22%. The majority of the balance of production goes towards processing apples, but there are some apples that remain unsold.

CORE INSIGHTS

As noted previously, the ratio of fresh to processing apples has remained consistent over the decade with around two-thirds going towards fresh and the remainder going to processing. This is not the case with organic apples. Because they are more difficult to cultivate and store, fresh apples make up 91% of organic production with only 9% going towards processing. This should not be surprising as Washington is responsible for the majority of U.S. organic production and the only apples they send to processing are those that don't make the grade for fresh markets. In 2021, Washington captured 97% of fresh, organic sales, but only 55% of processed, organic sales. On the processing side, California accounted for 27% of the organic sales with Michigan, Colorado and Oregon combining for another 10%.

[23] 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 2023/24 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 2023/24 CY, more than 72% of fresh apples and almost 43% 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, Fuji and Gala, for example, are primarily utilized as fresh while other varieties like Idared, Rome and York are primarily utilized for processing.[24]

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

2023/24 (F)	UTILIZATION	% OF STATE PRODUCTION	% OF NATIONAL USE TYPE
FRESH			
United States	**166,423,164**	**66.6%**	
Washington	119,962,135	75.2%	72.1%
New York	13,692,289	52.3%	8.2%
Michigan	13,405,365	49.0%	8.1%
Pennsylvania	4,706,227	44.9%	2.8%
Oregon	2,486,156	83.5%	1.5%
Virginia	1,977,372	42.6%	1.2%
California	1,037,739	21.8%	0.6%
Other	9,155,879	65.6%	5.5%
PROCESSING			
United States	**75,315,340**	**30.1%**	
Washington	32,223,810	20.2%	42.8%
New York	12,356,285	47.2%	16.4%
Michigan	13,843,595	50.6%	18.4%
Pennsylvania	5,738,229	54.8%	7.6%
California	3,671,101	77.1%	4.9%
Virginia	2,618,108	56.4%	3.5%
Oregon	470,799	15.8%	0.6%
Other	4,393,414	31.5%	5.8%

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: 2018-2022.
The sum of fresh, processing and not sold apples equals total production.

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

2018-2022 AVERAGE	FRESH	PROCESSING
Total Varieties	**71.3%**	**28.7%**
Ambrosia	80.6%	19.4%
Braeburn	79.0%	21.0%
Cortland	43.0%	57.0%
Cosmic Crisp	77.4%	22.6%
Empire	72.6%	27.4%
Fuji	80.0%	20.0%
Gala	82.4%	17.6%
Golden Delicious	52.7%	47.3%
Granny Smith	76.4%	23.6%
Honeycrisp	61.5%	38.5%
Idared	6.5%	93.5%
Jonathan	36.8%	63.2%
McIntosh	67.1%	32.9%
Mutsu/Crispin	16.1%	83.9%
Newtown Pippin	40.0%	60.0%
Pink Lady/Cripps Pink	81.4%	18.6%
Red Delicious	82.8%	17.2%
Rome	8.2%	91.8%
Rome Sport	40.8%	59.2%
Spartan	94.1%	5.9%
Stayman	15.9%	84.1%
York	2.5%	97.5%
Others	68.6%	31.4%

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

[24] The data in **Table 11** were derived using USApple's December 1, 2018-2022 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 36.2 million bushels in 2022 – a 7% decline over 2021 levels. At the same time, fresh apple imports also decreased by nearly 13% to 5.3 million bushels. This resulted in a 2.1-million-bushel decrease in the year-over-year balance of trade.

While the U.S. still maintains a healthy net positive balance of trade, there is still much work needed to get back to the high-water mark set in 2018. In that year, total exports were 48.5 million bushels and the trade balance was 41.6 million bushels. That represents a decline in net exports of more than 10.6 million bushels in just four years with an estimated value of almost $110 million.

36.2
MILLION BUSHELS EXPORTED

The majority of this impact was due to the reduction in fresh apple exports to India. From 2018 to 2022, U.S. exports to India declined by 7.7 million bushels – 63% of the total 12.2-million-bushel decline over the period. In 2018, the value of these exports was more than $157 million. In 2022, the value was less than $4.8 million – a nearly $153 million loss to U.S. apple farmers. From January 2019 through June 2023, it is estimated that the loss of the Indian market has cost U.S. apple growers more than $658 million. **Table 12** provides five years of fresh apple trade levels for select export/import partners as well as the value of those exchanges in 2022.

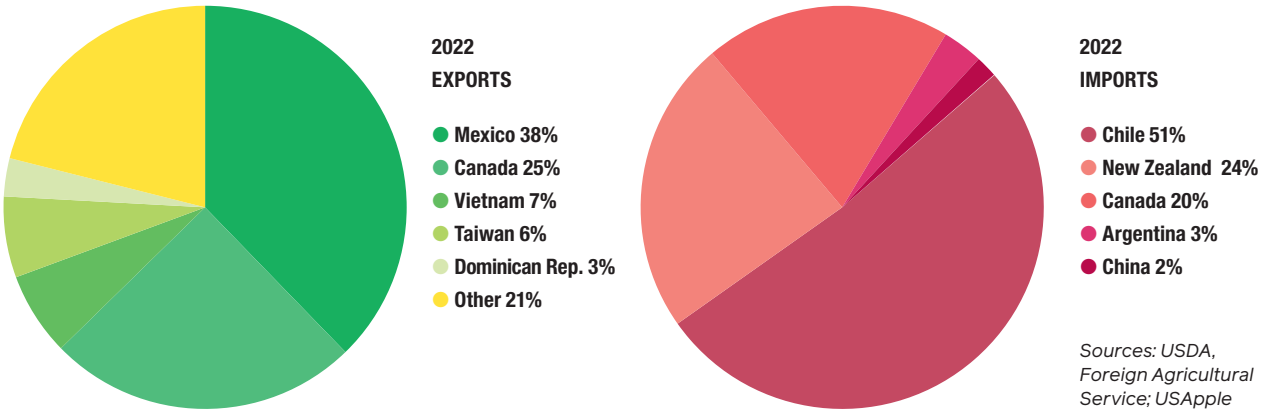
Figure 8 highlights the primary export and import markets for U.S. apples in 2022.

Table 12: U.S. Fresh Apple Trade

	2022	2021	2020	2019	2018	2022 $
Total U.S. Exports	**36.2**	**39.1**	**42.1**	**43.5**	**48.5**	**$876.0**
Mexico	13.7	15.8	13.2	12.9	14.8	$314.6
Canada	9.0	7.5	7.9	7.3	7.8	$203.0
Vietnam	2.4	1.7	2.5	2.8	2.0	$68.4
Taiwan	2.4	2.9	2.2	4.0	2.3	$65.7
Dominican Republic	1.1	1.1	1.1	1.1	1.1	$30.4
Indonesia	1.0	1.2	1.5	1.7	1.3	$24.2
Hong Kong	0.9	1.0	1.1	1.4	1.3	$22.1
Israel	0.8	0.5	0.7	0.4	0.6	$20.1
Thailand	0.5	0.5	0.8	1.1	0.8	$13.5
China	0.4	0.5	0.5	0.6	0.6	$10.6
Other	4.0	6.6	10.7	10.2	15.8	$103.5
Total U.S. Imports	**5.3**	**6.1**	**5.7**	**7.5**	**6.9**	**$175.6**
Chile	2.7	3.1	2.8	4.1	3.3	$85.2
New Zealand	1.3	1.3	1.5	1.7	2.1	$60.5
Canada	1.0	1.2	1.0	1.1	1.0	$25.0
Argentina	0.2	0.3	0.3	0.6	0.3	$3.0
China	0.1	0.2	0.1	0.1	0.2	$1.7
Other	0.0	0.0	0.0	0.0	0.0	$0.2
U.S. Balance of Trade	**30.9**	**33.1**	**36.4**	**36.0**	**41.6**	**$700.4**

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

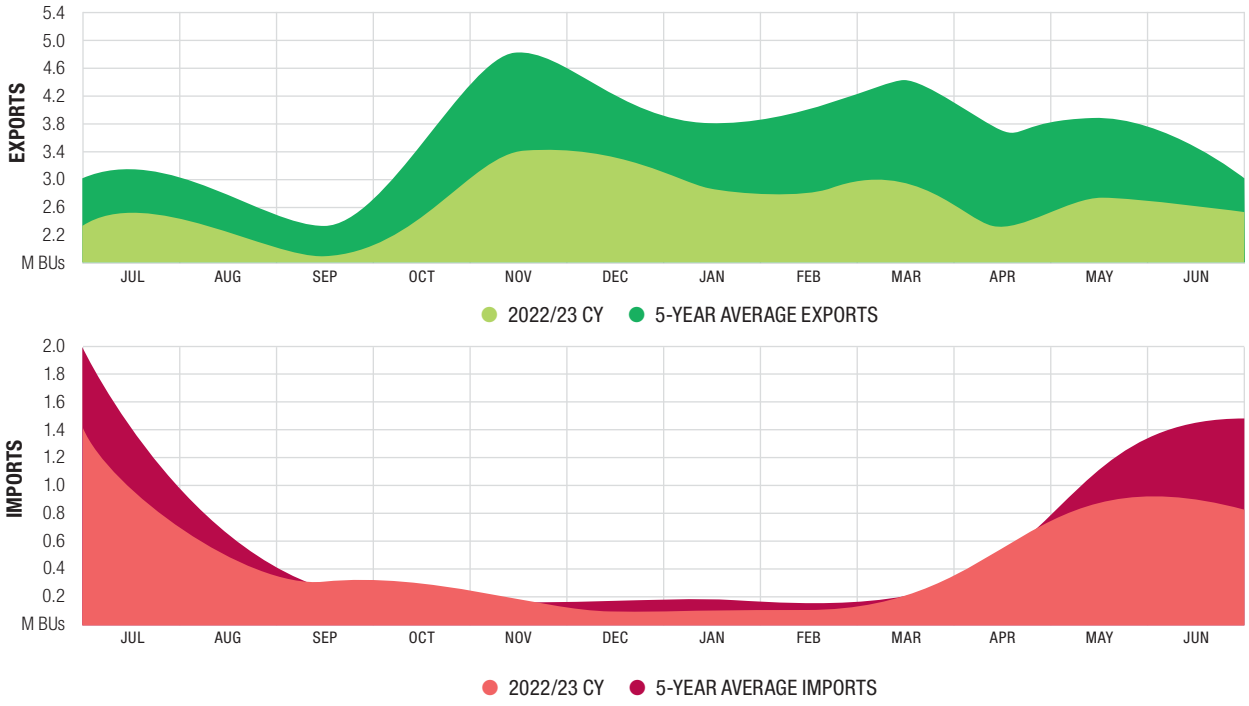
Figure 8: U.S. Fresh Apple Trading Partners



Sources: USDA, Foreign Agricultural Service; USApple

On a monthly basis for the 2022/23 CY (July to June), both exports and imports are down compared to their five-year averages (see **Figure 9**). Lower exports can be explained by, among other factors, reduced domestic production, a strong dollar and lost markets. Lower imports may be due to several factors as well including inflation, supply chain constraints and catastrophic weather events. In February 2023, for example, Cyclone Gabrielle hit New Zealand's North Island at the beginning of harvest causing widespread destruction. The areas hardest hit were responsible for two-thirds of that country's apple production and its estimated that a quarter of the apple trees in the region have been destroyed.

Figure 9: U.S. Monthly Fresh Apple Trade



Sources: USDA, Foreign Agricultural Service; USApple

CORE INSIGHTS

With the loss of the Indian market in 2018, U.S. fresh apple exporters have been scrambling to find a home for millions of bushels of fruit – fruit that used to go abroad but is now leading to excess domestic supply and lower prices at home. Although exports have been consistently falling as shown in **Table 12**, there are a few bright spots. Among the top-10 export markets, Canada grew by 21%, Vietnam increased by 46% and Israel grew by 62% compared to last year. Outside of the top-10, exporters have also been making inroads into smaller, but growing markets like Barbados, Bermuda, Nicaragua, Cambodia and Singapore. There are also a few markets like the U.K. that predominantly buy organic apples from the U.S. While these markets are small, they are valuable. Organic apples make up less than 15% of total U.S. fresh apple exports. In the U.K., the figure is closer to 40%. As a result, the average apple sent to the U.K. is valued around $0.91 per pound compared to $0.58 per pound for all fresh apple exports.

When compared to the 2021/22 CY, exports are down by more than 16% and imports are down by 19%. Given that exports are so much larger than imports, this led to a net decline in the balance of trade by almost 16% or 5.1 million bushels. The net trade balance as measured by value also declined – down 16% or almost $113 million (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 2022, the U.S. imported more than 555 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, those imports equate to more than 4.6 billion pounds. U.S. fresh market exports weigh in at around 1.5 billion pounds (36.2 million bushels). What the processing market loses in price, it makes up for in quantity. The value of these imports – almost $683 million.

For the most part, U.S. processors don't compete in this market globally. Exports of apple juice concentrate are only 2.8% of imports leading to a massive negative balance of trade (540 million gallons) valued at almost $623 million. Fortunately, given the strength of the fresh export market, the net trade balance for fresh and apple juice concentrate is still a positive $78 million.[25]

On a year-over-year basis, imports of apple juice concentrate are up by 33% and exports are up by 13% (by value). Given the enormity of the import market, this caused net trade to decline by 35% or $161 million (see **Table 13**).

China, the world's largest apple producer, had long been the dominant supplier of apple juice concentrate into to the U.S. Last year, however, U.S. apple juice concentrate imports from Turkey more than doubled while those from China fell by almost half. In 2022, Turkey continued its growth, with imports increasing by more than 27% to 178 million gallons. This was enough to claim the top spot as apple juice concentrate imports from China were only up 14% year over year to 164 million gallons.

When measured by value, Turkey (35%) has a significantly greater share of the U.S. apple juice concentrate import market compared to China (20%). This means that, not only are we bringing in more Turkish concentrate, but we are paying more per unit than we do for Chinese juice. 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 2023/24 apple crop forecasts and completing the picture of worldwide apple supply in the year to come.

Table 13: U.S. Apple Juice Concentrate Trade

	2022	2021	YEAR-OVER-YEAR % CHANGE
LEVELS			
U.S. Balance of Trade	**(540,345,519)**	**(448,959,442)**	**20.4%**
Total Exports	15,287,898	14,225,662	7.5%
Total Imports	555,633,417	463,185,104	20.0%
VALUE			
U.S. Balance of Trade	**$(622,752,000)**	**$(461,734,000)**	**34.9%**
Total Exports	$59,820,000	$53,133,000	12.6%
Total Imports	$682,572,000	$514,867,000	32.6%

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

[25] 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. Once these are accounted for, the U.S. ends up with a negative total apple-related trade balance of -$170 million 2022.

Global Apple Production

Global apple production has been steadily increasing since 1961. In 2021, the most recent year for which the UN has data, worldwide apple production totaled around 4.9 billion bushels. These apples were grown on slightly more than 11.9 million acres resulting in an average yield of about 410 bushels per acre.

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 2021, apple production has increased by 91%, acres harvested has fallen by 23% and average yield has increased by 149%.

In 2021, China alone was responsible for producing more than 2.4 billion bushels, around 49% of world supply. In the same year, Turkey overtook the U.S. to become the world's second largest apple producer at almost 236 million bushels (4.8%). The U.S. was not far behind, producing just over 234 million bushels (4.8%). Rounding out the top five were Poland (4.4%) and India (2.4%). A complete list of apple production by country is shown in **Appendix B**.

In terms of area harvested, China still tops the list at 5.2 million acres, but by this metric, the U.S. falls to seventh in the world with slightly more than 290,000 acres. India moves into the number two spot, followed by Russia, Turkey, Poland and Iran.

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 808 bushels per acre compared to 467 for China or 155 for India, for example. By this measure, the U.S. is number eleventh in the world. New Zealand tops the list at 1,231 bushels per acre with Switzerland, Chile, Belgium and South Africa rounding out the top five. For reference, the global average is 366 bushels per acre.

The remaining portion of this section provides details on the 2023/24 CY production forecasts for select countries and regions.

CORE INSIGHTS

Turkey's apple production has been growing by an average of around 19% a year over the past five years. According to UN data, in 2021, Turkey just barely surpassed the U.S. to become the number two global producer of apples. While this ranking change may be premature as the UN uses USDA data that only includes production from the top-seven U.S. states, the trend is clear – Turkey has become a major player on the apple world stage.

This surge in fresh supply is being absorbed primarily by India and Russia that took in almost 10 million bushels in the 2021/22 CY.[26] In India, Turkey has stepped in to fill the gap left by the U.S. apple growers who were shut out of that country as a result of retaliatory steel and aluminum tariffs. In Russia, Turkey is stepping in to fill the gap left by Polish apples that were shut out of that market due to geopolitical issues related to Russia's annexation of Crimea (2014) and invasion of Ukraine (2022).

Since Poland has been shut out of Russia, previously the destination for 60% of their total apple exports, they have made a concerted effort to get their fruit into the U.S. At this point, they have been unable to do so as they have not undergone a comprehensive pest review, but, given the situation in Ukraine, the pressure is mounting. As the fourth largest producer in the world, a sizable influx of Polish apples into the U.S. would likely have a significant depressive impact on domestic prices for certain varieties.[27]

[26] USDA, Foreign Agricultural Service. Fresh Deciduous Fruit Annual: Turkey. November 10, 2022.
[27] DW.com. "Vladimir Putin finds unlikely ally in Polish farmers". December 2, 2019. www.dw.com/en/

China

Despite the fact that the U.S. does not conduct a great deal of fresh apple trade with China, it is nevertheless important to keep an eye on their production numbers as a way of gauging world-wide supply.

According to China's Chamber of Commerce of Foodstuffs and Native Produce via the World Apple and Pear Association (WAPA), China's 2023 estimated production will be up by 3% year over year to around 2 billion bushels. If accurate, this would represent an increase of around 57 million bushels – roughly equivalent to the combined production of New York and Michigan. This follows a particularly challenging 2022 season for China where weather-related losses reduced expected production by around 260 million bushels. Additionally, generally challenging market conditions, along with an ageing farmer population, have been pushing growers into alternative crops.[28]

Europe

Taken as a group, Europe would be the second largest apple producing region behind China. According to WAPA, the major European apple-growing countries listed in **Table 14** will produce almost 612 million bushels in the 2023/24 CY. This is 3.2% below 2022/23 production levels and 1% lower than the five-year average.

Within Europe, Poland is the largest apple-producing country expected to produce almost 210 million bushels – an 11% decrease from last year. Rounding out the top five are Italy, France, Germany and Hungary.

On a varietal basis, Golden Delicious accounts for 19% of all European apples. The next largest varieties include Gala, Red Delicious, Idared and Red Jonaprince. The estimated 2023/24 production by varieties is featured in **Table 15**.

Table 14: European Apple Production, by Select Countries

	2023/24 (F)		2022/23		5-YR. AVERAGE	
Europe Total	**611,572,086**		**631,833,594**		**617,346,091**	
Poland	209,701,355	34.3%	235,946,831	37.3%	209,176,445	33.9%
Italy	110,440,964	18.1%	110,913,382	17.6%	111,805,729	18.1%
France	78,788,920	12.9%	73,014,915	11.6%	75,996,401	12.3%
Germany	49,971,387	8.2%	56,270,301	8.9%	54,422,619	8.8%
Hungary	28,870,024	4.7%	14,697,467	2.3%	25,027,686	4.1%
Spain	28,135,150	4.6%	21,626,272	3.4%	25,521,101	4.1%
Romania	21,311,327	3.5%	21,258,836	3.4%	20,838,908	3.4%
Portugal	16,429,668	2.7%	15,274,867	2.4%	16,356,181	2.6%
United Kingdom	12,597,829	2.1%	12,597,829	2.0%	10,970,609	1.8%
Greece	11,128,082	1.8%	16,849,596	2.7%	14,949,423	2.4%
Netherlands	10,865,627	1.8%	12,335,374	2.0%	12,986,262	2.1%
Belgium	10,655,663	1.7%	12,545,338	2.0%	11,862,955	1.9%
Austria	5,826,496	1.0%	7,926,134	1.3%	7,632,184	1.2%
Czech Rep	5,406,568	0.9%	7,243,751	1.1%	6,445,889	1.0%
Croatia	3,411,912	0.6%	2,991,984	0.5%	3,390,916	0.5%
Slovenia	2,467,075	0.4%	2,624,548	0.4%	2,603,551	0.4%
Lithuania	1,837,183	0.3%	2,677,039	0.4%	2,383,089	0.4%
Slovakia	1,417,256	0.2%	1,679,710	0.3%	1,805,689	0.3%
Sweden	1,259,783	0.2%	1,574,729	0.2%	1,480,245	0.2%
Denmark	787,364	0.1%	1,259,783	0.2%	1,102,310	0.2%
Latvia	262,455	0.0%	524,910	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 2023/24 (F) data.

[28] USDA, Foreign Agricultural Service. "Fresh Apples, Grapes, and Pears: World Markets and Trade." June 2023.

Table 15: European Apple Production, by Select Varieties

	2023/24 (F)		2022/23		5-YR. AVERAGE	
Europe Total	**611,572,086**		**631,833,594**		**617,346,091**	
Golden Delicious	113,800,385	18.6%	101,884,939	16.1%	112,750,566	18.3%
Gala	80,153,684	13.1%	76,479,318	12.1%	74,642,134	12.1%
Red Delicious	32,386,918	5.3%	35,956,302	5.7%	36,082,281	5.8%
Idared	31,547,062	5.2%	33,594,210	5.3%	39,515,189	6.4%
Red Jonaprince	25,878,040	4.2%	30,392,261	4.8%	23,809,896	3.9%
Shampion	22,151,182	3.6%	23,778,401	3.8%	24,387,296	4.0%
Jonagold	19,474,143	3.2%	21,101,363	3.3%	22,550,113	3.7%
Granny Smith	16,692,123	2.7%	21,521,290	3.4%	19,810,085	3.2%
Fuji	16,114,722	2.6%	17,531,978	2.8%	16,807,603	2.7%
Elstar	15,537,322	2.5%	19,736,598	3.1%	18,277,350	3.0%
Cripps Pink	15,327,358	2.5%	16,744,614	2.7%	14,823,445	2.4%
Ligol	11,548,010	1.9%	13,647,648	2.2%	13,122,738	2.1%
Braeburn	10,288,227	1.7%	10,603,172	1.7%	12,209,396	2.0%
Jonagored	8,818,480	1.4%	10,813,136	1.7%	15,904,759	2.6%
Other	191,854,431	31.4%	198,048,363	31.3%	172,653,241	28.0%

Sources: World Apple and Pear Association; USApple
Notes: Production levels are in 42-pound bushels.
Five-year averages do not include 2023/24 (F) data.

South America

In 2021, the UN reported that Argentina, Brazil and Chile together made up 94% of South American apple production (4% of world production). According to USDA and WAPA[29], in the 2023/24 CY, Argentina, Brazil and Chile have produced a combined 151.4 million bushels, up 2% or 2.9 million bushels from last year.[30]

This gain was due primarily to a 9% increase in Argentinian production to 27.8 million bushels. Brazilian apple production also grew, increasing by 2% to 60.4 million bushels. Production in Chile was expected to be down just over a percent to around 63 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 WAPA, Mexico's 2023/24 crop will be around 1% below last year's figure with production totaling 42 million bushels. If true, this would still be a great year for Mexico as the 2022/23 season enjoyed production levels near 10-year highs.

[29] 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.
[30] 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 2023/24 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-2022.

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 (see **Figure 8**). According to the Fruit and Vegetable Growers of Canada, Canadian production will decrease to 18.7 million bushels – a more than 5% drop from 2022/23 levels (see **Table 16**). This represents a 6% decrease 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 731,000 bushels or around 8%. British Columbia, on the other hand, is expected to increase production year over year by almost 18%, or around 567,000 bushels.

On a varietal basis, Gala is the number one apple grown in Canada with an expected 2023/24 production volume of more than 4 million bushels, more than 21% of total production. Rounding out the top five are McIntosh, Honeycrisp, Ambrosia, and Cortland (see **Table 17**).

In total, the estimates for the U.S., China, Europe (including the U.K.), South America, Mexico and Canada represent approximately 73% 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

	2023/24 (F)	2022/23	5-YR. AVERAGE
LEVELS			
Canada	**18,661,891**	**19,687,324**	**18,536,972**
Ontario	7,935,000	8,666,000	7,365,200
Quebec	4,410,000	5,569,000	5,404,999
British Columbia	3,735,000	3,168,153	3,678,664
Nova Scotia	2,359,891	2,086,071	1,910,817
New Brunswick	222,000	198,100	177,292
PERCENT CHANGE (VS. 2022/23)			
Canada		**-5.2%**	**0.7%**
Ontario		-8.4%	7.7%
Quebec		-20.8%	-18.4%
British Columbia		17.9%	1.5%
Nova Scotia		13.1%	23.5%
New Brunswick		12.1%	25.2%
MARKET SHARE			
Canada	**100.0%**	**100.0%**	**100.0%**
Ontario	42.5%	44.0%	39.7%
Quebec	23.6%	28.3%	29.2%
British Columbia	20.0%	16.1%	19.8%
Nova Scotia	12.6%	10.6%	10.3%
New Brunswick	1.2%	1.0%	1.0%

Source: Fruit & Vegetable Growers of Canada
Notes: Production levels are in 42-pound bushels.
Five-year averages do not include 2023/24 (F) data.

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

2023/24 (F)	CANADA	BRITISH COLUMBIA	NEW BRUNSWICK	NOVA SCOTIA	ONTARIO	QUEBEC
Total Varieties	**18,661,891**	**3,735,000**	**222,000**	**2,359,891**	**7,935,000**	**4,410,000**
Gala	4,000,704	1,671,000	20,000	118,704	2,055,000	136,000
McIntosh	2,847,113	124,000	55,000	190,113	904,000	1,574,000
Honeycrisp	2,646,444	179,000	75,000	1,020,444	1,234,000	138,000
Ambrosia	2,599,956	1,387,000	12,000	134,956	1,008,000	58,000
Cortland	1,176,450	-	38,000	101,450	227,000	810,000
Spartan	900,770	159,000	2,500	7,270	61,000	671,000
Empire	892,878	-	2,500	10,378	539,000	341,000
Red Delicious	623,429	50,000	-	61,429	512,000	-
Spy	478,091	-	-	219,091	259,000	-
Others	2,496,056	165,000	17,000	496,056	1,136,000	682,000

Source: Fruit & Vegetable Growers of Canada
Note: Production levels are in 42-pound bushels.

Appendix

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

2022	LEVELS		VALUES		YEAR-OVER-YEAR % CHANGE
APPLE JUICE CONCENTRATE					
World Total	**481,839,795**		**$574,366,000**		**29%**
Turkey	160,186,715	33%	$214,166,000	37%	35%
China	135,578,037	28%	$117,571,000	20%	19%
Poland	49,867,247	10%	$61,971,000	11%	186%
Ukraine	49,510,086	10%	$55,528,000	10%	188%
Chile	25,980,127	5%	$35,250,000	6%	-44%
APPLE JUICE CONCENTRATE - FROZEN					
World Total	**65,077,583**		**$67,122,000**		**-8%**
China	27,678,014	43%	$25,534,000	38%	-7%
Brazil	21,465,534	33%	$21,735,000	32%	85%
Turkey	15,748,112	24%	$19,522,000	29%	-10%
Serbia	94,177	0%	$144,000	0%	N/A
South Africa	56,163	0%	$90,000	0%	-75%
APPLE JUICE CONCENTRATE - BRIX < 20					
World Total	**14,067,053**		**$44,504,000**		**26%**
Ukraine	7,687,352	55%	$22,950,000	52%	223%
Canada	2,169,328	15%	$7,374,000	17%	-18%
Turkey	1,973,629	14%	$7,137,000	16%	-37%
Mexico	1,342,839	10%	$4,502,000	10%	109%
Chile	476,038	3%	$1,240,000	3%	-41%
APPLE JUICE CONCENTRATE - FROZEN, ORGANIC					
World Total	**1,580,409**		**$2,464,000**		**-21%**
China	820,254	52%	$772,000	31%	1133%
Chile	352,273	22%	$702,000	28%	-45%
Turkey	307,470	19%	$664,000	27%	-73%
Argentina	87,177	6%	$292,000	12%	-14%
New Zealand	12,231	1%	$18,000	1%	22%

Sources: USDA, Foreign Agricultural Service, USApple
Notes: Trade levels are in gallons.
Year-over-year changes are calculated on levels.

Appendix B: Global Apple Production, by Country: 2021

	World Total	4,889,236,068	
1	China	2,413,788,992	49.4%
2	Turkey	235,855,707	4.8%
3	United States of America	234,487,897	4.8%
4	Poland	213,501,700	4.4%
5	India	119,469,408	2.4%
6	Iran (Islamic Republic of)	117,637,473	2.4%
7	Russian Federation	116,330,449	2.4%
8	Italy	116,096,339	2.4%
9	France	85,721,925	1.8%
10	Chile	81,718,184	1.7%
11	Brazil	68,103,021	1.4%
12	Ukraine	67,129,104	1.4%
13	Uzbekistan	64,993,667	1.3%
14	South Africa	60,300,084	1.2%
15	Germany	52,733,985	1.1%
16	Morocco	46,703,090	1.0%
17	Democratic People's Republic of Korea	42,369,136	0.9%
18	Egypt	41,641,034	0.9%
19	Japan	38,478,809	0.8%
20	Pakistan	36,597,790	0.7%
21	Republic of Moldova	33,998,390	0.7%
22	Mexico	33,162,040	0.7%
23	Spain	32,325,503	0.7%
24	Romania	31,163,878	0.6%
25	New Zealand	29,778,149	0.6%
26	Algeria	27,416,917	0.6%
27	Republic of Korea	27,081,710	0.6%
28	Hungary	27,007,645	0.6%
29	Argentina	26,980,350	0.6%
30	Serbia	26,940,351	0.6%
31	United Kingdom	24,334,424	0.5%
32	Portugal	19,328,743	0.4%
33	Canada	18,453,982	0.4%
34	Belarus	17,673,704	0.4%
35	Azerbaijan	16,187,496	0.3%
36	Syrian Arab Republic	15,831,785	0.3%
37	Afghanistan	15,358,148	0.3%
38	Australia	14,954,489	0.3%
39	Greece	14,780,927	0.3%
40	Kazakhstan	13,795,083	0.3%
41	Belgium	13,109,090	0.3%
42	Netherlands	12,860,283	0.3%
43	Tajikistan	12,552,022	0.3%
44	Lebanon	12,230,481	0.3%
45	Switzerland	10,867,937	0.2%
46	Austria	10,828,359	0.2%
47	Tunisia	8,136,098	0.2%
48	Peru	7,510,598	0.2%
49	Kyrgyzstan	7,172,975	0.1%
50	Czechia	6,034,360	0.1%
51	Albania	5,839,471	0.1%
52	Israel	5,301,586	0.1%
53	North Macedonia	4,874,467	0.1%
54	Armenia	4,863,428	0.1%
55	Bosnia and Herzegovina	4,335,280	0.1%
56	Iraq	4,142,428	0.1%
57	Georgia	3,868,583	0.1%
58	Turkmenistan	3,505,567	0.1%
59	Croatia	3,133,185	0.1%
60	Uruguay	2,939,493	0.1%
61	Nepal	2,512,479	0.1%
62	Bulgaria	2,311,177	0.0%
63	El Salvador	2,305,485	0.0%
64	Lithuania	1,912,770	0.0%
65	Sweden	1,691,783	0.0%
66	Denmark	1,604,124	0.0%
67	Slovakia	1,553,207	0.0%
68	Guatemala	1,335,707	0.0%
69	Slovenia	1,207,817	0.0%
70	Yemen	1,093,167	0.0%
71	Jordan	1,078,005	0.0%
72	Norway	982,683	0.0%
73	Libya	852,798	0.0%
74	Ireland	832,507	0.0%
75	Colombia	686,657	0.0%
76	Latvia	430,426	0.0%
77	Finland	414,154	0.0%
78	Ecuador	377,499	0.0%
79	Madagascar	375,476	0.0%
80	Zimbabwe	348,556	0.0%
81	Malawi	165,921	0.0%
82	Bolivia (Plurinational State of)	143,763	0.0%
83	Cyprus	139,101	0.0%
84	Bhutan	121,979	0.0%
85	Estonia	103,407	0.0%
86	Montenegro	81,159	0.0%
87	Saint Vincent and the Grenadines	79,156	0.0%
88	Luxembourg	53,016	0.0%
89	Palestine	49,288	0.0%
90	Paraguay	33,867	0.0%
91	Grenada	25,069	0.0%
92	Honduras	9,944	0.0%
93	Kenya	6,196	0.0%
94	Malta	525	0.0%

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

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