

NOVEMBER 2022

# Almond Market Update

## Key Takeaways

- Almond prices are currently depressed due to transitory effects of the pandemic.
- Future almond supply is unlikely to keep pace with historical demand due to limited water availability, setting the stage for higher commodity prices.
- Orchards in water-secure areas stand to have greater appreciation due to tightening groundwater regulation in California.

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## Current Market Conditions

Over the last 26 years almond prices have increased by 3% on average annually, underpinned by steadily increasing production and consumption. As we explore in this market update, it appears likely that these long-term trends are set to be impacted by cyclical factors and, more importantly, potentially disrupted by secular supply constraints. We first explore the short-term confluence of events which have led to the currently depressed almond prices. These temporary disruptions that have led to depressed almond prices come at a time when groundwater regulation in the world's dominant supplier of almonds could remove significant supply from the market.

Almond prices are currently depressed due to lingering supply issues as a result of the pandemic. Over the longer term, almond markets are cyclical, and new supply often runs at a lag to pricing, driving a pattern of cyclical peaks and troughs. This is largely due to the fact that new almond plantings take approximately 6 years to reach production. Today almond pricing stands at ~\$1.70/lb, below the \$2.50/lb seen in recent years and down from the all-time high of \$4.00 in 2015.

**Figure 1: Historical Almond Pricing**



Past performance does not guarantee future results and there is no guarantee this trend will continue.

Source: USDA

**Figure 2: New Supply Historically Follows Price**

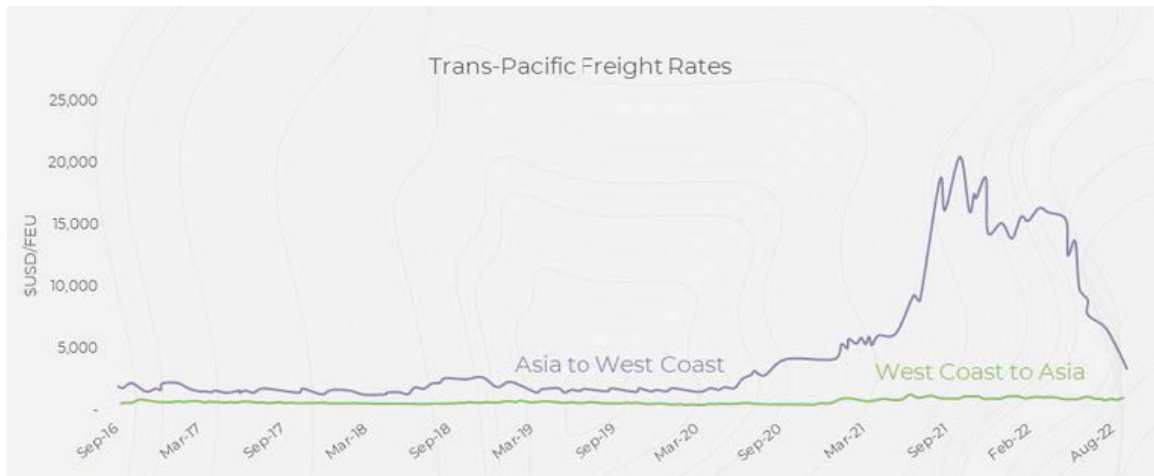


Past performance does not guarantee future results and there is no guarantee this trend will continue.

Source: USDA

California almonds are heavily reliant on the export market. It's important to remember that California produces around 80% of the world's supply of almonds, and roughly 70% of this has historically been exported. Recently, port disruption has put downward pressure on almond pricing. The root cause of this was pent up U.S. demand for high-value Asian exported consumer goods during the pandemic. This led to Asia-to-U.S. freight rates skyrocketing, as shown below. As a result of these higher Asia-to-West Coast rates, ships stopped making the trip to Oakland, CA to pick up Asia-bound almonds and other agricultural commodities, instead sailing deadhead straight back to Asia to pick up more lucrative freight.

**Figure 3: Asia to U.S. West Coast Rates Cause Ships to Bypass Oakland**



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Source: Freightos

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**Figure 4: Oakland Port Disruptions Shut Off Global Market to U.S. Almonds**

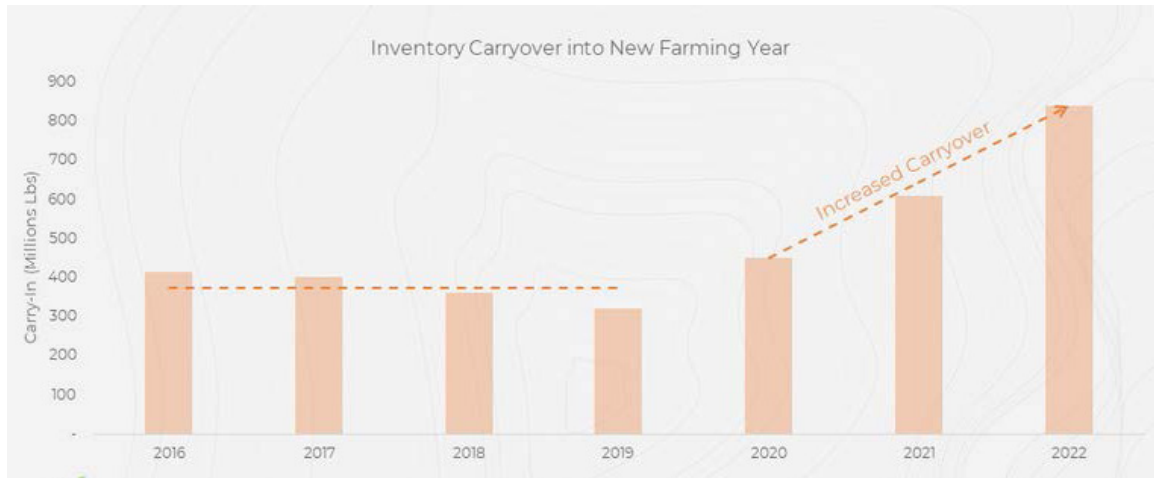


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Source: Freightos

Around 70% of California almonds are exported, so this disruption caused increased inventory which sat on the domestic market, pushing down pricing. Carryover, which is the amount of almonds brought from one harvest year into the next, increased substantially between 2020 and 2022, a reflection of this disruption. This carryover increase was also influenced by a strong crop in 2020. If properly stored, almonds can carry a shelf life of two years.

**Figure 5: U.S. Almond Inventories Hit All-Time Highs**

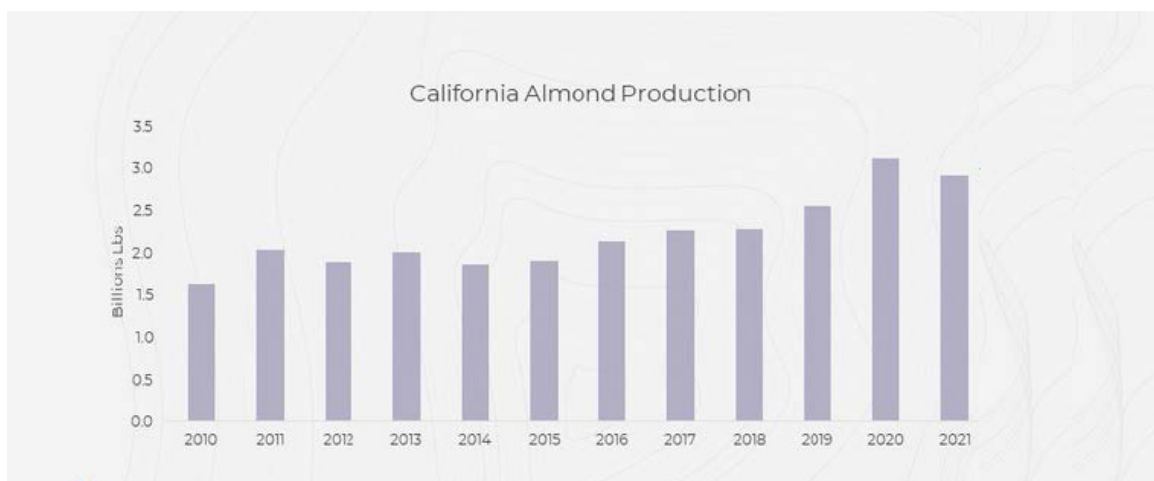


*Past performance does not guarantee future results and there is no guarantee this trend will continue.* Source: Almond Board of California

While California bearing acreage has steadily increased over the last two decades in an effort to keep up with global demand, we saw almond production peak in 2020 at 3.1 billion pounds. We believe U.S. almond production growth has plateaued due to the implementation of groundwater regulations in California, the migration of almond acreage from higher-yielding areas that are water-stressed to lower yielding acreage with greater water security, and the natural removal of older orchards - particularly in water-stressed areas. We explore each of these factors further in our long-term outlook below.

The 2022 production forecast was initially expected to be 2.8 billion pounds, according to the USDA, however the forecast was revised down (7%) to 2.6 billion pounds in July to account for a freeze that hit in the last week of February. AcreTrader affiliates within the industry believe the ultimate production number could be closer to 2.4 billion pounds.

**Figure 6: U.S. Almond Inventories Hit All-Time Highs**



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Source: USDA



While almond pricing has been impacted by the pandemic and export market woes, growers are seeing increasing cost pressures, as evidenced by increased fertilizer prices following the war in Ukraine. The combination of cyclically low almond prices, rising input costs, and ongoing drought is causing some growers to remove trees earlier than anticipated. During drought times growers are more heavily reliant on groundwater, which typically contains a higher amount of dissolved salts; this causes salts to build in the soil profile. The application of surface water for irrigation can help leach the salts from the soil and root zone. The inability to apply surface water in many water-stressed areas can cause growers to remove trees before the end of their productive life. While data on orchard removals is imperfect, anecdotal commentary suggests that growers are fallowing orchards earlier than anticipated. Some growers are choosing to convert these acres back to row cropping.

**Figure 7: Input Prices Further Squeezing Grower Margins**



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Source: St. Louis FRED

## Long-Term Outlook for the U.S. Almond Industry

In the medium-term, the port of Oakland has begun to normalize, going hand-in-hand with the decreased rates shown above. The month of August saw 162 million pounds of almonds exported—16% higher than the previous year. This increase is likely a clear-out of some carryover inventory. The USDA expects global inventories to reduce by a third from last year's level. Ultimately shelf life is limited, and with production down from the 2020 peak and exports normalizing, it is only a matter of time before the excess inventory is cleared. Harvest 2022 and ultimate export figures should provide greater clarity in the coming weeks.

**Figure 8: Worldwide Consumption Outpacing Domestic Production**



Past performance does not guarantee future results and there is no guarantee this trend will continue.

Source: USDA

What is the outlook for almonds in the long-term? Positive consumption trends continue globally at a clip of around 6% annually. The Almond Board of California continues to invest heavily in marketing almonds as a healthy snack, dairy alternative and plant-based protein. India, a large importer of Californian Almonds, continues to be a strong market. According to the USDA, “a wider consumer base with disposable incomes will incorporate more almonds into their diets based on perceived health benefits and cultural traditions”. By far the largest supplier to this growing worldwide demand is California, accounting for 80% of global exports.

**Figure 9: California is the Dominant Global Exporter**

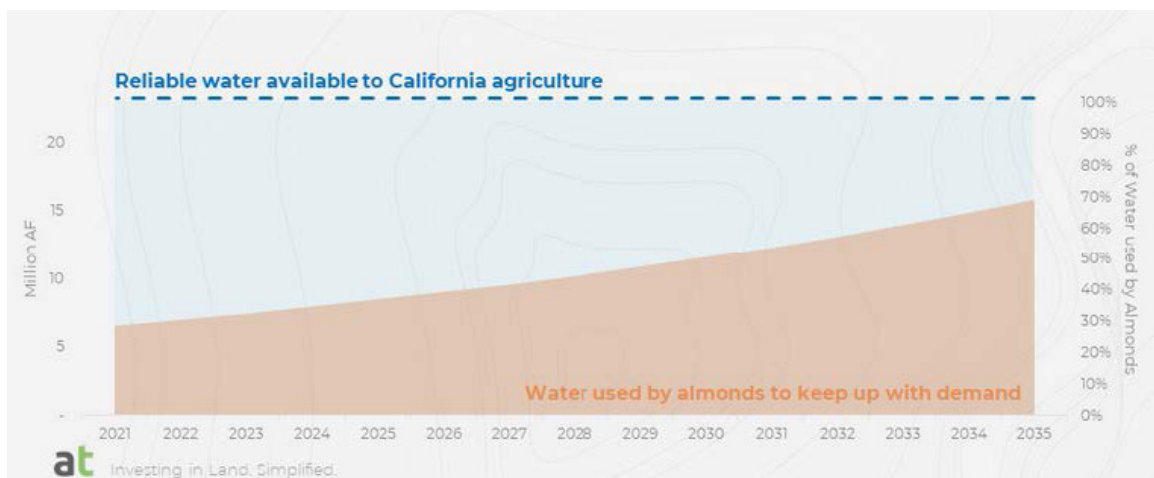


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Source: USDA

Water is the mitigating factor in almond supply in the United States, and thus the world. The current export disruptions and lower pricing are happening against the backdrop of insecure water in the San Joaquin and—to a lesser extent—Sacramento Valleys, where almonds are grown. The San Joaquin Valley is estimated by the Public Policy Institute of California to be over-drafted by 1.9 million acre-feet of water, which is 16% of agricultural usage in the Valley. Almonds already use an estimated 28% of the reliable water supply available to California agriculture, according to AcreTrader analysis. If we extrapolate current acreage growth forward, almonds will start to see unsustainable shares of water usage in the valley, given demand from other specialty crops as well as everyday domestic use.

**Figure 10: Water is the Mitigating Factor**



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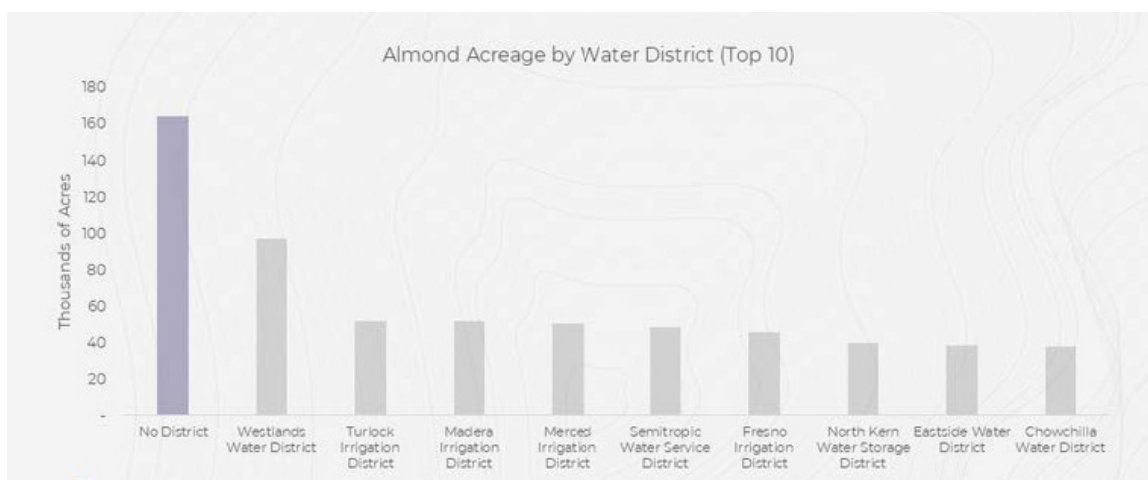
Source: AcreTrader; PPIC; DWR

## What is the Sustainable Groundwater Management Act (SGMA), and How Does it Affect Investments in Almonds?

SGMA was passed in 2014 and seeks to remove all overdraft from California groundwater basins by 2040. It placed power in the hands of local administrators to manage local groundwater to achieve these goals. These administrators sit at the helms of Groundwater Sustainability Agencies (GSAs) which produced Groundwater Sustainability Plans (GSPs) to address overdraft. When AcreTrader diligences prospective investment properties, we read these plans carefully to ensure the “Sustainable Yield” (how much can be pumped without overdraft) is sufficient—when supplemented by surface water—to grow almonds.

AcreTrader analysis of almond acreage in California reveals 12% of acreage to be without a surface water district, and large amounts of acreage reside in historically weak surface water districts, which often coincide with large groundwater overdrafts. These districts are most at risk of losing almond acreage. 68% of almond bearing acreage in California resides in critically over-drafted basins. It is for this reason that strong dual-source water is a key aspect of any almond investment.

**Figure 11: 12% of Bearing Almond Acreage Today Resides Outside of a Surface Water District**



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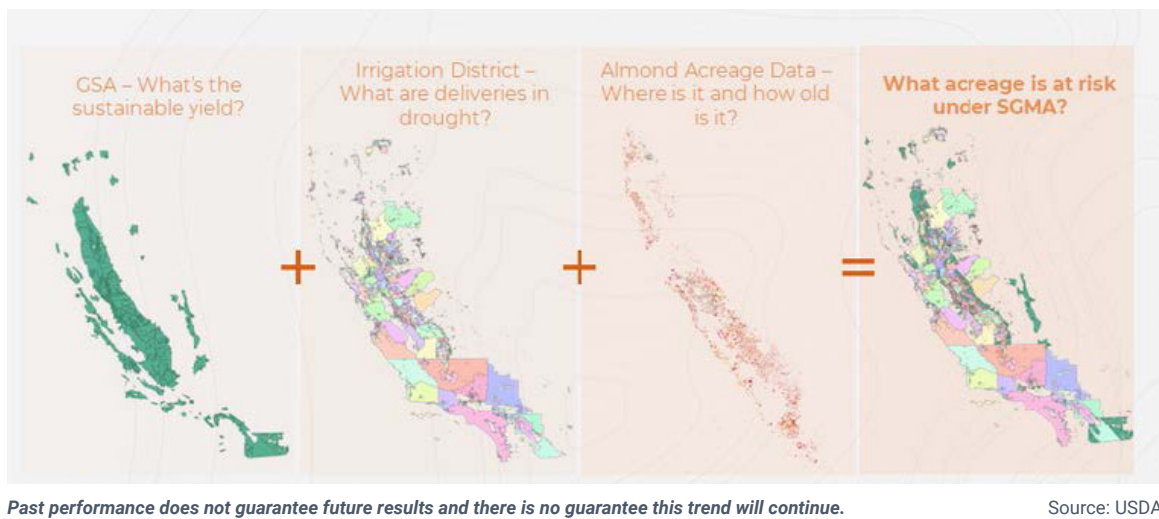
Source: AcreTrader; Land

Analyzing LandIQ data on almond acreage across California and overlaying that with individual Groundwater Sustainability Agencies’ (GSA) Sustainable Yields, as well as surface water deliveries during drought, we generated estimates of water availability post-SGMA. While it varies based on climate and soil types, as a general rule almonds need at least 3.5 acre-feet per acre per year (AFY). If GSAs were to implement the sustainable yields in their proposed Groundwater Sustainability Plans (GSP), we could see much of California’s acreage struggling to meet water requirements during a year of low surface water availability, such as 2015 or the last two years. California swings between rare wet years and drought. Permanent crops are inelastic to water demand, meaning an orchard needs to survive drought year surface water deliveries, especially in a SGMA world. In the simplest terms, GSP’s are meant to demonstrate to the State Water Resources Control Board how the local GSA will bring groundwater pumping and groundwater recharge into alignment, thus reaching sustainability.

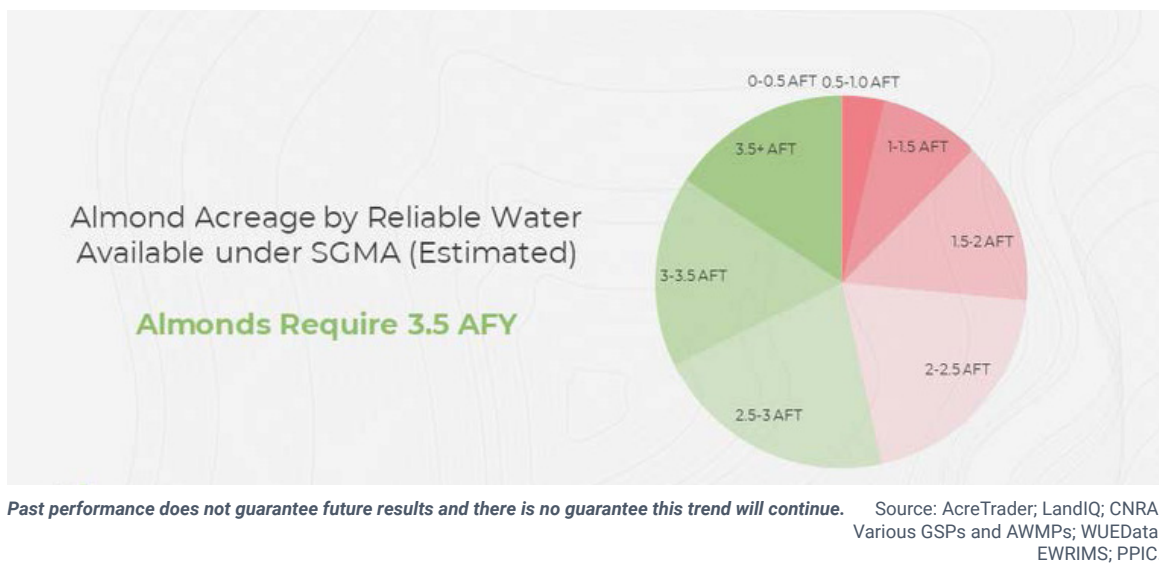


Many GSPs outline additional steps to increase water availability, such as recharge projects. We use PPIC data on these projects to account for this. This exercise serves to highlight that much of the almond acreage today is largely groundwater-dependent in drought. If GSAs start implementing strict pumping caps like those seen in East Kaweah GSA (0.83 AFY), then growers could be forced to pay fines, transfer in expensive water, and/or fallow acres to meet crop needs. Under the implementation systems we have seen thus far from GSAs, growers are typically forced to pay for water use above sustainable yields. This may make stronger districts or areas with more balanced aquifers more attractive for almond developments. This highlights the need for strong surface water rights to gain a competitive advantage in this worst-case scenario. Whether through fallowing or simply becoming uneconomical due to increased water costs, approximately 47% of today's bearing acreage is at risk of increased fallowing and/or higher water costs as GSAs limit groundwater availability.

**Figure 12: Analyzing SGMA's Impact on California Almonds**



**Figure 13: SGMA's Impact on Water Supplied to California Almonds**



On top of this water-stressed acreage, we analyzed USDA reporting of almond acreage to calculate the natural attrition of aging almond orchards. Through this analysis, we see that natural churn can be expected to increase in the coming years, due to older orchards being pulled out. While it again varies by multiple factors (e.g., water quality, soil quality, climate, management), as a general rule the productive life of an orchard is 25-30 years. As discussed earlier, the ongoing drought has caused many growers to rely on groundwater pumping, which typically contains a significant amount of dissolved salts. With no ability to leach the soil and remove the salts from the root zone, the productive life of an orchard can be shortened in many instances. With SGMA currently being implemented, the likelihood of growers replanting almonds into water stressed acreage should be low. Just under half of today's bearing acreage is water deficient under SGMA, and 20% of the acreage is 20+ years old. Under this new reality it's difficult to see how bearing acreage continues to increase at the steady pace we have seen over the last 25+ years. It is these factors that lead us to believe that 2020's production of 3.1 billion pounds likely represents a near-term ceiling for California almond production. Meanwhile, the demand for plant-based protein continues to increase globally. So, while almond prices are currently at a pandemic-induced cyclical low, the stage is set for much stronger cyclical highs over the next 5-10 years.

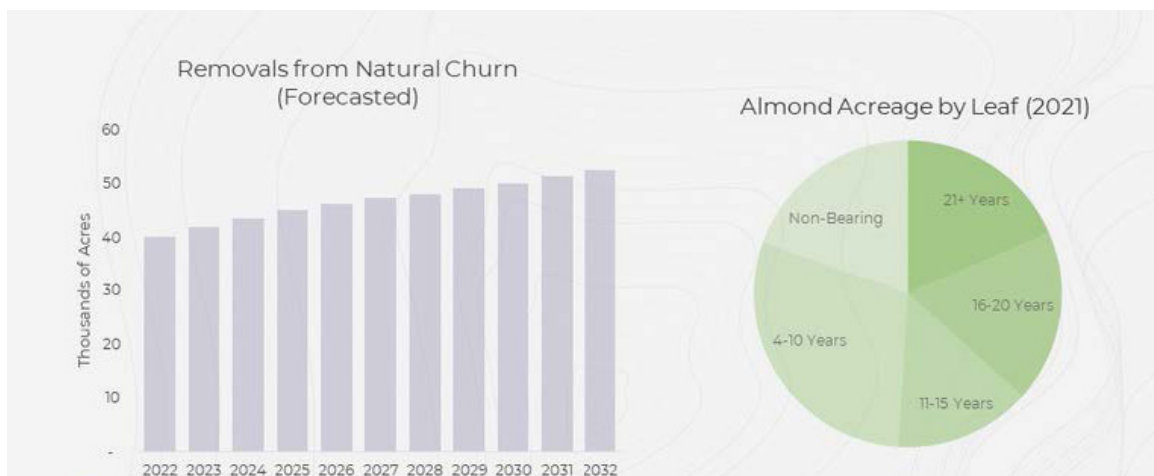
**Figure 14: SGMA is Likely to Exacerbate Water Haves and Have Nots**



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Source: Westwater Research;  
NASDAQ

**Figure 15: Approx. 20% of Bearing Acreage Today is 20+ Years Old**

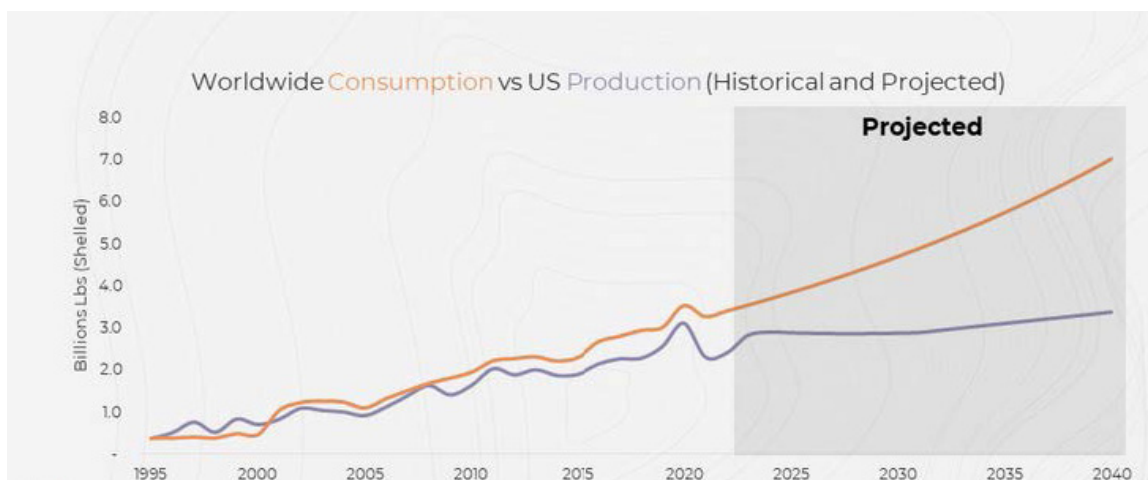


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Source: AcreTrader; USDA

In forecasting supply, we focus on three variables: removals, new acreage, and yields. LandIQ publishes estimates of removed acreage each year. While the data is imperfect, their 2022 estimate is 59,000 acres, which is 54% higher than the amount we would expect from natural attrition. This suggests acreage is coming out at higher rates due to water stress. Secondly, non-bearing acreage in California sits at 320,000 acres due to an increase in recent plantings. This new acreage coming online will increase the amount of almonds being supplied. On the other hand, depressed pricing has historically caused fewer new plantings. Lastly, water stress causes lower yields, and almonds migrating north for more secure water will also see lower yields. When we combine these factors we see that net supply will struggle to keep up with demand growth, providing a potential tailwind to pricing.

**Figure 16: Projected Supply Increases Aren't Enough to Keep Up With Demand Trends**



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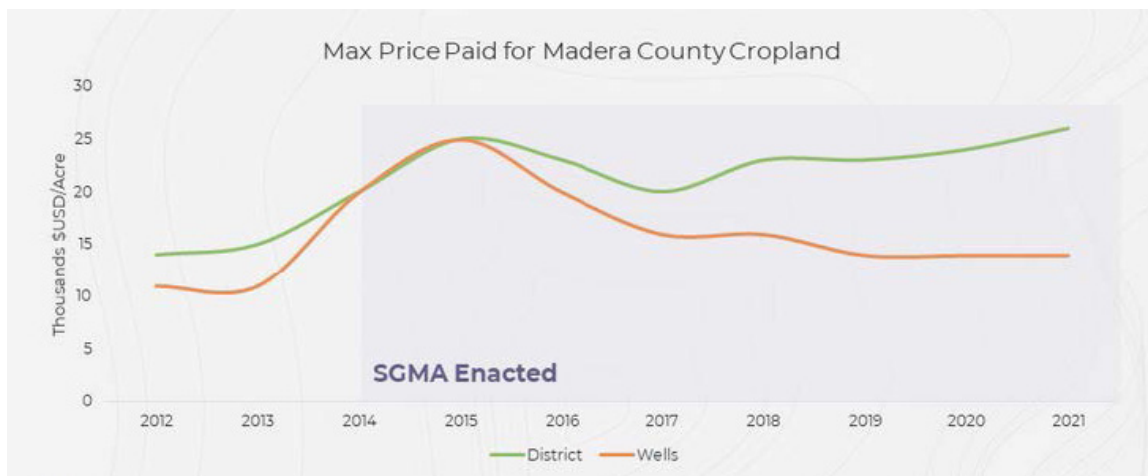
Source: AcreTrader; USDA; LandIQ

## What Does This Mean for the Long-Term Strength of Almond Investments?

When restrictions are implemented, highly-overdrafted areas of the Central Valley with little surface water become at risk. GSAs such as Madera and East Kaweah have started limiting groundwater pumping to levels unsustainable for profitable almond production. These limits can—and already have—driven a difference in value between acreage with weak surface water rights and acreage with strong surface water rights. As groundwater-reliant acreage is impacted to a higher degree, we are likely to see acreage coming out of almond production.

How does this impact land values? As previously mentioned, strong surface water rights have led to stronger appreciation of land values in water-secure areas with better long-term prospects in the face of groundwater pumping restrictions.

**Figure 17: Water is the Differentiating Factor for Land Values**



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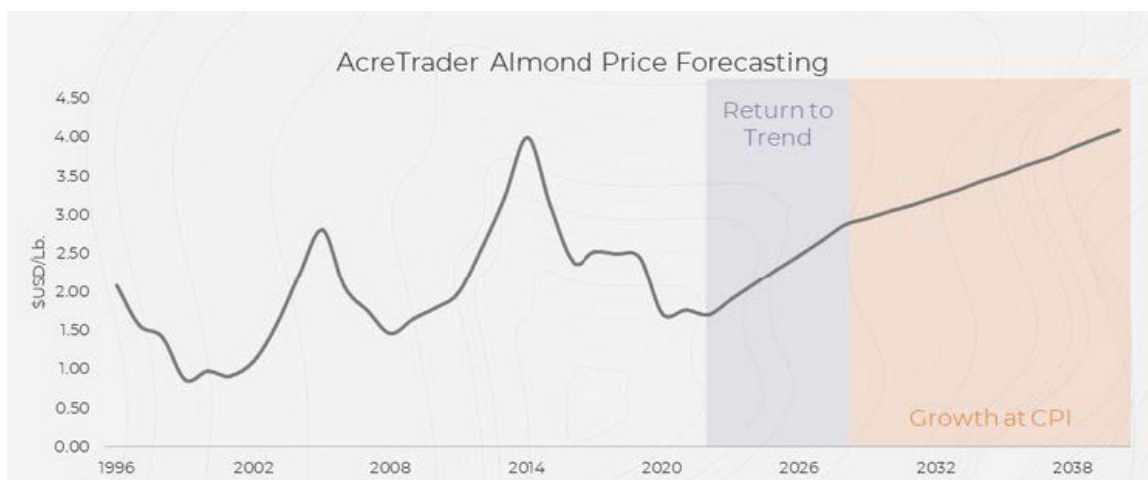
Source: California ASFMRA

## How Does AcreTrader Approach Almond Orchard Investments?

At AcreTrader, we focus our diligence on water districts' surface water rights and GSAs' abilities to reach sustainable yields. Those properties with reliable dual-source water and/or sustainable aquifers to take advantage of these long-term trends are well positioned to capitalize on potentially higher almond prices as supply can no longer keep pace with demand. We also look at property-specific nuances such as riparian surface water rights tied to the property, ability to bank water for later years, and irrigation system efficiency, among other factors.

When modeling the outlook for almond pricing we base our assumptions on the actual long-term historical trends. We do not factor in the potential removal of supply from the market. When we incorporate the historical trends into our assumptions, we assume a steady return to the long-term trend in pricing.

**Figure 18: AcreTrader Uses Long Term Trends to Approach Pricing Conservatively**



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Source: AcreTrader; USDA

## Final Thoughts

While almond prices currently stand at pandemic-induced cyclical lows, we believe future supply will be unable to keep up with historic demand trends. This sets the stage for younger almond orchards in water secure areas to capitalize on the coming potential structural imbalance between supply and demand.

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## About AcreTrader

AcreTrader is a land investment and technology company that empowers its customers to buy and sell land smarter through advanced technology, data, and expertise. Since its founding in 2018, AcreTrader has broadened access to research, buy, sell, and invest in land for thousands of investors, farmers, and landowners across the U.S. and Australia. Find out more by visiting [acretrader.com](https://acretrader.com).

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