WHAT DRIVES U.S. PECAN MARKETS?

An Analysis of Wholesale Pricing, Sizing of Market Factors and Avenues for Improving Industry Profitability

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American PECANS

LOUX ANALYTICS
AGRICULTURAL ECONOMIC CONSULTING

THE TEAM

Trusted Insights from Industry Leaders

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With a family farming legacy in California dating back to 1907 and over 20 years of experience in processing, international sales, marketing, and leadership as a Chief Commercial Officer, Steve has a deep and unique understanding of agricultural supply chains from farm to fork. During his career centered on food commodities and helping farmers, Steve has facilitated more than $7 billion in global trade of U.S. agricultural commodities to more than 60 countries. Steve currently leads a global trading group and nut brokerage firm, exporting from the U.S., Europe, Asia, and South America to markets across the globe.

REPORT OUTLINE

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SECTION 1

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY: PROJECT BACKGROUND

For the last several years, pecan prices, particularly of in-shell pecans, have languished at unprofitable levels for many growers despite declining supply and growing domestic sales.

The market's seeming ambivalence towards supply and demand prompted the American Pecan Council (APC), administrator for the federal marketing order for pecans, to sponsor research into why "despite growing demand and expanded marketing efforts, [do] pecan growers continue to experience volatile and, in some cases, declining prices[?]." At time of writing, both in-shell and pecan halves prices are climbing, alleviating some of the short-term pain that helped prompt this research initiative. Yet the underlying challenges in the market remain, which necessitates concerted investment and collaboration throughout the U.S. pecan industry.

In order to answer this fundamental question, the following research details a wide-ranging, data-driven investigation into "What Drives U.S. Pecan Markets?"

- The report first examines the role supply and demand fundamentals play in affecting the value of both in-shell and shelled pecans through rigorous analysis of historical market and pricing data.
- This analysis is then complemented by an investigation into how some of the unique aspects of the U.S. pecan industry delay or dampen the influence of market fundamentals on pecan prices.
- The report goes on to review various product differentiators, such as shell-out or country of origin, that are unlikely to affect the general market value of pecans but can make a difference on an individual trade.
- Finally, the report weighs all the various pricing factors and identifies several strategies to improve profitability throughout the supply chain.

EXECUTIVE SUMMARY: WHAT DRIVES PECAN MARKETS?

As will be shown in the following report, our team found that:

- Supply and demand fundamentals are far from the only determinants of price, but they do play a critical role in influencing pecan prices even if it is not immediately apparent to many market participants. However, their influence varies between in-shell and shelled pecans.
    - Supply has the largest influence on in-shell prices. Our analysis found that for every additional 10 million lbs. of pecan kernels harvested, in-shell prices move $0.15/lb. ($0.30 per point) lower.
    - By contrast, demand, particularly internationally, plays a much larger role in halves and pieces prices. For every additional 10 million lbs. of pecan halves and pieces exported, shelled prices increased by $0.33/lb. on average.
- Yet undergirding the entire pricing structure is an industry wherein limited competition for both in-shell and shelled pecans mutes market fundamentals. Unique facets of the pecan industry, including lack of data, limited working capital and a mismatch in contract terms further reduce the influence of supply and demand. However, when a major external buyer – typically from abroad – disrupts the market, prices can react quickly.
- Finally, not all pecans or pecan trades are alike. Prices can certainly vary from transaction to transaction on account of quality factors (shell-out, size, etc.), how it is produced (e.g. organic), where it was grown and where it was sold.

KEY QUESTION AND FINDINGS: SUPPLY & DEMAND

Key Question:

To What Extent Do **Supply and Demand Fundamentals** Affect the Price of Pecans?

Key Findings:

1) **The total market balance – as reflected by stocks to use or change in inventories – only affects price in following season**, for both in-shell and shelled. In other words, if demand runs stronger than supply in 2024/25, prices for both in-shell and shelled won't react until the 2025/26 season.

2) **In-shell pecan prices are primarily driven by changes in supply.** On average, for every additional 10 million lbs. of pecan kernels harvested, in-shell prices decreased by $0.30 per point. The emergence of an aggressive international buyer of in-shell pecans would also improve prices but primarily in the season that followed. Changes in domestic demand appear to have no impact on in-shell prices.

3) **Shelled pecan prices are primarily driven by changes in demand,** particularly export demand. For every 10 million lbs. of pecans exported on a shelled basis, shelled prices rose by $0.33 per pound; for every 10 million lbs. of pecans consumed domestically, shelled prices increased by $0.05 per pound. Supply had only a minimal impact on shelled prices, wherein every additional 10 million lbs. of pecan kernels harvested decreased shelled prices by $0.02 per pound.

4) **There is no data to suggest that pecan prices are heavily influenced by the prices of other nuts.** Pecan prices were correlated with an aggregation of tree nut prices, but primarily due to major international buyers purchasing multiple nuts at the same time rather than pecans competing with walnuts, almonds or any other nut.

5) **In-shell pecan prices do vary seasonally**, peaking right as the Eastern harvest begins and before the holiday and gift pack market rush. Prices then ease as the season progresses, only to climb again in March as the harvest concludes and supplies are at their low-ebb. Pecan pieces and prices at retail also rise in advance of the Thanksgiving and Christmas holidays. Conversely, there is no evidence supporting the assertion that halves prices are seasonal.

KEY QUESTION AND FINDINGS: INDUSTRY STRUCTURE

Key Question:

To What Extent Does the **Structure of the U.S. Pecan Industry** Affect the Price of Pecans?

Key Findings:

1) **The scarcity of data – and the limited trust in the data that is available – dampens the influence of supply and demand fundamentals on pecan prices.** Prices can move in concert with the data, but they typically only do so when the fundamental moves are undeniable to all market participants (e.g. China's purchasing of in-shell or a hurricane felling orchards in Georgia).

2) **Limited competition for both in-shell and shelled pecans constrains price movement** unless market forces disrupt the status quo. In-shell prices typically improve only when supply is short or there is an aggressive international in-shell buyer in the market, because it necessitates shellers raise bids in order to secure supplies. Similarly, shelled pecans prices typically only rise when there is sufficient demand from international customers to avoid the 'race to the bottom' on bids for the major retailer contracts.

3) **The lack of working capital entrenches tight margins for all parties.** The need for cash exacerbates seasonal price trends by limiting the ability for growers to hold onto in-shell pecans to sell when markets improve, thus reducing profits for growers. Additionally, because shellers are paying for pecans in cash but selling on credit, a risk premium is built into sales prices for in-shell, lowering the price paid to growers. Yet even with that risk premium, shellers can easily misjudge the market and suffer substantial losses, historically resulting in consolidation and even more limited competition for in-shell. Finally, the lack of capital limits the capacity of the industry to invest in the very strategies that would raise the value of pecans.

4) **A mismatch in contract terms** between when shellers secure sales contracts with retailers and when in-shell pecans are purchased simultaneously **limits the ability for shellers to push prices higher, creates substantial financial risks for shellers, and restricts the price upside for in-shell pecans.** Effectively, because the price for shelled pecans is largely established before the start of the harvest when neither supply nor demand conditions are known, price increases for both shelled and in-shell are typically delayed until the following season, if they occur at all.

KEY QUESTION AND FINDINGS: PRODUCT DIFFERENTIATORS

Key Question:

To What Extent Do **Specific Product Differentiators** Affect the Price of Pecans?

Key Findings:

- **The shell-out yield has a significant influence on the price of in-shell pecans**, reflecting the fact that the value of the pecan is in the kernel, not the shell. On average, a 5% difference in shell-out resulted in roughly an 10% difference in price, or about $0.20/lb. on an in-shell basis.
- **The size of the pecan had a limited impact on the price of in-shell pecans, but it did make a difference for halves.** Outside of Chinese buyers, the nut count had a minimal impact on the in-shell price paid to growers. For every 10 nuts in a pound, in-shell prices only moved $0.03 per point. The size of the pecan had a greater influence once shelled as mammoth and junior mammoths had a distinct premium relative to jumbo or extra-large pecans. The price premium for size was greatest between junior mammoths and jumbo pecans ($0.09/lb.) with more modest and more volatile premiums between mammoths and junior mammoths and jumbo and extra-large pecans.
- **Outside of China, the pecan variety had no measurable impact on price that could not be explained by other factors.**
- **Organic pecans do carry a premium over conventionally produced pecans both for in-shell and at retail.** However, the size of the market remains small.
- **The state of origin has no measurable impact on price after accounting for other factors.** The country of origin – particularly North American versus South African pecans – can influence prices, but it only appears to matter for certain customers. For instance, China has a clear preference for South African pecans, while European traders prefer U.S. or Mexican supply.
- **Various international destinations are willing to pay premium prices for pecans over and above the commodity value.** Positively, the U.S. has been able to supply many of the higher value, but lower volume, markets, like Korea and Taiwan.

EXECUTIVE SUMMARY: WEIGHTING OF PRICE DRIVERS

PRICE DRIVER		IN-SHELL	SHELLED	NOTES
Supply & Demand	Harvest Size	Major	Minimal	Impact on shelled prices is only seen in the following year
	Inventory	Modest	Modest	Changes in inventory only matters in the following season or during the off-season
	Imports	Minimal	Modest	
	Int'l Demand	Minimal	Major	Most years int'l demand has only a minimal impact on in-shell prices, but it can be a major determinant if a player like China enters the market
	Dom. Demand	Minimal	Modest	
	Competition	Minimal	Minimal	
	Seasonality	Major	Modest	
Industry Structure	Lack of Data	Modest	Modest	Mostly dampens price movement rather than moves it
	Limited Competition	Major	Major	Arguably the biggest factor for both in-shell and shelled, impacting many of the other price drivers listed
	Lack of Capital	Modest	Modest	
	Contract Terms	Major	Major	For in-shell, contract calendar results in changes to the market balance not being reflected in price until the following year; For shellers, it reduces bargaining power
Product Differentiators	Shell-out	Major	N/A	
	Size	Minimal	Modest	In-shell size only has a major price impact for China; halves size do matter but mostly on the junior mammoth-jumbo divide
	Varietal	Minimal	Minimal	
	Organic	Major	Modest	Significant price difference but a small market
	Origin	Modest	Modest	Only matters in country of origin rather than state
	Destination	Major	Modest	

SECTION 2

Methodology & Data Availability

PROJECT METHODOLOGY: QUANTITATIVE

The foundation of this ambitious project was a comprehensive review of pecan market data in order to identify and measure the key factors guiding pecan prices both today and historically.

There were four key data sources that provided the bulk of the underlying data supporting this project. U.S. government data provided limited but key fundamental statistics such as imports, exports and cold storage on a monthly basis. Annual balance table data from USDA as well as data from the U.S. Agricultural Census provided less frequent but more holistic information. Given the limited government sources, the private industry has partially filled the gaps. American Pecan Council's monthly position report provided important insights into market fundamentals with more detail than USDA over the last several years, while Strata Markets provided one of the few sources of aggregated pricing data available today. Lastly, key retail data was sourced from Circana.

While none of these data resources were perfect or very detailed in their own right, through cross-referencing different resources as well as the utilization of secondary research and qualitative interviews our team was able to triangulate this study's findings.

U.S. Government

American Pecan Council

Strata Markets

Circana

PROJECT METHODOLOGY: QUALITATIVE

Given the admittedly imperfect data on the pecan industry, our team endeavored to interview a diverse array of industry stakeholders with exposure to different parts of the supply chain. Interviews were conducted confidentially in order to gather as much candid feedback as possible.

These interviews helped gather critical insight into the drivers behind any price relationships as well as inform which recommendations would be most impactful on bolstering profitability within the industry. Interviews were also supplemented with an analysis of all available past research on the pecan market, the most relevant of which were the Strategic Plan work done by the Boston Consulting Group in 2018 as well as the price, marketing and supply chain research conducted by Professor Oral Capps in 2023.

23
Total Stakeholder Interviews[1]

12
Growers

9
Shellers

6
Traders/Retailers/ Industry Experts

[1] Some interviews were counted in more than one category

NOTE ON DATA AVAILABILITY: PRICES

One of the primary challenges in accurately assessing pecan prices, or even pecan markets in general, is the lack of data. First and foremost, there is very little available data on pecan prices, but our team has sought out to triangulate information from multiple sources to create a relatively comprehensive analysis.

Prior to this current season, USDA reported prices of in-shell pecans paid to growers during the peak of the harvest season across several different regional offices (commonly referred to as **Shipping Point** prices). However, the data available is not uniform and does not include individual trades. Instead, the weekly reports are meant to show a general market trend. Unfortunately, this data is no longer being published, but it does provide a historical dataset for prior seasons.

USDA also publishes year-end estimates of average in-shell prices paid to growers in the **Fruit and Nut Yearbook**, and more granular data every five years as part of the **U.S. Agricultural Census**. The **American Pecan Council** also includes average price estimates as part of their year-end handler survey. Given the infrequency of all of these datasets, and focus solely on in-shell, their primary utility is in identifying long-running trends.

The most reliable – and auditable – series of price data available can be attained through calculating the average unit value of import and export trade volumes as published by the **U.S. Census Bureau** on a monthly basis. Unfortunately, this data has drawbacks as well. First, it only captures trade that crosses international borders, so it fails to give a comprehensive look at the domestic market, which consumes an estimated 93% of U.S.-grown pecans. Second, beyond differentiating between shelled and in-shell, the export data is unable provide much insight into the quality, type or other differentiating factors of the pecans imported or exported.

More recently, a private company, **Strata Markets**, has begun publishing data on pecan trades, bids and offers – both in-shell and halves and pieces. It is the most detailed of any of the available pricing data on pecans, and Strata Markets was exceedingly helpful in providing their full dataset to our research team for this project, which was a major boon for this report. However, given that Strata Markets has only been publishing data for two full seasons, and the sample sizes are small, the data has clear limitations as part of a historical analysis.

Finally, our team analyzed retail data from **Circana** that includes the volume and value of pecan sales – and nut sales more generally – over the last five years. However, that data is limited only to retail and has some notable difficulties in ascertaining the quantity of pecans as part of a mixed nut offering.

Given this reality, our team endeavored to cross reference multiple sources of data where possible and combine data analysis with stakeholder interviews to put the pieces of this complex puzzle together.

NOTE ON DATA AVAILABILITY: SUPPLY & DEMAND

Beyond simply data on prices, **there is surprisingly little data available on pecan market fundamentals.**

Critical metrics such as pecan production, shell-out/yields, and domestic utilization are only updated annually by USDA and have a significant lag to the data. In fact, USDA will not publish the **Fruit and Tree Nut Yearbook** for the 2024/25 harvest season until near the end of February 2026 by which point almost all of the 2025/26 harvest and in-shell sales have already been completed. Gratefully, the production statistics in the Yearbook are based on the **May NASS survey**, so we are able to get an estimate prior to the Yearbook's publication, but even that May data is noticeably lagging the market. The **U.S. Agricultural Census** does provide some more granular data on a state and county level, but that is only published every five years. While this data is helpful in examining the past, it is of little use to market participants looking to negotiate prices with their customer.

Positively, the U.S. government does report on in-shell and shelled inventories in their **Cold Storage** report as well as **international trade** on a monthly basis, but that data is a far cry from a holistic supply-demand balance table. Gratefully, to fill the void of government data, the **American Pecan Council publishes a position report** derived from a handler survey, including receipts, inventory, domestic sales, outstanding commitments and international sales (among other statistics). However, the monthly position report only goes back to 2018 with the creation of the marketing order, making monthly historical analysis challenging. Additionally, our qualitative interviews with market participants and deep familiarity with the data through publishing the APC's monthly Pecan Market Analysis have highlighted some of the imperfections in the data.

For this research project, our team has done its best to fill in the data gaps. We have utilized data from all the sources listed above as well as other private sources where available. However, we also fully recognize the imperfections in each of the datasets. Qualitative interviews have helped verify and challenge our data findings, making the analysis stronger as a whole.

One final data note, there is limited consistency across datasets with regards to their annual reporting. Most reports use marketing years, but even then, not all marketing years are the same: USDA uses October to September, but APC uses September to August. Being in the Southern Hemisphere, South Africa's marketing year is naturally inverted. Some other reports, like the U.S. Agricultural Census or Mexican production data use the calendar year. **Where feasible, our team uses standard APC reporting by Marketing Year September to August. If an analysis uses a different breakdown, that difference is explicitly noted.**

“WHAT PECAN PRICES ARE WE TALKING ABOUT?”

One of the critical challenges of this research is how to identify and disaggregate trends across the three main pecan markets: **in-shell**, **halves** and **pieces**.

Each of these distinct products could justify a research report within themselves. Overall, **the following report will include data and analysis across all three with a particular focus on how the in-shell and shelled markets interact with one another.** Unfortunately, there is very little data available that includes a breakdown between halves and pieces. As such, this research project will primarily reference “shelled” markets as inclusive of both halves and pieces with differentiation noted where possible.

Finally, when analyzing pecan prices, our team makes a distinction between what moves the “**base price**,” which is defined as the commodity value of pecans, and what factors can create **premiums**, or conversely **deductions**, relative to the base price – whether quality factors like shell-out or marketing differentiation like state or country of origin.

The analytical section of this report will first identify what moves – or often fails to move – the base price for both in-shell and shelled, followed by an examination on how the structure of the pecan industry influences the price paid for pecans, and finally what differentiating factors can affect the final sales price for individual shipments.

SECTION 3

Pecan Supply & Demand

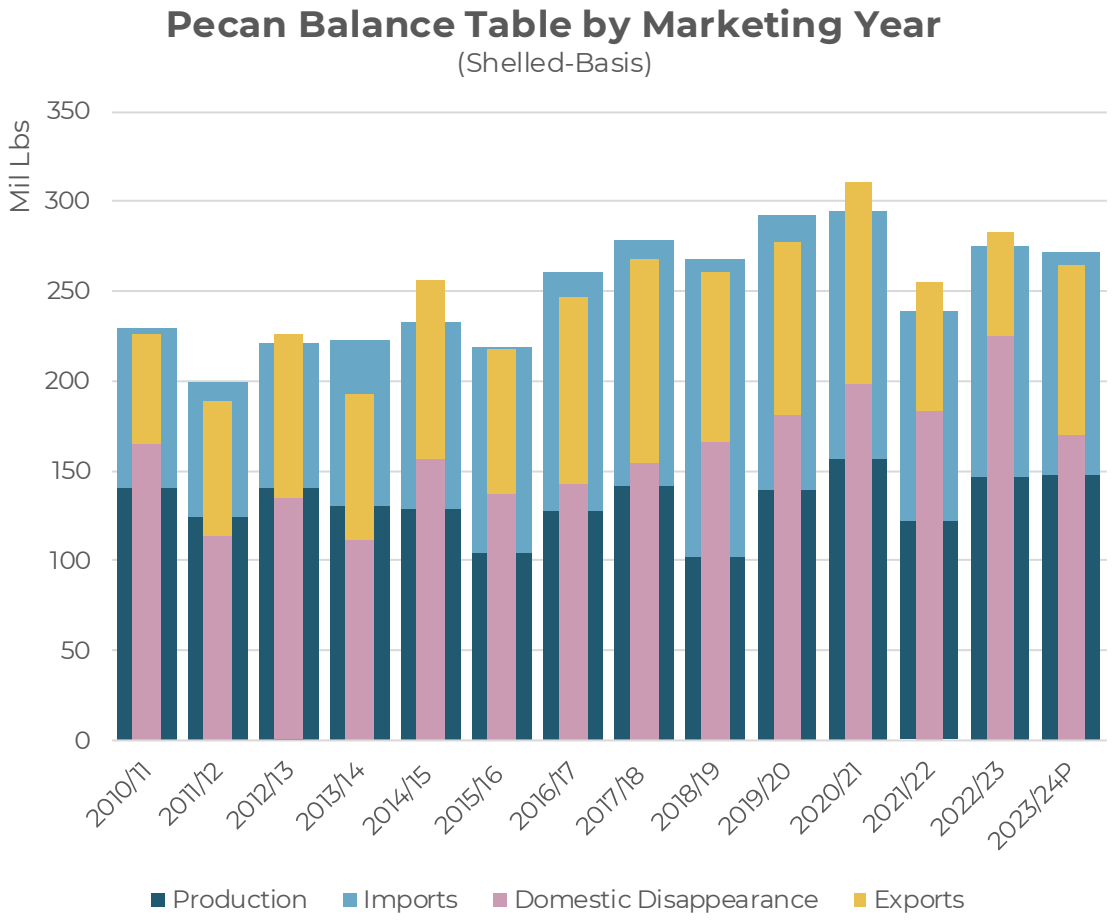
SUPPLY AND DEMAND FUNDAMENTALS: INTRODUCTION

In a textbook commodity market, pecan prices would simply be driven by supply and demand. An increase in supply would push down prices, while increases in demand would boost returns. **And yet, there are few if any textbook markets, and the U.S. pecan market certainly isn't one.**

According to our qualitative interviews, given the lack of real-time, or trusted, data available to market participants, supply and demand are typically ascertained via word of mouth or local harvest conditions. USDA's Cold Storage and APC's position report are effectively the only datapoints available on market fundamentals that are published during the harvest and marketing season. Meaning, **most growers, brokers, accumulators, shellers and retailers are flying blind on market fundamentals during the season, largely using last season's conditions as a guide to be combined with the latest market chatter.**

Yet despite the challenges, the data would suggest **supply and demand does play a critical, if limited, role in influencing the base price for both in-shell and shelled pecans,** even if participants are not able to see the data in real-time (but that too influences how fundamentals affect prices).

Figure 3.1



Source: USDA Fruit and Nut Yearbook

2023/24 data is preliminary

KEY QUESTION AND FINDINGS: SUPPLY & DEMAND

Key Question:

To What Extent Do **Supply and Demand Fundamentals** Affect the Price of Pecans?

Key Findings:

1) **The total market balance – as reflected by stocks to use or change in inventories – only affects price in following season**, for both in-shell and shelled. In other words, if demand runs stronger than supply in 2024/25, prices for both in-shell and shelled won't react until the 2025/26 season.

2) **In-shell pecan prices are primarily driven by changes in supply.** On average, for every additional 10 million lbs. of pecan kernels harvested, in-shell prices decreased by $0.30 per point. The emergence of an aggressive international buyer of in-shell pecans would also improve prices but primarily in the season that followed. Changes in domestic demand appear to have no impact on in-shell prices.

3) **Shelled pecan prices are primarily driven by changes in demand,** particularly export demand. For every 10 million lbs. of pecans exported on a shelled basis, shelled prices rose by $0.33 per pound; for every 10 million lbs. of pecans consumed domestically, shelled prices increased by $0.05 per pound. Supply had only a minimal impact on shelled prices, wherein every additional 10 million lbs. of pecan kernels harvested decreased shelled prices by $0.02 per pound.

4) **There is no data to suggest that pecan prices are heavily influenced by the prices of other nuts.** Pecan prices were correlated with an aggregation of tree nut prices, but primarily due to major international buyers purchasing multiple nuts at the same time rather than pecans competing with walnuts, almonds or any other nut.

5) **In-shell pecan prices do vary seasonally**, peaking right as the Eastern harvest begins and before the holiday and gift pack market rush. Prices then ease as the season progresses, only to climb again in March as the harvest concludes and supplies are at their low-ebb. Pecan pieces and prices at retail also rise in advance of the Thanksgiving and Christmas holidays. Conversely, there is no evidence supporting the assertion that halves prices are seasonal.

SUPPLY AND DEMAND FUNDAMENTALS: INTRODUCTION

In order to assess how much market fundamentals influence pecan prices, our team examined:

1) The relationship between in-shell prices and supply and demand factors, including harvest size, inventories, domestic consumption and exports;

2) The relationship between the price paid for halves and pieces and those same market fundamentals;

3) Whether pecan prices are correlated – and thus in competition with – other nuts; and

4) The degree to which seasonality impacts the prices for both in-shell and shelled pecans.

Our team utilized an array of data to triangulate the impact of market fundamentals on pecan prices. The Fruit and Nut Yearbook was a critical component of the historical analysis as the only complete balance table for pecans prior to the American Pecan Council's formation. This data was then supplemented with data from other U.S. government sources, the American Pecan Council, Strata Markets, and retail data from Circana.

HOW ACCURATE ARE THE PRICES IN THE FRUIT AND TREE NUT YEARBOOK?

Before moving on, it is worth examining whether we can rely on the supply, demand and price data supplied by USDA's Fruit and Nut yearbook given the importance of this dataset to the study's conclusions.

As there is a substantial lag from the completion of the season to the publishing the Fruit and Tree Nut Yearbook, we should hope that the time was used to make the data as accurate as possible.

Gratefully, we can assess the accuracy of the data by comparing prices received by growers as reported by USDA to the average unit values for U.S. in-shell exports to Mexico as reported by the U.S. Census Bureau. The prices for in-shell exports would need to be verified by a commercial invoice, so the data should be considered reliable – albeit subject to small sample size bias at times. Given the substantial trade of in-shell pecan to Mexico only to be re-exported back to the U.S. as halves and pieces, U.S. in-shell exports to Mexico should provide a reasonable proxy for market prices, at least in the western growing regions.

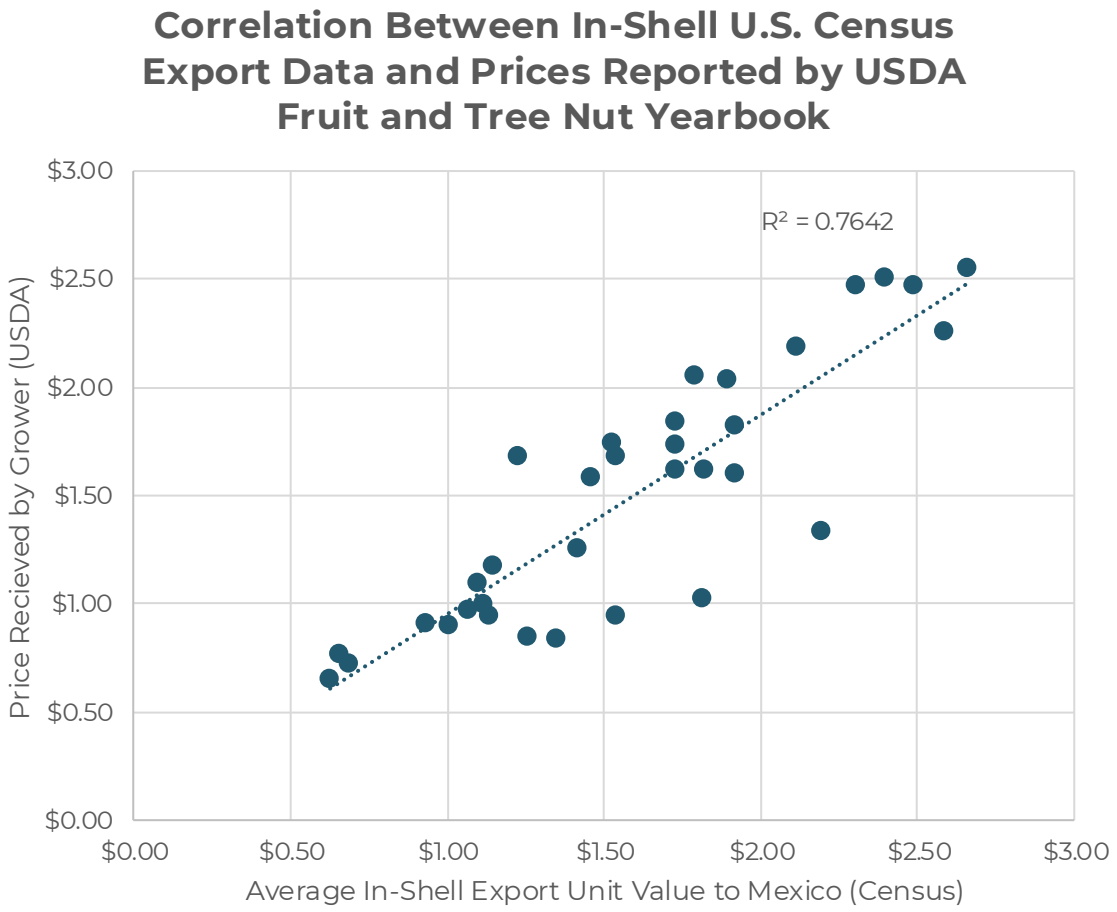
Positively, as shown in the graph on the right, with the exception of the last few years, the data lines up nearly perfectly between the two datasets.

- We dive into more detail on the reason for the recent divergence on Page 47, but the long and short of that analysis is that we should have a relative confidence in the Fruit and Tree Nut Yearbook's data.

Overall, while no pecan dataset can be considered perfect, we should consider the in-shell prices reported by USDA as sufficiently reliable – at least when conducting historical analyses.

Additionally, the supply and demand information lines up closely with APC handler data from the last several years, suggesting that, at the very least, they are all equally incorrect (but hopefully equally accurate!). There is no other dataset prior to the APC to reasonably compare to USDA's estimates. So, for the historical analysis, while it may not be perfect, it is the best and only data available.

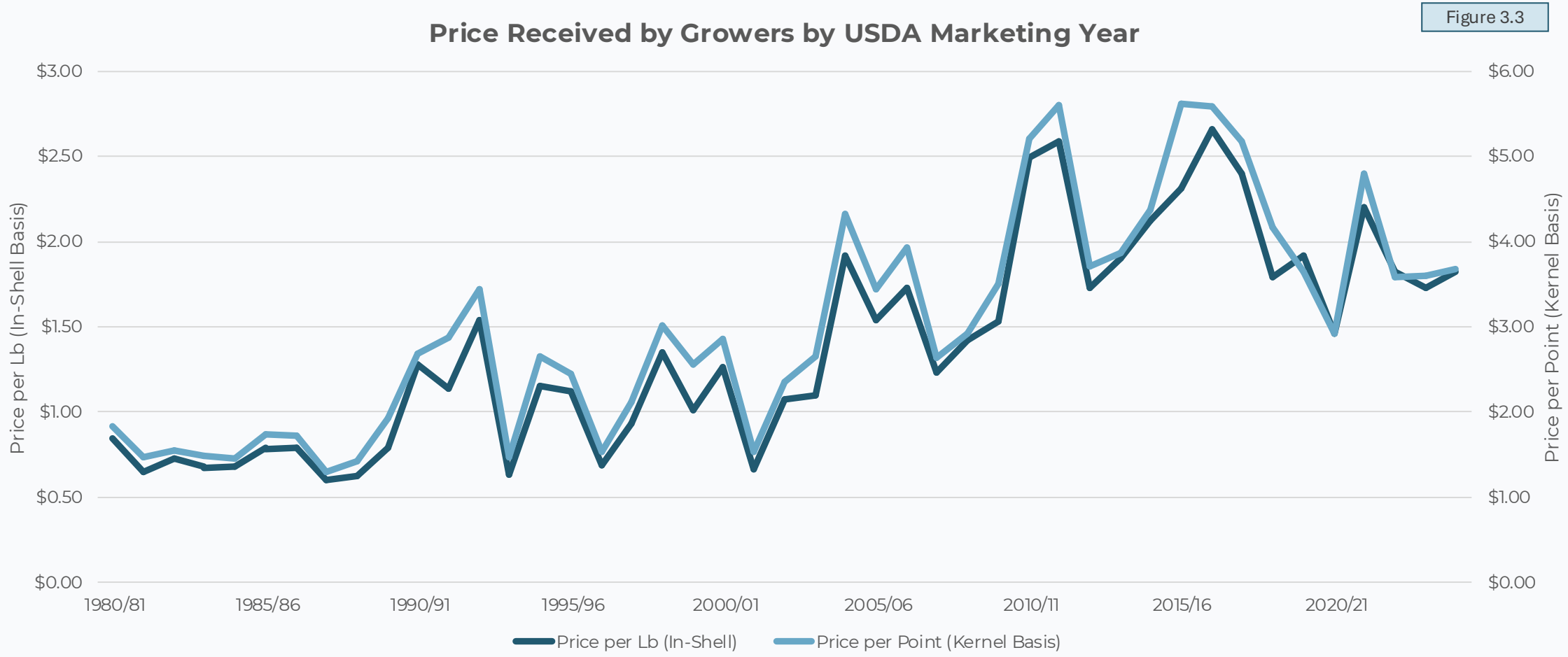
Figure 3.2



Source: USDA, U.S. Census Bureau

TO WHAT EXTENT DO SUPPLY AND DEMAND FUNDAMENTALS AFFECT THE PRICE OF PECANS?

Figure 3.3



Source: USDA Fruit and Tree Nut Yearbook

SECTION 3

Pecan Supply & Demand

SECTION 3.1

In-Shell Fundamentals

Supply & Demand Balance: Does It Move In-Shell Prices?

Using data from USDA's Fruit and Tree Nut Yearbook as the most comprehensive data available on prices and the general balance table, we can analyze how closely in-shell prices received by growers matched supply and demand conditions over the last several decades.

If supply and demand fundamentals played a major role in price setting, the first indicator would be whether in-shell prices generally correlate with stocks-to-use, which is a useful proxy for the supply and demand balance of a given season. While stocks-to-use can be calculated in a few different ways, our team used two primary methods:

Ending Stocks-to-Net Use:

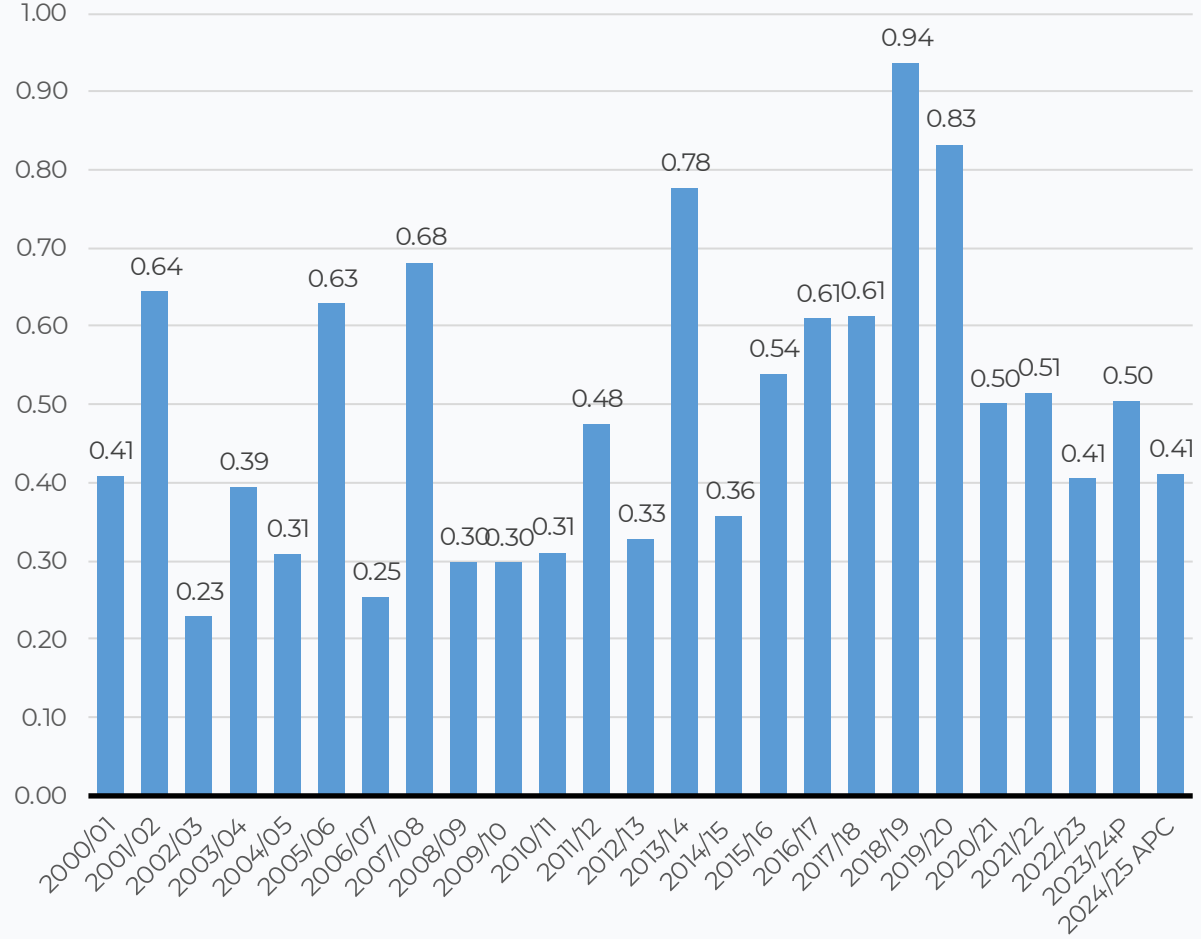
- Calculation: Ending Stocks / (Domestic Utilization + Exports – Imports)
- Assesses how much inventory there was at the conclusion of the season compared to how many pecans were utilized in a given season adjusting for the level of imports.
- Effectively it measures the balance of supply and demand for U.S. pecans in a given season.

Beginning Stocks-to-Total Prior Season Use:

- Calculation: Beginning Stocks / (Domestic Utilization + Exports)
- Assesses how much inventory there is at the start of the year compared to total consumption the year-prior. Excludes imports as it assumes imports would be filling what is demanded rather than part of the aggregate demand picture.
- Basically, it assesses supply conditions coming into the season with demand from last year as a proxy for demand expectations in the year ahead.

In both instances, the higher the number, the greater supply is relative to demand.

Figure 3.4



2023/24 data is preliminary, 2024/25 is based on data from the American Pecan Council
Source: Loux Analytics, USDA Fruit and Nut Yearbook

Supply & Demand Balance: Does It Move In-Shell Prices?

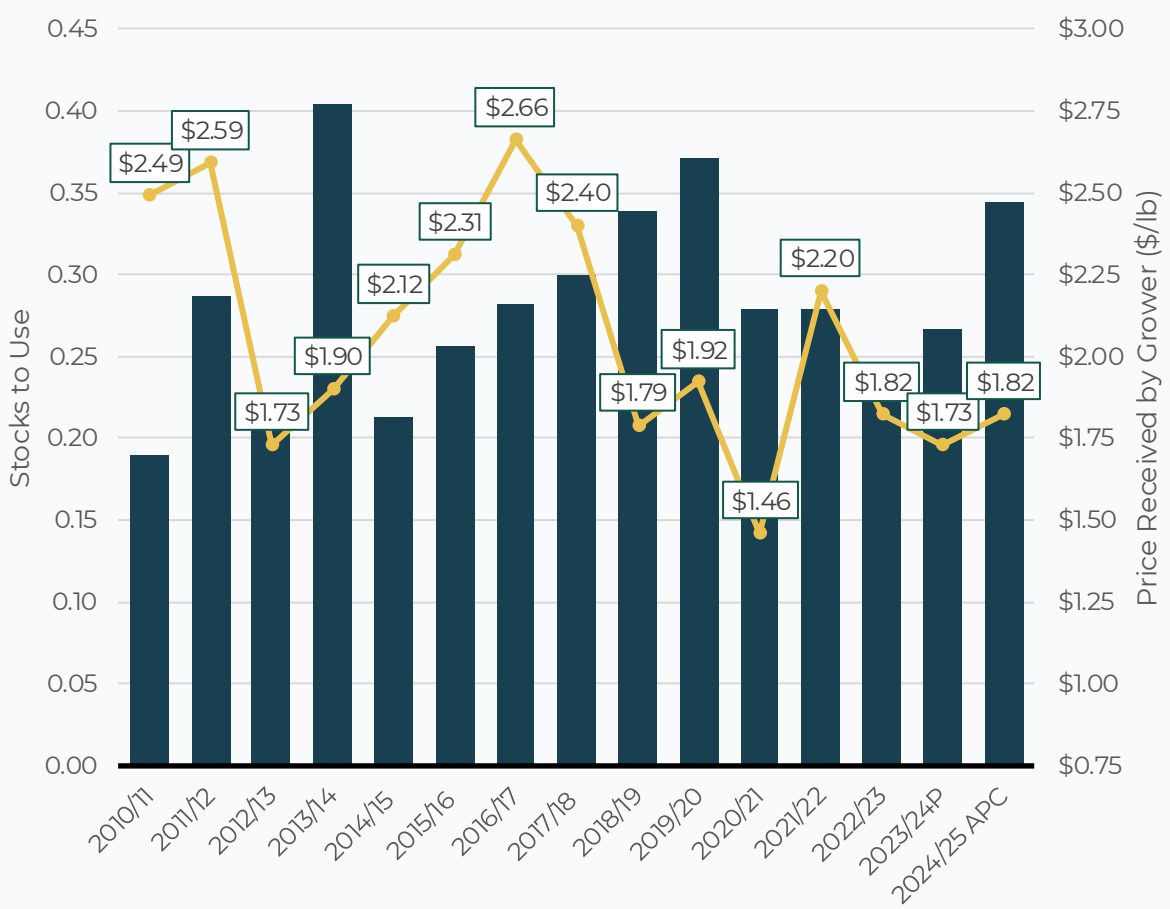
Looking first at the ending stocks-to-net use, there is fairly weak correlation with in-shell prices. For instance, in the 2012/13 season, ending stocks-to-net use declined, which would imply a tight market situation. However, that same year, prices plummeted. Yes, production did rise in that year, but both domestic utilization and exports did as well. Conversely, the following year, inventories relative to demand rose dramatically as domestic sales and exports declined, suggesting a soft market. Nonetheless, in-shell prices paid to producers rose. There are plenty of similar examples throughout the last decade.

In short, according to the data, **there is virtually no correlation between the ending stocks-to-net use and the in-shell price paid to growers as demonstrated in Figures 3.5 and 3.7.**

Meaning, **the average in-shell price of a given season does not correlate to the aggregate supply and demand of that particular season.**

Given the dearth of real-time data on market fundamentals and timing of the harvest relative to consumption, this lack of correlation should not be particularly surprising.

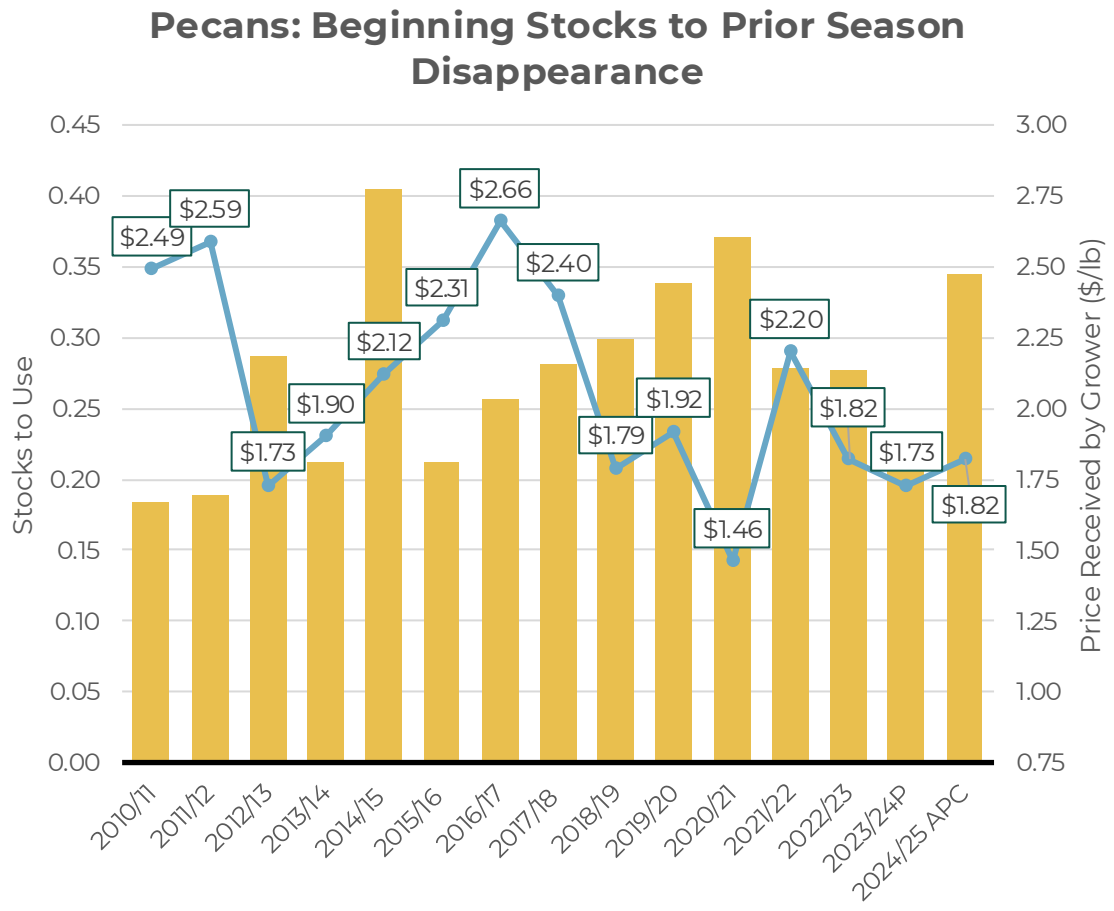
Figure 3.5



2023/24 data is preliminary, 2024/25 is based on data from the American Pecan Council
Source: Loux Analytics, USDA Fruit and Nut Yearbook

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Figure 3.6



2023/24 data is preliminary, 2024/25 is based on data from the American Pecan Council
Source: Loux Analytics, USDA Fruit and Nut Yearbook, American Pecan Council

While by no means perfect, there does seem to be more of a connection with prices and the supply and demand fundamentals from the season prior.

As shown in the scatterplot in Figure 3.8, the higher the stocks-to-use from the prior season, the lower the in-shell price for the year ahead. There is still not a 1-to-1 correlation, but the trend is surprisingly robust.

Translating this into actionable findings, rather than prices reflecting the current season's supply and demand, the data appears to show that **in negotiating prices, market participants are (consciously or not) weighing the state of inventories at the beginning of the marketing year and basing their expectations for the upcoming year's orders on the season before.**

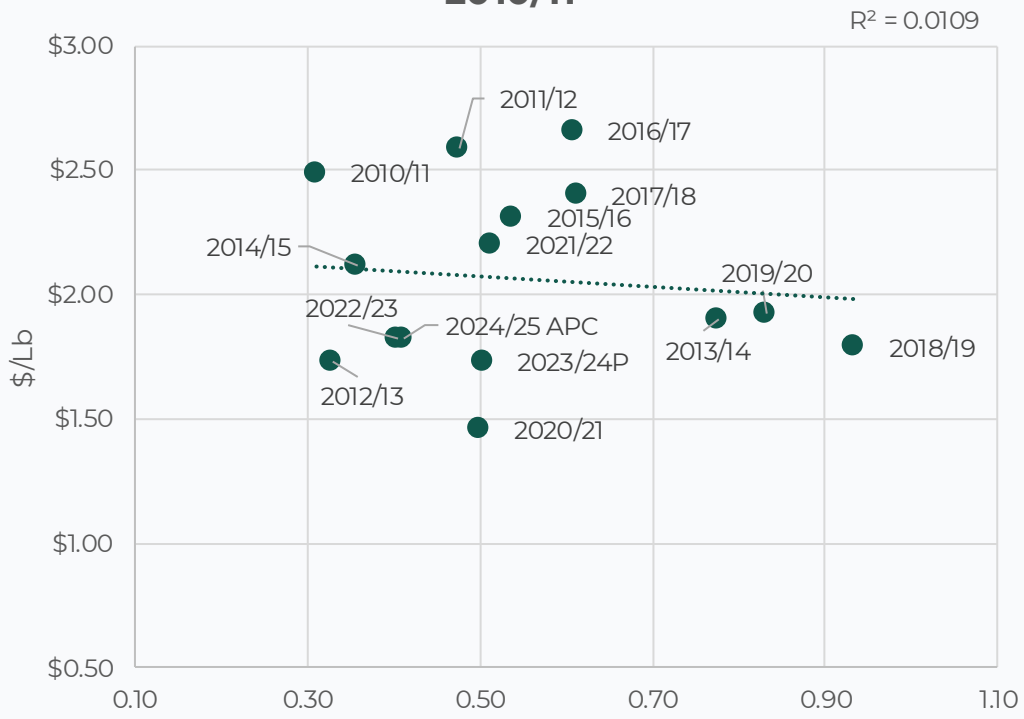
As will be discussed in greater detail later, the structure of the pecan industry likely also plays a critical role in this correlation. Given how USDA calculates their season, the harvest and marketing of pecans occurs right at the start of the marketing year, while the majority of the utilization (when it leaves inventory and is delivered to retailers or other customers) occurs at the tail of the season. Additionally, as many of the retailers are booking orders for the year in advance prior to the harvest, it helps further explain why the **supply and demand from the season before is a better predictor of the prices for the year ahead than actual supply and demand in the current season.**

In short, there is a substantial lag in in-shell prices and market fundamentals – a reality likely exacerbated by lack of real-time data.

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Figure 3.7

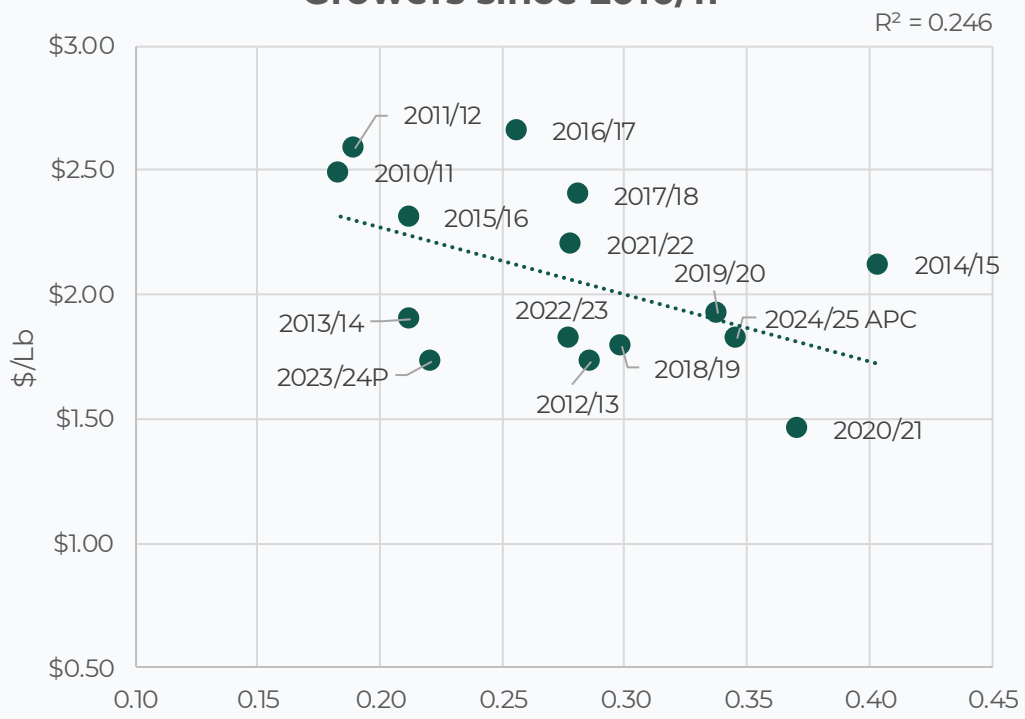
Correlation Between Ending Stocks to Net Use & Price Received by Growers since 2010/11



Source: Loux Analytics, USDA Fruit and Nut Yearbook, American Pecan Council

Figure 3.8

Correlation Between Beginning Stocks to Prior Season's Use & Price Received by Growers since 2010/11



Source: Loux Analytics, USDA Fruit and Nut Yearbook, American Pecan Council

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Adding further evidence to the theory that there is a noticeable lag in prices compared to shifts in the market fundamentals, if we examine the change in inventories over the season prior compared to the change in prices during that time, there is a clear, if imperfect, connection between inventories gaining over the season prior and prices falling (as well as the inverse, inventories being drawn down and prices improving). (See Figure 3.9 on the next page)

Furthermore, if you examine the change in inventories over the particular season (ending stocks minus beginning stocks) in question to the change in prices compared to the year prior, the correlation completely breaks down (Figure 3.10). Meaning, **even if pecan inventories were drawn down over the course of a year, the average prices paid to growers would typically fail to improve in that season. However, they would rise in the season that follows.**

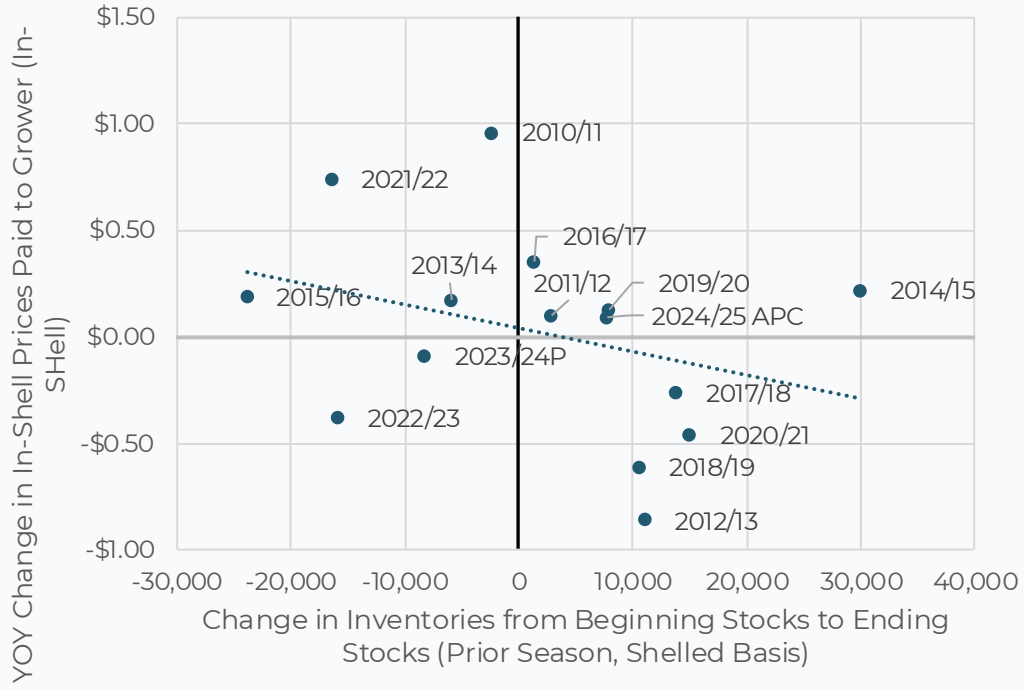
Examining market fundamentals through stocks-to-use and changes in inventory, **the data would suggest that the aggregate supply and demand balance only influences in-shell prices the following year.** Additionally, even if it does influence it the following year, the movement in prices is relatively modest. For instance, **on average, a 10% decrease in inventories from year-to-year, resulted in only a $0.01/lb. improvement in in-shell prices since 2009/10.**

This insensitivity could be the result of pecans generally carrying heavier inventories compared to other nuts. This would reduce the need for in-shell prices to react quickly to supply and demand changes given the relative abundance on hand even if inventories do tighten.

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Figure 3.9

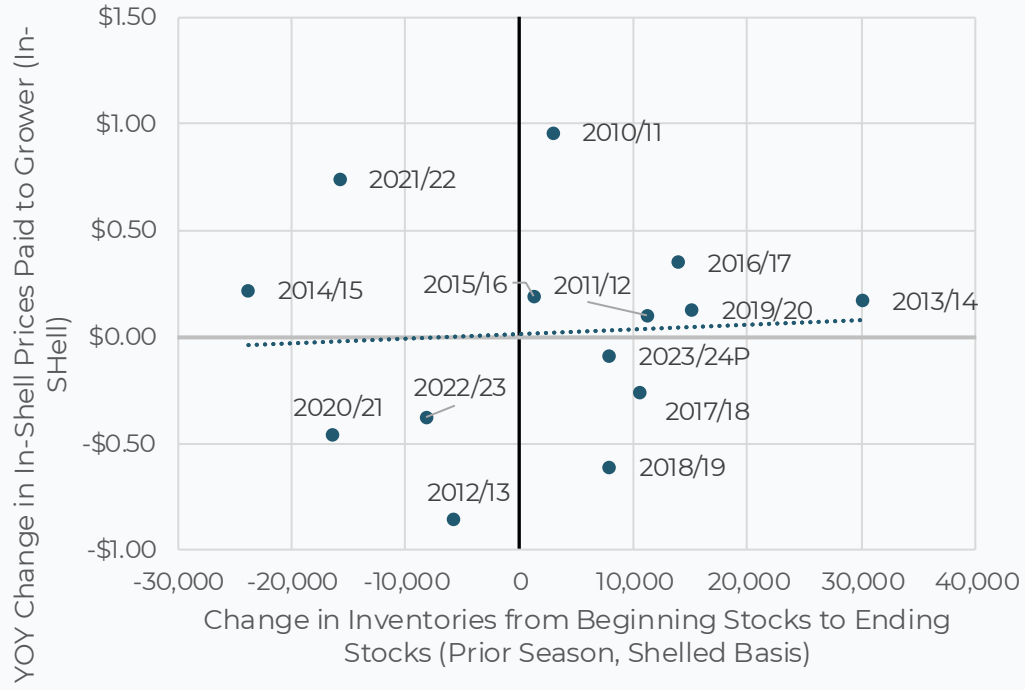
Correlation Between Change in Inventories During Prior Season and Change in Prices From Year-to-Year



Source: Loux Analytics, USDA Fruit and Nut Yearbook, American Pecan Council

Figure 3.10

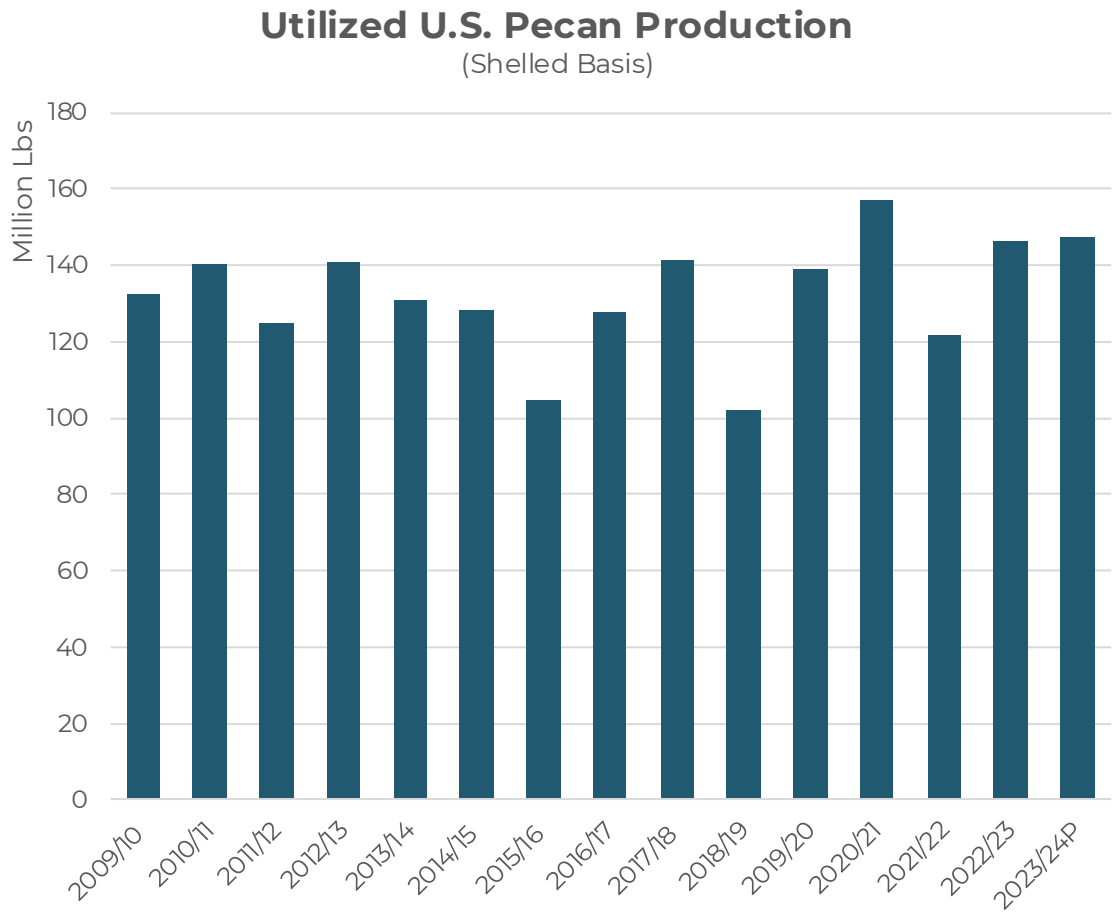
Correlation Between Change in Inventories During Current Season and Change in Prices From Year-to-Year



Source: Loux Analytics, USDA Fruit and Nut Yearbook, American Pecan Council

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Figure 3.11



Source: USDA Fruit and Nut Yearbook – data based on NASS May Survey

Stocks-to-use and changes in inventory attempt to reflect the supply and demand conditions as a whole. As shown, those factors only have a limited impact on in-shell prices, and usually not until the following season.

However, by isolating other variables and digging beyond the total market balance, our analysis shows that the size of the pecan harvest can have a noticeable influence on in-shell prices.

Supply is a much more influential driver of prices than in-season demand or even the aggregate supply-demand balance albeit with some notable exceptions.

Given this, in-shell pecans could be classified as a "supply-driven" commodity – at least since U.S. (and Mexican) production matured around 2010. Perhaps most interestingly, production volume even seems to matter for that particular season – in contrast to most other data points. This would suggest market participants are relatively aware of supply in the market in real time, even if demand and the market's overall balance is primarily based on the season prior.

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

As shown in Figure 3.12, there is a near-perfect correlation between U.S. pecan production[1] and the prices paid to growers in a given season. Basically, for 10 million lbs. of shelled pecans produced, there is about a $0.15/lb. decline in-shell prices.

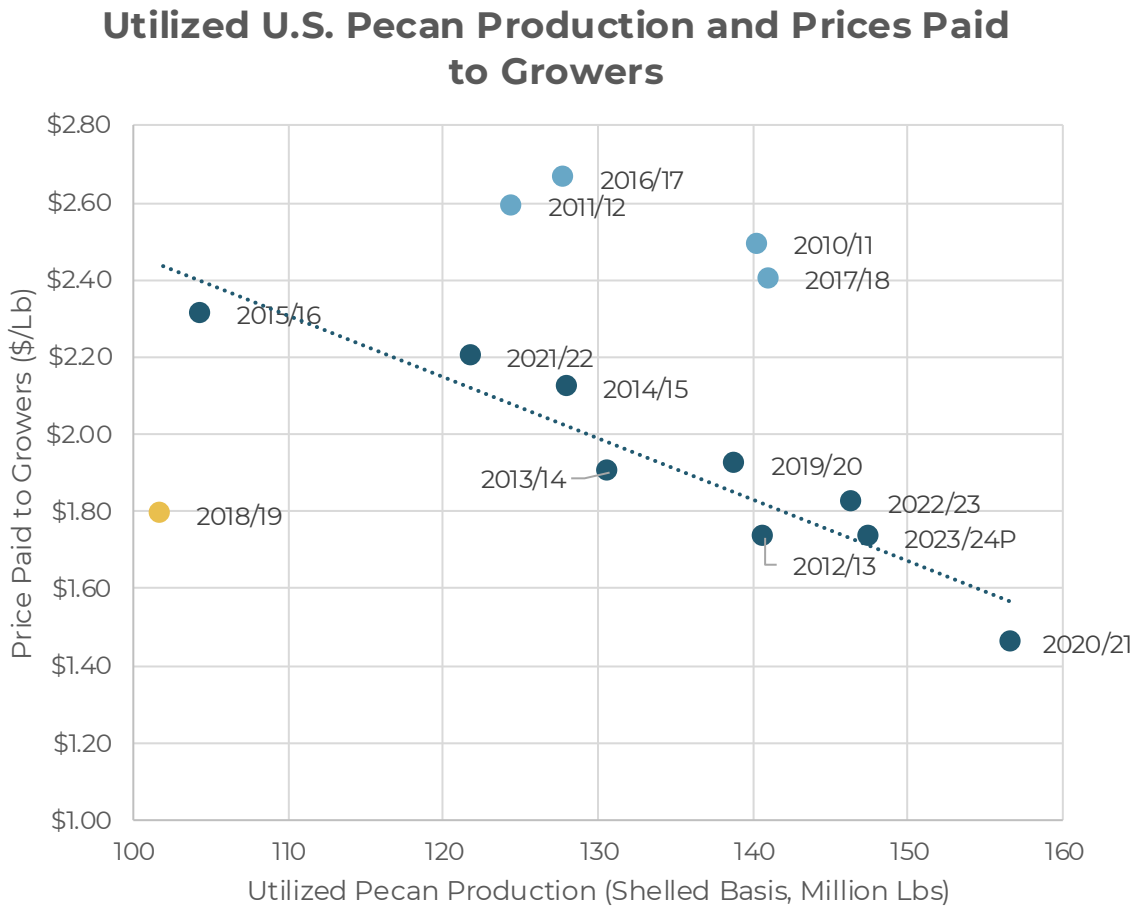
Additionally, given that pecan production has largely held static over the last 15 years, the absolute volume of production has a greater impact on prices than the change in production from year-to-year.

However, there are some notable outliers.

- Outliers where price is notably higher than implied by production: 2010/11, 2011/12, 2016/17 and 2017/18
- Outliers where price is notably lower than implied by production: 2018/19
- In general, the positive outliers seem to correlate with aggressive buying from China while the negative outlier in 2018/19 appears directly connected with the collapse of Chinese buying during the first trade dispute between the U.S. and China.

Taken together with prior analysis of the stocks-to-use and inventory changes, the data would suggest that supply is a much bigger driver of price than demand – unless that demand includes a sudden change in buyer behavior like China entering or exiting the market. And even then, active buying by China in 2023/24 didn't have a noticeable impact on prices nor did their more modest retreats in 2013/14 and 2021/22.

Figure 3.12



Source: Loux Analytics, USDA Fruit and Nut Yearbook, American Pecan Council

[1]Utilized pecan production reflects total production that enters the market, excluding much of the informal native supply.

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

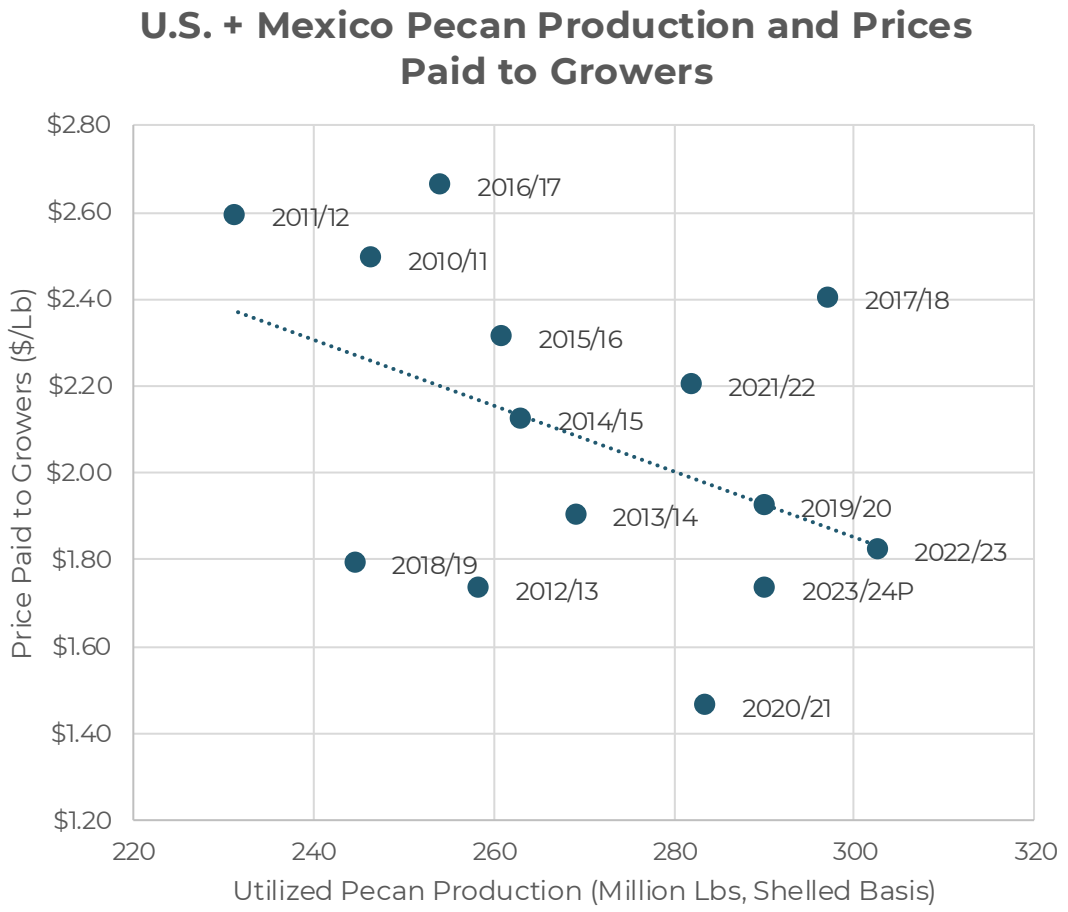
Interestingly – and a surprise finding to our team – despite their significance in the U.S. market, the correlation between supply and price weakens when Mexico's production is included in the total supply calculation as demonstrated in Figure 3.13. Similarly, there appears to be no connection between Mexican production and U.S. pecan prices (Figure 3.14). And even isolating for how many pecans are imported into the U.S. shows little connection with U.S. prices (Figure 3.15), despite import levels being correlated with total Mexican pecan production (Figure 3.16).

This consistent lack of connection and general positive momentum in domestic consumption growth would imply that the **imports from Mexico are largely filling a demand gap rather than necessarily weighing heavily on the in-shell market in the U.S.**

The only counter-example appears to be 2018/19, when an increase in imports from Mexico contributed to the collapse in prices despite U.S. pecan production being clearly weak. However, the price weakness that year was primarily connected to China's in-shell purchases collapsing that same year as China placed additional tariffs on U.S. products. Increased imports likely further weakened the market, but the primary culprit for an oversupplied market appears to be an import collapse in China, not a sudden surge in Mexican production.

This is not to say that U.S. and Mexican pecans are not competing with one another. As will be discussed in greater detail in later sections, the prices for shelled pecans sourced from the U.S. and Mexico are tightly connected (see Slide 148). **Still, Mexican-grown pecans appear to have limited influence on the U.S. in-shell prices.**

Figure 3.13

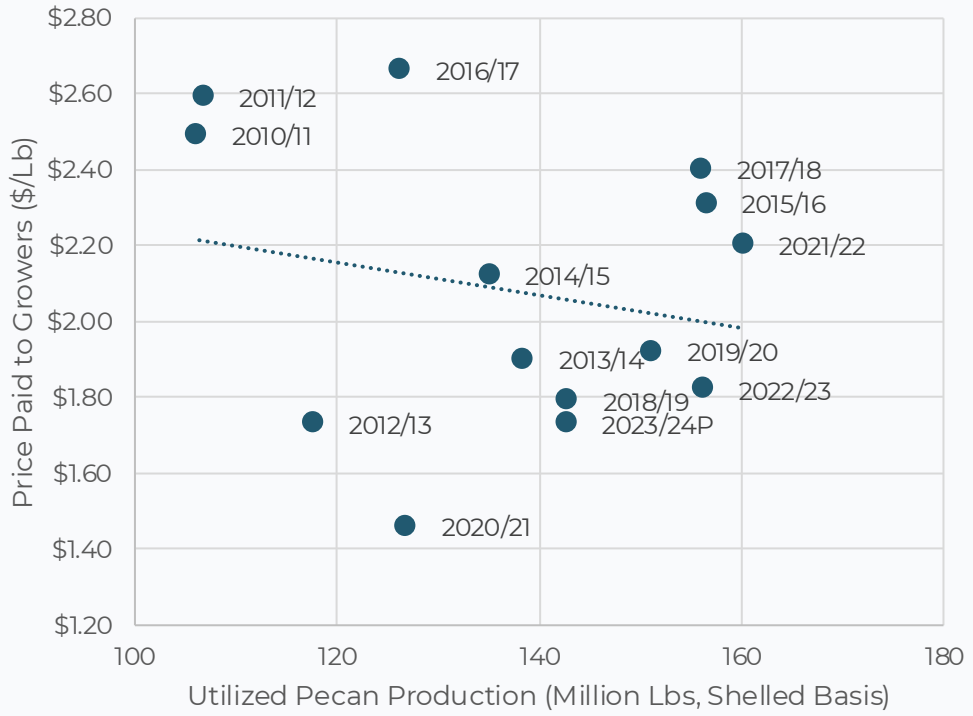


Source: Loux Analytics, Consejo Mexicano de la Nuez, USDA, APC

[1]*Utilized pecan production reflects total production that enters the market, excluding much of the informal native supply.*

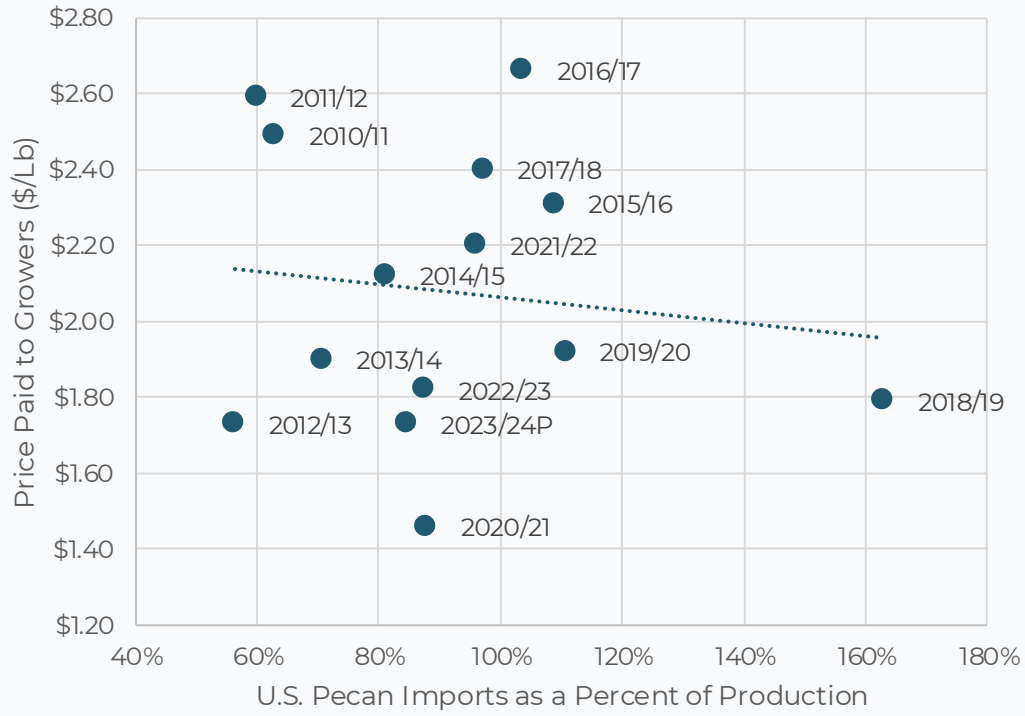
SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Figure 3.14



Source: Loux Analytics, Consejo Mexicano de la Nuez, USDA, APC

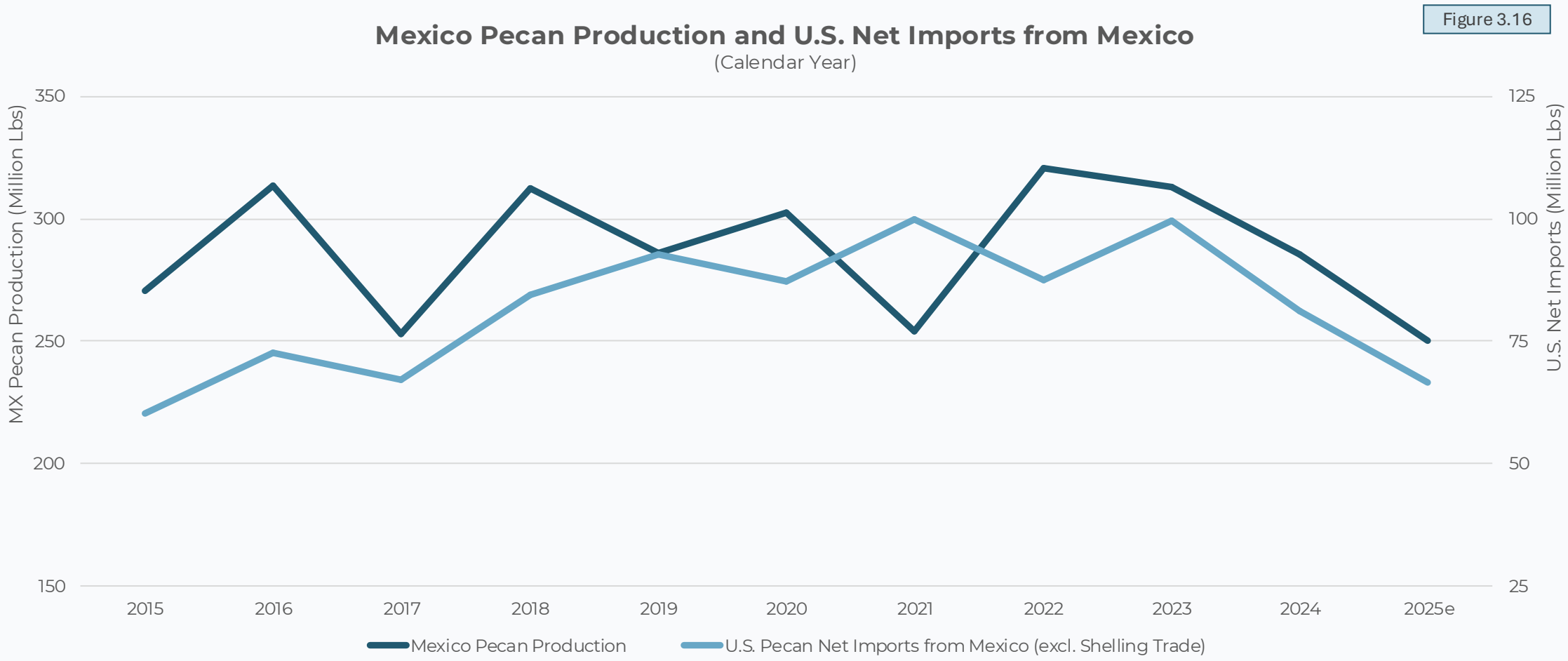
Figure 3.15



Source: Loux Analytics, Consejo Mexicano de la Nuez, USDA, APC

MEXICO PECAN PRODUCTION & U.S. IMPORTS

Figure 3.16



Source: Loux Analytics, Consejo Mexicano de la Nuez, U.S. Census Mexico production is pre-harvest estimate

Supply & Demand Balance: Does It Move In-Shell Prices?

If supply is such an important driver of in-shell prices, where does demand factor in? After several decades of stagnation, domestic utilization[1] of pecans has generally been growing over the last decade and a half. Unfortunately, **year-over-year increases in domestic demand has had virtually no impact on in-shell prices, even if delayed a season.** In fact, the modest-but-noticeable correlation between domestic demand and price is inverted, meaning the greater the domestic consumption, the lower in-shell prices paid to growers.

This finding would imply that pecan consumption is fairly elastic. Yet, as will be shown **in Section 3.3**, pecans largely do not compete with any other nuts and do not have any significant price correlation with other nuts, even walnuts.

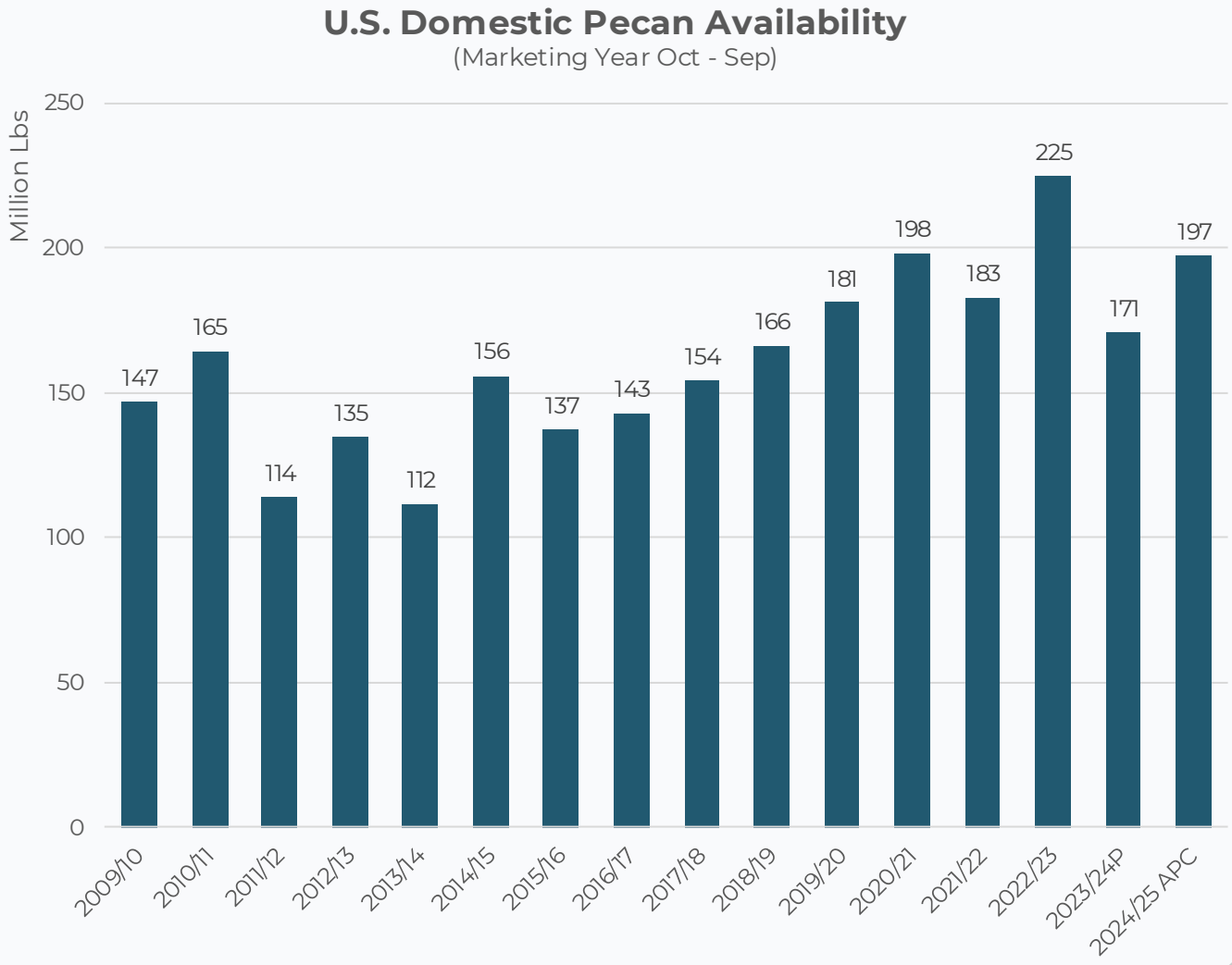
Perhaps, as prices increase, domestic consumers simply purchase fewer pecans. Insights gleaned from our qualitative interviews seem to suggest that **the domestic utilization statistic largely reflects the clearing of product,** yet there does appear some price sensitivity at retail as detailed in the following section.

Given the sharp decrease in old crop in-shell prices once the new season begins, there is limited incentive to hold onto inventory. As such, in years where there is an abundance of supply and/or limited competition from international buyers, like China, prices must drop in order to clear old-crop inventory.

Effectively, the data would suggest lower prices are very capable of buying domestic demand. However, there appears little incentive for domestic buyers to compete for in-shell pecans unless there is an aggressive external player, like China, also competing for supplies.

[1]Domestic availability or domestic utilization is a proxy for total consumption in the U.S. as it takes production + imports – exports + change in inventory to calculate a residual of how many pecans have been "utilized" somewhere in the supply chain

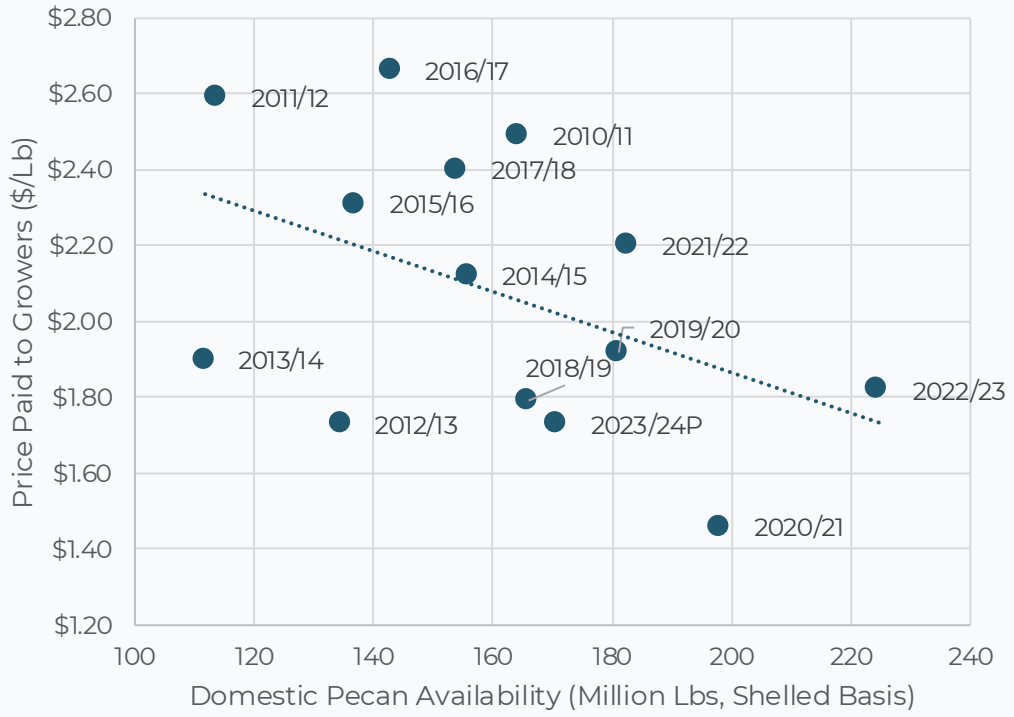
Figure 3.17



Source: USDA Fruit and Nut Yearbook

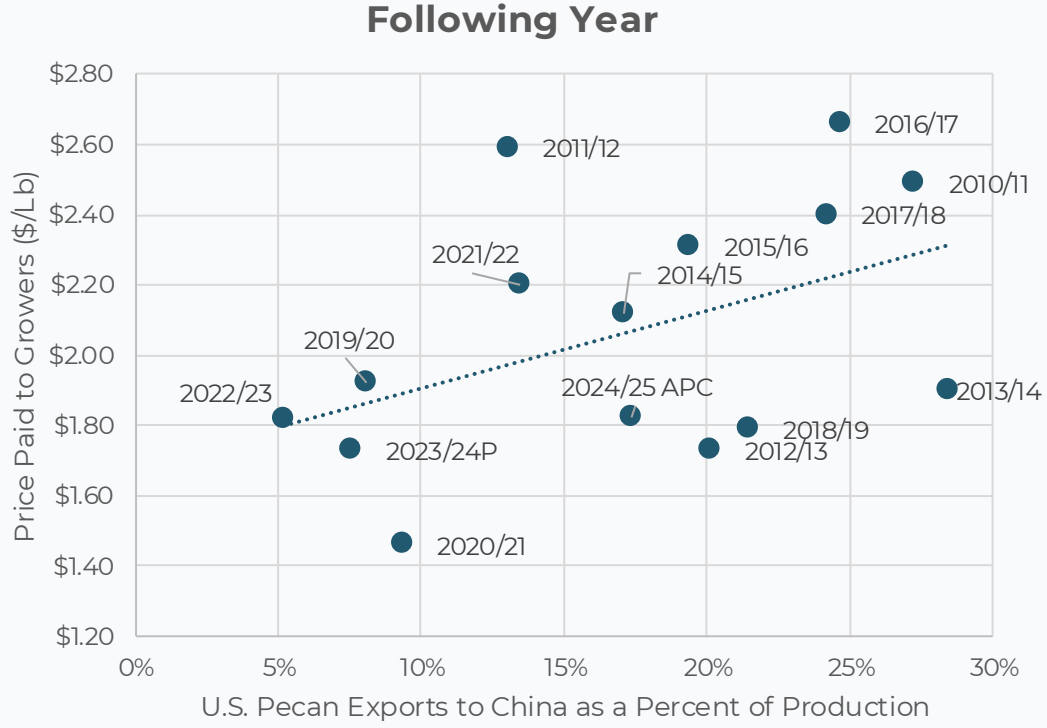
SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Figure 3.18



Source: Loux Analytics, USDA Fruit and Nut Yearbook

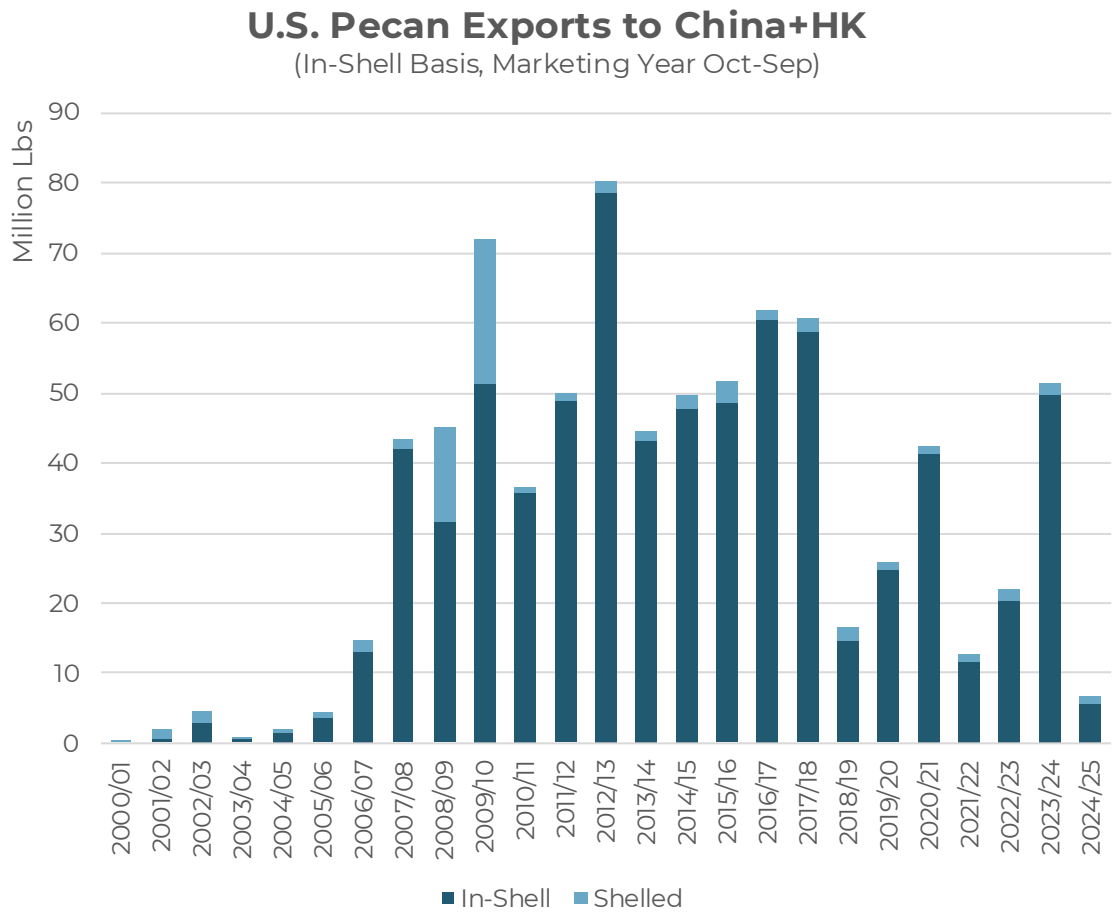
Figure 3.19



Source: Loux Analytics, USDA Fruit and Nut Yearbook

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Figure 3.20



Source: U.S. Census

While growing U.S. domestic demand does not appear to be driving in-shell prices higher, the data would suggest that robust international sales can have a positive impact, but it is far from a cure-all.

Aggressive buying from China has historically had a strong connection with higher prices paid to growers. Oddly, the rise in prices seems arrive the year following. This overall surge in prices likely doesn't reflect China's direct purchasing. Instead, the higher in-shell price the following year appears to reflect the domestic and Mexican shellers paying higher prices in recognition of the additional competitor for in-shell in the marketplace.

As shown in Figure 3.21, China has consistently paid above the domestic market and even purchased as much as 28% of U.S. pecan production in 2013/14. However, **given the other 70-plus percent of pecans are purchased by either domestic or Mexican shellers, the bigger factor in determining in-shell prices appears to be how an external player affects the competitive landscape rather than a notable difference in total commercial utilization.**

Due to a combination of geopolitics and commercial realignment towards South Africa, China's bouts of aggressive purchasing have become smaller and less frequent. As such, in-shell prices have fallen over the last several years. The surprise buy from China in 2023/24 only resulted in a limited bump in in-shell prices the following season as market participants, as verified by interviews, did not expect China to be a factor the following season that would justify raising bids in order to secure supplies.

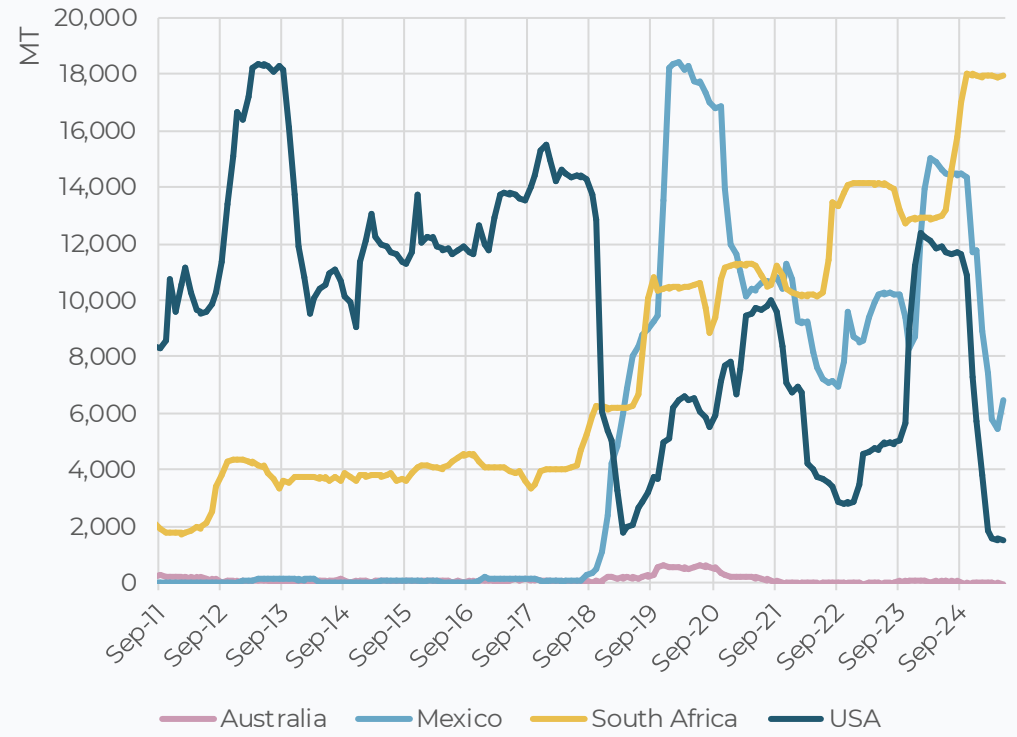
This will be discussed in greater detail in the industry structure part of the section, but the data makes clear **strong international demand can boost prices.**

SUPPLY & DEMAND BALANCE: DOES IT MOVE IN-SHELL PRICES?

Figure 3.21

Source: USDA, U.S. Census

Figure 3.22

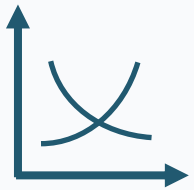


Source: Loux Analytics, Trade Data Monitor

SUPPLY & DEMAND BALANCE: IN-SHELL CONCLUSIONS

On a macro-level, **the strongest connection between market fundamentals and the base, or average, in-shell pecan price appears to be the size of the U.S. harvest.**

There is impressively ample and growing domestic demand for pecans, but demand only had a noticeable impact on in-shell prices when an external buyer – specifically, China – entered or exited the market, and even that impact was largely in the year that followed. Additionally, China's impact is lessening as market participants don't expect China to be a consistent competitor in the marketplace.



There is seemingly **no connection between ending stocks-to-net use or change in inventories for a given season and in-shell prices that year**, meaning that supply and demand within a season has very little bearing on in-shell prices. However, **the stocks-to-use from the prior season as well as changes in inventory both appear to have clear, albeit limited, correlations with the price paid to growers in the season that follows**. Taken together, this would suggest that **market participants – whether growers or shellers – are largely speculating on demand for the year ahead and basing it on the prior year's sales.** Conversely, participants seem to have a much better handle on production, which does appear to influence in price in the current year.

SUPPLY & DEMAND BALANCE: IN-SHELL CONCLUSIONS

Overall, in-shell prices tend to have a one-year lag with changes in the market fundamentals, but even then, the price movement is relatively modest.

In-shell pecans are primarily a "supply-driven" driven commodity. However, that supply impact is limited to U.S. production. **Mexico's pecan production and even the U.S.' total pecan imports appear to have no measurable impact on U.S. in-shell prices.**

Given the market consistently clears without heavy inventory carryover and, after accounting for supply changes, in-shell prices only move when an external buyer aggressively enters the market, we should gather that **there is limited competition for pecans in the United States – a reality consistently verified by our stakeholder interviews.** As such, while domestic pecan demand is generally increasing, **domestic sales have had seemingly no impact on increasing in-shell prices.**

In general, **high-priced years were driven by either: 1) weak U.S. pecan production and/or 2) an aggressive external buyer** purchasing large volumes of in-shell pecans the year-prior. Years with low prices were largely driven by the inverse – strong production and/or China exiting.

In both high and low-priced years, the market cleared primarily through greater domestic sales, suggesting plenty of unfulfilled domestic demand. **Effectively, if there is supply available, the domestic market has had no challenges absorbing it.** However, despite "ample" domestic demand, **without an external competitor or limited supply, there does not appear to be sufficient competition or urgency for in-shell to drive prices higher.** Around the margins, stocks-to-use and inventory levels from the prior year can affect price but to a much lesser degree. Overall, **this paints a picture of an in-shell market that is largely ambivalent to domestic demand and reacts only when there are major swings in supply or an external competitor arriving on the scene.**

SECTION 3

Pecan Supply & Demand

SECTION 3.2

Halves & Pieces Fundamentals

Supply and Demand Balance: Halves and Pieces

In contrast to the in-shell market, there is a noticeable lack of historic (and current) data available on halves and pieces, especially in the U.S. market. In lieu of readily available data, we have to use several imperfect proxies to calculate how supply and demand impacts shelled prices and how those halves & pieces prices connect with the in-shell market.

The primary way to assess the shelled price is to examine the **average unit value of shelled pecans from Mexico into the United States.** Unfortunately, despite the obvious challenges in applying an imported price to the domestic market, this is the only dataset that has a sufficient historical basis to examine its correlation with supply and demand fundamentals.

To help provide additional data and information, our team analyzed **retail prices through Circana** as well as **halves and pieces prices courtesy of Strata Markets.** Retail data only goes 5-years back and is at least one-step removed from the pecan industry, reflecting only the final prices paid by the consumer. And while Strata Markets has by far the most detailed data, it only goes back to two full seasons.

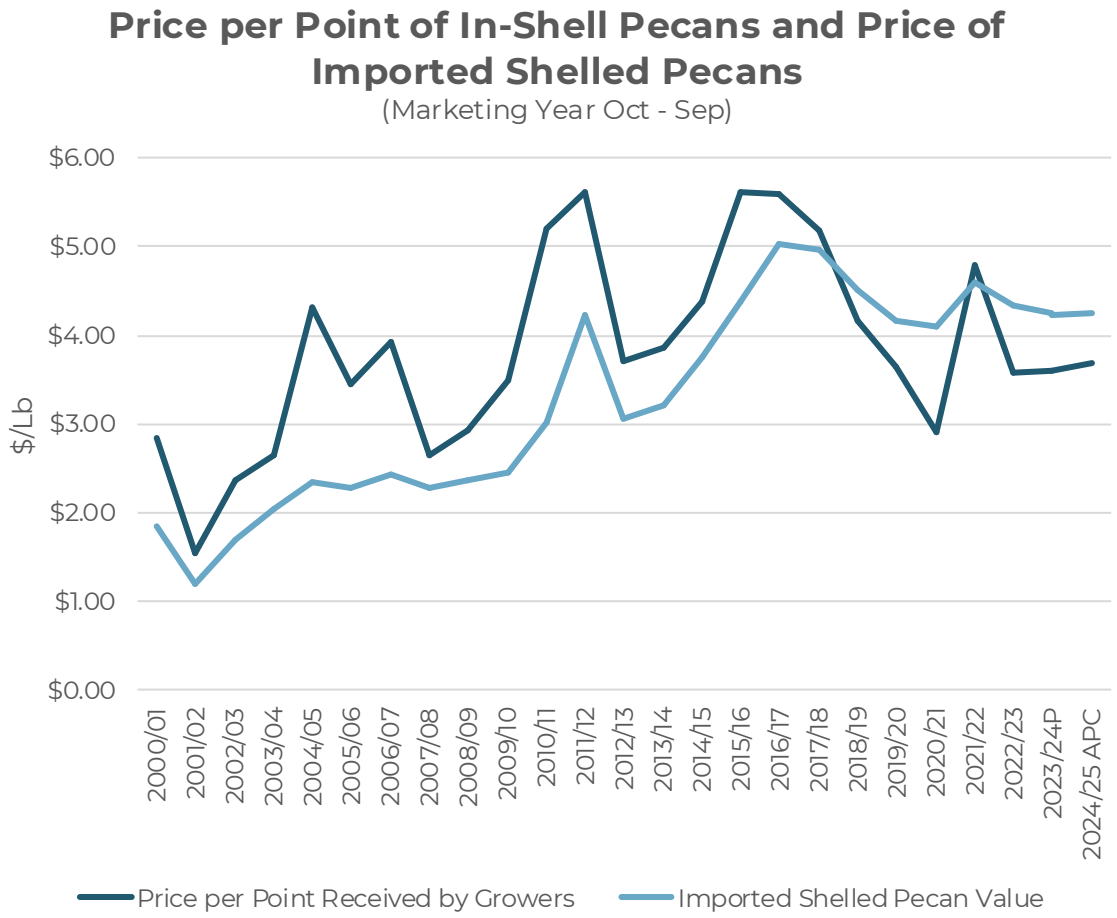
While none of these datasets are sufficient in themselves, triangulating across all three can provide insight into how supply and demand impact shelled markets and how those shelled markets influence – and are influenced by – the in-shell price.

Figure 3.23

Source: U.S. Census

PRICE RELATIONSHIP BETWEEN SHELLED & IN-SHELL

Figure 3.24



Source: USDA, U.S. Census

In a perfect market, one would expect the shelled price (inclusive of both halves and pieces) to highly correlate with the in-shell market with the cost of shelling resulting in a higher price for shelled on a per point basis. Using the imported shelled price and comparing it to U.S. in-shell export prices and the in-shell prices paid to growers, we see that while the two markets are clearly connected, there is not a 1-to-1 relationship.

By using shelled imports into the United States as a proxy for the shelled price, we can identify how shelled prices for a given season relate to the in-shell price paid to growers as well as to overall supply and demand conditions, just as we did the in-shell market.

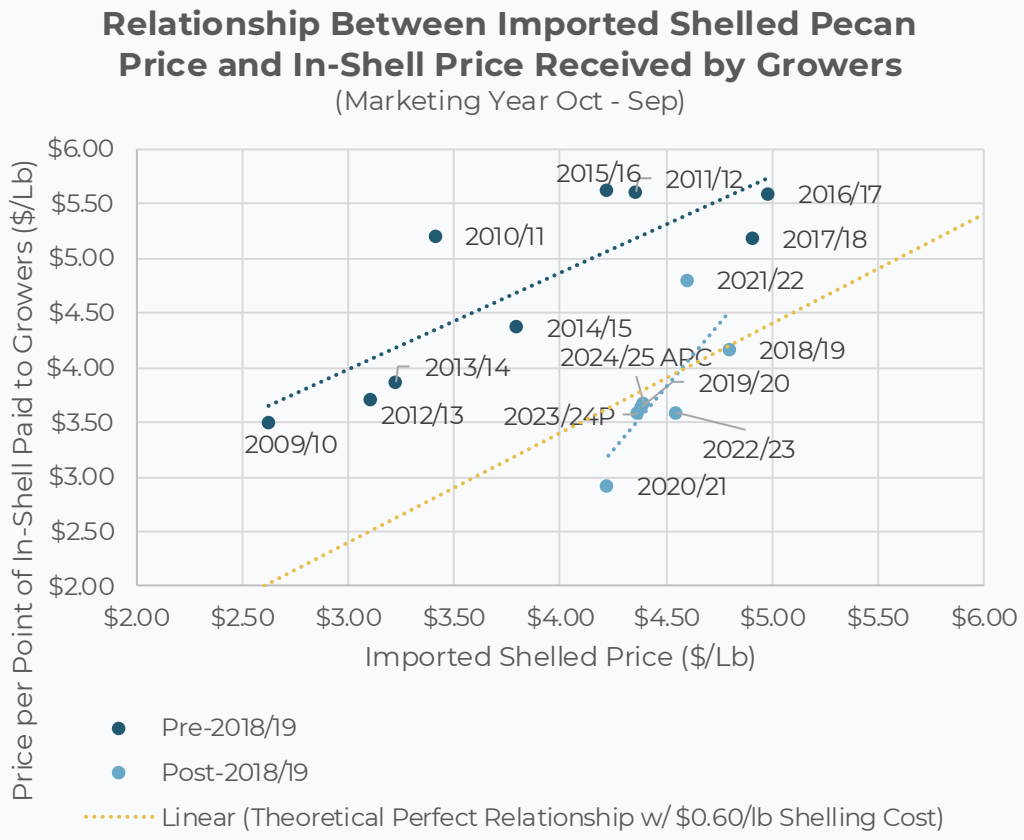
On the first point, **there is a positive correlation between higher imported shelled prices and higher in-shell prices received by growers. Unfortunately, the correlation is rather weak.**

More confusingly (though also consistent with U.S. in-shell export prices), for the 20 years before the 2018/19 season, the price of the imported shelled pecans was lower than the average prices paid to the grower on a per point basis. While it is certainly true that sheller margins have frequently been negative, a consistent inversion would suggest that the shelled pecans that were being imported at a lower price than the average domestic shelled value. As such, **the imported figure is likely understating domestic prices for halves and pieces in the United States pre-2018/19.**

Interestingly, **shelled import prices have become consistently higher than the per point value of in-shell since 2018/19** (with the exception of 2021/22 when China was actively buying in-shell). This relationship would be more economically rational given the costs of shelling. Positively, even as the price relationship shifted, the in-shell and shelled prices have remained correlated. The shift since 2018/19 may also be reflecting less aggressive pricing by shelled pecans out of Mexico in recent years.

PRICE RELATIONSHIP BETWEEN SHELLED & IN-SHELL

Figure 3.25



Source: Loux Analytics, USDA, U.S. Census

Breaking down this relationship further, the chart to the left examines the relationship between the shelled price – as, again, reflected solely by the imported shelled price – and the in-shell price paid to growers as estimated by USDA.

The data prior to 2018/19 has been separated from harvests after 2018/19 given the flip in the pricing relationship that occurred that year. The yellow dotted line reflects a theoretically perfect relationship between in-shell and shelled prices if the cost of shelling was $0.60/lb. on a point basis.

Prior to 2018/19, the relationship between in-shell and shelled prices was parallel to the theoretically perfect line albeit with the price inversion wherein the shelled price was lower than the in-shell price. Meaning, on average, the shelled price matched closely with the in-shell price with the in-shell price being $0.89/lb. above the imported shelled price on a per point basis.

Since, 2018/19, the in-shell and shelled prices remain fairly correlated, but there does seem to be a more economically rational margin built in for the shelling costs. On average, the imported shelled price was $0.71/lb. higher than the in-shell price on a per point basis

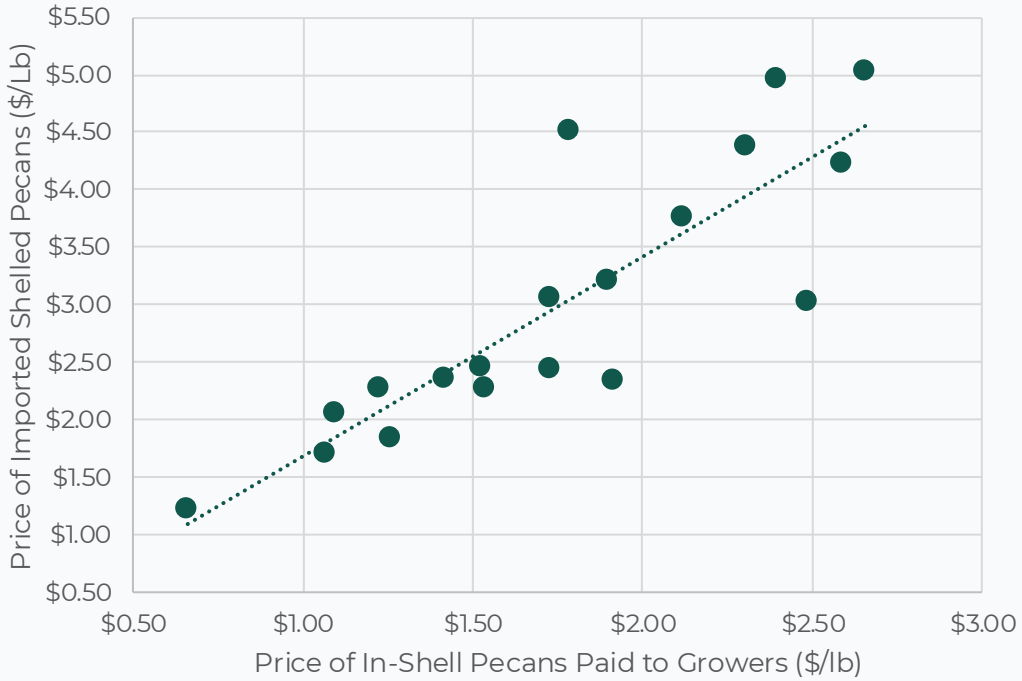
This is a rather long-winded way to say that **while the shelled prices reflected in the data pre-2018/19 seem too low to truly reflect the U.S. market, the consistent correlation over the last decade and a half suggests that the in-shell and shelled markets are clearly connected.**

PRICE RELATIONSHIP BETWEEN SHELLED & IN-SHELL

Figure 3.26

Price of In-Shell Pecans Paid to Growers and Price of Imported Shelled Pecans

(2000/01 - 2017/18, Marketing Year Oct - Sep)

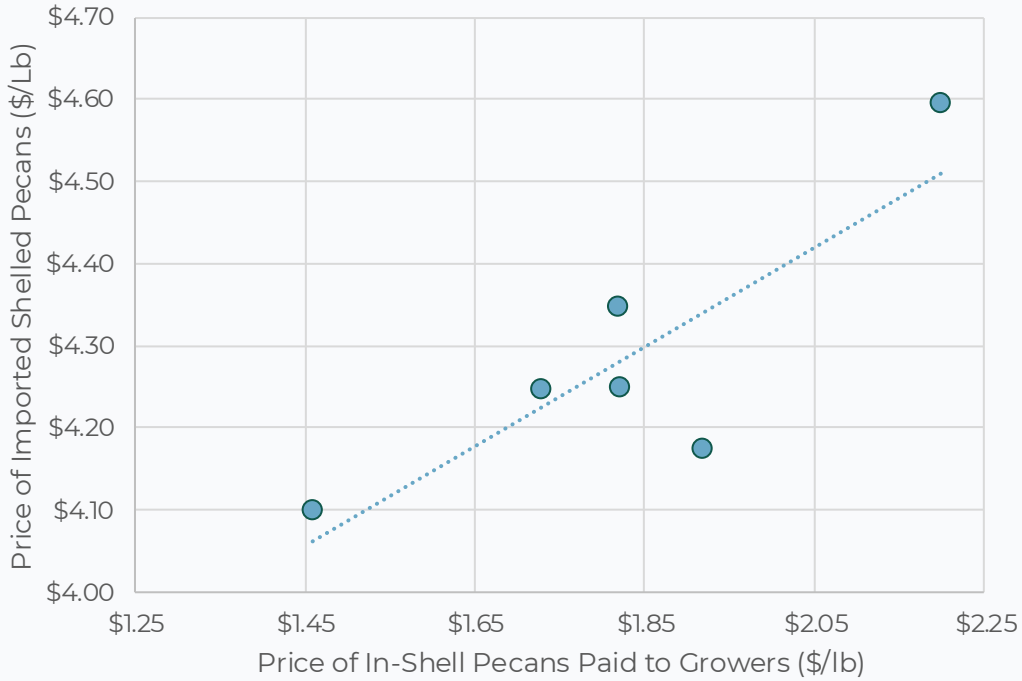


Source: Loux Analytics, USDA, U.S. Census

Figure 3.27

Price of In-Shell Pecans Paid to Growers and Price of Imported Shelled Pecans

(2018/19 - 2024/25, Marketing Year Oct - Sep)



Source: Loux Analytics, USDA, U.S. Census

PRICE RELATIONSHIP BETWEEN SHELLED & IN-SHELL

If the shelled and in-shell prices have a fairly strong correlation, this begs the ultimate question – **which market is the driver?** Does competition for in-shell drive the prices for shelled? Or does the market for halves and pieces influence the in-shell price?

In most instances, **our findings would suggest that neither in-shell nor shelled are the dominant mover.** Rather, the data seems to suggest that shelled and in-shell pecans typically move in concert with each other.

Given how dissatisfying that finding is, we can say that there is some evidence that the in-shell market was more often the first mover with the price for shelled pecans then following. However, even that finding has only a few clear examples.

To demonstrate this from a data perspective, we can first examine the price relationship between shelled pecans imported from Mexico and in-shell exported to Mexico on three-month moving average price[1]:

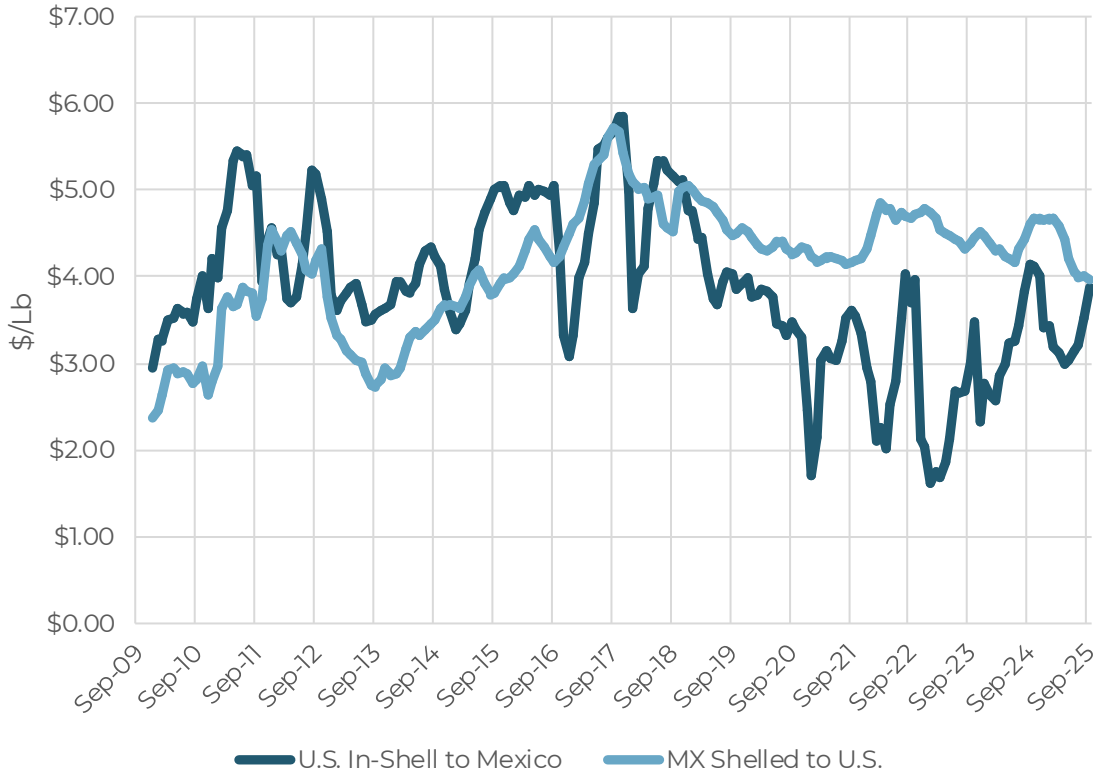
- Prior to 2018/19, the strongest correlation between the two variables was the current month. The correlation weakened when lagging either in-shell or shelled prices. This would imply in-shell and shelled prices to/from Mexico typically moved in concert with another.

- Since 2018/19, the strongest correlation proved to be when imported shelled prices were lagged two months. This would imply that shelled prices follow the in-shell price. This trend becomes more pronounced if using a 6- or 12-month average to further smooth out the volatility. All told, this would suggest that now that the imported shelled price is reflecting the shelling cost, in-shell prices may be moving first.

Finally, **while examples are relatively few, the major shifts in price direction[2] initially started with the in-shell market, which were then reflected in the shelled market a month or two later.** However, as discussed in the previous section, in-shell prices to Mexico and average prices paid to growers more generally lagged China's involvement by a year anyways. As such, **with the exception of China's direct purchases, prices for both in-shell and shelled pecans both typically moved the following season.**

Figure 3.28

Average Prices for U.S. In-Shell Exports to and Shelled Imports from Mexico
(Rolling 3-Months)



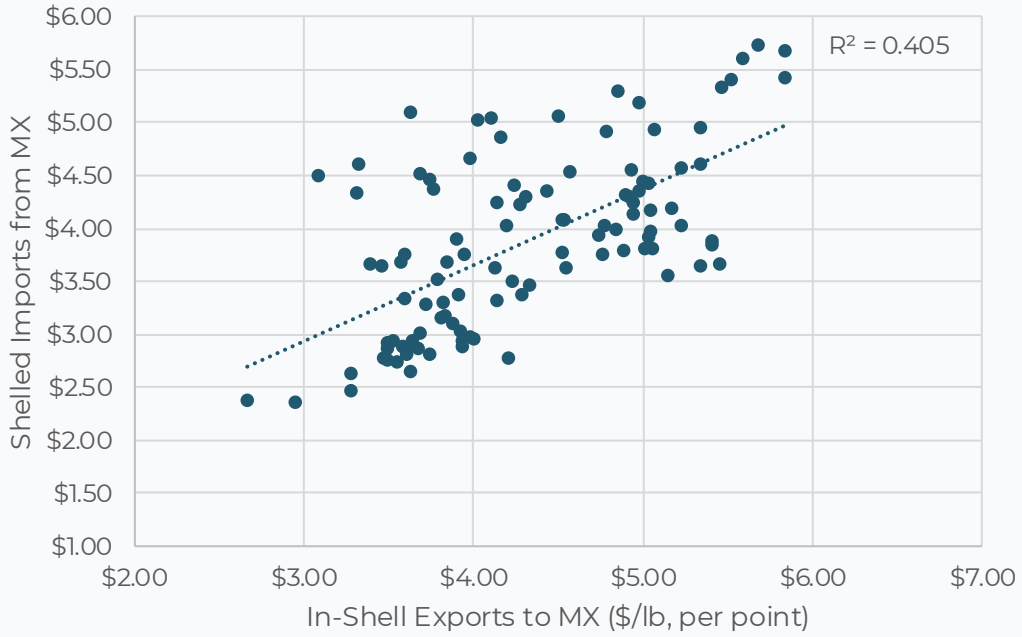
Source: U.S. Census

[1] *To smooth volatility*

PRICE RELATIONSHIP BETWEEN SHELLED & IN-SHELL

Figure 3.29

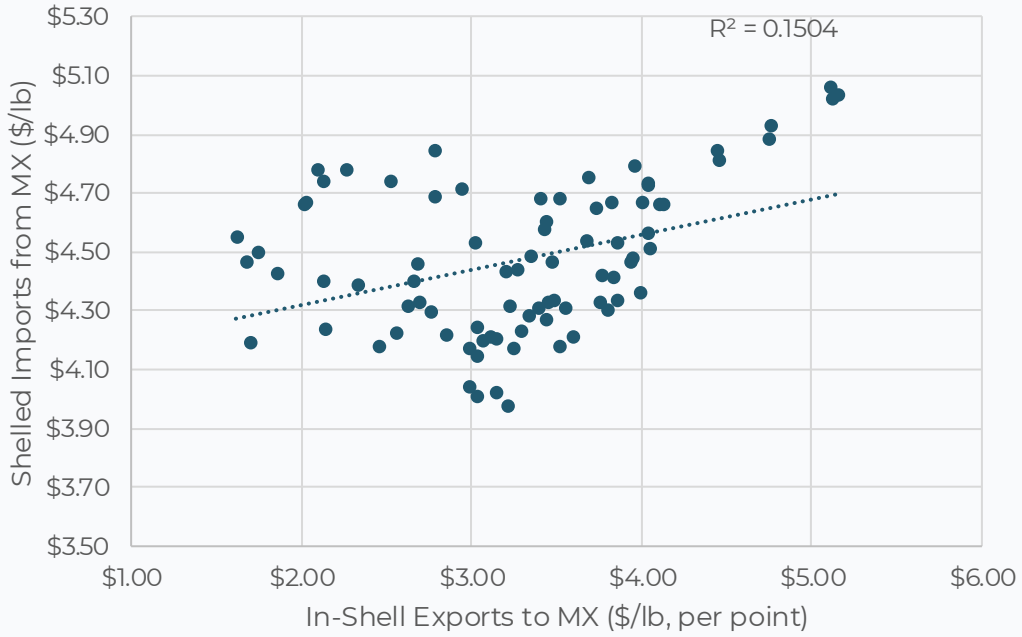
Correlation between **In-Shell Export Prices and Shelled Import Prices** to/from Mexico between Sep 2009 and Sep 2018
(No Lag for Either Shelled or In-Shell, Rolling 3-Months)



Source: Loux Analytics, U.S. Census

Figure 3.30

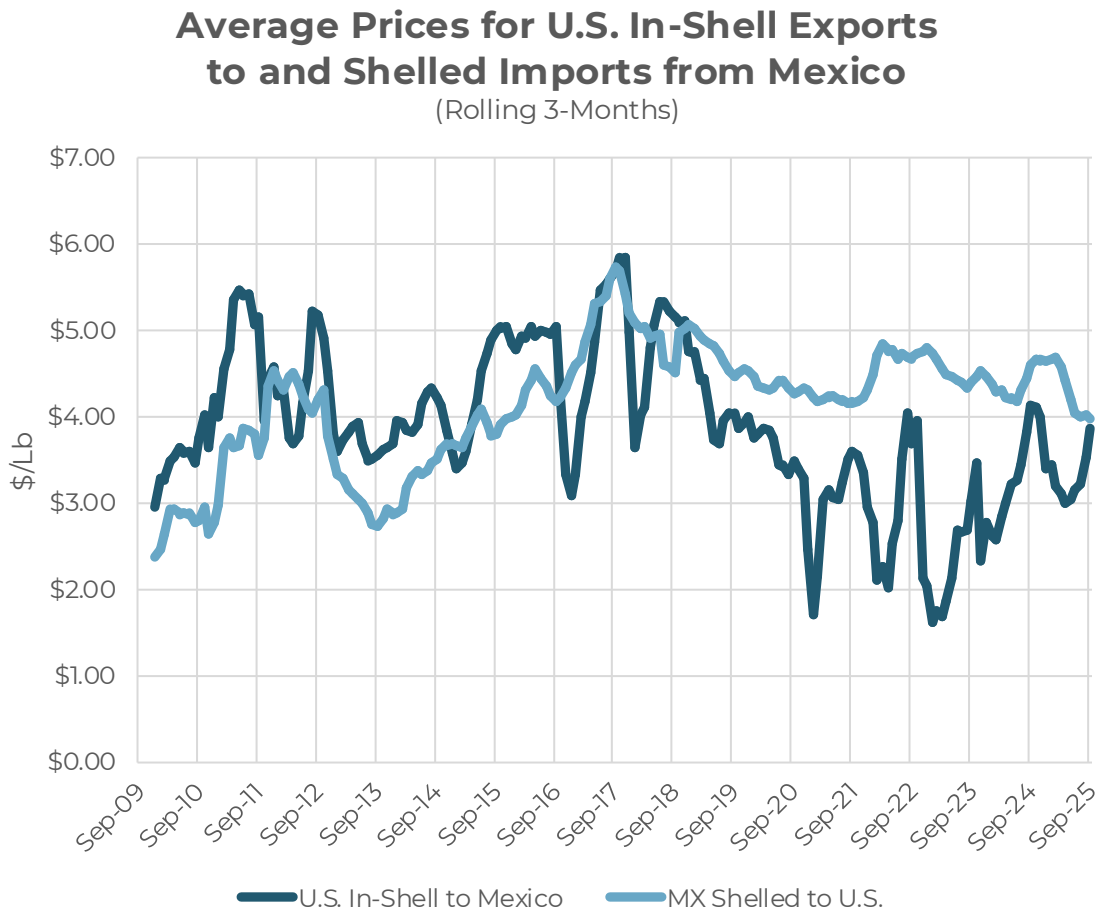
Correlation between **In-Shell Export Prices and Shelled Import Prices** to/from Mexico since Sep 2018
(Shelled Prices Lagged Two Months, Rolling 3-Months)



Source: Loux Analytics, U.S. Census

PRICE RELATIONSHIP BETWEEN SHELLED & IN-SHELL

Figure 3.31



Source: U.S. Census

Another point which would appear to suggest that prices tend to move in concert, but in-shell has the potential to be the first mover derives from the fact that **in-shell pecan prices are far more volatile than shelled pecan prices.**

Perhaps some of the volatility in the data could be attributed to small sample bias. For instance, in the 2024/25 marketing year, U.S. shelled exports were roughly 2x the volume of in-shell exports, and U.S. imports of shelled pecans were 3.3x the volume of in-shell exports. Yet, small sample size cannot be the only culprit as even on rolling 3, 6 and 12-month bases, **in-shell pecan prices are still far more volatile than the shelled pecan prices.**

This difference in price volatility would imply that shellers are passing on relatively stable prices to their customers while bearing a significant risk in in-shell price movement whether caused by to supply shocks or a buyer like China (as identified in the previous section) or simply seasonality causing volatility in in-shell prices as will be discussed in a **Section 3.4.**

As reported frequently in our qualitative interviews, there is significant risk borne by shellers as a result of: 1) agreeing to sales prices with retailers for the year ahead prior to securing the in-shell, 2) paying for in-shell pecans in cash, 3) extending payment terms to their customers, and 4) typically holding the inventory themselves.

This will be discussed in more detail in **Section 4**, but in brief, the four factors above have a noticeable impact on causing in-shell and shelled prices to run together: Given the buying concentration of the retailers putting out bids prior to the harvest, shellers have limited ability to push higher shelled prices onto retailers. And without higher margins on the shelled pecans, there is limited ability for shellers to pay more for in-shell, especially after accounting the carry risk. As a result, **shelled and in-shell move in concert most of the time – both reflecting last season's supply and demand conditions with an adjustment for the current harvest.** However, when a shortage of in-shell (either due to a poor harvest or expectations of an active China) forces a major shift in in-shell price as shellers compete for supplies, but moving shelled prices substantially higher remains difficult and is delayed from the in-shell movement.

Supply and Demand Balance: Halves and Pieces

Given the fact that the shelled pecan price and the in-shell price typically move in tandem, we would expect a similar correlation with supply and demand fundamentals as the in-shell market. And yet, the correlations are not identical even after accounting for the structural shift in the price data starting in 2018/19.

First for the similarities: just like in-shell, **both stocks-to-use and changes in inventory once again had a modest impact on the price but did so primarily in the following season** rather than the current season (Figures 3.33 and 3.34). Unfortunately, just as in the case of in-shell prices, the correlation is imperfect, suggesting the total supply-demand balance has only a limited and delayed impact on shelled prices.

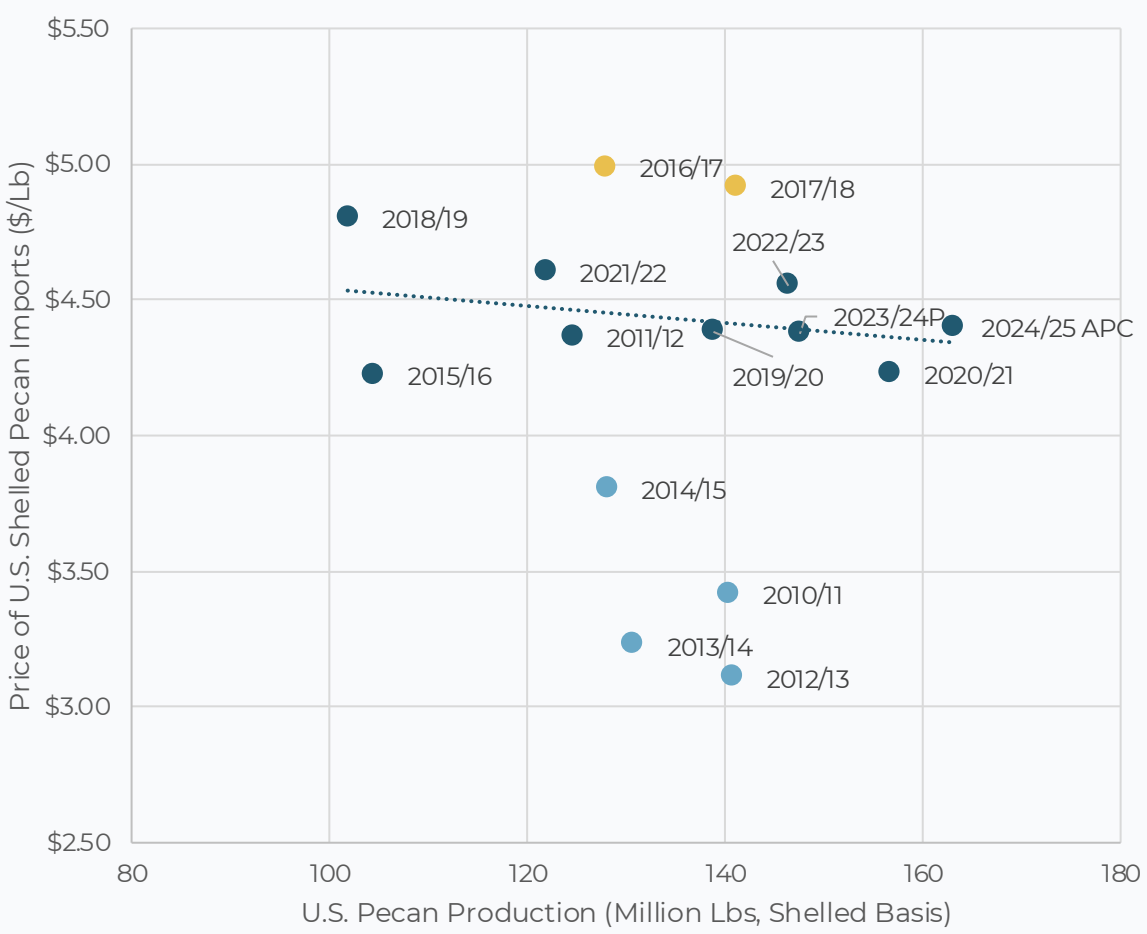
Yet, in a slight contrast to in-shell markets where U.S. pecan production is the biggest influence on prices, **there is a much more modest correlation between the total U.S. harvest size and the price of shelled pecans**. Whereas a 10 million lb. change in the U.S. harvest moved in-shell prices by $0.15/lb ($0.30 per point), a 10 million lb. change in the U.S. harvest only moved shelled prices by $0.02 per point ($0.01/lb in-shell).

The data's outliers even highlight demand's pre-eminence in shelled prices. The positive outliers – namely 2016/17 and 2017/18 – were two of the peak years of China's buying. By contrast, the lower-than-expected outliers correlated to noticeably soft domestic utilization.

We should also note that despite the imported shelled pecan price reflecting imports from Mexico, the harvest in Mexico had virtually no correlation with the final shelled price.

Taken together, this would imply that **supply has a much weaker impact on shelled prices than in-shell.** Meaning, even when in-shell supplies are short and the harvest is poor, shellers have been unable to push higher price through to their customers. However, if demand is strong and shelled prices rise, the higher returns for the kernel are not always reflected in the in-shell market.

Figure 3.32



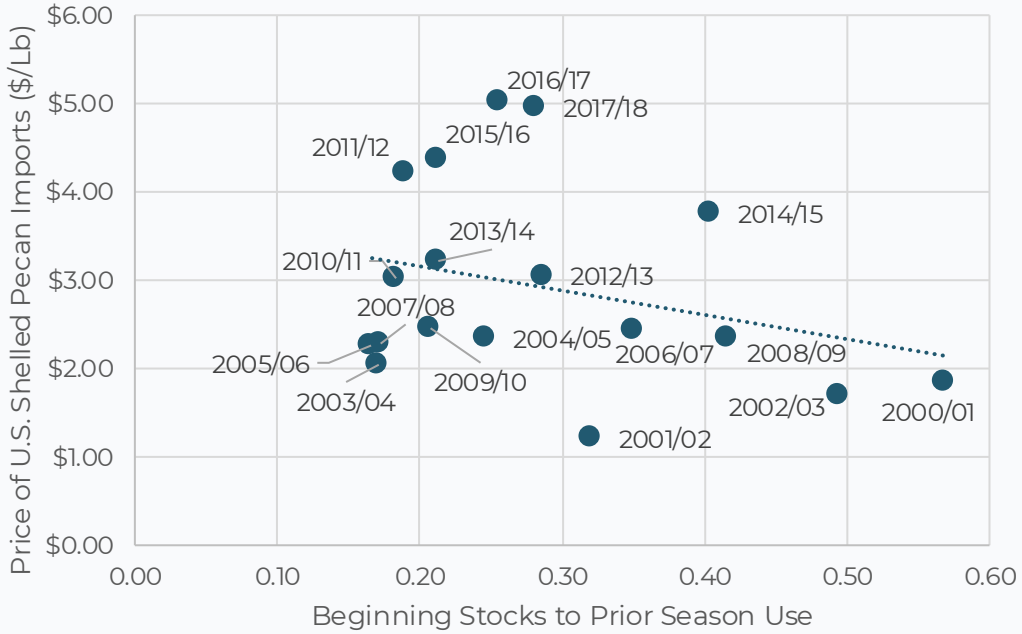
Source: USDA, U.S. Census

SUPPLY AND DEMAND BALANCE: HALVES AND PIECES

Figure 3.33

Correlation Between **Beginning Stocks to Prior Season Use** and Price of Imported Shelled Pecans

(2000/01 - 2017/18, Marketing Year Oct - Sep)

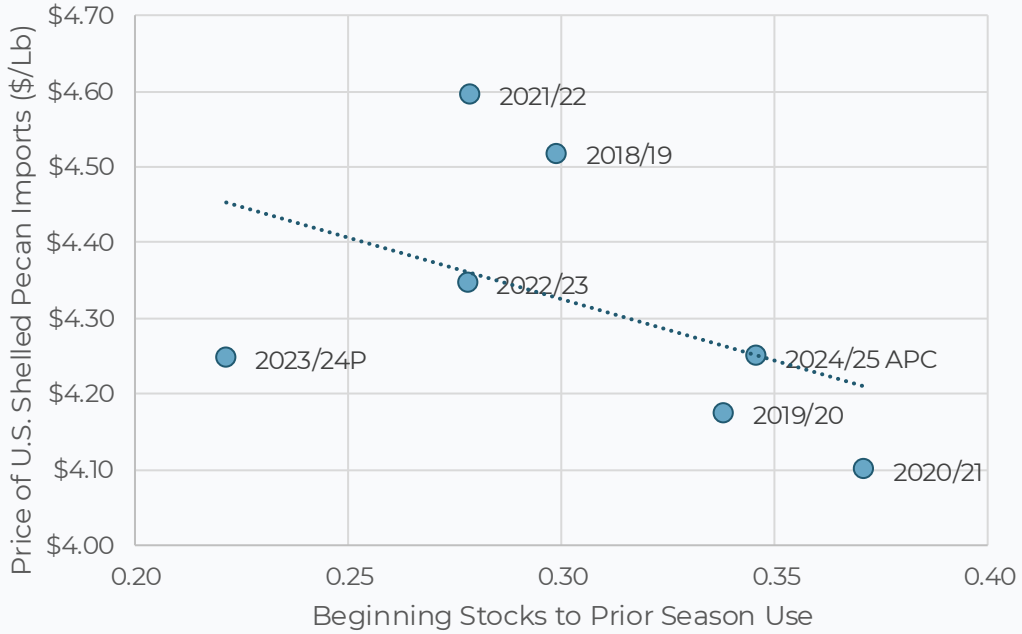


Source: USDA, U.S. Census

Figure 3.34

Correlation Between **Beginning Stocks to Prior Season Use** and Price of Imported Shelled Pecans

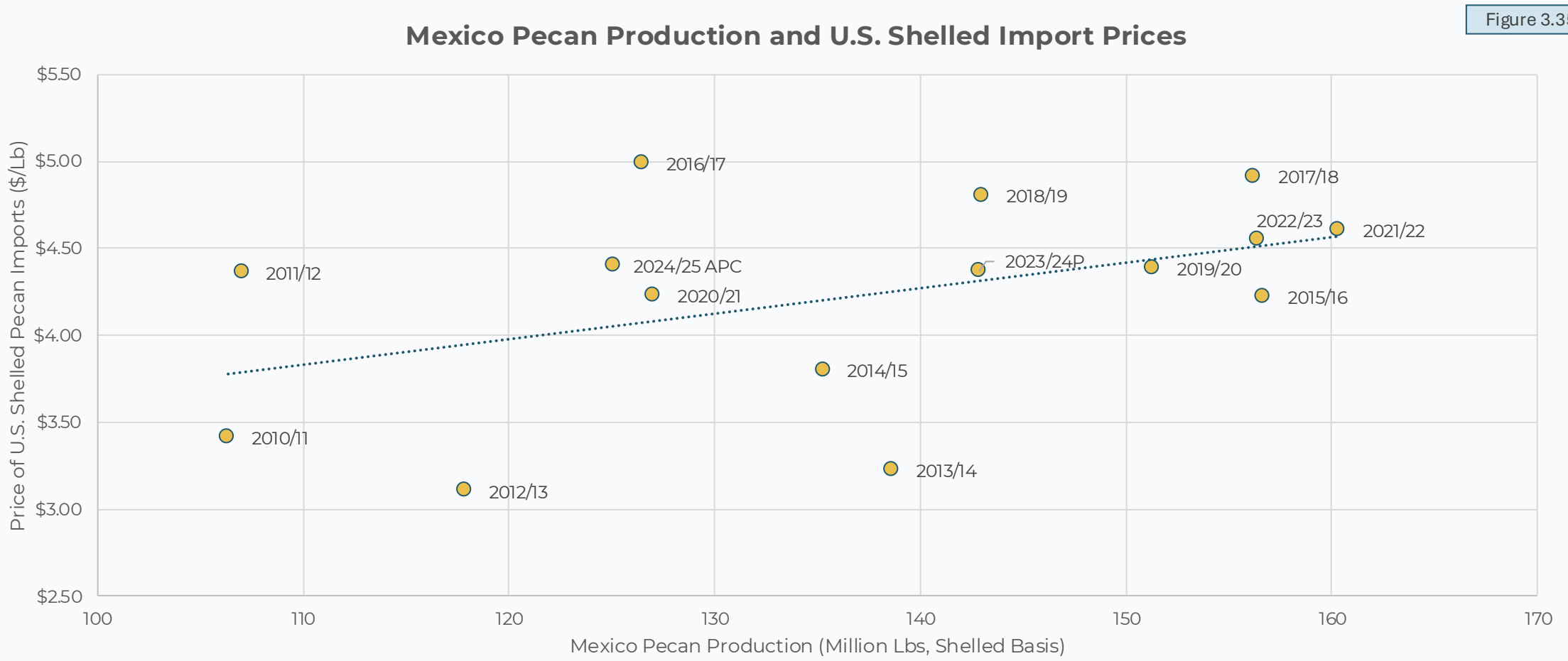
(2018/19 - 2024/25, Marketing Year Oct - Sep)



Source: USDA, U.S. Census

SUPPLY AND DEMAND BALANCE: HALVES AND PIECES

Figure 3.35



Source: Loux Analytics, Consejo Mexicano de la Nuez, USDA, APC

Supply and Demand Balance: Halves and Pieces

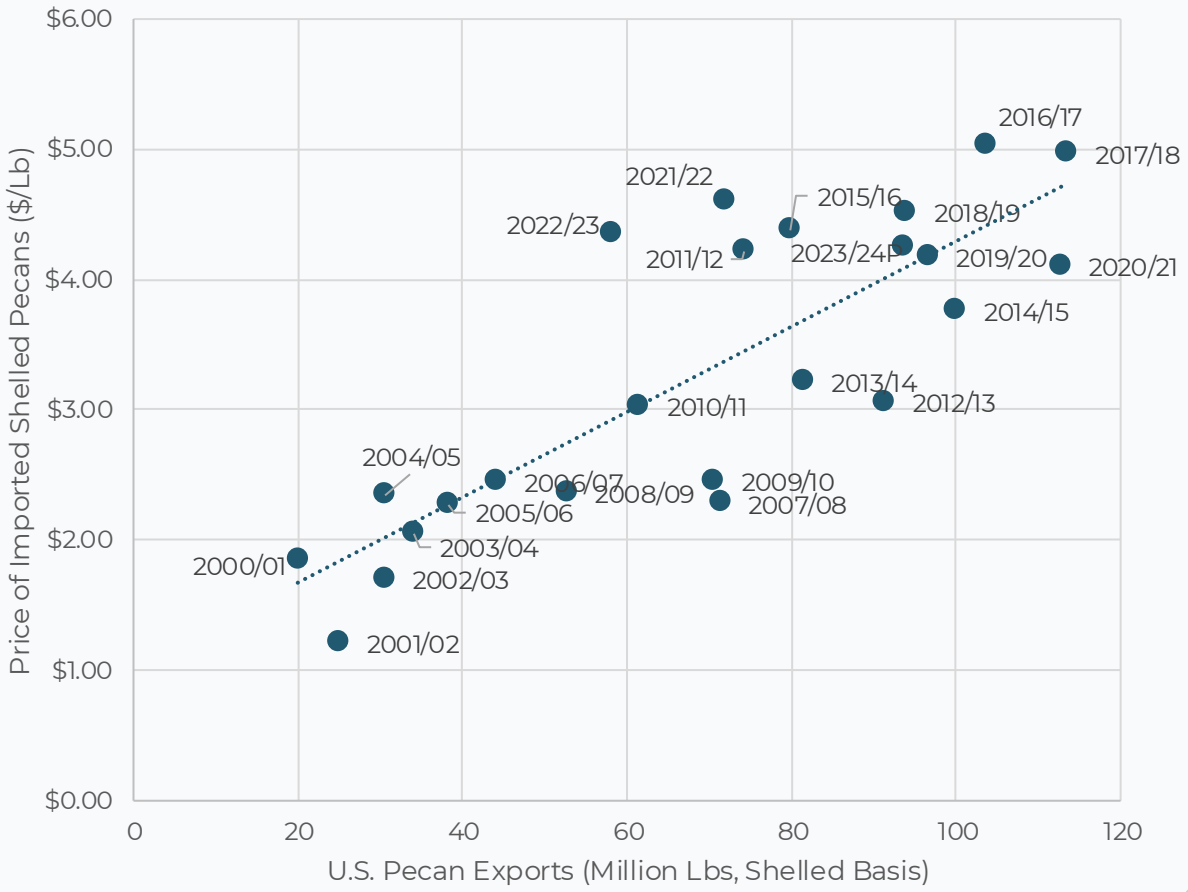
Instead of shelled pecans being primarily supply-driven like in-shell, our analysis shows the correlations are far stronger for demand.

Notably, the clearest correlation for the shelled pecan price – other than the in-shell price – was the total volume of U.S. pecan exports. That correlation has not been as strong since the 2018/19 season when the shelled price correlation with in-shell shifted. However, even accounting for that, as shown on the right, for every 10 million lbs. of additional U.S. pecan exports, the price of shelled pecans increased by roughly $0.33/lb.

While still positive, the correlation with domestic demand over the last 15 years is noticeably weaker than the correlation with exports. While shelled prices didn't have a negative correlation with domestic utilization like in-shell did, the impact of stronger domestic sales is generally muted – for every 10 million lbs. of additional domestic consumption, shelled prices only rose by $0.05/lb.

This suggests, just as in the case of in-shell, **the domestic market is fully capable of absorbing additional supplies but there is little ability to push prices higher in most years without an export business competing with domestic buyers for U.S. halves and pieces.**

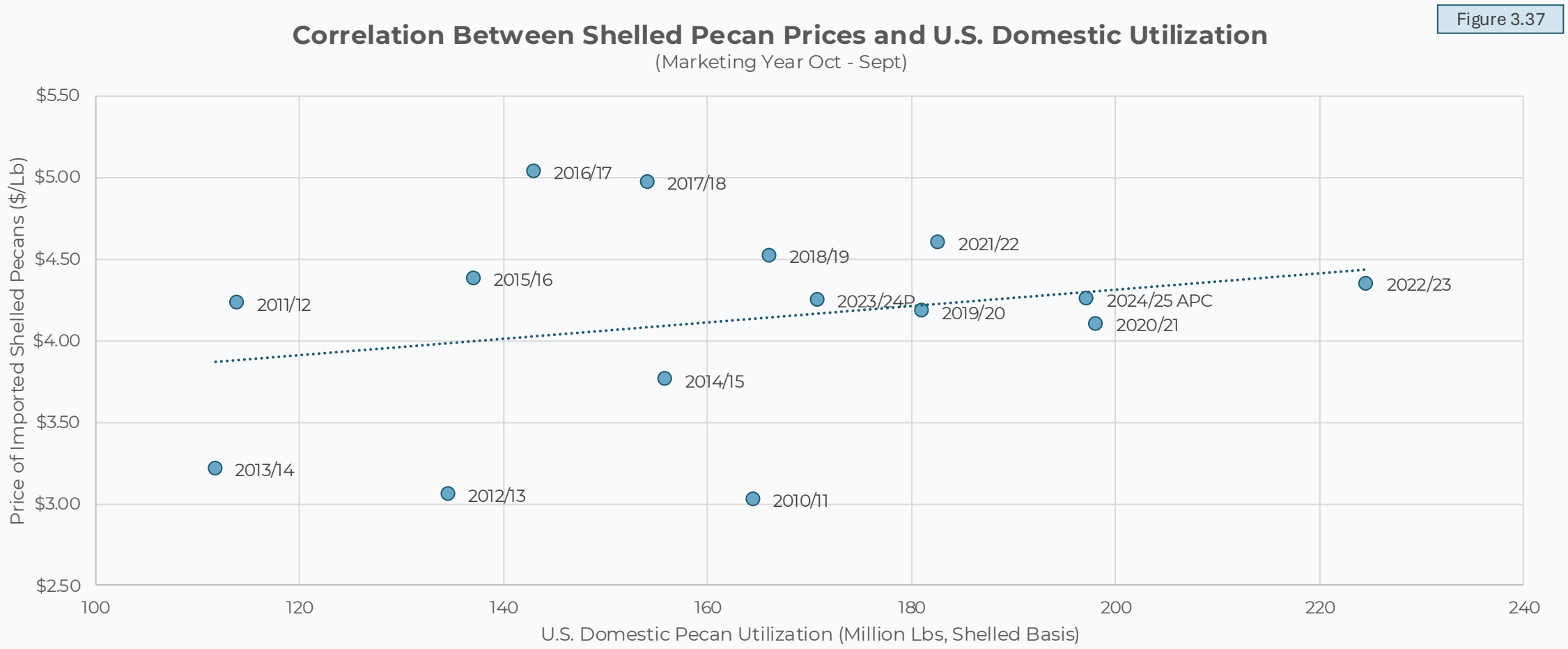
Figure 3.36



Source: U.S. Census

SUPPLY AND DEMAND BALANCE: HALVES AND PIECES

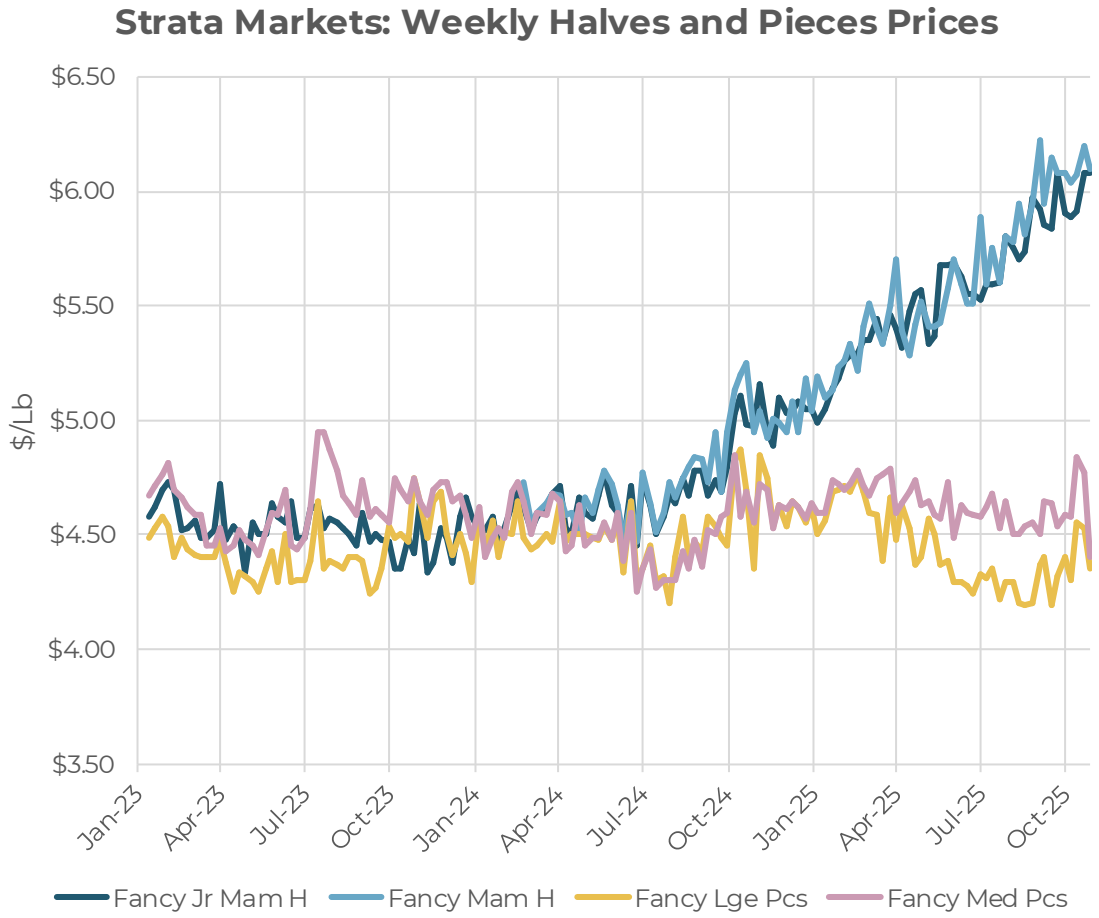
Figure 3.37



Source: USDA, U.S. Census

SUPPLY AND DEMAND BALANCE: HALVES AND PIECES

Figure 3.38



Source: Strata Markets

Attempting to break down the relationship beyond simply "shelled" pecans remains a challenge as there is a significant lack of data differentiating between halves and pieces. Gratefully, using data courtesy of Strata Markets, we can confirm that prices for halves and pieces have the capacity to diverge significantly even if we only have data for the last two seasons.

The rise in the halves price was frequently mentioned in our qualitative interviews. Given the robust purchasing of halves at retail, which has generally outperformed foodservice, ice cream and bakery in 2025, it seems demand dynamics are being reflected in the price disparity between halves and pieces. While anecdotal, the pricing data combined with the commentary would provide evidence that demand can and does influence halves prices.

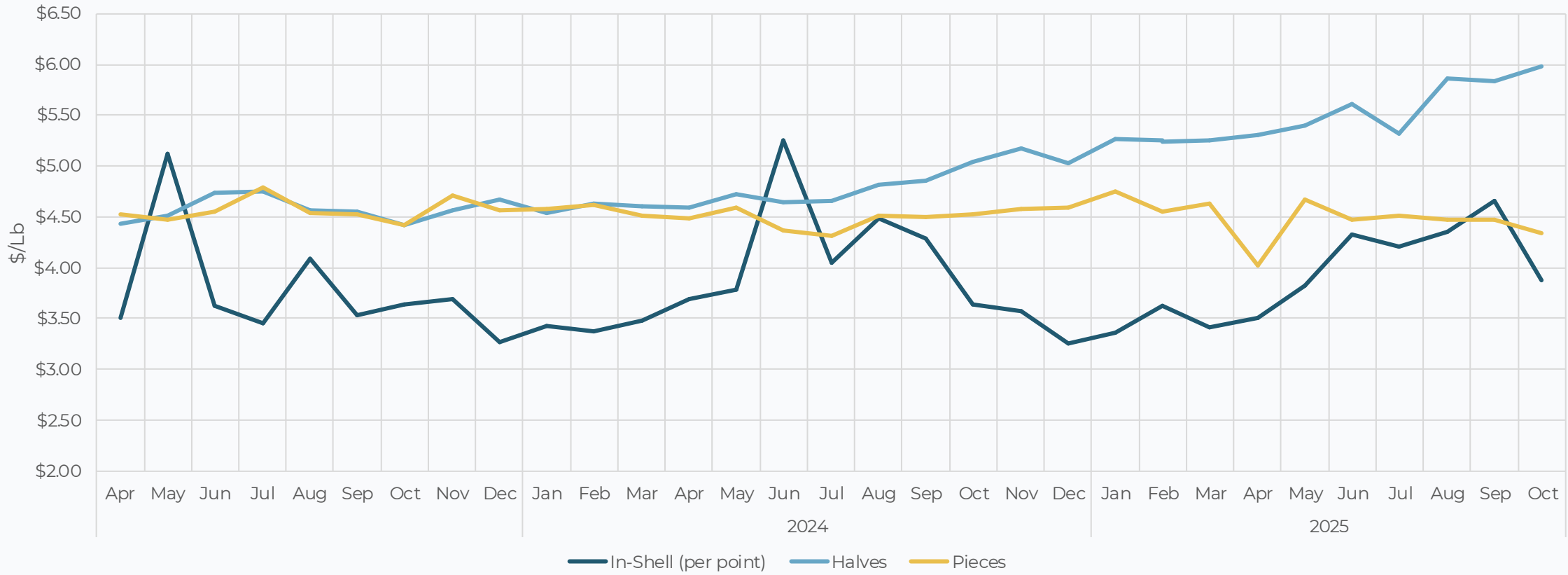
Additionally, as shown in Figure 3.39, the halves prices do appear to allow for firmer in-shell prices as well, even to the point that in-shell surpassed the return for pieces on a per point basis. This would suggest that halves prices are the primary product in the shelled category correlating with the in-shelled price.

There is unfortunately not enough historic data to identify the exact correlation between the three data points in the Strata Markets data. Still, the data does provide some useful commentary even if it is primarily a snapshot in time.

SUPPLY AND DEMAND BALANCE: HALVES AND PIECES

Figure 3.39

Strata Markets: Average Monthly Prices Reported for U.S. and Mexico Pecans
(In-Shell, Halves and Pieces)



Source: Strata Markets

SUPPLY AND DEMAND BALANCE: RETAIL PRICES

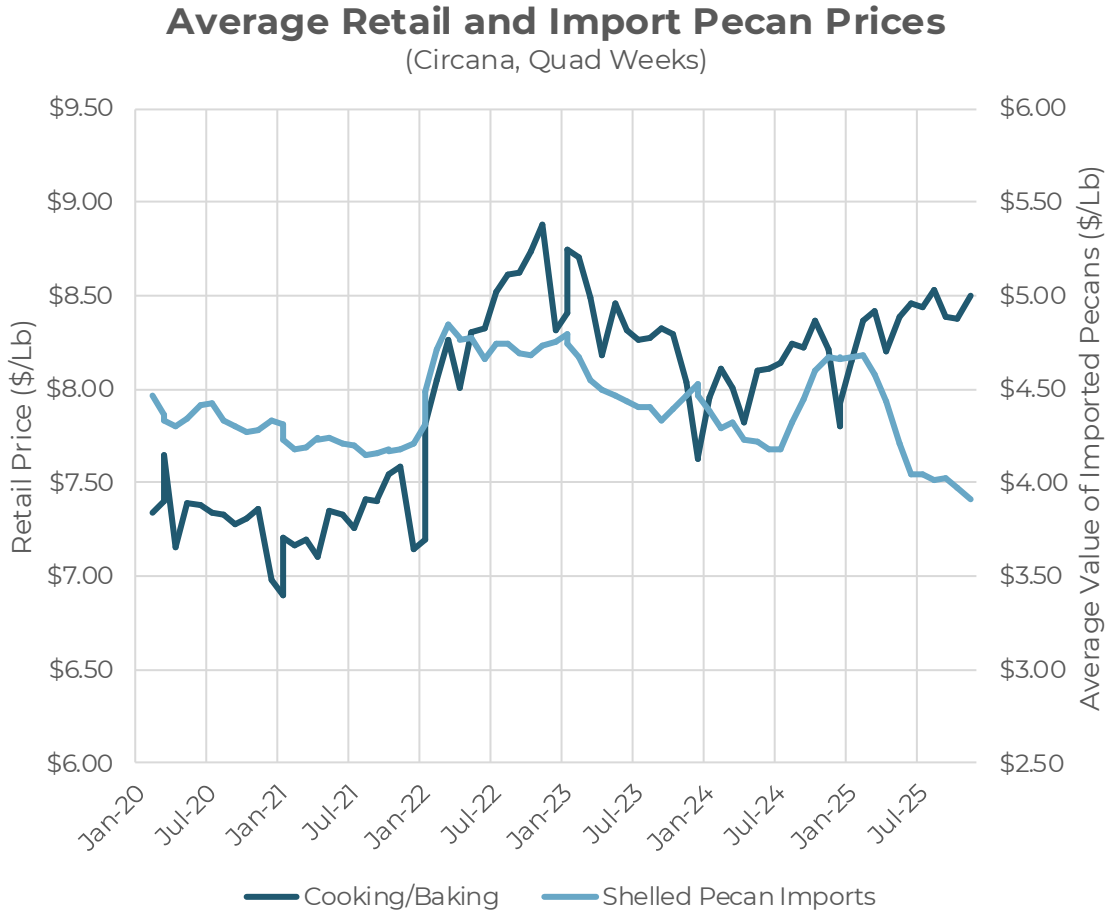
Turning from the wholesale market to consumer channel, prices at retail over the last five years behave in a similar manner to other grocery staples. Typically, retailers prefer to keep prices as stable as possible. Prices will rise on account of wholesale prices climbing, but there is a delay. Additionally, retail prices are much slower to retreat if commodity markets ease.

Comparing average retail price data from Circana with the average price of imported shelled pecans as a proxy for wholesale markets, we see pecans exemplify this practice.

Retail pecan prices jumped in 2022 in concert with a rise in the price of imported shelled pecans. And while the wholesale price of shelled pecans did soften throughout the rest of the year and into 2023, retail prices never returned to their 2021 levels. Once again, retail prices climbed in 2024 and 2025 – seemingly a result of wholesale prices rising – but they did not retreat in concert in wholesale markets.

As shown in Figure 3.41 on the following page, there appears a fairly consistent correlation between the two prices, but they do tend to diverge when wholesale prices are falling as retailers are able to improve their overall margin, in part to make up for when wholesale prices climb faster than retail prices.

Figure 3.40

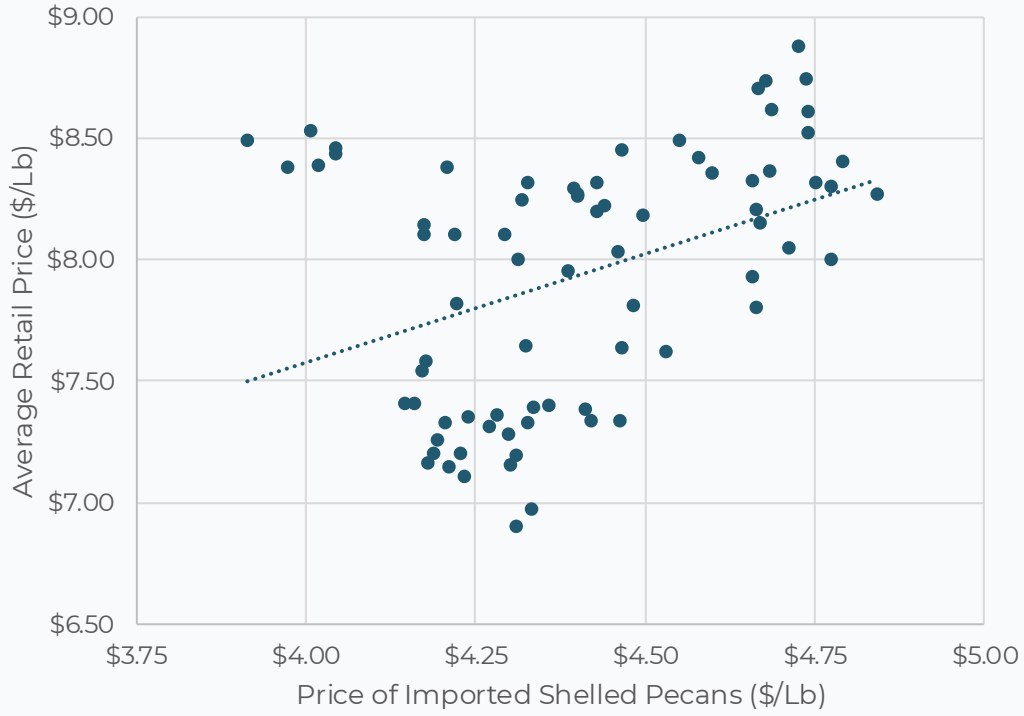


Source: Loux Analytics, Circana, U.S. Census

SUPPLY AND DEMAND BALANCE: RETAIL PRICES

Figure 3.41

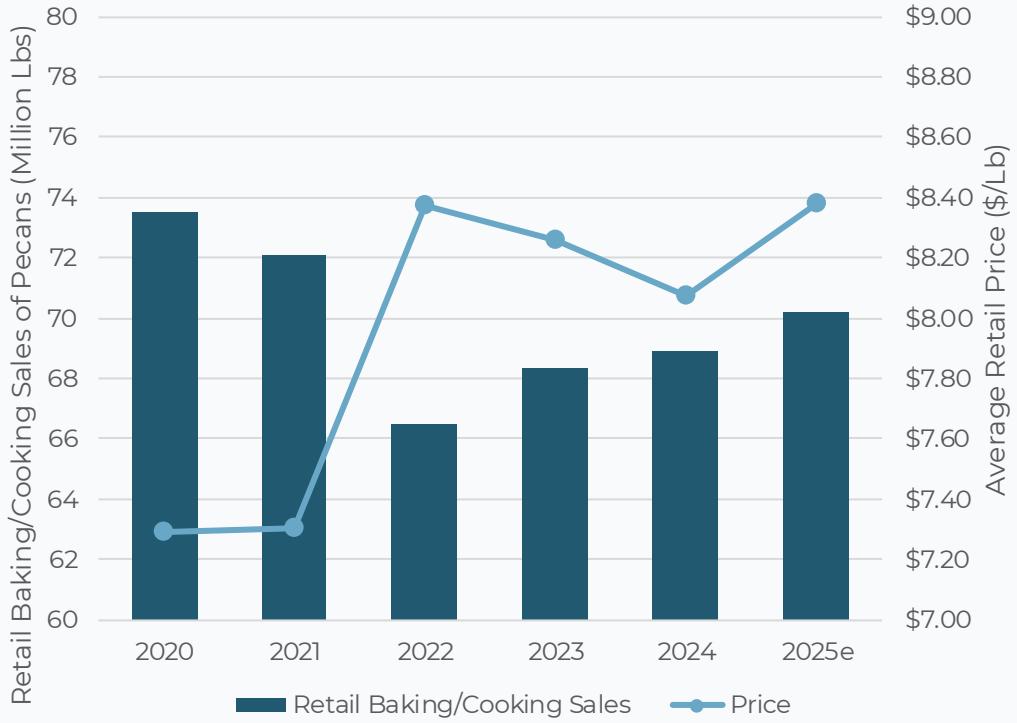
Correlation Between Retail and Wholesale Pecan Prices



Source: Loux Analytics, Circana, U.S. Census

Figure 3.42

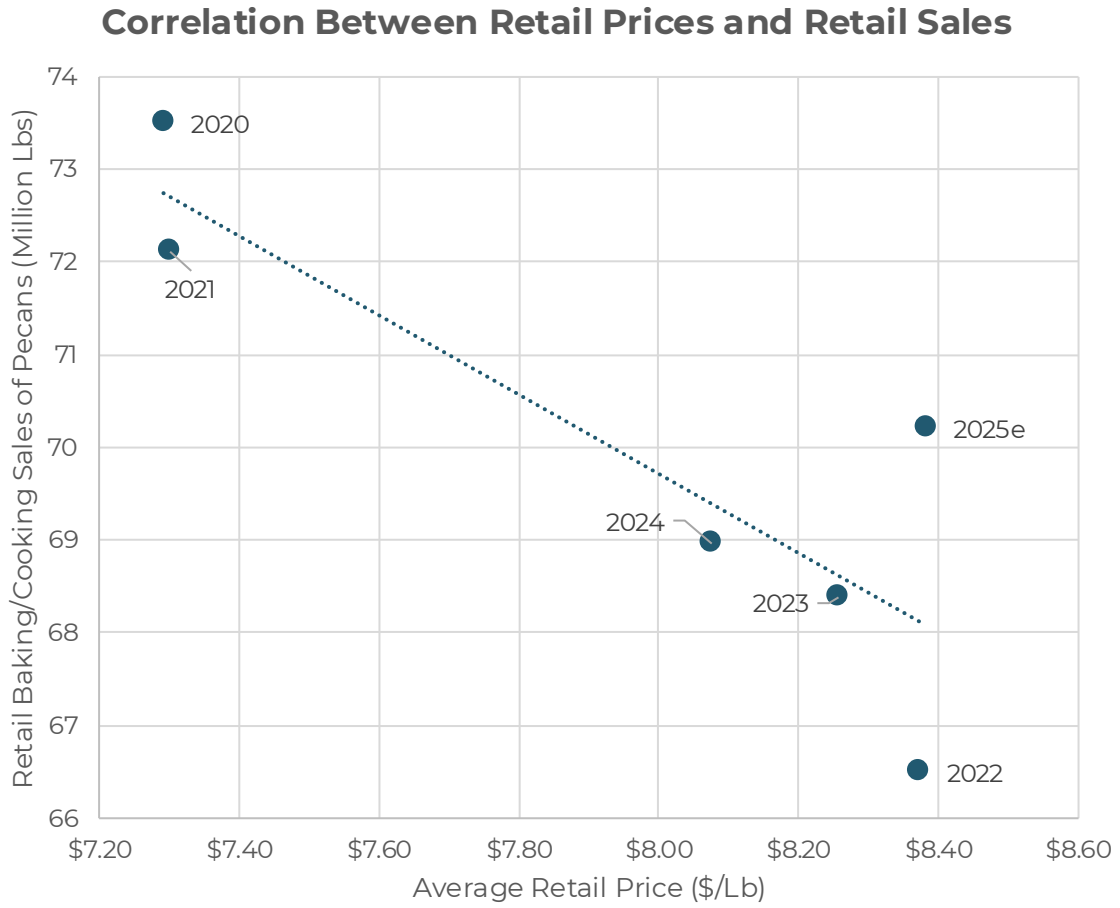
Correlation Between Retail Prices and Retail Sales



Source: Loux Analytics, Circana

SUPPLY AND DEMAND BALANCE: RETAIL PRICES

Figure 3.43



Source: Loux Analytics, Circana

Additionally, retailers keeping prices elevated even as wholesale prices fall may have a negative effect on overall pecan consumption.

As shown on the left and Figure 3.42 on the prior page, consumption – at least in baking/cooking – does appear to be sensitive to price changes. When prices rose by 15% in 2022, demand declined by 8%. While an admittedly small sample size, **it appears that U.S. retail consumption is sensitive to major price increases.** Conversely, when retail prices moderated in 2023 and 2024, consumption started to recover even as it did not reach 2020 or 2021 levels.

Gratefully, consumers become acclimated to higher prices over time. Indeed, 2025 prices were slightly higher than 2022 prices, but because consumers were used to prices over $8/lb. estimated retail consumption was noticeably higher than of the prior three years.

We should note that retail sales in 2020 and 2021 were likely elevated due to the COVID-19 pandemic increasing spending at grocery in aggregate. As such, we should be cautious about overstating pecan's retail sensitivity. But based on the data available, it does appear that consumers will pull back when prices jump substantially even as they eventually become used to the new price levels in time – a trend that is measurable through many other parts of the economy.

SUPPLY AND DEMAND BALANCE:
SHELLED CONCLUSIONS

In examining the role supply and demand plays in halves and pieces markets, we must be fully cognizant that the data available to analyze these markets is clearly lacking. Even so, there are several critical findings. Using shelled import prices as a proxy for the U.S. halves and pieces market, we can see that:

Shelled and in-shell prices are correlated, though in-shell prices tend to be more volatile. Overall, despite imported shelled prices being unusually low relative to the shelled price prior to the 2018/19 season, the two benchmarks appear to have moved in tandem.

Despite the correlation, neither in-shell nor shelled pecans are consistently the first mover in pecan markets, meaning **shelled prices do not inherently follow in-shell nor do in-shell follow shelled markets.** However, **there were a few clear instances wherein in-shell prices were the first mover** with those instances specifically tied to a major shift in the markets (e.g. China unexpectedly entering/exiting the market). Yet in most months, without a major shift in the supply-demand balance, the markets moved in tandem even as in-shell prices were notably more volatile than shelled prices, likely a result of the inherent seasonality of pecans and shellers offering fixed cost contracts to the major retailers.

SUPPLY AND DEMAND BALANCE:
SHELLED CONCLUSIONS

In general, shelled pecans are driven by the similar supply-demand fundamentals as in-shell pecans but they are not perfectly alike. Effectively, **while in-shell prices were primarily supply-driven, shelled pecan prices appear to be majority demand-driven, specifically export demand.**

Unlike in-shell prices, **the size and quality of a given harvest had only a limited bearing on the price of pecans.** Meaning, even when in-shell supplies are short and/or the harvest is poor, shellers have been unable to push higher price through to their customers – likely exacerbated by when contracts were negotiated.

Aggregate supply and demand measures, such as **stocks-to-use and changes in inventory, once again had a stronger correlation with shelled prices in the season that followed than the particular season being reflected in the fundamental data.** However, even then, the level of impact remained minimal.

Export sales had the biggest influence on the average price of shelled pecans. Domestic utilization of shelled pecans had a positive impact on price but a far weaker one than exports. Taken together, this suggests that the domestic market can fully absorb additional supplies, but there is limited capacity to push prices higher in tight supply years without an external competitor.

SUPPLY AND DEMAND BALANCE: HALVES AND PIECES CONCLUSIONS

Digging deeper by examining what little data is available on the halves and pieces markets, particularly Strata Markets and Circana as well as qualitative interviews:

Halves and pieces have plenty of potential to move independently based on their own supply and demand dynamics, especially given the differences in buyers – halves are the focus of retail-centric demand; pieces are geared towards foodservice and food manufacturing. According to our qualitative research, given that halves can be chopped into pieces (though it adds costs), halves tend to have a premium relative to pieces more often than the inverse.

In-shell prices are primarily connected to returns for pecan halves. However, a weaker piece market can weigh on in-shell prices, particularly for poor quality loads.

SUPPLY AND DEMAND BALANCE: RETAIL CONCLUSIONS

Retail pecan prices do appear correlated to wholesale halves markets, particularly when prices are rising. Yet, when wholesale prices fall, retailers appear more likely to hold prices at elevated levels in order to recoup margin lost during the prior bull market.

The data would suggest that retail consumption is sensitive to major swings in prices though consumers do become acclimated to price changes over time.

SECTION 3

Pecan Supply & Demand

SECTION 3.3

Correlation & Competition with Other Nuts

CORRELATION & COMPETITION WITH OTHER NUTS

Moving on from simply looking within the pecan supply and demand balance table, it is worth examining whether pecans do compete with other nuts, especially given the fact that retail consumption proved to be fairly elastic and shelled pecan prices did suffer when demand was softer.

In our interviews with stakeholders, industry experts repeatedly spoke about how pecans don't typically compete with other nuts outside of walnuts. Pecan's status as a premium nut as well as their limited usage in mixed nut bags reportedly makes pecans less likely to be substituted.

Because pecans are at a consistent premium to most other nuts (pistachios are a notable exception), **there is little incentive to replace pecans with a cheaper nut when pecan prices rise as mixed nut bags that still want to market pecans are already near the minimum content** (5-10% depending on the grade). Conversely, pecans rarely if ever get cheaper than walnuts, almonds, hazelnuts, etc. As such, there **is little financial incentive to boost percentage of pecans in a mixed nut bag even if pecan prices fall.** Given this reality, the perception among interviewees was that trends in other nut prices had a limited impact overall on pecan prices, because they didn't act in competition with one another.

There were a few comments made by respondents that walnuts and pecans could compete with each other, especially in the baking or cooking sector. However, **the data – as shown on the next several slides – would suggest that there is a very loose correlation with walnuts, and that correlation (if there ever was much of one) has weakened over time.**

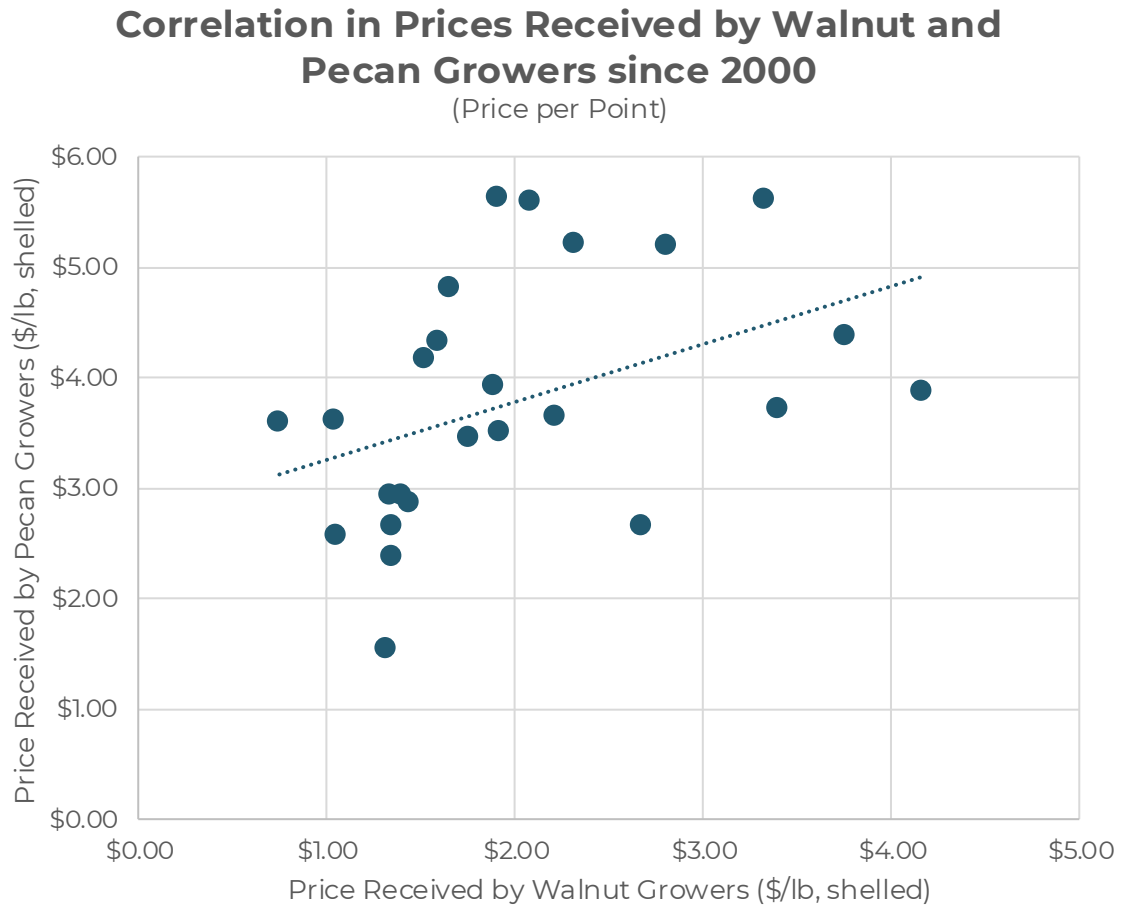
CORRELATION & COMPETITION WITH OTHER NUTS

Utilizing USDA data, **pecan and walnut prices followed similar trajectories through 2010 or so, but the two nuts have become less correlated over the last decade and a half.** The divergence around that time likely reflects China switching from a major importer of both walnuts and pecans and into a dominant grower and exporter of walnuts, in contrast to pecans.

Without the same major buyer, the other differences in the two nuts – namely independent growing regions resulting in uncorrelated supply trends and pecans' unique place in holiday baking, cooking and gifting – have pushed the pecan and walnut prices to move independently of one another.

Yet despite the lack of a correlation with walnuts, **our team has found a surprisingly robust correlation between international pecan price trends and movement in average tree nut prices** (Figure 3.48)**.**

Figure 3.44

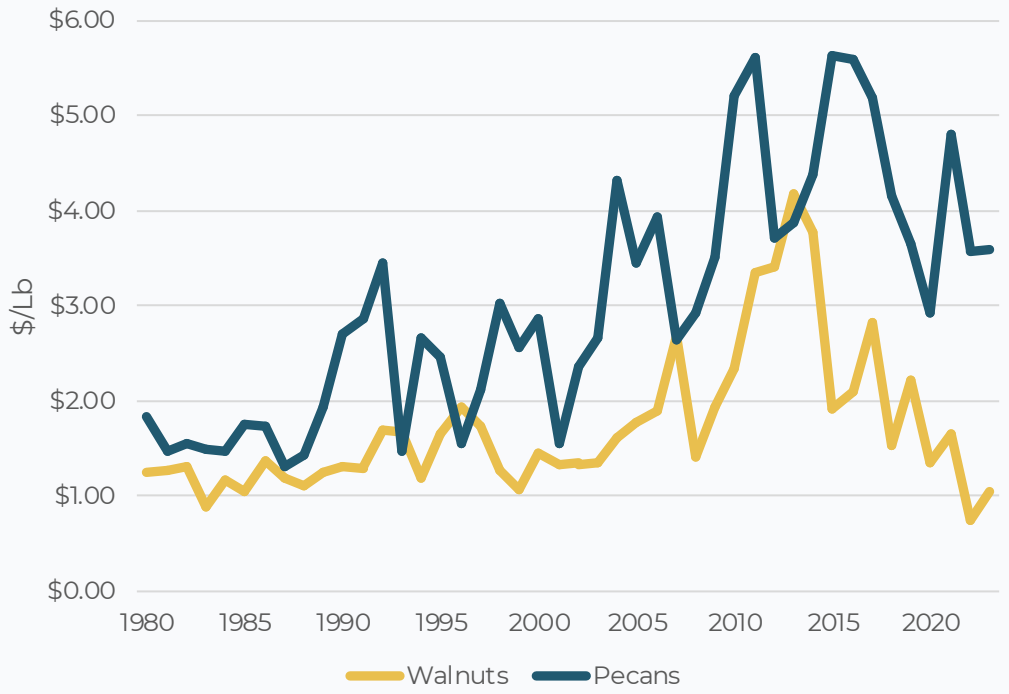


Source: USDA Fruit and Tree Nut Yearbook

WALNUT AND PECAN PRICES OVER TIME

Figure 3.45

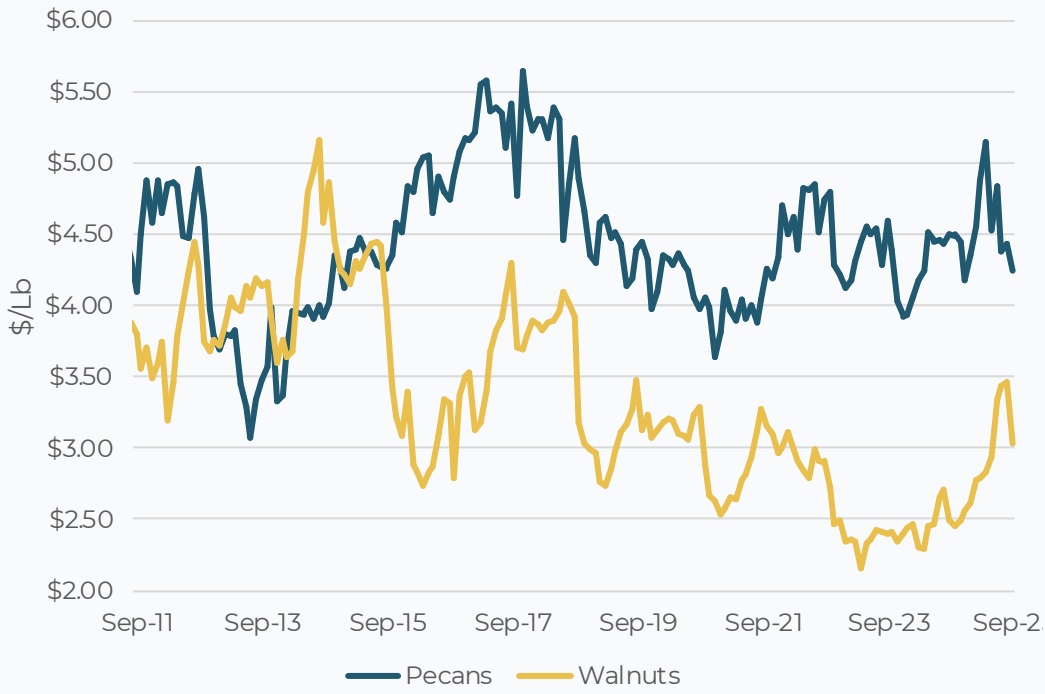
Prices Received by Walnut and Pecan Growers
(Price per Point)



Source: USDA Fruit and Tree Nut Yearbook

Figure 3.46

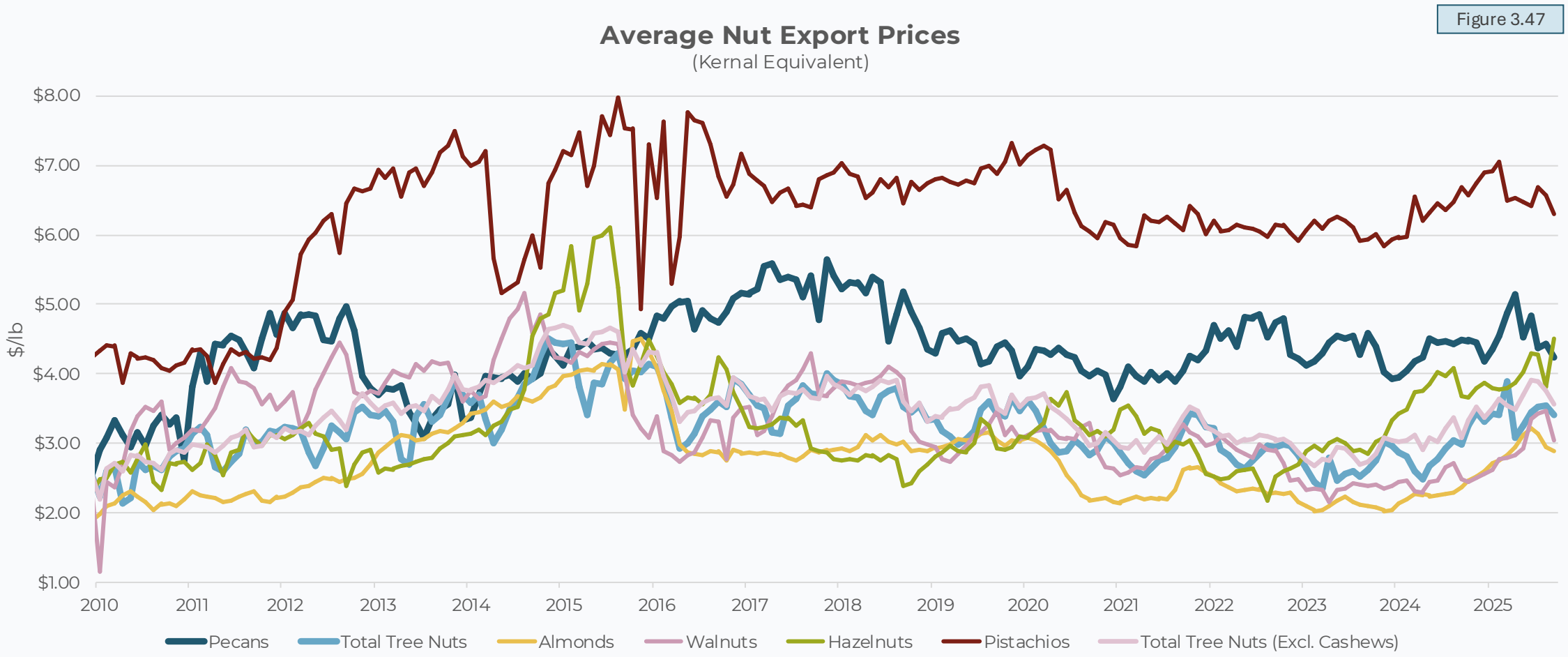
Average Global Export Prices for Pecans and Walnuts
(Kernel Basis)



Source: Loux Analytics, Trade Data Monitor

CORRELATION AND COMPETITION WITH OTHER NUTS

Figure 3.47



Source: Loux Analytics, Trade Data Monitor

CORRELATION AND COMPETITION WITH OTHER NUTS

Looking at international trade data, there appears to be a surprisingly strong correlation between the average global price for pecans traded across international borders and tree nuts as a general category even as pecans consistently trade at a premium to other nuts (with pistachios as the lone exception).

Given pecans unique geographic footprint within the U.S. as well as limited external competition outside of Mexico and South Africa, there is no evidence that supply trends are correlated. As such, any correlation must come from demand.

However, while there does appear to be some correlation between pecans and global tree nut trade at the broadest level, the primary culprit appears to be the fact that major international buyers of pecans – China, Europe, MENA and the U.S. – are also the primary buyers of nuts more generally. As shown in Figure 3.49, those four markets account for 90% of global pecan imports, and 60% of tree nut imports (excluding cashews). China and Europe alone account for 45% of pecan trade and 42% of all tree nut trade (excluding cashews).

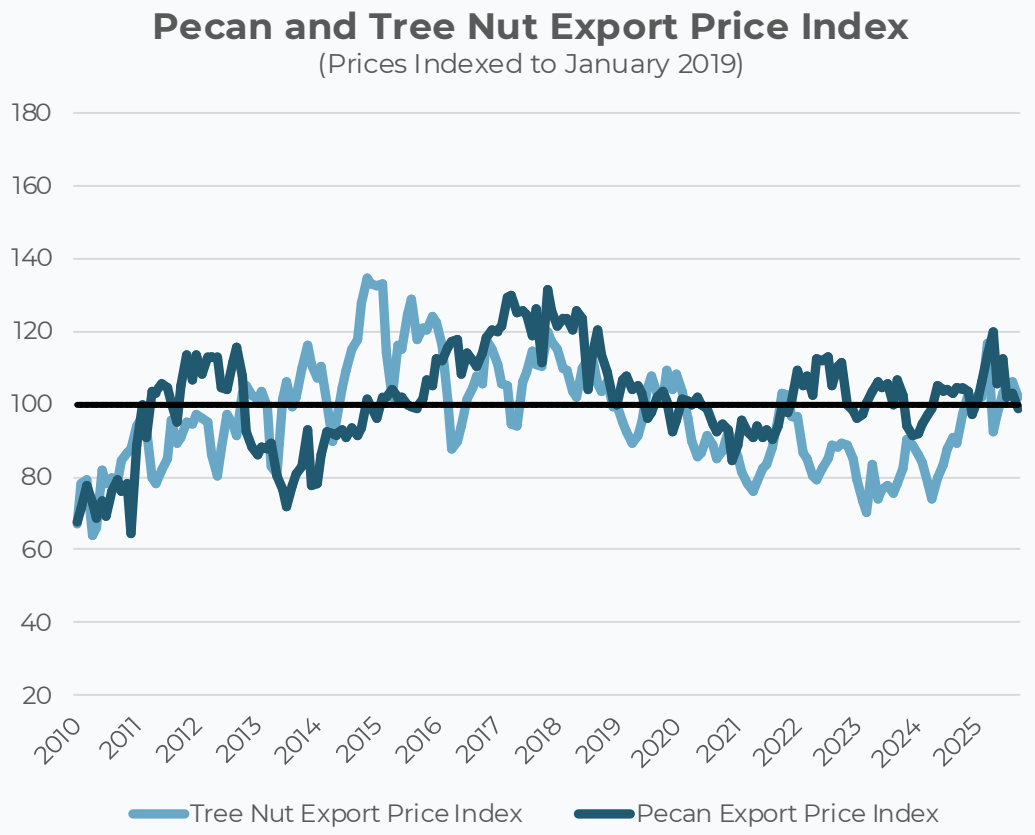
Importantly, as it relates to price impacts, **when China, Europe and MENA are actively buying (or conversely retreating) in pecans, they tend to do so across their aggregate nut purchases as well.** Explained more simply, when China is active in buying pecans, they tend to be buying aggressively in other nuts as well. When European purchases of tree nuts in general slow down, pecan purchases also slow.

Thus, any price correlation between pecans and other nuts does not derive from direct competition and substitution, but rather correlated buying activity. This is further supported by the fact that there does not appear to be a single nut that correlates as well with pecans as just the general tree nut index.

The charts on the following pages put global trade of pecans and tree nuts in aggregate on an index to isolate whether pecan and total tree nut purchasing behavior move in concert. As mentioned in the market overview, pecans represent less than 4% of global tree nut trade so pecan trade will have very little impact on the overall tree nut index. Given the smaller volume the pecan trade index tends to be more volatile than the aggregate tree nut measure, but, notably, the trade indices do tend move in the same direction across all three major pecan markets, especially China.

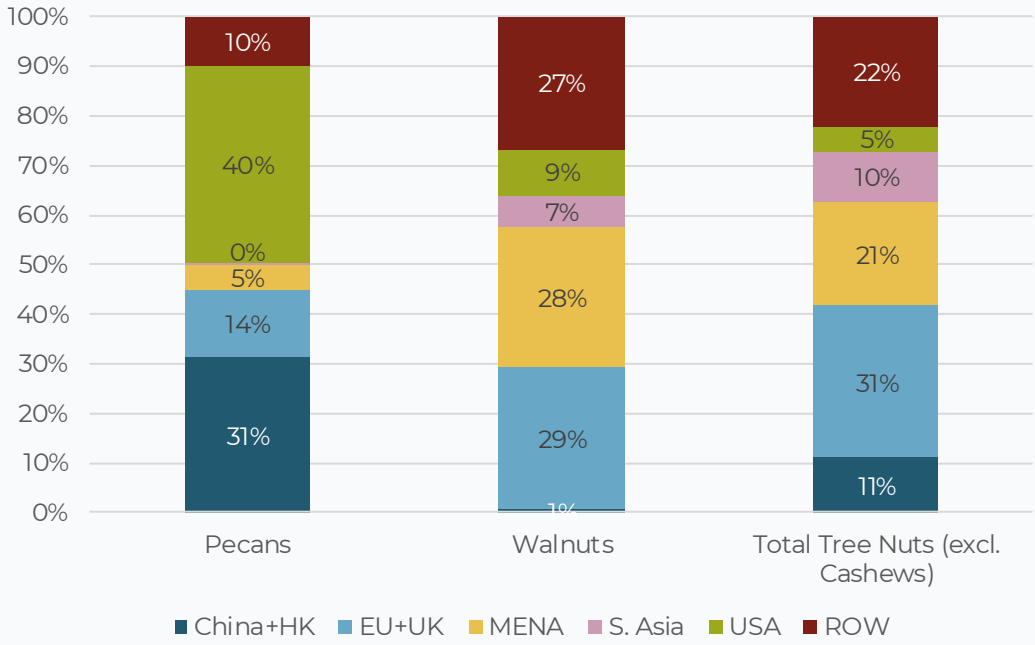
CORRELATION AND COMPETITION WITH OTHER NUTS

Figure 3.48



Source: Loux Analytics, Trade Data Monitor

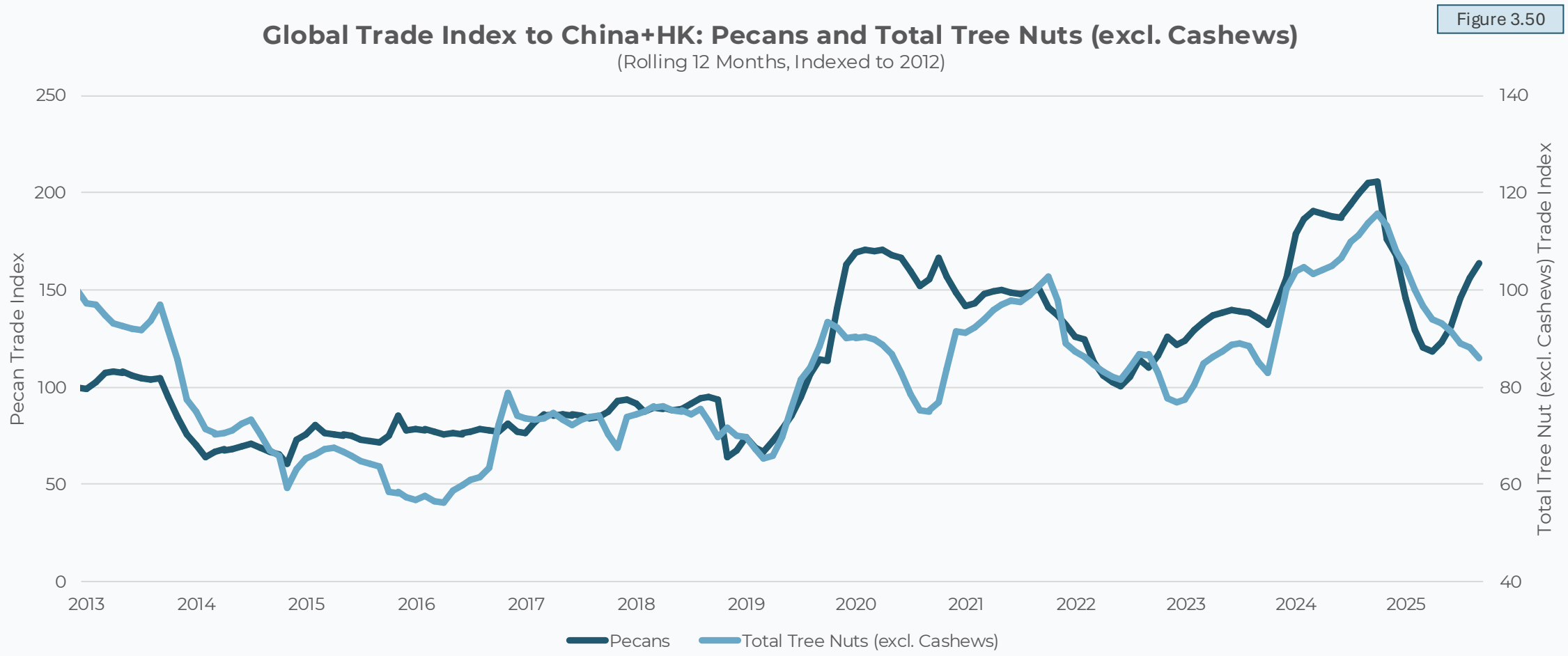
Figure 3.49



Source: Loux Analytics, Trade Data Monitor

CORRELATED BUYING BEHAVIOR: CHINA

Figure 3.50



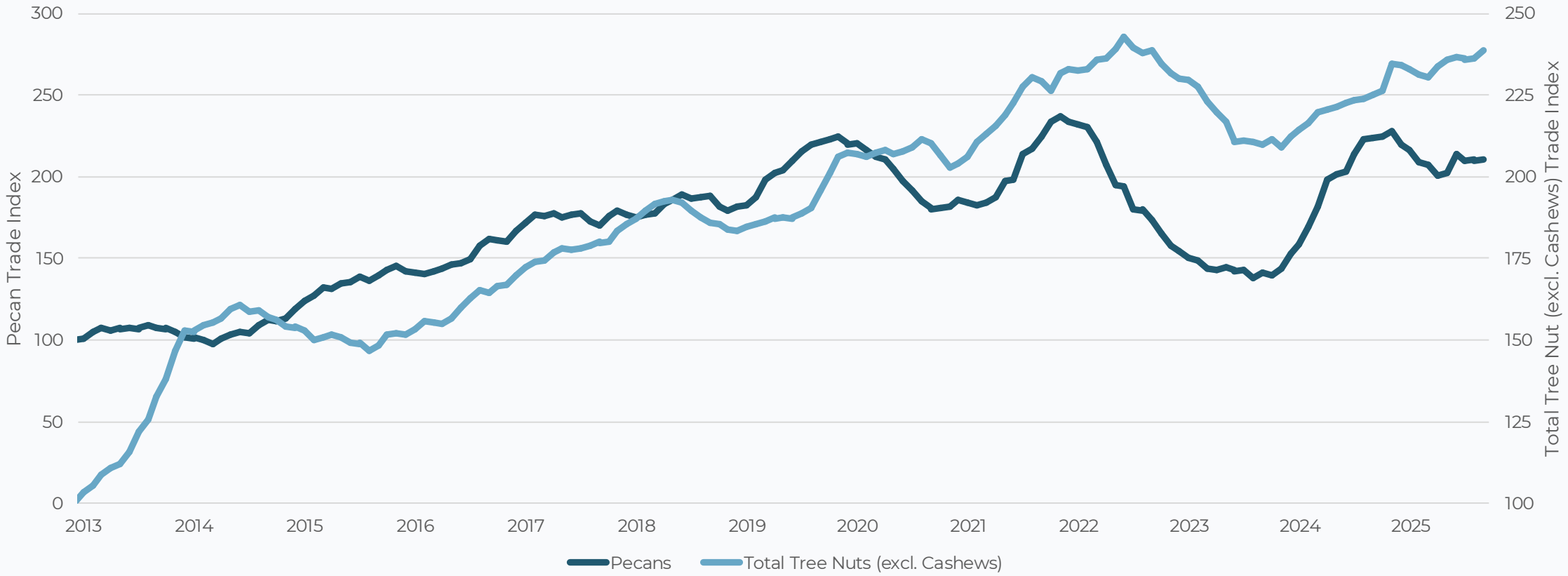
Source: Loux Analytics, Trade Data Monitor

CORRELATED BUYING BEHAVIOR: EU+UK

Figure 3.51

Global Trade Index to EU+UK: Pecans and Total Tree Nuts (excl. Cashews)

(Rolling 12 Months, Indexed to 2012)



Source: Loux Analytics, Trade Data Monitor

CORRELATED BUYING BEHAVIOR: MENA

Figure 3.52

Global Trade Index to MENA: Pecans and Total Tree Nuts (excl. Cashews)

(Rolling 12 Months, Indexed to 2012)

Source: Loux Analytics, Trade Data Monitor

(LACK OF) CORRELATION WITH OTHER NUTS: CONCLUSIONS

In many respects, **pecans are in an enviable position as a premium nut with few direct competitors**.

The historical price correlation between pecans and walnuts has weakened over time as domestic demand for pecans has improved and China has flipped from a major buyer of walnuts to an exporter (thus reducing the frequency in which China drove prices higher or lower for both nuts simultaneously).

Internationally, the major pecan import markets, namely China, the EU and the Middle East-North Africa typically buy pecans at similar rates to their nut purchases in general. This **correlated buying results in pecan prices typically following global tree nut price trends in general, but there is little connection with any tree nut in particular.**

Given **pecan's premium status, there is little direct influence from other nuts on pecan prices**. However, this relationship (or lack thereof) could evolve as pecan expands its eating occasions and moves beyond its year-end holiday concentration where pecans may start competing with other nuts to a greater degree.

SECTION 3

Pecan Supply & Demand

SECTION 3.4

Seasonality

Seasonality in Pecan Markets

The final supply and demand factor that has a notable influence on pecan prices is seasonality. As evidenced both by the data and interviews with industry experts, the pecan market's seasonality plays a major role in the pricing of pecans.

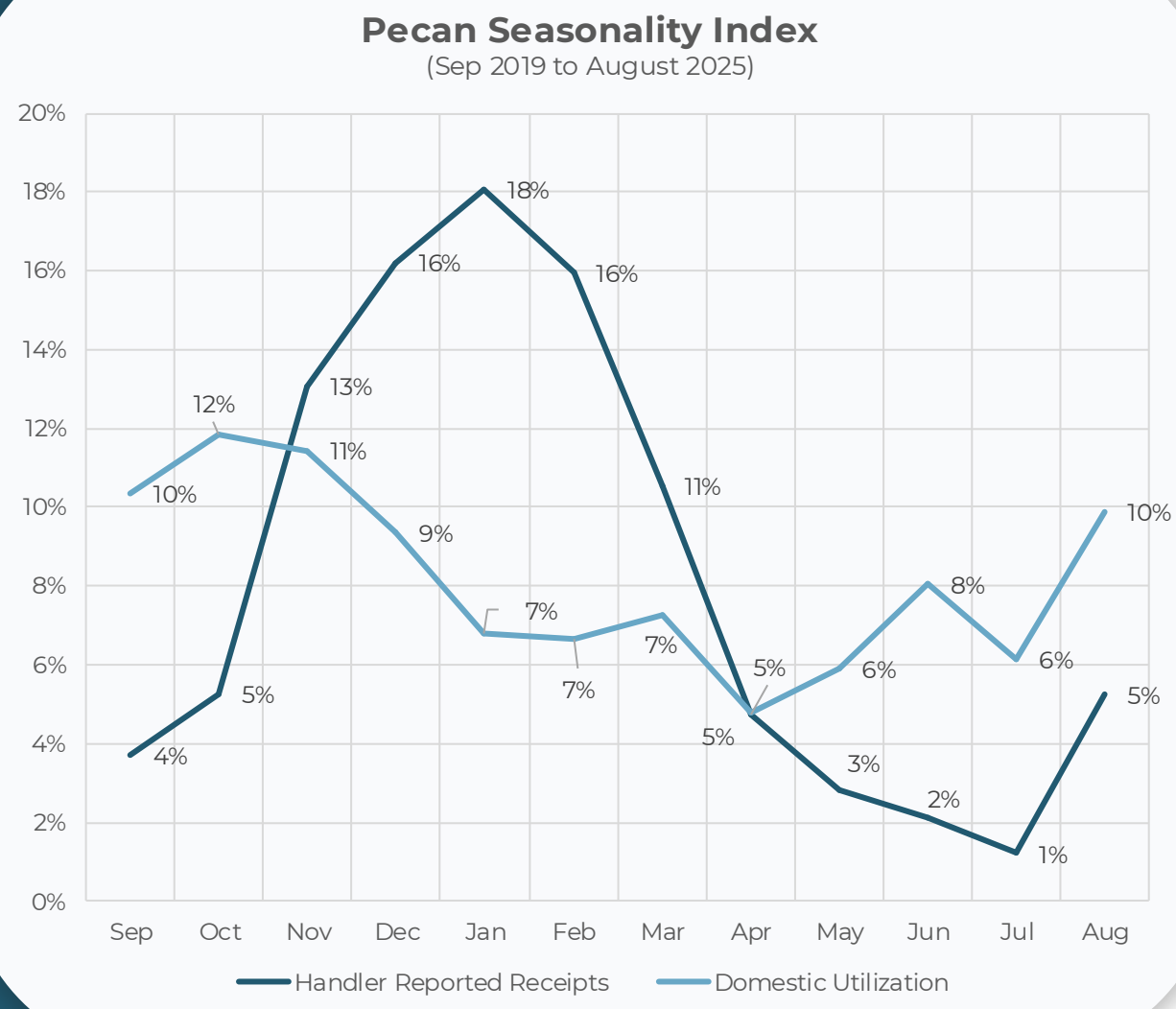
The chart on the right shows the variation in seasonality between domestic utilization (consumption) and the harvest (handler receipts). The seasonality can be measured by calculating a month's average proportion of the full year's total, whether production, consumption, exports, etc. For example, between the 2019/20 marketing year and the 2024/25 marketing year, September accounted for 10% of a given year's domestic consumption on average, but just 4% of handler receipts.

Given how popular pecans are over the Thanksgiving, Christmas and New Year holidays and the sheer quantity of pecans produced in the western states, this seasonality will be of little surprise to readers. However, this dynamic does have a noticeable impact on pricing.

Over last five years, over 50% of the pecans consumed in the U.S. were consumed between August and the end of the calendar year. However, only 27% of the harvest had reached handlers by that point in the season, let alone had those pecans been shelled, bagged and shipped to customers.

As a result, in-shell prices tend to be higher at start of the marketing year right as the new crop in Georgia is starting to be harvested and at the conclusion of the harvest when demand once again outpaces supply.

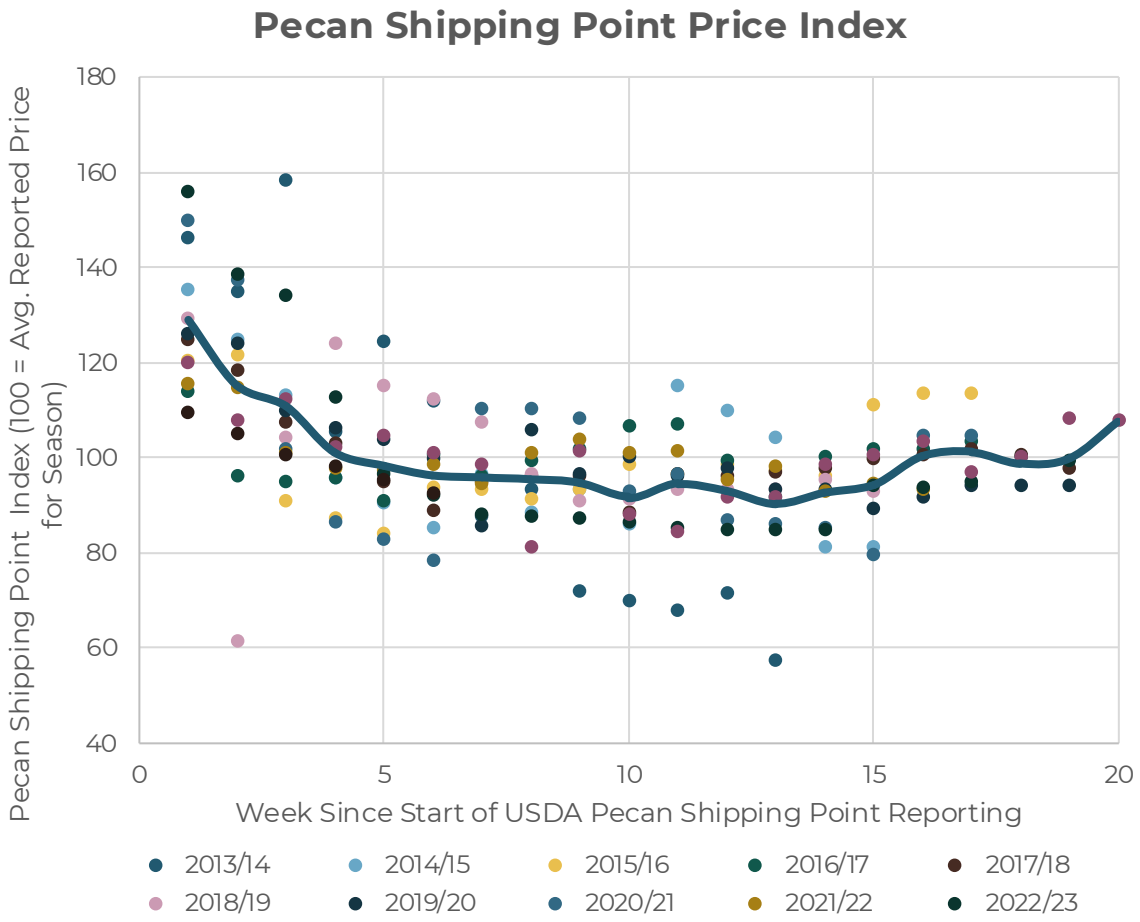
Figure 3.53



Source: Loux Analytics, APC

SEASONALITY IN PECAN MARKETS: IN-SHELL

Figure 3.54



Source: Loux Analytics, USDA AMS Shipping Point

Using shipping point data from USDA, we calculate that over the last decade or so**, in-shell prices paid to growers were typically 30% above the full season average in the first week of the harvest** (using when USDA started published pricing data – usually late October – as a proxy for when the harvest started in earnest), **20% higher in the second week, and 10% higher in the third week before settling at or below the seasonal average.**

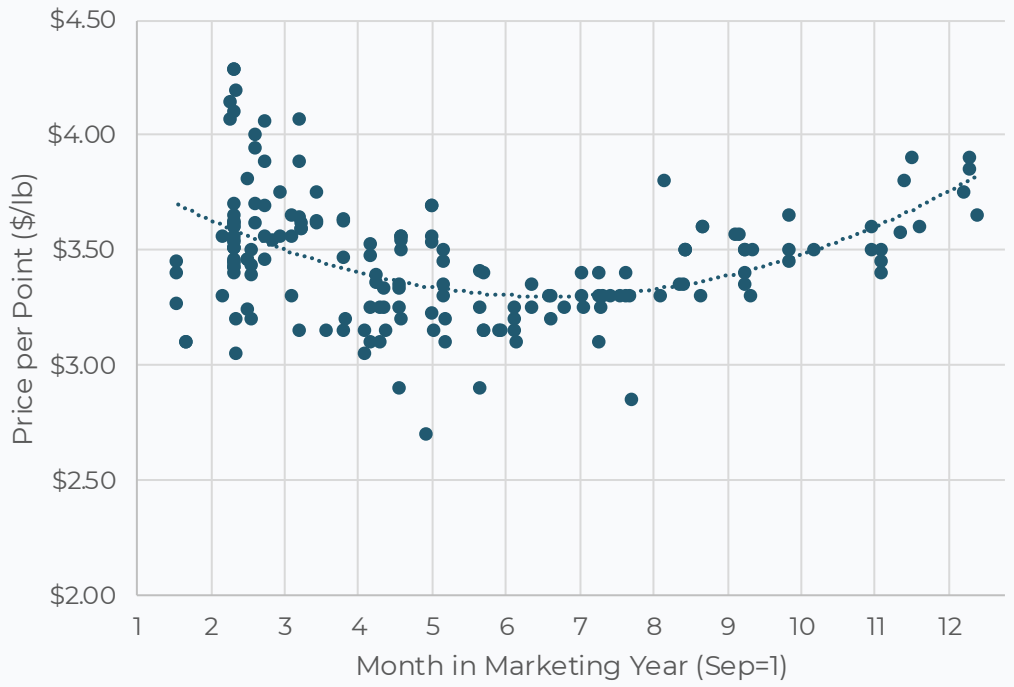
The seasonal trends apply not only at the beginning of the marketing year, but also as the harvest winds down. While USDA reporting typically ceases as market activity wanes, what data is available in later months does show a notable increase towards the full season average.

Furthermore, while only having data for two full seasons, Strata Markets data validated this finding as shown on the next page. Data from both the 2023/24 marketing year and 2024/25 harvest showed a similar seasonal trend as the USDA data. In fact, Strata markets data, which runs year-round, showed the sharp, seasonal curve continued for those months where USDA shipping point reporting pauses with March being a notable inflection point. Effectively as verified by both USDA, Strata Markets, and our stakeholder interviews, **the strongest pricing is typically at the start of the season, followed by a low-ebb during the peak of the Western harvest and then a rally during the off months beginning in March.**

However, despite the data showing higher prices for in-shell pecans that were sold either at the very beginning of the season or in the off-season, both shellers and growers reported in our interviews that once the new crop becomes available, prices noticeably deteriorate for any in-shell pecans from the prior season. As such, there is risk to those who hold in-shell inventory too long.

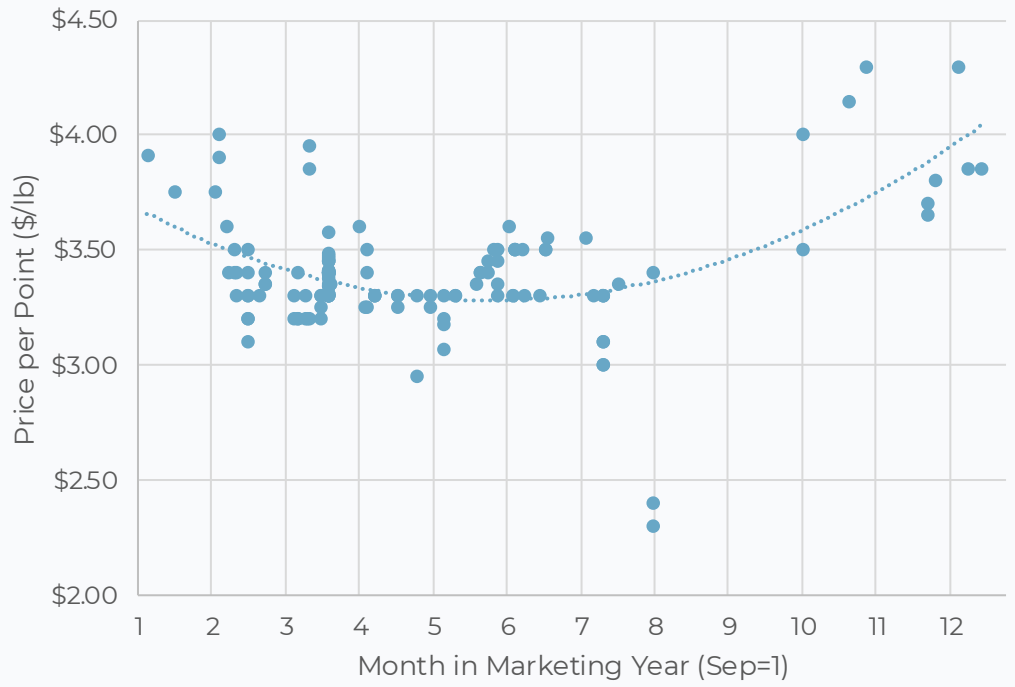
SEASONALITY IN PECAN MARKETS: IN-SHELL

Figure 3.55



Source: Strata Markets

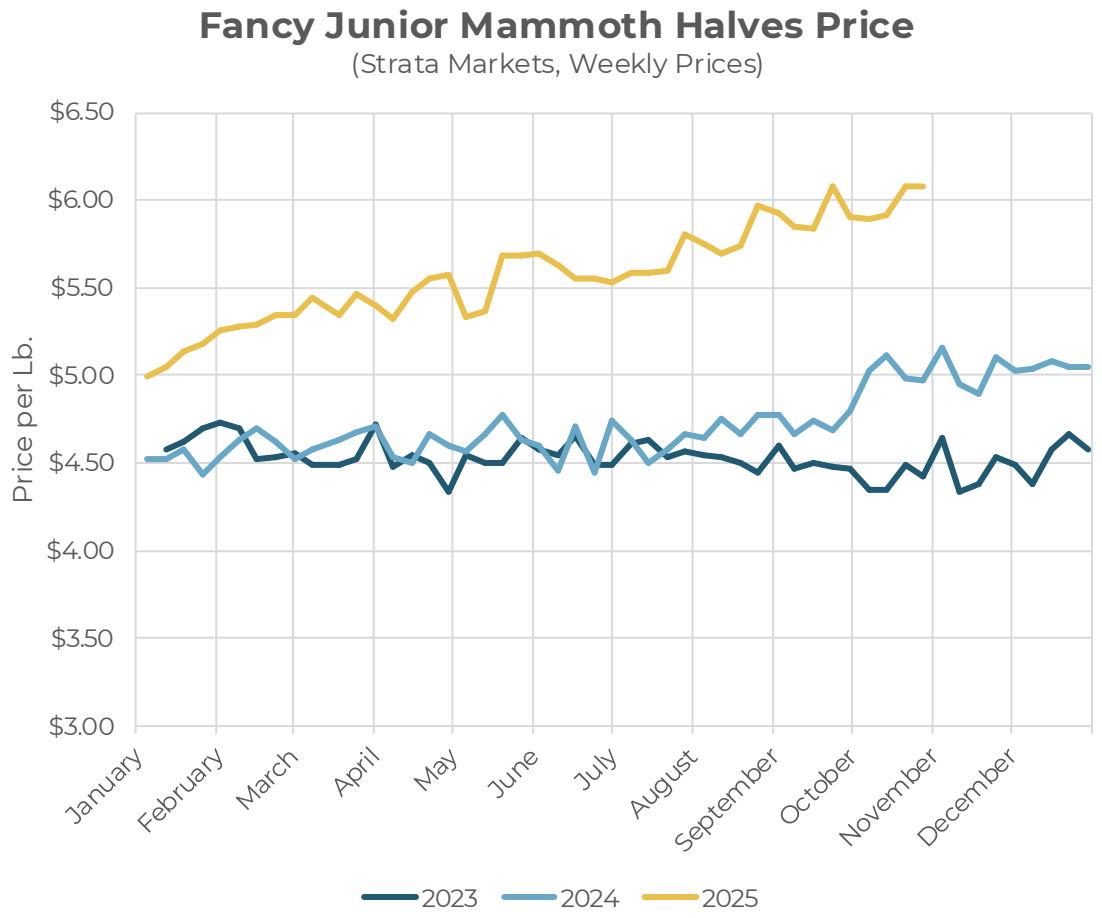
Figure 3.56



Source Strata Markets

SEASONALITY IN PECAN MARKETS: HALVES AND PIECES

Figure 3.57



Source: Strata Markets

Examining the shelled market, seasonality plays far less of a role in price. Unfortunately, there is not as robust of a historical data series as there is for in-shell.

Still, since Strata Markets data was able to clearly identify a trend in in-shell prices over the prior two years, one would expect that if there was seasonality in shelled prices, that would also show up in the Strata Markets data. However, **there appears to be virtually no seasonal trend in halves prices** – a stark contrast to the in-shell side of the equation.

As will be discussed in more detail in the Industry Structure section of the report, the lack of seasonality for halves would appear to be a logical outgrowth of the fact that many retailers prefer to book year-long, fixed price contracts with only the occasional spot buy ahead of the holidays to ensure there is enough on hand prior to the Thanksgiving baking rush.

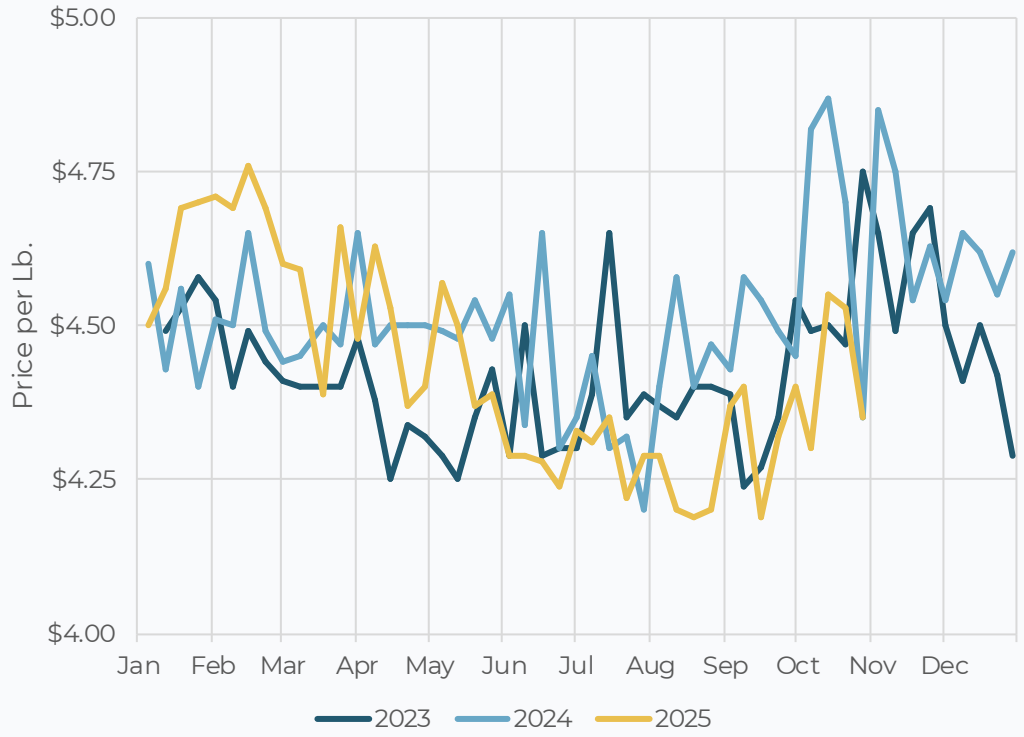
Still, we should be cautious about declaring halves prices at wholesale have no seasonality on account of the fact that the upward trend of the halves markets over the last two years could be disguising underlying seasonality.

Additionally, over the last three years, **pieces prices have been cyclical, peaking in October and November** (Figure 3.58), likely as bakeries and restaurants put more pecan-centric recipes on their menu for the holidays. Similarly**, pecans at retail have also been highly seasonal,** peaking right before the holidays, only to go on sale as soon as rush has ended.

Given the available data, it is perhaps most prudent to say that there is no evidence of seasonality in halves prices over the last three years, but we should not rule out the possibility that halves prices may have underlying seasonality in a stable market.

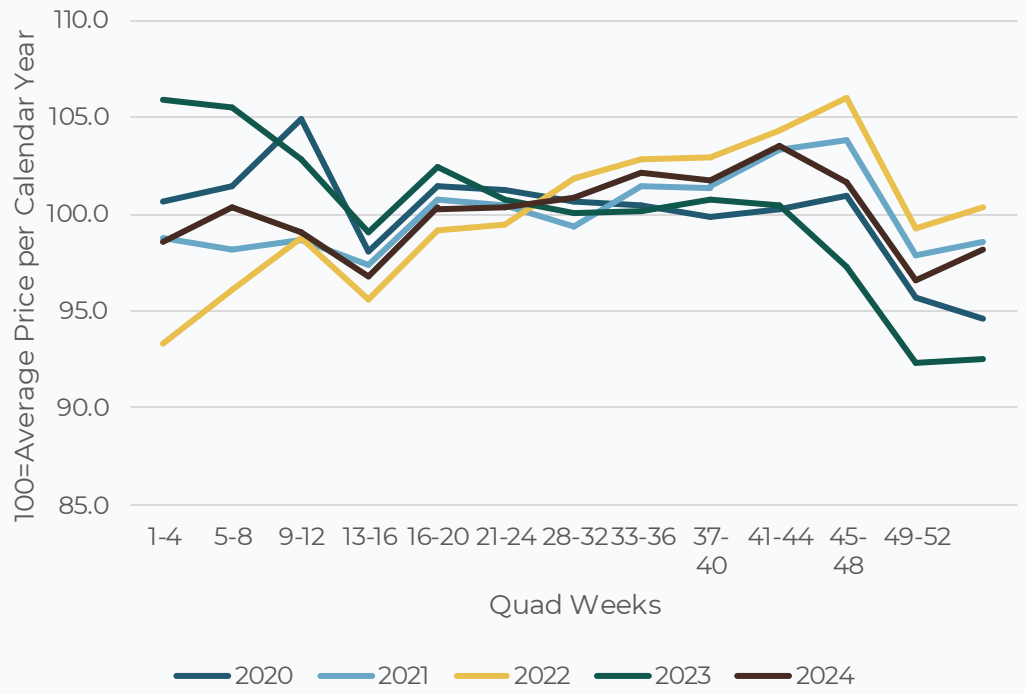
SEASONALITY IN PECAN MARKETS: HALVES AND PIECES

Figure 3.58



Source: Strata Markets

Figure 3.59



Source: Circana

SEASONALITY IN PECAN MARKETS:
IN-SHELL CONCLUSIONS

As shown repeatedly in the data and confirmed by expert interviews, **seasonality plays a major role in the price paid for in-shell pecans**. The seasonality of in-shell prices is primarily driven by five key factors:

1. Pecans' **production season is primarily concentrated in just a few short months** between October and February for both the U.S. and Mexico.

2. Similarly, **consumption is concentrated around the holiday season.** However, most of the product sold over the holidays is delivered to retailers in the months prior (August – November), meaning a large portion of the Eastern crop and virtually all Western crop is too late for the holiday – necessitating the retailers or shellers caught short to pay premium prices to secure limited supplies.

3. Additionally, at the start of the season, the **premium gift pack market is able and willing to pay a premium for high quality, new crop pecans.** Most of this value is captured by Georgia growers.

4. After the conclusion of the season, **prices typically rise during the off-season as there is little supply available and shellers caught short must pay premium prices in order to secure in-shell from those growers or brokers with access to cold storage.** Strata Markets data would suggest much of the in-shell sold off-season is from the West

5. Finally, as will be discussed in more detail in the following section, **a grower base starved for working capital often necessitates cash sales immediately after harvest.** This results in weaker prices during the peak of harvest as there is a relative abundance of pecans available. Conversely, prices rise when there is a shortage later in the year when most growers have sold their inventory.

SEASONALITY IN PECAN MARKETS:
SHELLED CONCLUSIONS

While in-shell pecans have highly seasonal (and thus more volatile) prices, **there is no evidence that halves prices at wholesale are seasonal**, though the underlying seasonality could be disguised by the lack of available data and the general price trajectory over the last two years.

By contrast, **there is clear evidence that pieces and prices at retail do climb seasonally**, peaking in late autumn, before a post-holiday hangover. This likely reflects the baking boom around Thanksgiving and into the holiday season after which retailers look to clear inventory.

SECTION 3

Pecan Supply & Demand

SECTION 3.5

Conclusions

OVERALL SUPPLY-DEMAND CONCLUSIONS

Perhaps our most frequently asked question during our qualitative interviews was "**in your opinion, how much do supply and demand drive pecan prices**?"

Responses varied wildly and covered the full spectrum from:

"It's all supply and demand"

to

"Supply and demand has no bearing at all. The U.S. crop is near all-time lows and prices haven't moved."

Our research has found that **the truth is somewhere in the middle though it probably matters more than most industry participants think.**

OVERALL SUPPLY-DEMAND CONCLUSIONS

Supply and demand **does clearly have a measurable impact** on pecan prices in certain instances…

The total size of the U.S. harvest has a clear correlation with the average in-shell price paid to growers (albeit with some notable exceptions). On average, **for every additional 10 million lbs. of pecan kernels harvested, in-shell prices move $0.15/lb. ($0.30 per point) lower.**

Additionally, the price for shelled pecans is clearly correlated with total export sales. **For every additional 10 million lbs. of pecans exported, shelled prices increased by $0.33/lb. on average.**

Finally, domestic demand did have a positive impact on shelled prices though its impact was modest. **For every additional 10 million lbs. of pecans utilized domestically, shelled prices rose $0.05/lb. on average.**

OVERALL SUPPLY-DEMAND CONCLUSIONS

But **other changes in market fundamentals frequently fail** to move market prices for in-shell pecans, halves or pieces…

Aggregate supply and demand fundamentals – as reflected by stocks-to-use and change in inventory – are correlated with both in-shell and shelled prices. However, **aggregate market fundamentals only seemed to matter in the season that followed and even that impact was limited.**

Domestic demand had no measurable impact on in-shell prices. In fact, it had an inverse correlation, suggesting the domestic market acted as the buyer of last resort when the market needed to clear. There was no evidence of growers able to push higher prices except when the harvest was weak or China was actively buying.

U.S. pecan production had only a minimal impact on shelled prices. The lack of correlation with supply combined with the weak relationship with domestic demand implies that unless there was an active export business, shellers have limited ability to push higher prices to domestic customers. This trend is likely further exacerbated by the seasonal timing of contracts, harvests and consumption.

OVERALL SUPPLY-DEMAND CONCLUSIONS

Ultimately, the underlying factor influencing whether supply and demand moves in-shell and shelled prices has been competition or, usually, the lack thereof…

In-shell pecan prices tended to rise when either 1) China entered the market buying large quantities of in-shell, or **2) harvest conditions were weak.** Both cases resulted in shellers needing to compete aggressively to secure enough pecans to fulfill contracts, which in turn shifted the negotiating balance in growers' favor. However, **all things being equal, our research would suggest growers have limited capacity to negotiate higher prices** – even if there is robust demand for shelled pecans – unless there are alternative buyers or simply not enough pecans to go around.

That said, sales during the off-season when in-shell supplies are at their lowest (and thus competition is the strongest) do result in higher prices on average, but they do not meaningfully move the "base" price for pecans.

Shelled pecan prices tended to rise when there was either 1) robust export sales, creating additional competition for halves and pieces, **or 2) strong domestic consumption**, enabling shellers to push modest price increases to retail customers.

However, just like in-shell pecans, all things being equal, our research would suggest **shellers have limited capacity to push higher prices onto domestic customers** – even if in-shell supplies are tight – unless there are alternative customers overseas.

The reason why supply and demand has such a limited influence on pecan prices – both for in-shell and shelled – and why changes in the competitive landscape have such an outsized impact on prices largely derives from the unique features and structure of the U.S. pecan industry…

SECTION 4

Industry Structure: Role in Price Setting

INDUSTRY STRUCTURE: INTRODUCTION

As demonstrated in the previous section, **supply and demand do have a measurable impact on pecan prices, but only in limited instances**. As far as market fundamentals go, in-shell prices were primarily influenced by changes in the U.S. supply, while shelled prices were primarily affected by international demand. For virtually everything else, pecan prices were insensitive to supply and demand changes.

In most instances, **this insensitivity to market fundamentals as well as other price peculiarities can be traced directly the structure of U.S. pecan industry, most notably**:

- The scarcity of trusted data
- Limited competition for both in-shell and shelled pecans
- Lack of working capital
- A mismatch in typical contract terms

As will be shown, these factors have:

- Weakened overall prices, harming margins for both shellers and growers
- Delayed and/or dampened the impact of market fundamentals on prices
- Exacerbated seasonal pricing trends
- Created additional layers of risk for market participants

KEY QUESTION AND FINDINGS: INDUSTRY STRUCTURE

Key Question:

To What Extent Does the **Structure of the U.S. Pecan Industry** Affect the Price of Pecans?

Key Findings:

1) **The scarcity of data – and the limited trust in the data that is available – dampens the influence of supply and demand fundamentals on pecan prices.** Prices can move in concert with the data, but they typically only do so when the fundamental moves are undeniable to all market participants (e.g. China's purchasing of in-shell or a hurricane felling orchards in Georgia).

2) **Limited competition for both in-shell and shelled pecans constrains price movement** unless market forces disrupt the status quo. In-shell prices typically improve only when supply is short or there is an aggressive international in-shell buyer in the market, because it necessitates shellers raise bids in order to secure supplies. Similarly, shelled pecans prices typically only rise when there is sufficient demand from international customers to avoid the 'race to the bottom' on bids for the major retailer contracts.

3) **The lack of working capital entrenches tight margins for all parties.** The need for cash exacerbates seasonal price trends by limiting the ability for growers to hold onto in-shell pecans to sell when markets improve, thus reducing profits for growers. Additionally, because shellers are paying for pecans in cash but selling on credit, a risk premium is built into sales prices for in-shell, lowering the price paid to growers. Yet even with that risk premium, shellers can easily misjudge the market and suffer substantial losses, historically resulting in consolidation and even more limited competition for in-shell. Finally, the lack of capital limits the capacity of the industry to invest in the very strategies that would raise the value of pecans.

4) **A mismatch in contract terms** between when shellers secure sales contracts with retailers and when in-shell pecans are purchased simultaneously **limits the ability for shellers to push prices higher, creates substantial financial risks for shellers, and restricts the price upside for in-shell pecans.** Effectively, because the price for shelled pecans is largely established before the start of the harvest when neither supply nor demand conditions are known, price increases for both shelled and in-shell are typically delayed until the following season, if they occur at all.

SECTION 4

Industry Structure: Role in Price Setting

SECTION 4.1

SCARCITY OF TRSUTED DATA

INDUSTRY STRUCTURE: SCARCITY OF TRUSTED DATA

One of the clearest challenges facing the pecan industry is the **scarcity of trusted data** – whether for prices or just general market data. **Simply, there is not enough data available to market participants:**

- Until Strata Markets launched a pecan survey, there was simply no real-time data available on the prices of shelled pecans, let alone halves and pieces.
  - This lack of data is exactly why our team needed to utilize the average unit value of imported shelled pecans as a proxy in our fundamental analysis. While useful for our needs, the trade data has a two-month lag at minimum. And so, it is of limited utility in price negotiations. Plus, it reflects additional processing and transit costs (as well as lower shelling costs in Mexico). As a result, these prices are not 100% applicable to domestic sales.
- Similarly, prior to Strata Markets, the only source for in-shell pecan prices that was anything near real-time was the USDA Shipping Point report.
  - However, that data was only available during the harvest and did not have much in the way of specificity but instead talked more broadly about market trends. As such, it was not particularly useful in establishing clear market prices. Furthermore, USDA has halted publication of that report.
  - USDA and APC have historically published average in-shell prices paid to growers, but only upon the conclusion of the season, making this an imperfect method of price discovery.
- On the market data side of the equation, until the creation of the American Pecan Council and its publishing of the Industry Position Survey, the only pecan market datasets published on a monthly basis were Cold Storage and U.S. Imports and Exports.
  - Critical statistics like production are only published a couple times a year by NASS, and the timing of those reports makes them not particularly enlightening. The October NASS survey largely forecasts expected conditions rather than detailing actual production. Conversely, the May data, which is more comprehensive is unfortunately published several months after the harvest concludes.
  - Similarly, USDA doesn't publish domestic utilization data except in the Fruit and Tree Nut Yearbook. Once again, that report lags the market significantly and is not published until February of the following year. Meaning, the 2025/26 harvest will largely be complete before USDA publishes *preliminary* consumption data for 2024/25 season.
- Given the lack of data, "the pecan industry relies on non-scientific approaches," as explained by one market observer.
  - For example, crop size and yield as reported by other pecan associations are determined through informal polling rather than systematic measurement. Additionally, some participants cited keeping their own private pricing data as the best option available.

INDUSTRY STRUCTURE: SCARCITY OF TRUSTED DATA

While having data is critical, it is of little use in helping establish market prices if folks don't use it. **Our interviews frequently found a lack of trust in or utilization of what information is published:**

- The most common reason for lack of trust was that the data – whether USDA or Strata – was **voluntary**.
    - Government data was referred to as "*voluntary and inconsistent*", as one interviewee said. As such, there was a heavy dose of skepticism (to put it mildly) in the Shipping Point prices or Cold Storage.
    - Even as APC data is mandatory, the attention to detail on some of the reporting pieces – namely imports and exports – is lacking. APC data was called "*as good as they can do*" and even "*a hell of a lot better than what we were doing*" Yet even so, APC commitments and inventory numbers were frequently mentioned as inaccurate.
- Alternatively, some industry participants cited **manipulation**.
    - One participant claimed "*historical manipulation and inconsistencies*" as a reason to discard the USDA data.
    - A couple respondents mentioned attempted manipulation of APC position reports either for tax deferrals benefits or to avoid paying assessments until product is sold and delivered as a reason for distrust.
- Even if they generally trusted the data, other respondents did not use the publicly available market data due to the **timing** of the reports.
    - The 30-to-60-day (or more) delays of both USDA and APC data makes it challenging to work with during the height of the season. As stated by one interviewee, "*timing inaccuracies can distort market understanding.*"
- Finally, a **lack of detail** held back utilization.
    - One participant described USDA data as "*extremely misleading*" due to the lack of detail on quality, variety and yield. For instance, using a standard yield factor of 0.5 can greatly over or understate the actual quantity of pecans in the market once shelled.

SCARCITY OF TRUSTED DATA: PRICE IMPLICATIONS

The data limitations and lack of trust in the data is a frequent gripe of the industry. But how does it affect for prices for pecans? Fundamentally, the scarcity of trusted data has two key impacts:

1 Hampers the establishment of an agree-upon market price

Without an agreed-upon market price – whether established through a spot or futures market like the CBOT or CME or a survey with clear criteria and sufficient liquidity – market participants are largely negotiating blind, frequently basing their position on what their neighbor got or their last offer. This can lead to a wide variation in prices paid based primarily on how much the grower or sheller needs the sale – whether for cashflow or simply to secure the volume.

2 Dampens market movement without an undeniable swing in supply or demand

Without trusted market data, market participants are largely negotiating based on leverage. As such, prices only move when there is an undeniable factor clear to both parties, like China entering the market or a particularly poor harvest.

As such, prices are slow to react to supply and demand changes simply because participants can't see (or don't trust) the changes in market fundamentals.

SCARCITY OF TRUSTED DATA: PRICE IMPLICATIONS

Data is a necessity to achieve greater transparency and navigate volatile markets. But it takes more than just having the data:

1 Step Having the data > **2 Step** Believing the data > **3 Step** Using the data

Unfortunately, pecans faces challenges on all three steps. There is some data but not enough. What data is available is frequently not trusted. And even when folks do trust the data, they have a hard time using it in price negotiations.

This scarcity of trusted data fundamentally limits negotiations between parties – whether grower and sheller, or sheller and end customer – resulting in prices being slow to move in one direction or another, and largely insensitive to supply and demand changes unless such dynamics are undeniable by both parties.

The current game of telephone used to gauge market prices and conditions can be effective – even advantageous – for buyers and sellers who have a strong network.

However, the pecan market's informality and lack of transparency also acts as a barrier to entry for new participants, including procurement staff that may want to incorporate pecans into a new product or recipe, but don't know how to manage their price risk.

SECTION 4

Industry Structure: Role in Price Setting

SECTION 4.2

LIMITED COMPETITION

INDUSTRY STRUCTURE: LIMITED COMPETITION

Perhaps the largest (and the most sensitive) industry factor influencing pecan prices is the **lack of competition** at multiple points within the supply chain. During our interviews, this was perhaps the most frequently brought up and emotive challenge facing the pecan industry.

At its most basic, the lack of competition **weighs on margins** and **dulls price movement** to changes in the fundamentals unless a new competitor enters the marketplace and/or negotiating leverage flips in the seller's favor.

Firstly, **pecan production is highly inelastic.** It takes nearly a decade for pecan trees to become sufficiently productive to be profitable, but they can be productive for decades thereafter. As such, once the investment is made, it makes little economic sense to pull trees when prices are low. And even if prices are high, there is a substantial delay between planting additional acreage and harvesting more pecans.

Meaning, for both shellers and retailers, there is a significant amount of confidence that supply will be available the following year even if prices paid to growers and shellers, respectively, are low. Additionally, paying higher prices will only net additional supply for that particular sale, but they will not incentivize greater supply anytime soon. As such, both buyers are incentivized to utilize their negotiating leverage to secure lower prices given the comparatively few repercussions on the viability of their supply.

LIMITED COMPETITION: IN-SHELL

Digging deeper on the in-shell side of the equation, it was universally agreed that growers have few options for selling their in-shell.

While estimates vary from across market participants, the common wisdom is that **six shellers purchase about 80% of all pecans** in the United States with three being exceptionally influential – a marked decline compared to ten or twenty years ago. This consolidation of the pecan shelling industry – driven by poor margins, limited capitalization and, occasionally, bad bets – **creates asymmetric negotiating leverage between growers and shellers.**

This asymmetric negotiating leverage helps explain why in-shell prices were particularly sensitive to supply changes. A poor harvest generally forced shellers to compete more for in-shell, helping raise prices.

Of course, the inverse was true as well. When there was a stronger harvest, prices softened as competition for in-shell waned. **Domestic and Mexican shellers are the only game in town capable of clearing the in-shell market** – a necessity for a grower-base in need of cashflow, limited cold storage and the old crop losing its value.

LIMITED COMPETITION: IN-SHELL

Similarly, asymmetric leverage explains how in-shell prices had virtually no correlation with demand except when a new buyer, like China, entered the market.

Our analysis found that China's purchasing was particularly influential, not just because they purchased a large volume of pecans at premium prices, but, more importantly, because **China gave growers another option to whom they could sell their in-shell.** As a result, domestic and Mexican shellers needed to raise their offers in order to secure enough supplies to fulfill their domestic contracts. Ultimately, without an active buyer like China, **domestic sales have historically proven insufficient to pull the in-shell market higher.**

Yet, demand insensitivity can't solely be put at the feet of consolidation in the shelling community. Instead, much of the reason for the lack of a demand pull for in-shell can be traced to the lack of competition that shellers also endure when marketing halves and pieces.

LIMITED COMPETITION: HALVES AND PIECES

Similar to the in-shell market, the U.S. shelled pecan market is dominated by the major retailers and box stores, like Costco, Walmart/Sam's Club, Kroger, etc.

Based on Circana retail sales data, we can calculate that, **at minimum, 46% of pecans consumed in the U.S. in 2024/25 season were sold in the retail channel.** Furthermore, that figure only counts pecans sold in products that were exclusively marketed as pecans (as opposed to mixed nuts or blends, which would surely raise the figure higher).

To compound this challenge, **three-quarters of all pecans sold at retail were private label** (74% cooking/baking; 1% snacking). And so, for the bulk of the pecans consumed at retail, retailers can easily switch between shellers, making price and payment terms the primary selling point. This then further drives down prices for shelled pecans.

Additionally, most of the pecans in the cooking and baking section are branded as "pecan halves", which reportedly are required to be 85% intact halves by weight for many retailers. By contrast, most of the foodservice and food manufacturing industries are interested in pieces or meal. This then gives retailers even more market power over pecan halves, while pieces are focused on foodservice and food manufacturing.

And so, given the lack of alternative customers for halves, **shellers have limited ability to bid higher prices without losing the business altogether.**

LIMITED COMPETITION: HALVES AND PIECES

The lack of competition faced by shellers is further compounded by the fact that retailers will typically conduct **reverse auctions**, wherein shellers submit bids for their business for the year in advance and usually before the U.S. harvest has even begun.

- As demonstrated in the supply-demand analysis, shellers have been unable push higher prices even when supply is weak, likely due to the fact that many sales for the year have already been agreed to before supply even became short.

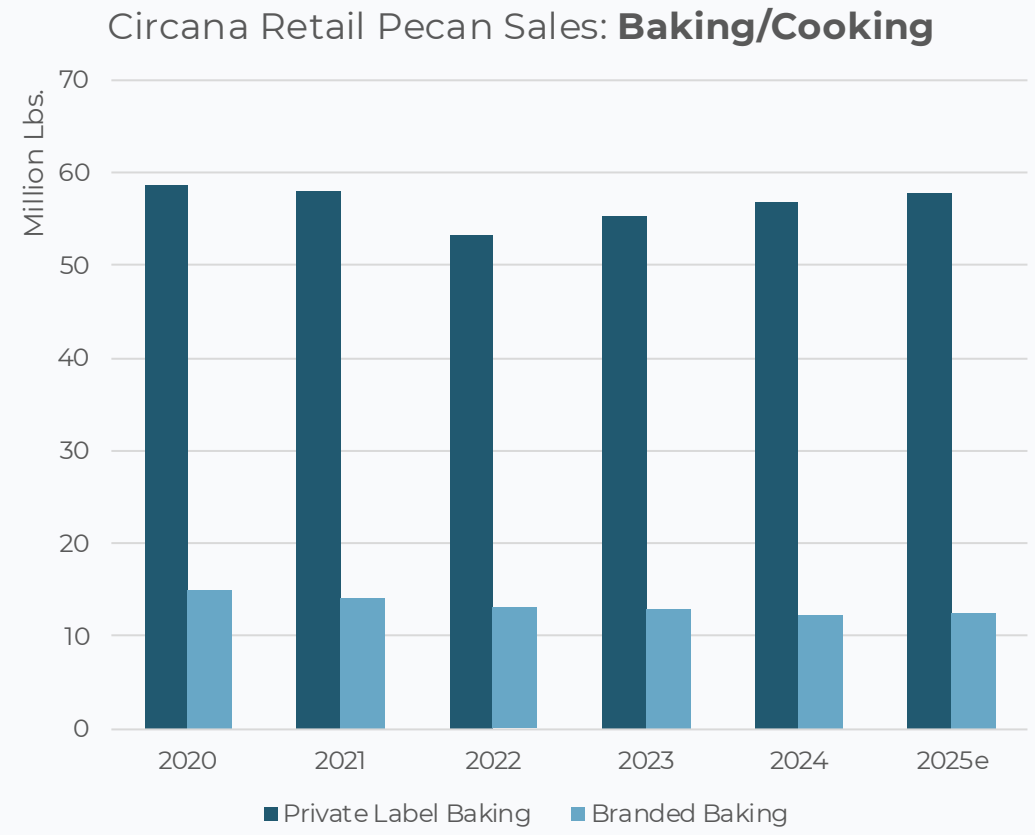
As a result, shellers are largely competing with themselves with no real ability to manage their price risk on the in-shell side. And, given the retailers' importance to move volume and maintain sufficient throughput at shelling facilities to be profitable, shellers are incentivized to win these auctions at virtually any cost.

This behavior is only enabled by the assumption that if only one or two shellers have the major contracts, they would be the only ones buying in-shell in any sizeable quantity and then can set the price for in-shell. While that could work in theory and years when supply is abundant, this has frequently burned shellers when the harvest came in weaker than expected or Chinese buyers provided an alternative.

- Given this reality, it should be of little surprise that our supply-demand analysis found export sales to be the primary determinant of higher shelled pecan prices. Fundamentally, international customers are providing an alternative to the main U.S. retailers, enabling those selling to U.S. retailers to raise their bids and those who miss out to sell internationally.

LIMITED COMPETITION: BRANDED V. PRIVATE LABEL

Figure 4.1



Source: Circana

Figure 4.2

Source: Circana

LIMITED COMPETITION: CONCLUSIONS

Ultimately, **this lack of competition for both in-shell and shelled pecans results in weaker margins for growers and shellers with the retailers coming out the main winner.** Positively, the American Pecan Council and many growers and shellers are already exploring ways to mitigate the lack of competition, albeit to mixed success and with plenty of costs associated with such efforts.

For Growers

- Investing in cold storage to hold onto product longer and thus sell when the market is at its strongest seasonally.
- Utilizing brokers or accumulators who can utilize large volumes of in-shell pecans to try and secure better prices.
- Merging with other growers to form a pool or, in one instance, a grower-owned cooperative.
- Developing a direct-to-consumer business
- Working to open the India market to U.S. pecans

For Shellers

- Developing an export business to diversify away from the concentrated U.S. retail segment
- Building a branded product in order gain business outside of the price-driven private label business.
- Expanding pecan's demand in the snacking category, which is nearly 90% branded product and one of the fastest growing categories at retail.
- Increasing food manufacturing and foodservice demand for pecans, thereby moving lower-priced pieces and building up an alternative customer base
- Vertically integrating through owning acreage in an effort to lower costs

SECTION 4

Industry Structure: Role in Price Setting

SECTION 4.3

LACK OF WORKING CAPITAL

INDUSTRY STRUCTURE: LACK OF WORKING CAPITAL

Perhaps the primary hurdle in achieving the diversification and thus mitigation against the lack of competition mentioned earlier is the **lack of working capital available for investment.** Working capital in the pecan industry has historically been scarce, but the current period of high interest rates has further exacerbated the challenge by raising the cost of borrowing.

This lack of cash plays out in several ways that negatively influence pecan prices.

For growers, there are substantial costs for starting, expanding or buying an orchard with no income from new plantings for 6 to 7 years. During that time, growers have incurred costs on everything from equipment, labor, water, crop inputs (fertilizers, fungicides, pesticides), and energy to say nothing of taxes, interest payments or even the costs of harvesting and cleaning the pecans.

As such, by the time pecans are harvested, **growers focus on selling in cash** to help pay down the many costs already incurred. And, because capital is limited, there is a lack of grower-owned cold storage, which forces many growers to move product to auction even if prices are low.

And even if there is cold storage, holding product in inventory is not free either – only paying out if there a premium to be made by holding onto the product to compensate for the inventory costs. As a result, in-shell pecans are often sold during the peak of harvest when supply is at its most abundant and prices are the lowest, exacerbating the seasonality in pricing.

One stakeholder aptly put it, ***"prices are frequently set by who must sell today."***

INDUSTRY STRUCTURE: LACK OF WORKING CAPITAL

The lack of capital on the part of the grower exacerbates the lack of competition and can further tilt negotiating leverage in the sheller's favor. As mentioned by one grower, *"financially stressed growers often sell at lower prices due to [their] immediate cash needs."*

This need to sell as soon as the product is harvested can be clearly identified in the data as well.

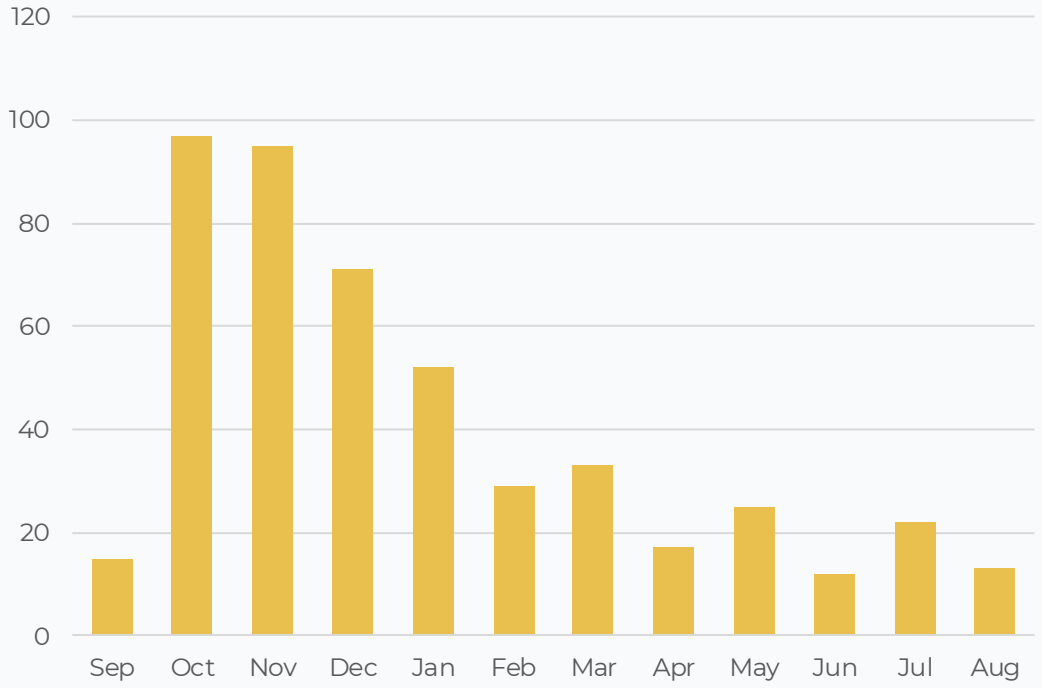
Examining data from Strata Markets over the last two harvests, roughly two-thirds of the in-shell trades reported into the survey of U.S. or Mexican origin occurred between October and January. By contrast, trades of halves and pieces reported into Strata Markets were fairly evenly distributed throughout the year.

And, as identified in Section 3.4, there is a very clear seasonal trend in pecan prices. Meaning, in order to maintain cashflow, not only do growers have to sell right away but they do so at the lowest point seasonally.

INDUSTRY STRUCTURE: LACK OF WORKING CAPITAL

Figure 4.3

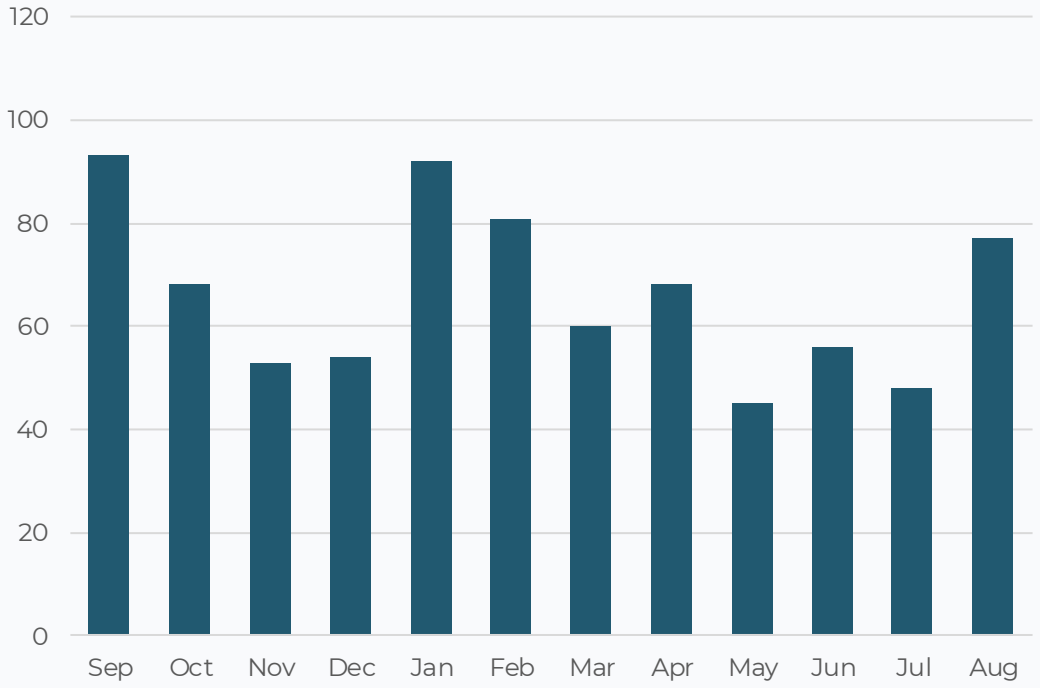
Strata Markets: Number of **In-Shell** Trades Reported by Month (2023/24 and 2024/25 Seasons)



Source: Strata Markets

Figure 4.4

Strata Markets: Number of **Halves & Pieces** Trades Reported by Month (2023/24 and 2024/25 Seasons)



Source: Strata Markets

INDUSTRY STRUCTURE: LACK OF WORKING CAPITAL

However, growers are not the only ones struggling with the lack of liquidity. Shellers face similar challenges that limit their ability to bid up prices without substantial financial risk to their business.

Importantly, by growers needing payment in cash, shellers must often borrow money in order to secure supplies, only to then also bear the costs of getting the product to market. Once in possession of the pecans, the costs of transport, shelling and storage are borne by the sheller.

By contrast, the major retail customers are not inclined to pay in cash but rather demand extended payment terms – something they can dictate due to their market strength. Additionally, shelled pecans are often not delivered to the retailer once the sale is secured, but rather over the course of the year-long contract. As such, shellers are then paying to hold the pecans on behalf of the customer long after purchasing the in-shell in cash.

For the many contracts not secured prior to the purchasing of the in-shell, shellers bear substantial price risk that the market could move between taking possession of the pecans and selling the product. As such, shellers then must (understandably) include a risk adjustment in their offers, which further pushes down in-shell prices.

LACK OF WORKING CAPITAL: PRICE IMPLICATIONS

Taken together, **both growers and shellers incur a substantial amount of costs and price risk prior to payment.**

The high cost of borrowing money with elevated interest rates, the need for cash simply to keep the lights on and the need to protect against price deterioration ultimately reduces the selling party's bargaining power in negotiations, pushing aggregate pecan prices – for both in-shell and shelled – lower.

This market reality also:

1. Exacerbates price seasonality in the marketplace,
2. Dampens the influence of supply and demand fundamentals on prices; And, most importantly,
3. Limits the potential of either growers or shellers to invest in the very strategies that could break the vicious cycle, like cold storage, marketing/ branding, international business, etc.

SECTION 4

Industry Structure: Role in Price Setting

SECTION 4.4

MISMATCH IN CONTRACT TERMS

INDUSTRY STRUCTURE: MISMATCH IN CONTRACT TERMS

The final component of the pecan industry's structure that plays a major role in the pricing of pecans is the mismatch in contract terms.

This mismatch isn't just the fact that shellers are buying pecans in cash but then selling on credit (which we discussed in the prior section). It is also the timing of when the major retail contracts or bids are agreed upon.

Fundamentally, as alluded to in earlier sections, our research found that many of the key retail accounts put out their reverse auctions for the year in advance before the harvest even begins in earnest. Given their importance, this then fuels competition for these accounts.

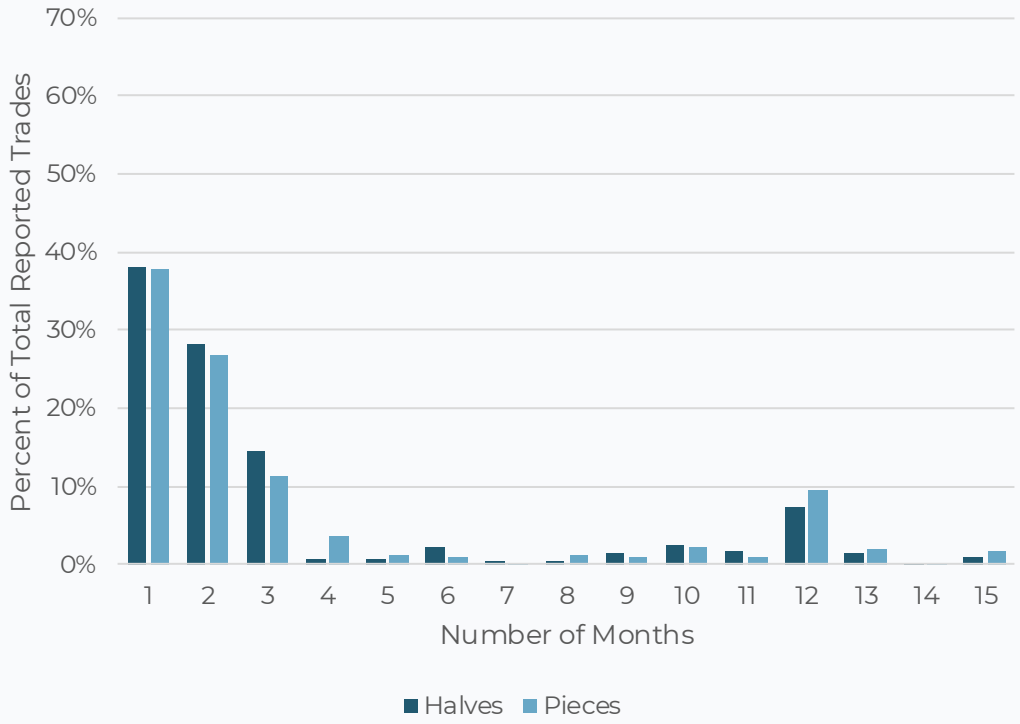
However, by that point, there is no real information available on the quality of the upcoming harvest or demand in the year in advance besides the size of the contract being bid on. Nonetheless, shellers competing for those contracts are forced to speculate on – and bid down – in-shell prices for the season to come.

Additionally, growers do not typically enter into contracts with shellers prior to the harvest or for multiple months of deliveries (as shown in the Strata data on the following page). As such, there is no way for shellers to manage risk to the cost side of their business even as they offer a clear risk management service to their customers through long-term, fixed price contracts.

INDUSTRY STRUCTURE: MISMATCH IN CONTRACT TERMS

Figure 4.5

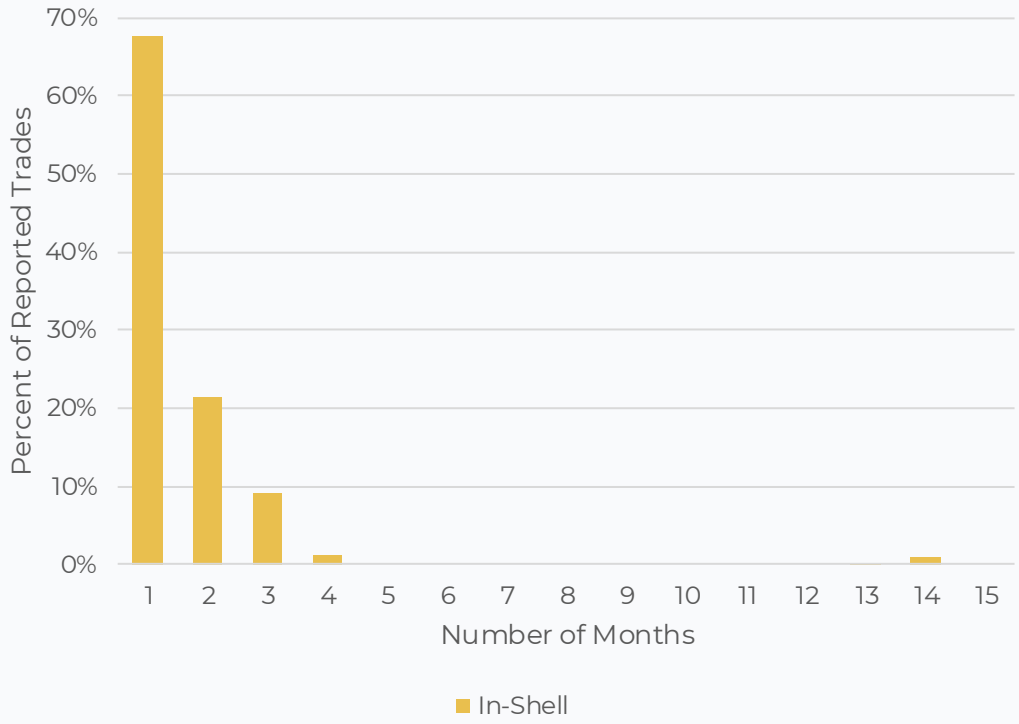
Strata Markets: Percent of **Halves & Pieces** Trades Reported by Contract Length



Source: Strata Markets

Figure 4.6

Strata Markets: Percent of **In-Shell** Trades Reported by Contract Length



Source: Strata Markets

INDUSTRY STRUCTURE: MISMATCH IN CONTRACT TERMS

By agreeing to a shelled price before knowing or being able to lock in their in-shell price, shellers take on a substantial amount of risk to their bottom line. If shellers win the contract but misjudge the harvest or the activity of China, the losses can be severe.

Hammering this point home, if we recall the correlations found in the prior analysis suggested that a 10 million lb. decrease in the U.S. harvest would increase in-shell prices by $0.30 per point. However, shelled prices would only increase by $0.02 per point. This mismatch highly suggests a substantial risk borne by shellers.

Yet in an average or normal year, by agreeing to a shelled price for the major contracts before the harvest, **the winning sheller can heavily influence – even set – the price of in-shell pecans for the rest of the market.** However, to win that bid, the winning sheller also had to bid the lowest price, putting downward pressure on the market overall.

Understandably, this dynamic also **dilutes the impact of market fundamentals** given the fact that production and consumption occur after prices are largely set.

Still, it helps provide a clear reason as to why prices tend to better reflect the prior season's market fundamentals than the season in question. Simply, whether intentional or not, the total market balance from the year that just concluded appears to have influenced the bidding behavior of those competing for this year's contracts.

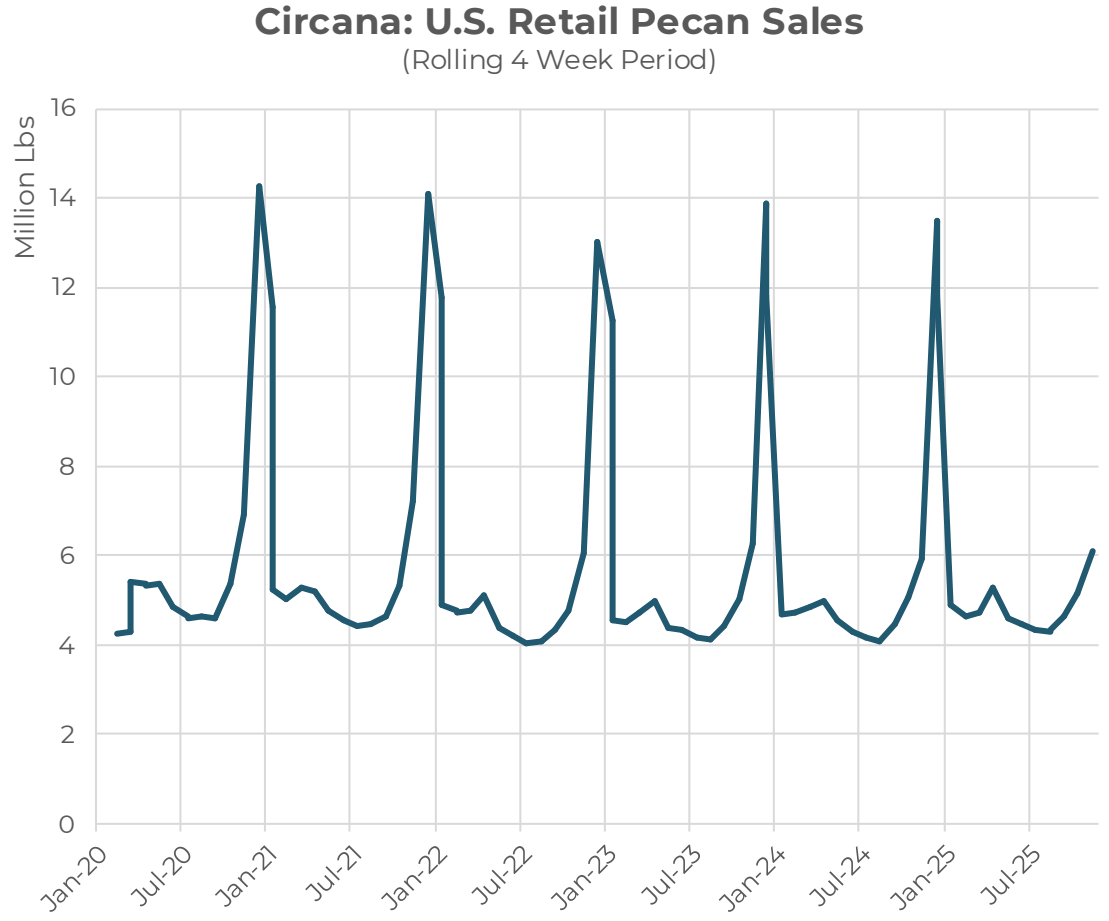
INDUSTRY STRUCTURE: MISMATCH IN CONTRACT TERMS

Finally, the mismatch in contract terms further **exacerbates seasonal price trends**. If consumer demand proves better than expected, the retailer is unlikely to be short until near the end of the contract as a result of robust holiday demand. Over the last five years, over 40% of all retail sales occur in the final 12 weeks of the year (23% of the year).

By the time that the retailer re-enters the market if their inventory is running low, much of the crop has already been sold, pulling up prices for those in-shell pecans in cold storage ahead of the new crop hitting the market.

If demand were stronger at other points in the year, retailers would likely need to come to the market multiple times throughout the year, potentially opening the opportunity for quarterly contracts – as opposed to annual. This would then allow shellers to manage their risk better (given the fact that much of the in-shell will have already been bought) and avoid having a couple winning contracts heavily influencing the market for the entire year before the harvest has even begun.

Figure 4.7



Source: Circana

CONTRACT TERMS: PRICE IMPLICATIONS

This mismatch in contract terms between retailers and shellers has several negative implications for the pecan industry.

In addition to limiting working capital for shellers, it also leads to speculative buying that often prematurely sets the market price for shelled and in-shell and creates limited opportunities for the market to adjust to actual supply and demand dynamics.

Greater competition from other customers to lessen the importance of these select retail contracts and/or smoothing out the seasonal consumption curve to move towards more frequent buys from retailers could help mitigate the negative implications caused by the mismatch in contract terms. Neither is an easy lift by any means, but both could be beneficial to shellers as well as growers.

SECTION 4

Industry Structure: Role in Price Setting

SECTION 4.5

CONCLUSIONS

INDUSTRY STRUCTURE: CONCLUSIONS

Taken together, the unique structure of the U.S. pecan industry has a profound effect on both in-shell and shelled pecan prices.

While there are many other structural factors that can influence pricing, the four our research identified – scarcity of trusted data, limited competition, lack of working capital and a mismatch in contract terms – had the largest impact overall on prices and were heavily interconnected.

These structural factors:

- Weakened overall prices, harming margins for both shellers and growers
- Delayed and/or dampened the impact of market fundamentals on prices
- Exacerbated seasonal pricing trends
- Created additional layers of risk for market participants

INDUSTRY STRUCTURE: CONCLUSIONS

Ultimately, the biggest issues facing the industry appear to be the concentration of the retailers and their overwhelming influence on pecan prices – for both shelled and in-shell – as well as the high cost of producing pecans long before any harvest comes to fruition. This dynamic ultimately results in the industry as a whole having a highly compressed margin.

As demonstrated by the graphic on the following page, growers are unable to effectively push costs of production lower, and shellers are unable to push prices for halves and pieces higher on a consistent basis.

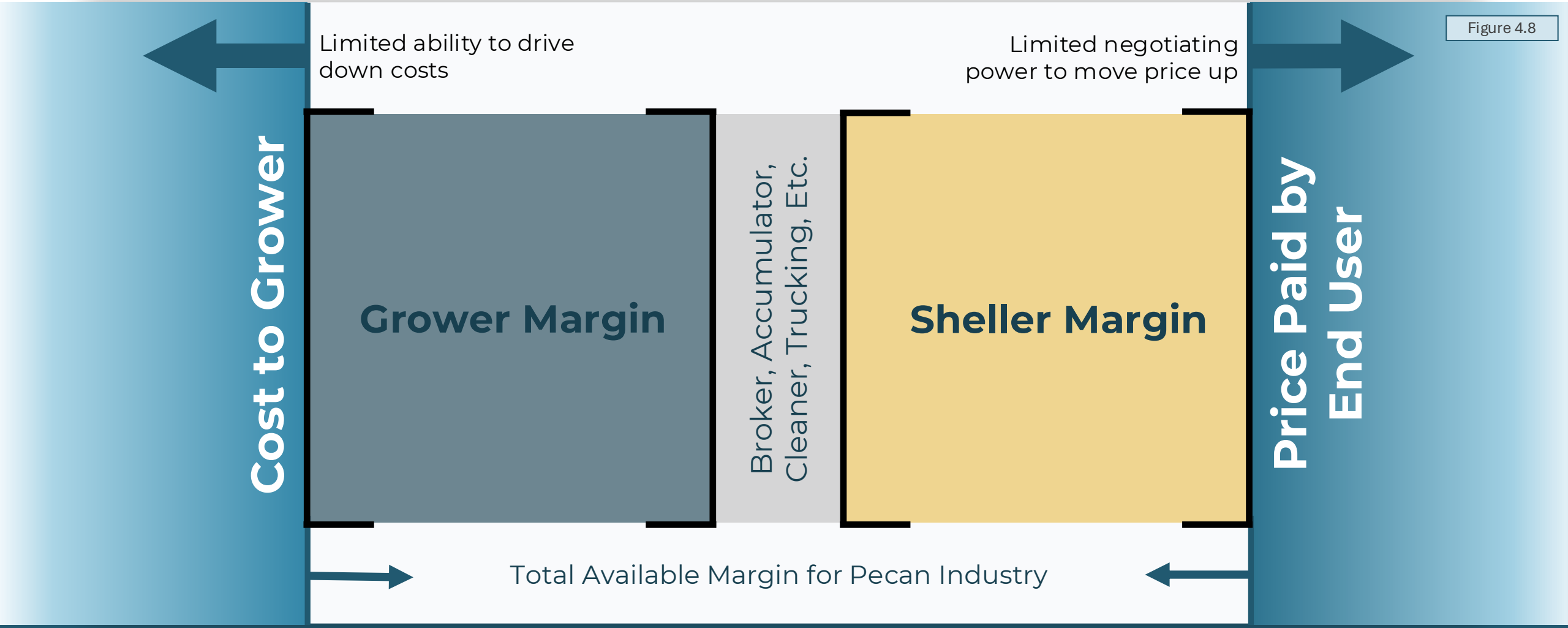
As a result, there is a relatively fixed margin available for the pecan industry as a whole. Thus, both sides of the in-shell divide, as well as the many other service providers in the supply chain, like cleaners, brokers, accumulators or storage providers, are all fighting over a small pie with few consistent winners. This dynamic and virtually zero-sum game amplifies tension within the pecan industry, limiting opportunities for collective investment.

Some in the supply chain are finding ways of maximizing the middle – whether it's growers owning cold storage, shellers vertically integrating or industry players collaborating to maximize bargaining power. Alas, all of these means require capital and have limited impact on growing the U.S. pecan industry.

Going forward, for the pecan industry as a whole, it will be critical to find ways to push the boundaries out, particularly by increasing competition for U.S. pecans and building a sustainable industry structure that doesn't require significant consolidation.

LIMITED LEVERAGE AND COMPETITION RESULTS IN COMPRESSED MARGINS AND ZERO-SUM TRANSACTIONS

Figure 4.8



SECTION 5

Product Differentiators

PRODUCT DIFFERENTIATORS: INTRODUCTION

- Most of the report's analysis up to this point has focused solely on what factors move the "base price" for in-shell and shelled pecans.
- Yet there are multiple other factors that can influence the price of an individual trade but may not have an impact on the general market for pecans. Product differentiators like shell-out, nut count, or organic claims can influence the prices paid on an individual transaction and offer specific premiums, but they do not have a broader influence on the market as a whole.
- Our team analyzed 6 product differentiators that also play in pecan prices to varying degrees:
    1. Shell-out rate/kernel fill
    2. Pecan size
    3. Varietal
    4. Organic v. Conventional
    5. Origin (State and Country)
    6. International destination

KEY QUESTION AND FINDINGS: PRODUCT DIFFERENTIATORS

Key Question:

To What Extent Do **Specific Product Differentiators** Affect the Price of Pecans?

Key Findings:

- **The shell-out yield has a significant influence on the price of in-shell pecans**, reflecting the fact that the value of the pecan is in the kernel, not the shell. On average, a 5% difference in shell-out resulted in roughly an 10% difference in price, or about $0.20/lb. on an in-shell basis.
- **The size of the pecan had a limited impact on the price of in-shell pecans, but it did make a difference for halves.** Outside of Chinese buyers, the nut count had a minimal impact on the in-shell price paid to growers. For every 10 nuts in a pound, in-shell prices only moved $0.03 per point. The size of the pecan had a greater influence once shelled as mammoth and junior mammoths had a distinct premium relative to jumbo or extra-large pecans. The price premium for size was greatest between junior mammoths and jumbo pecans ($0.09/lb.) with more modest and more volatile premiums between mammoths and junior mammoths and jumbo and extra-large pecans.
- **Outside of China, the pecan variety had no measurable impact on price that could not be explained by other factors.**
- **Organic pecans do carry a premium over conventionally produced pecans both for in-shell and at retail.** However, the size of the market remains small.
- **The state of origin has no measurable impact on price after accounting for other factors.** The country of origin – particularly North American versus South African pecans – can influence prices, but it only appears to matter for certain customers. For instance, China has a clear preference for South African pecans, while European traders prefer U.S. or Mexican supply.
- **Various international destinations are willing to pay premium prices for pecans over and above the commodity value.** Positively, the U.S. has been able to supply many of the higher value, but lower volume, markets, like Korea and Taiwan.

SECTION 5

Product Differentiators

SECTION 5.1

Shell Out/ Kernel Fill

SHELL-OUT

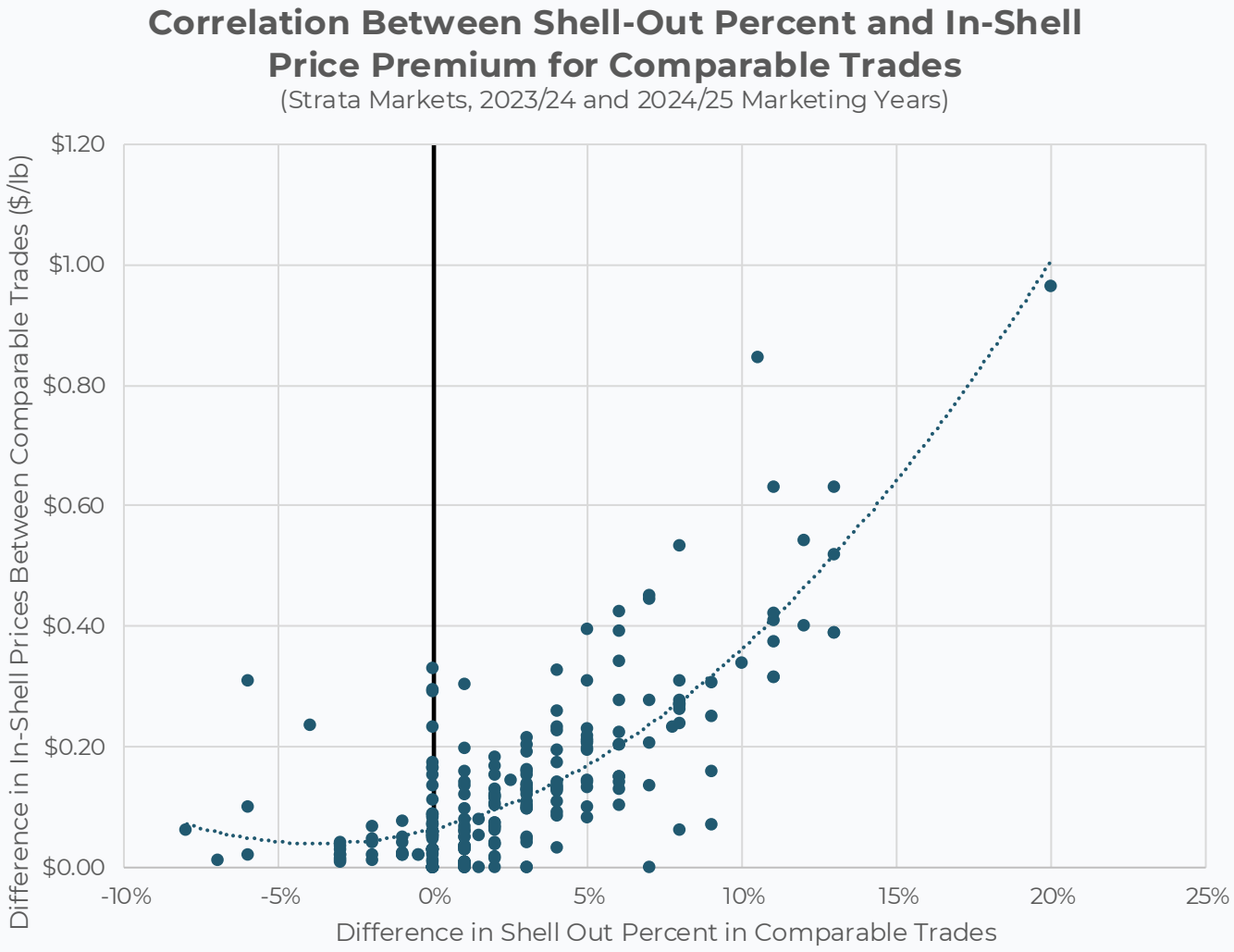
The shell out rate for pecans is arguably the clearest product differentiator that our team found.

In fact, yield was the primary predictor in determining whether two otherwise comparable in-shell pecan trades had different prices.

In order assess what role shell-out or yield played in pricing, our team analyzed Strata Markets data and found 210 instances of in-shell trades since May 2023 that were broadly similar to each other. We then analyzed the different characteristics of these trades as well as the differences in price in order to ascertain which factors had the largest influence.

We defined comparability as trades that occurred within three days of each other and were from similar origins.

Figure 5.1

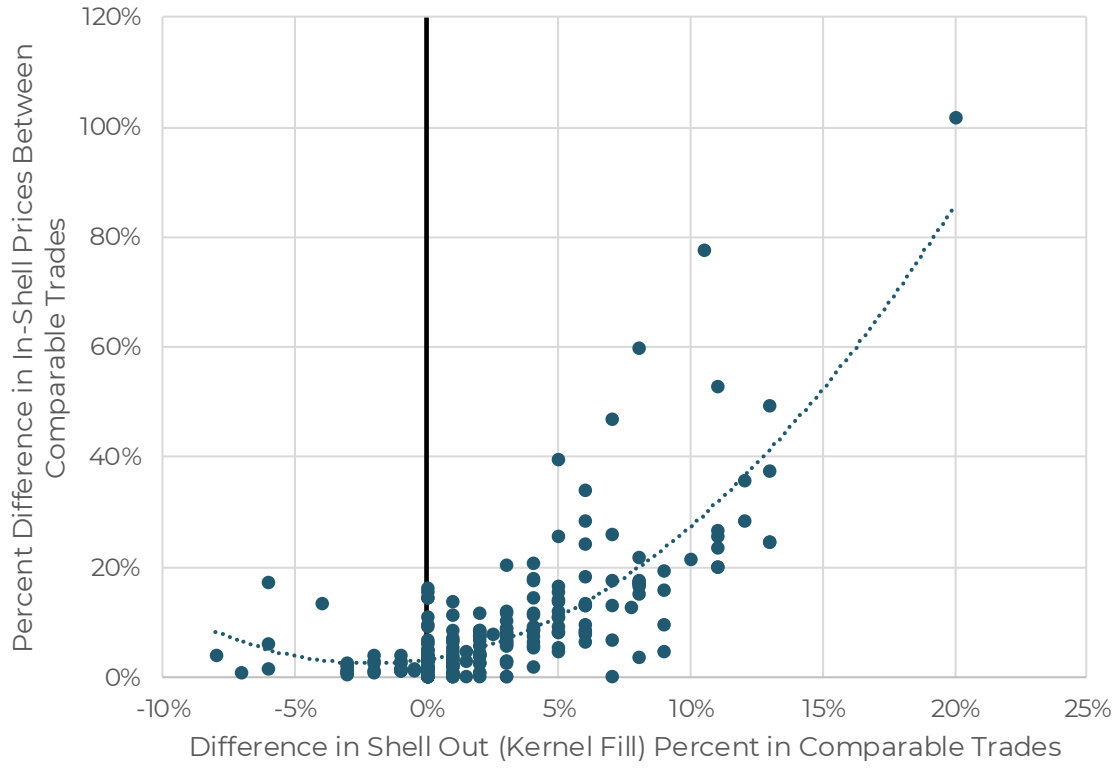


Source: Strata Markets

PRODUCT DIFFERENTIATORS: SHELL-OUT

Figure 5.2

Correlation Between **Shell-Out Percent** and **In-Shell Price Premium** for Comparable Trades
(Strata Markets: 2023/24 and 2024/25 Marketing Years)



Source: Loux Analytics, Strata Markets

Our analysis found that, on average, **a 5% difference in shell-out resulted in roughly an 10% difference in price, or about $0.20/lb. in-shell over the last three years.**

While shell-out was not a 100% perfect predictor – as there were instances of comparable trades wherein the pecan with a higher shell-out was sold for less than the lower-yield nut – the trend is nonetheless consistent.

The correlation for shell-out does deteriorate as the difference gets larger, however. Basically, once the difference between two trades reaches 10% or greater, the premiums become less consistent. In most of the instances where the difference in shell-out was greater than 10%, there were plenty of other differences at play impacting price.

Ultimately, given the tight margins for growers, it should be reassuring that a better kernel fill does positively influence the price paid for in-shell, suggesting the market does behave rationally when it comes to prioritizing the meat over the shell. Unfortunately, while varietal and improved plant genetics can help boost yields, much of it comes down to weather conditions – a factor not even APC can control.

Interestingly, when looking at reported trades from South Africa to China, shell-out had virtually no impact on the price of the pecan. Rather, the size and variety of the pecan had a much greater impact on price differences.

PRODUCT DIFFERENTIATORS: SHELL-OUT

Overall, the finding that shell-out positively impacts price should not be a particularly surprising finding. **The value of the pecan is ultimately in the meat, not the shell.** Arguably, it is more surprising that there is not a perfect correlation between kernel fill and price of the in-shell.

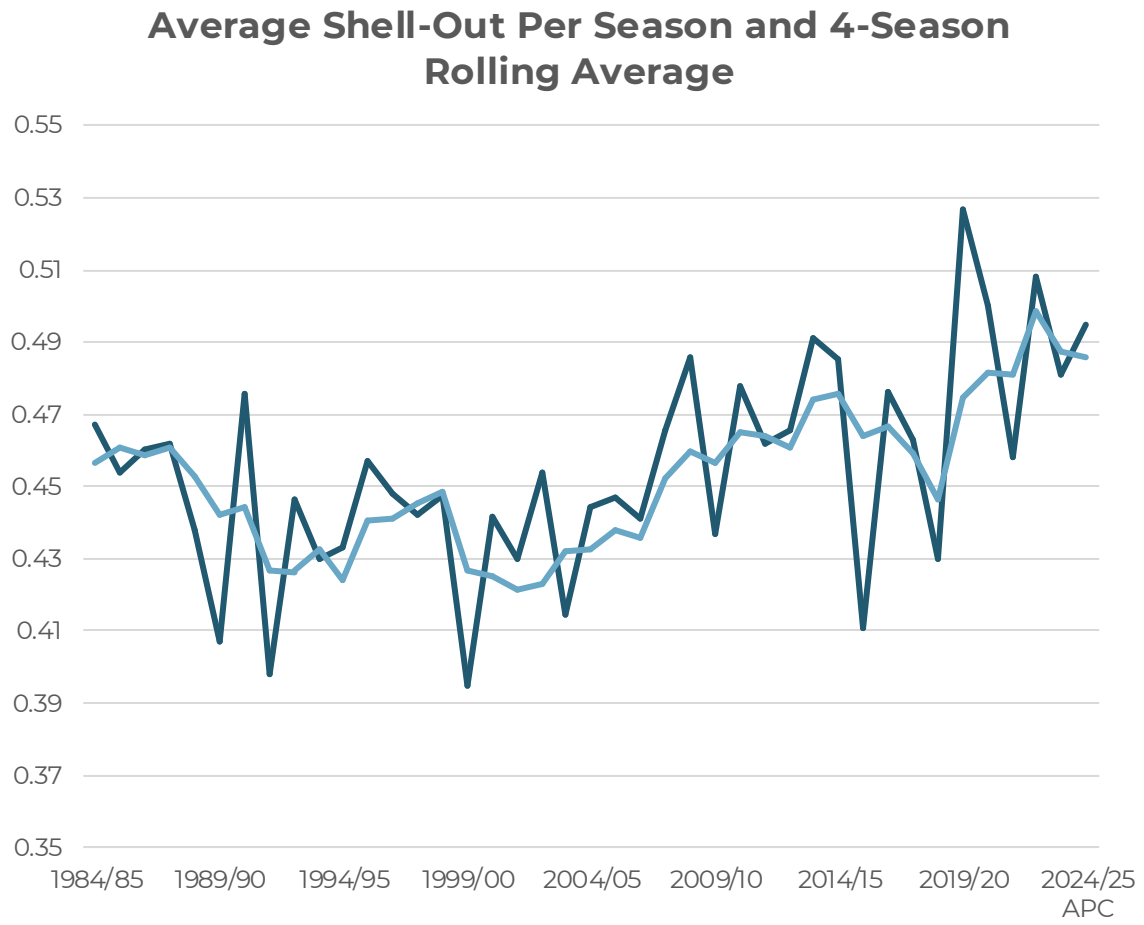
Perhaps this imperfect correlation can be tied to the fact that there are frequently disagreements on the actual shell-out yield between buyers and sellers. Different samples can understandably yield different results. Plus, disagreements are exacerbated by the lack of third-party grading in the pecan industry.

Additionally, because of the lack of price discovery mechanisms, it is also likely that there will simply be variation in prices received from one grower to the next.

Looking ahead, the good news for the industry is that the average shell-out for U.S. pecans has generally been on an upward trend, albeit with a few exceptions. In particular, 2015/16, 2018/19 and 2021/22 were impacted by a combination of hurricanes, disease and weather that was simply unconducive to growing pecans.

Still, by using a rolling 4-season average to account for variable weather as well as the alternate-bearing nature of pecans, the positive trend in shell-out does bode well despite yields being be volatile from year-to-year.

Figure 5.3



Source: USDA Fruit and Nut Yearbook, American Pecan Council

SECTION 5

Product Differentiators

SECTION 5.2

Size: Nut Count & Halves

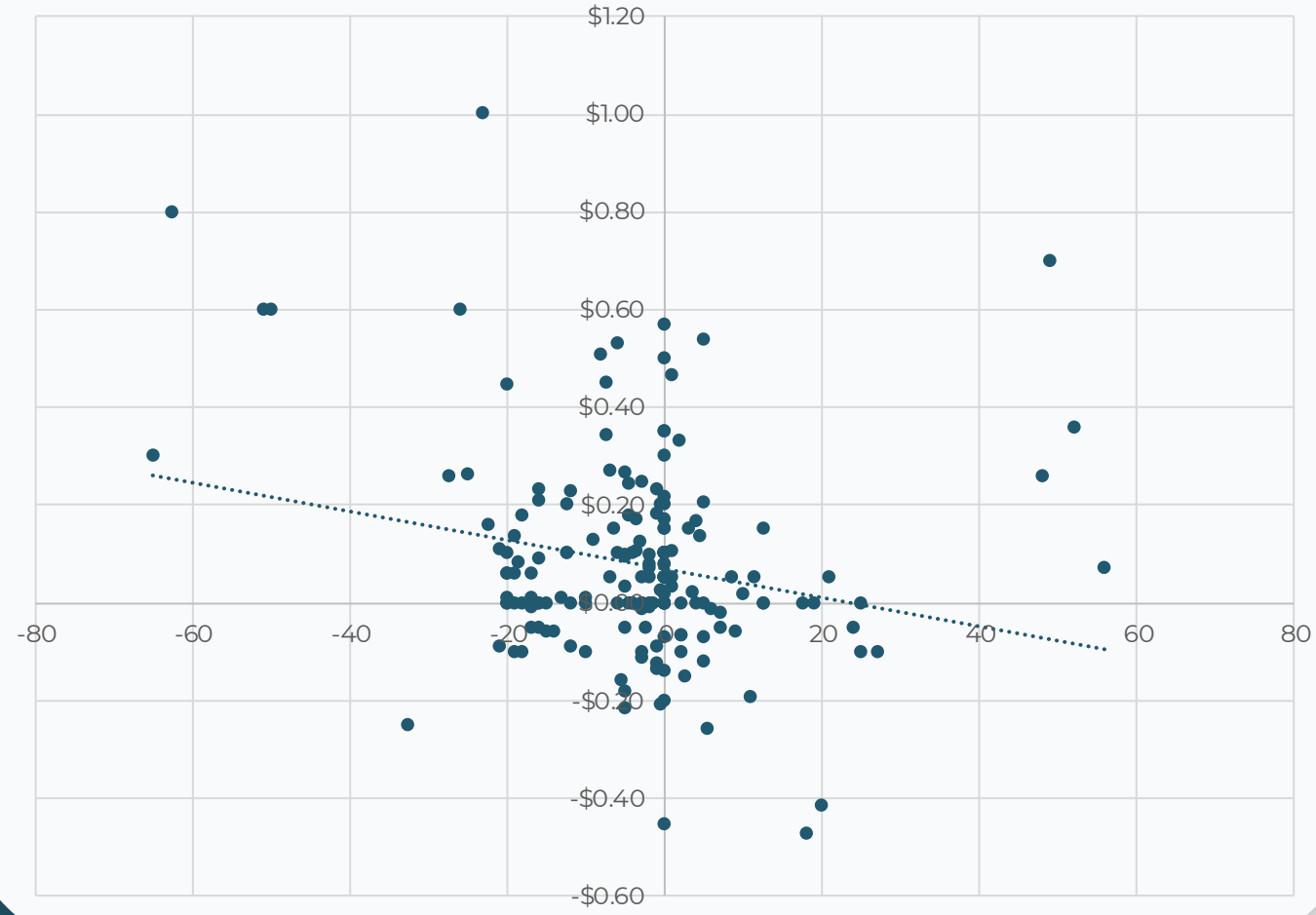
PECAN SIZE: NUT COUNT

In contrast to shell-out, **the nut count, or size of the in-shell pecan, has a much more modest impact on price and is far less consistent in offering a premium to U.S. growers.**

Fundamentally, in the U.S., the size of the pecan itself matters far less than the total weight of pecans.

Adjusting the in-shell price to a price per point in order to account for the shell-out premium, we can estimate that **for every 10 nuts in a pound, prices moved by about $0.03 per point.** While this is a positive correlation – meaning all else being equal a larger nut could warrant a premium – the impact is subdued on an in-shell basis

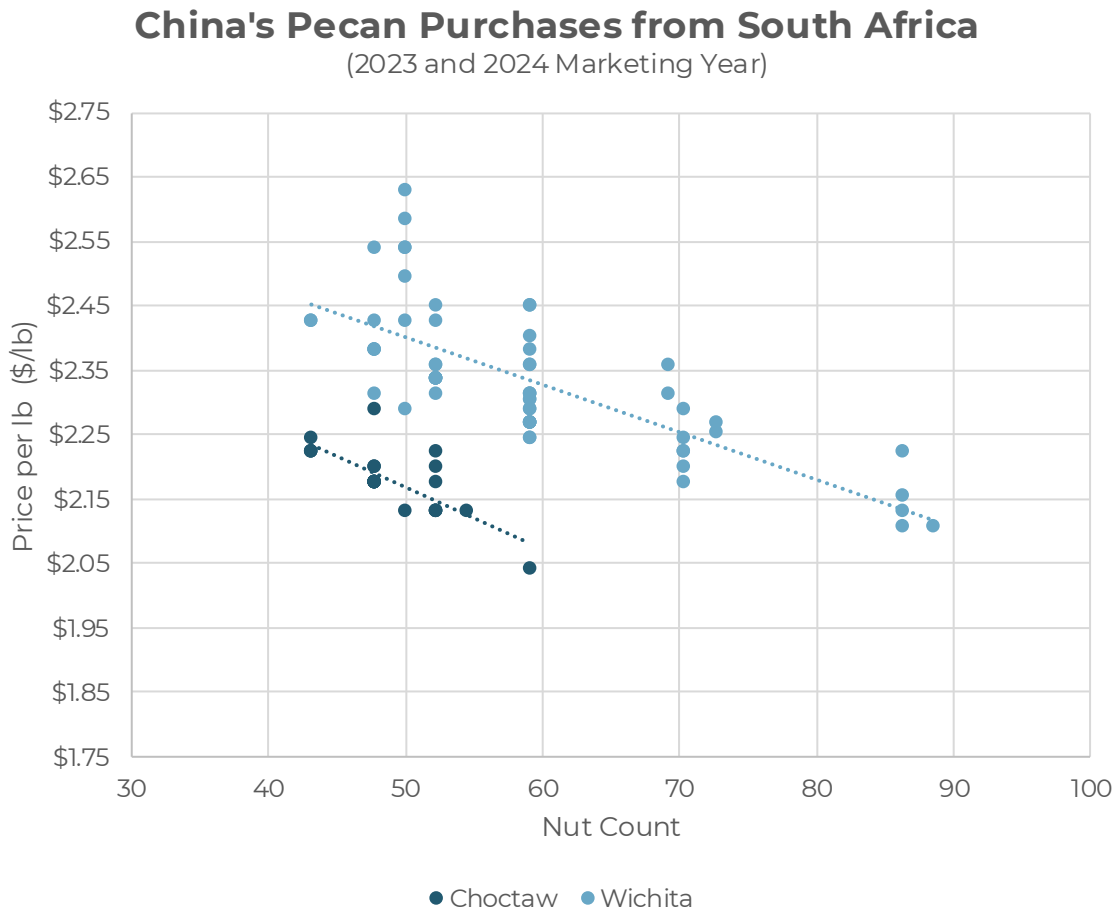
Figure 5.4



Source: Strata Markets

PECAN SIZE: NUT COUNT

Figure 5.5



Source: Strata Markets

There is one notable exception to the finding that nut count is largely irrelevant to price: China.

Examining sales from South Africa to China, nut count is more determinative in price than shell-out.

The varietal does play a role for Chinese buyers as well, but that primarily just shifts the curve rather than affecting the correlation with nut count. As will be discussed in the next section, Chinese buyers are willing to pay an additional $0.20/lb. for Western Wichita on an in-shell basis compared to Choctaw.

Yet, in both instances, for every 10 pecans in a pound, prices move by $0.075/lb on an in-shell basis.

The fact that pecan sales in China are largely centered around gift giving for the Chinese New Year likely explains why Chinese consumers may be more discerning – and willing to pay higher prices – when it comes to size. Conversely, with the exception of the gift pack or direct-to-consumer markets, U.S. consumers largely buy pecans for baking and cooking wherein weight is the primary determinant of value.

PECAN SIZE: MAMMOTH, JR. MAMMOTH, JUMBO, ETC.

Yet, in contrast to the in-shell market, there is a small but noticeable difference in prices for the size of the pecan halves themselves.

In general, the bigger the pecan half, the higher the price.

Yet there is not a perfect distribution in price between sizes. Instead, according to data from Strata Markets, **there is a distinct difference once the size stepped down from junior mammoth to jumbo,** but only a minor difference between mammoth and junior mammoth or between jumbo and extra-large.

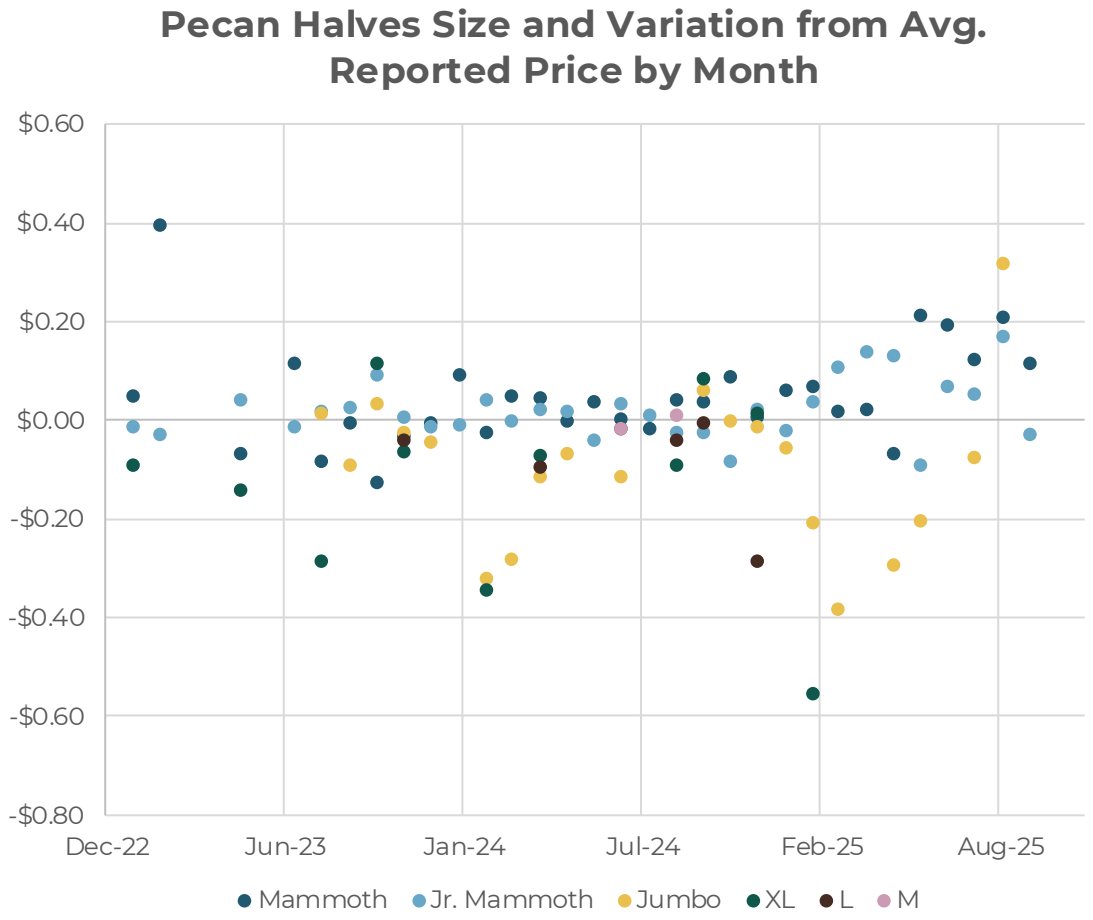
To examine this, we calculated the average pecan halves price reported into Strata Markets for each month over the prior two years. We then examined whether there was a consistent price relationship between the different sizes relative to the average price in order to account for changes in the base price over this time period.

Unsurprisingly, **mammoth halves, as the largest size, were the highest priced on average,** carrying a $0.03/lb. premium relative to junior mammoths. However, in general, prices for mammoth and junior mammoth halves tracked very closely to one another.

Yet the most notable price difference was once the size fell below a junior mammoth distinction. Of note**, junior mammoths carried a $0.09/lb. premium relative to jumbo pecans and a $0.15/lb. premium relative to extra-large halves.**

We should note that there were fewer trades of jumbo, extra-large and large pecans in the dataset compared to mammoth and junior mammoth. As such, we should be cautious in calculating an exact premium. Even so, it does appear that there is a clear price difference if the pecan halves are smaller than a junior mammoth.

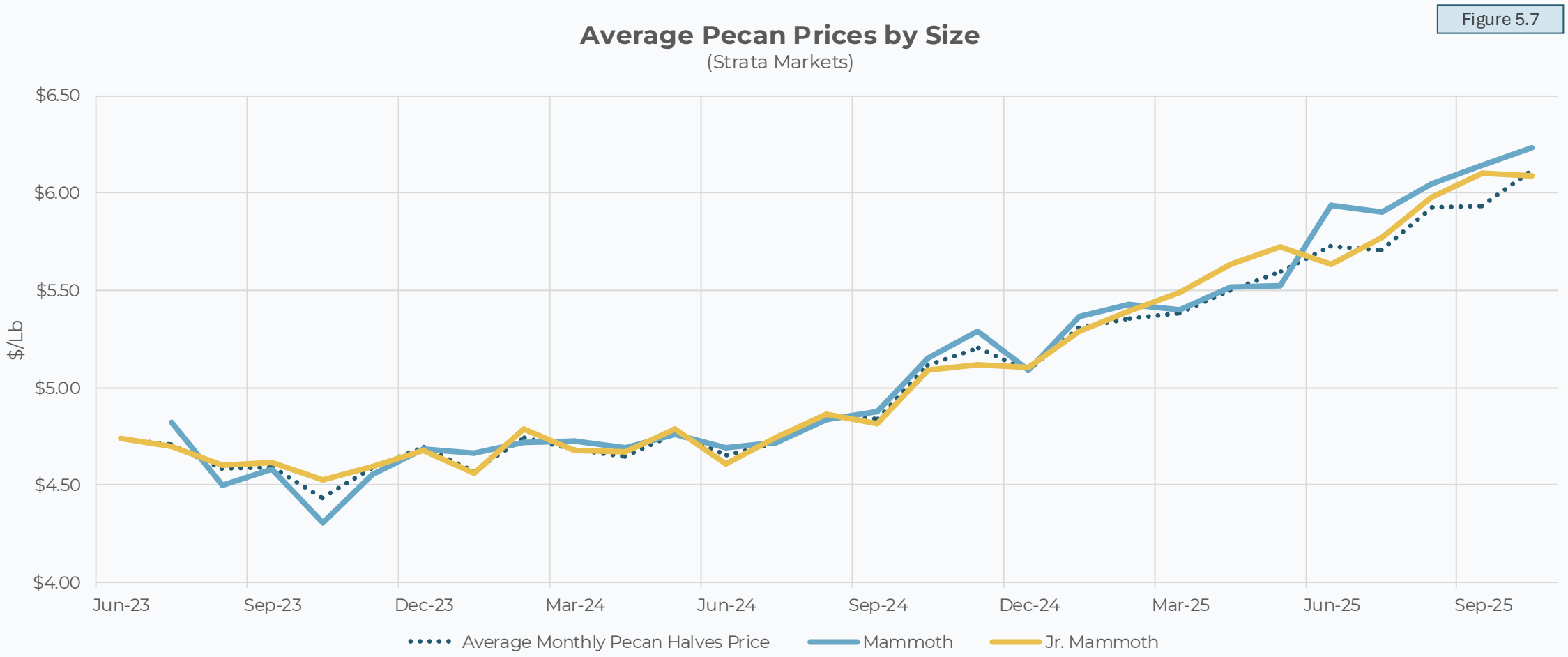
Figure 5.6



Source: Strata Markets

PECAN SIZE: MAMMOTH VS. JUNIOR MAMMOTH

Figure 5.7



Source: Strata Markets

Pecan Size: Conclusions

In sum, our research has found that:

1) Outside of China, the size of the in-shell has only a modest impact on the price paid to growers.

2) The size of the pecan does have a noticeable impact on the pricing of halves, especially along the divide between junior mammoth and jumbo.

How should we mirror these two findings that seemingly are at odds? Certainly, some of the incongruence can be traced back to the structure of the industry, as discussed in the prior section.

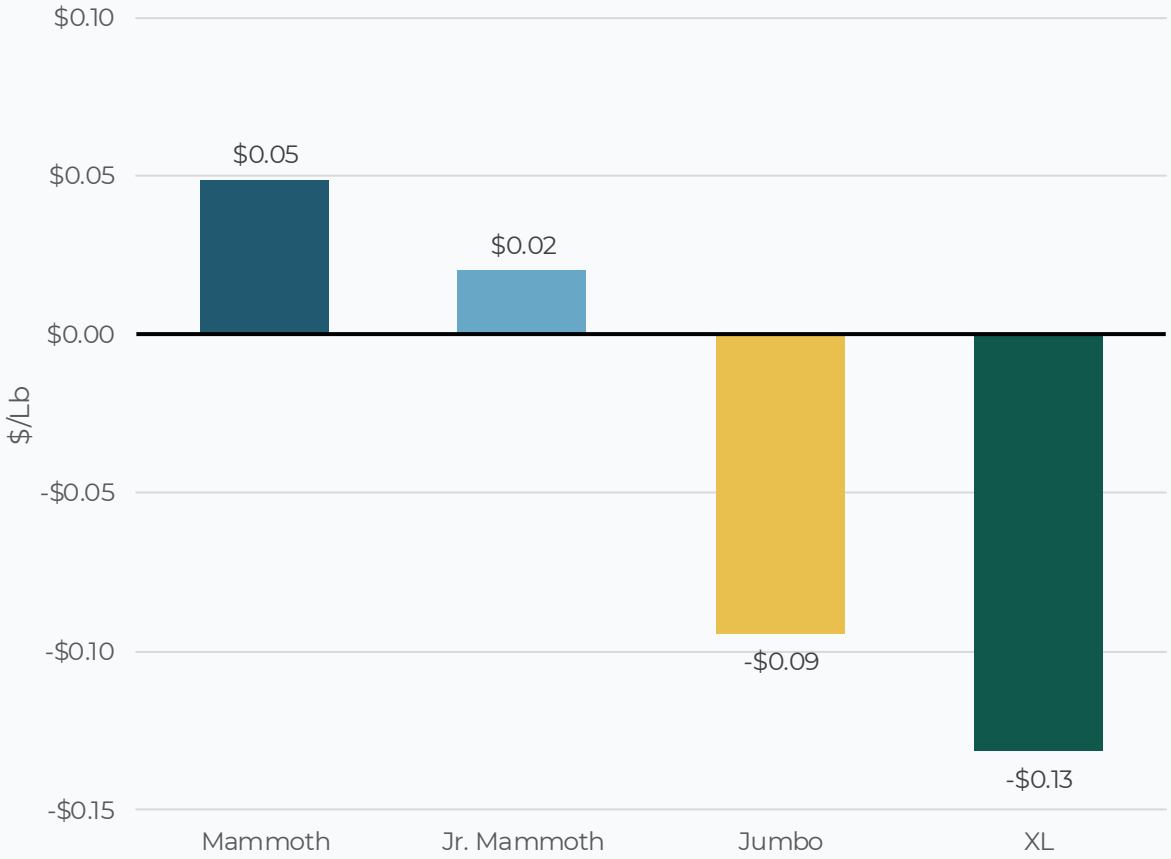
Otherwise, the price differences may come down to the fact that junior mammoth halves are simply the standard specification for most contracts – as relayed to us in our qualitative research. As such, the pecan halves that don't meet the specification then have to take a discount, but the move to mammoth only has a modest premium that is primarily reserved for the direct-to-consumer or gift pack business.

Translating this to the in-shell side: as long as the nut count (combined with the shell-out) implies that in-shell pecans will result in a junior mammoth or larger, there is little incentive to adjust pricing based on the nut count when buying U.S. nuts.

Figure 5.8

Average Price Difference Between Mammoth, Jr. Mammoth, Jumbo and XL Pecan Halves and Aggregate Price

(Strata Markets: January 2023 - October 2025)



Source; Strata Markets

SECTION 5

Product Differentiators

SECTION 5.3

Varietal

PRODUCT DIFFERENTIATORS: VARIETAL

During our qualitative interviews, several industry stakeholders mentioned that some Eastern varieties, namely Desirables and Stuarts, tended to have a premium relative to Western types, like Western Wichita and Western Schley, due to typically being larger, more brightly colored and with a higher shell-out.

Unfortunately, there is virtually no data available on pecan varieties, particularly on the prices, with the exception of Strata Markets. USDA's Shipping Point data would occasionally include notes on the varieties, but usually only when it was a native variety.

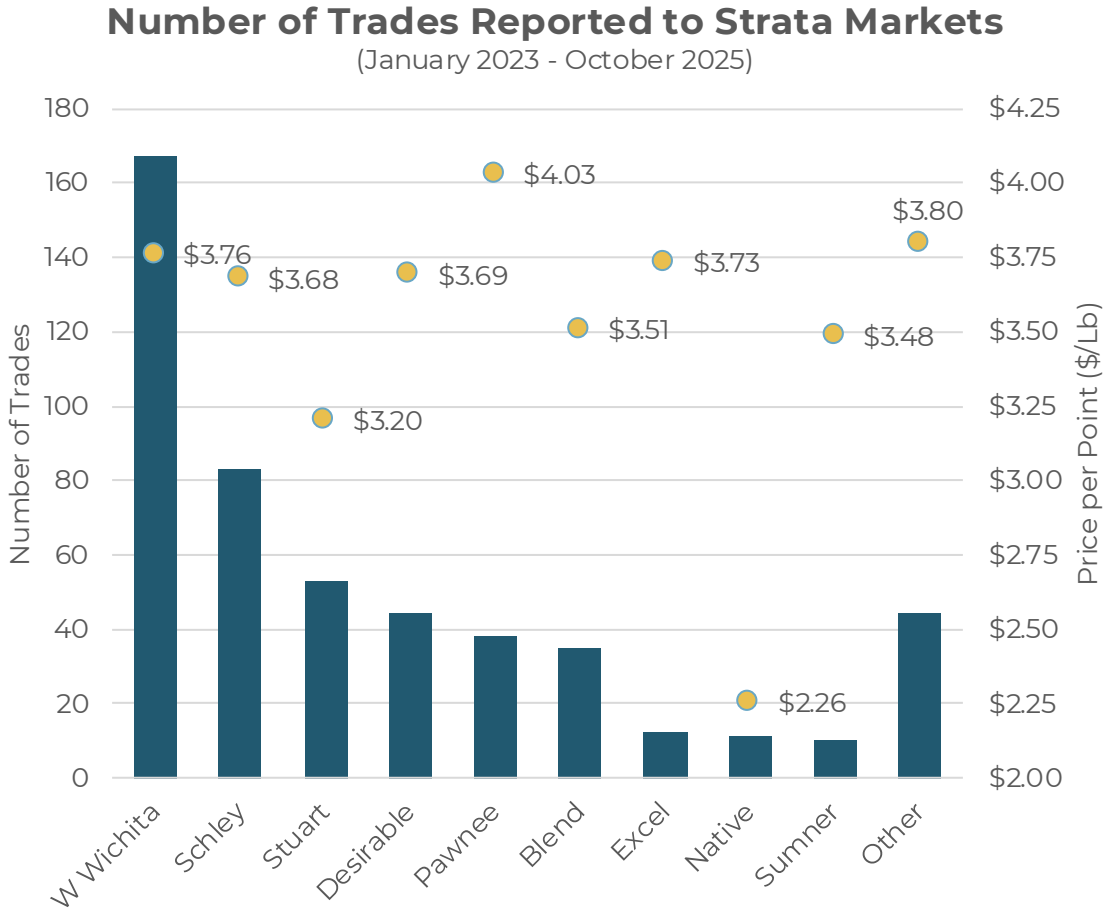
Gratefully, Strata Markets data can be utilized for the last two seasons. Using that data, our team found that on a per point basis, only Pawnee had a noticeable premium above the western varietals ($0.25 per point on average).

However, much of Pawnee's premium can also be traced to the seasonality in the market, wherein Georgia pecans are better timed to capture the giftpack buying and peak holiday buying than the West. As such, the early Pawnee harvests are likely the primary differentiating factor rather than strong consumer preference for Pawnee pecans specifically.

The one exception to the rule is native varieties, which are discounted substantially – even after adjusting for shell-out.

Ultimately, our findings suggest, that while Eastern varieties are priced higher on a per pound basis, much of the premium dissipates after adjusting for seasonality and shell-out.

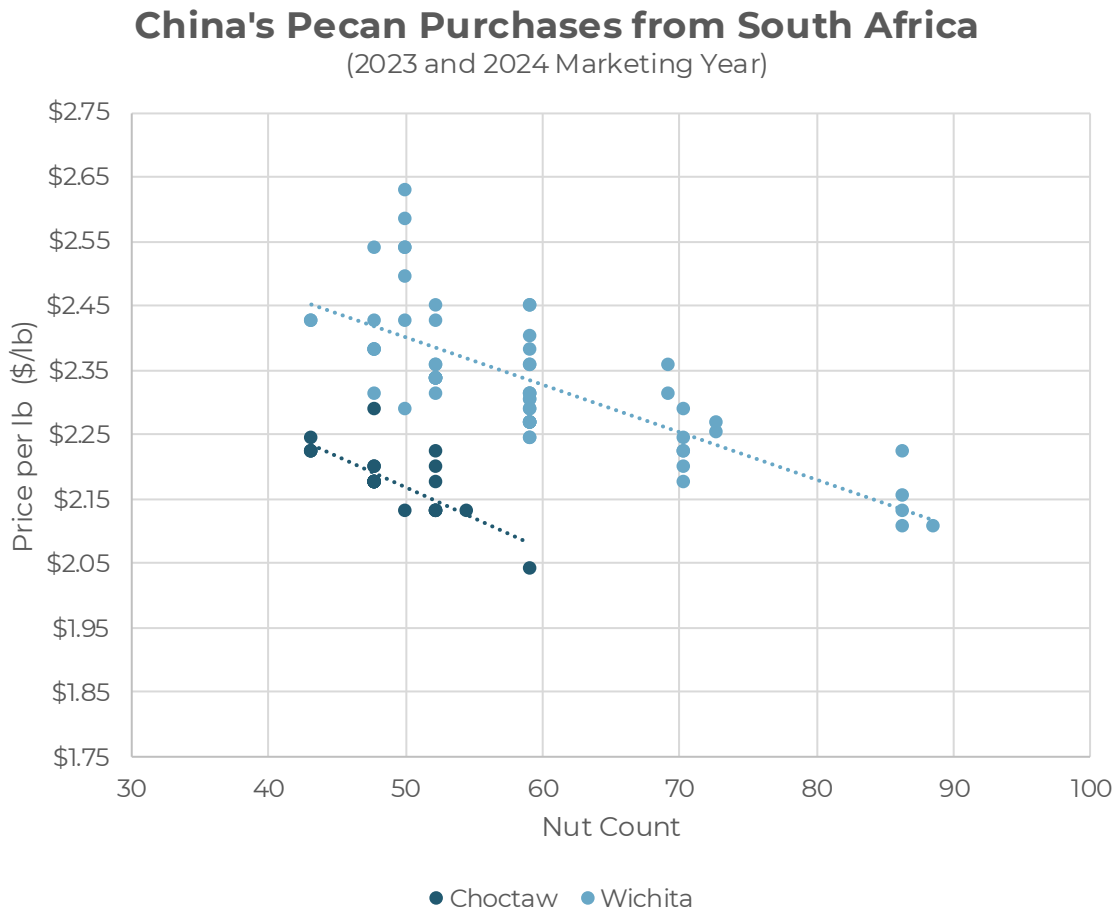
Figure 5.9



Source: Strata Markets

PRODUCT DIFFERENTIATORS: VARIETAL

Figure 5.10



Source: Strata Markets

This lack of a premium should not be particularly surprising. Based on our interview findings, consumer awareness around the differences in pecan varietals is negligible. There are certainly well-informed consumers who engage directly with growers or shellers for certain varieties or are active in the gift pack market, but that represents a small percentage of the market as a whole.

As discussed in the prior section, Chinese buyers do clearly have a preference for Western Wichita over Choctaw when it comes to their supply from South Africa. More surprisingly, they are willing to pay $0.20/lb. more on average for Wichita. Anecdotally, stakeholders in our interviews mentioned Chinese buyers preferring Eastern varietals as well, but unfortunately, there is very little data available to confirm that finding.

As such, while varietals may matter to China, they have minimal influence on the U.S. market outside of the direct-to-consumer business and the gift pack market.

As established earlier in the report, the varieties with a higher shell-out or timed to capture the high-value points in the season will receive better prices on average, but that premium is not based on the variety per se. While, the type of pecan tree certainly can influence those factors, there appears very little consumer awareness or preference for a specific pecan type today outside of China.

SECTION 5

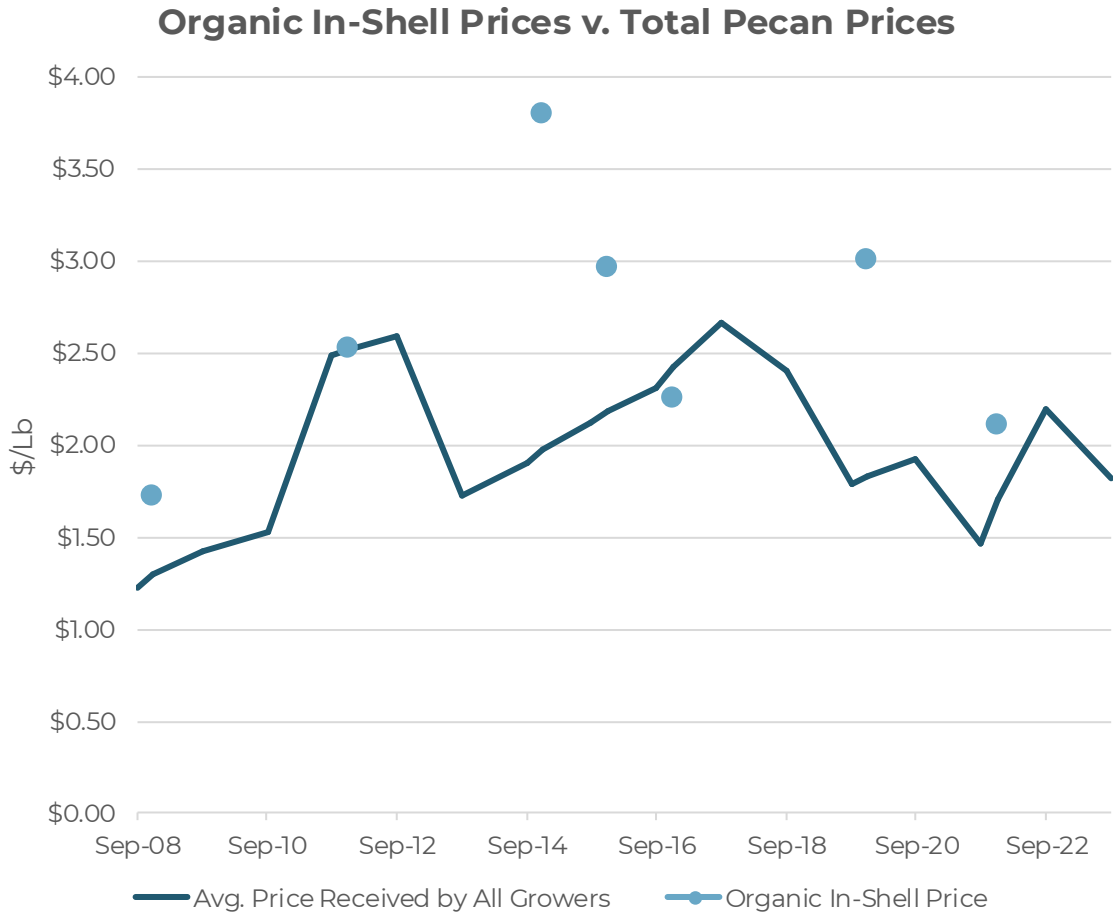
Product Differentiators

SECTION 5.4

Organic vs. Conventional

PRODUCT DIFFERENTIATORS: ORGANIC

Figure 5.11



Source: USDA National Organic Program, U.S. Agricultural Census

Switching gears from the pecan itself to how it is produced, we examined whether there was a difference in price paid for organic pecans and conventional ones.

One challenge to this research is the fact that organic pecans represent a miniscule fraction of overall pecan supply in the United States. While data is limited, by comparing information published by USDA's National Organic Program and the U.S. Agricultural Census, we can clearly state that organic pecans do typically carry a premium.

For the years where data is available, **organic pecans carried a $0.63/lb. premium on average over conventionally produced pecans**. Our qualitative research has also found – and is mirrored in the data – that the premium for organic tends to be on a sliding scale. Meaning, when conventional in-shell prices are high, the organic premium shrinks, and when conventional in-shell prices are low, the premium is greater.

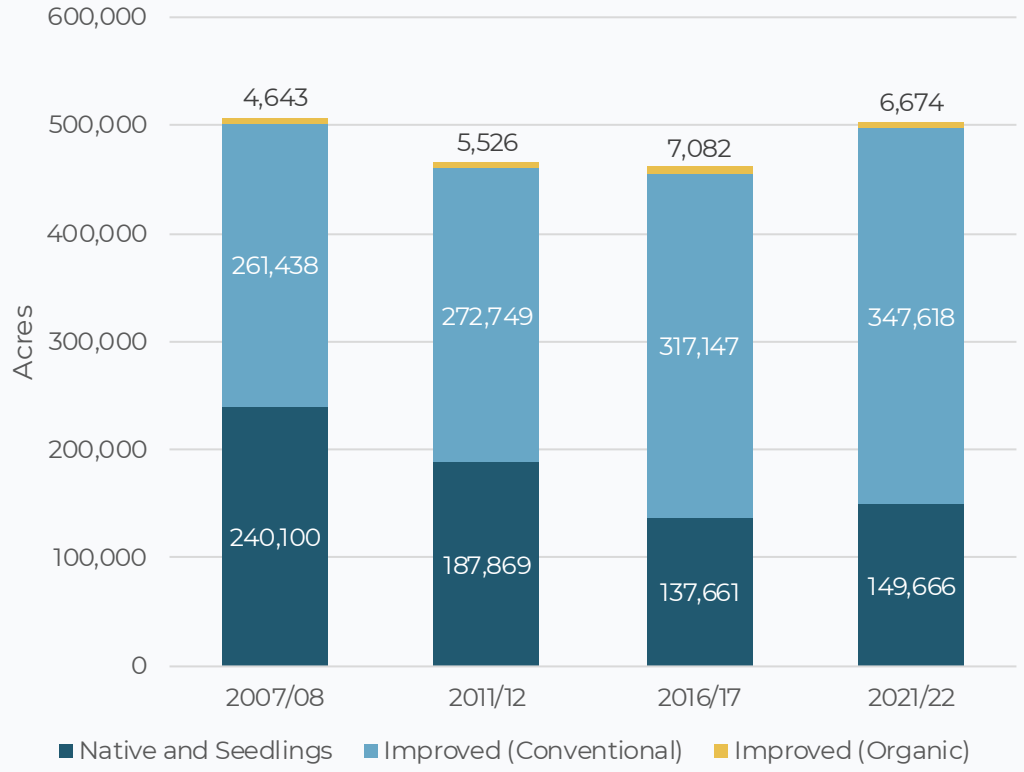
While the $0.63/lb. premium may sound attractive to producers at first glance, the reality of switching to organic may not worth the premium for many.

USDA requires a three-year period of organic management before pecans can be marketed as organic. As such, the cost to entry (as well as higher cost of production going forward) for a relatively small slice of demand likely contributes to the limited production.

PRODUCT DIFFERENTIATORS: ORGANIC

Figure 5.12

U.S. Pecan Acreage by Production Type



Source: USDA National Organic Program, U.S. Agricultural Census

Figure 5.13

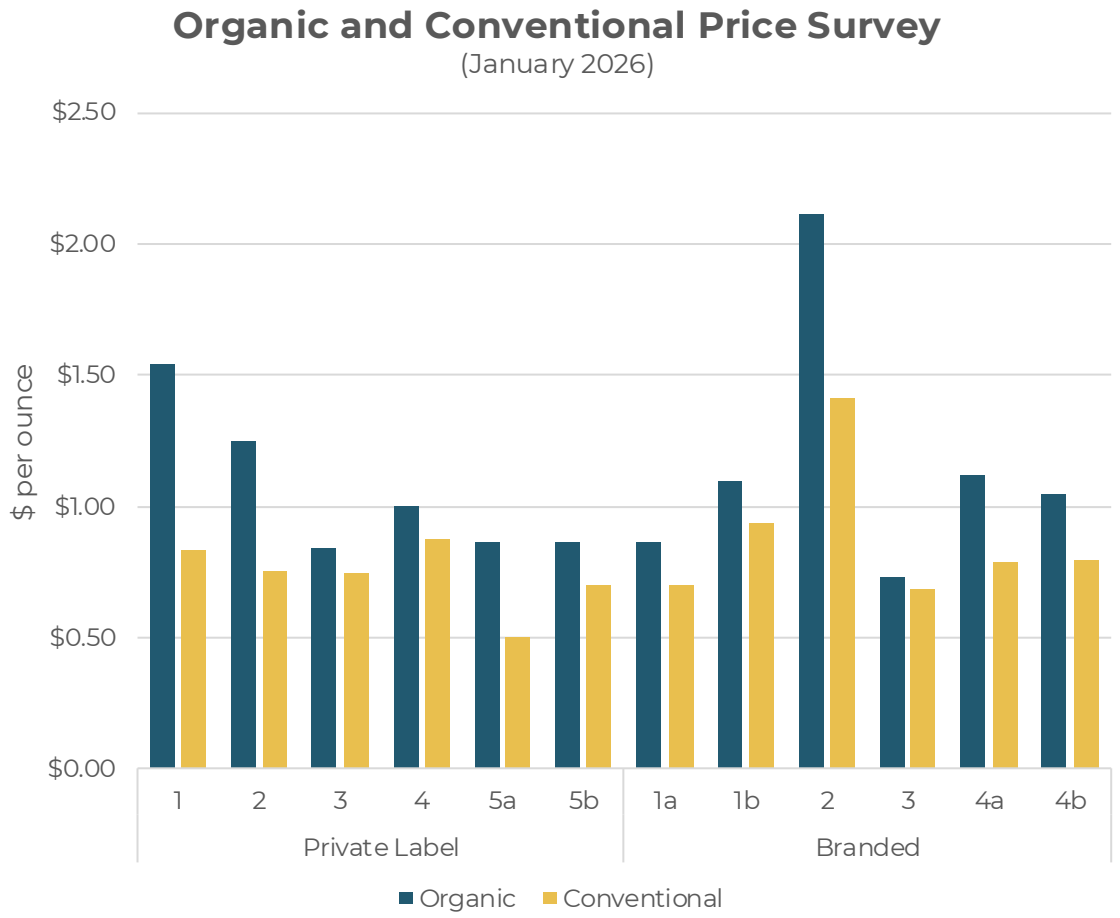
Organic Pecan Acres Harvested and Price by Calendar Year

Missing years reflect when there was no data available published

Source: USDA National Organic Program

PRODUCT DIFFERENTIATORS: ORGANIC

Figure 5.14



Source: Loux Analytics LLC

Unfortunately, there is virtually no data available on organic halves and pieces prices. Given the small size of the market, the lack of data is not surprising, but it is nonetheless disappointing.

Using a spot check of major retailers and brands that sell both organic and conventional pecans under the same brand, we can identify a clear premium in the prices paid by consumers though it does vary. **On average, organic pecans carry a $0.30 per ounce ($4.80/lb or 37%) premium** relative to conventional pecans at retail. The data does not identify whether that margin is reflected in the price that shellers receive, however.

Given what we know about retailer practices and their competitive position vis-à-vis shellers, it seems unlikely that the 37% premium directly correlates with the premium paid to shellers. Furthermore, in observing the direct-to-consumer brands, the premiums were notably below the private label brands of several of the retailers.

Ultimately, organic pecans are likely to remain a niche product for a specific subset of consumers who prefer – and are willing to pay for – organic products. The limited supply of organic pecans should help maintain the premium prices for organic halves and in-shell going forward. However, it remains doubtful that much of the premium for organic pecans at retail is being captured in the margins of the shellers and growers.

SECTION 5

Product Differentiators

SECTION 5.5

Origin & Destination

Product Differentiators: Origin (State, In-Shell)

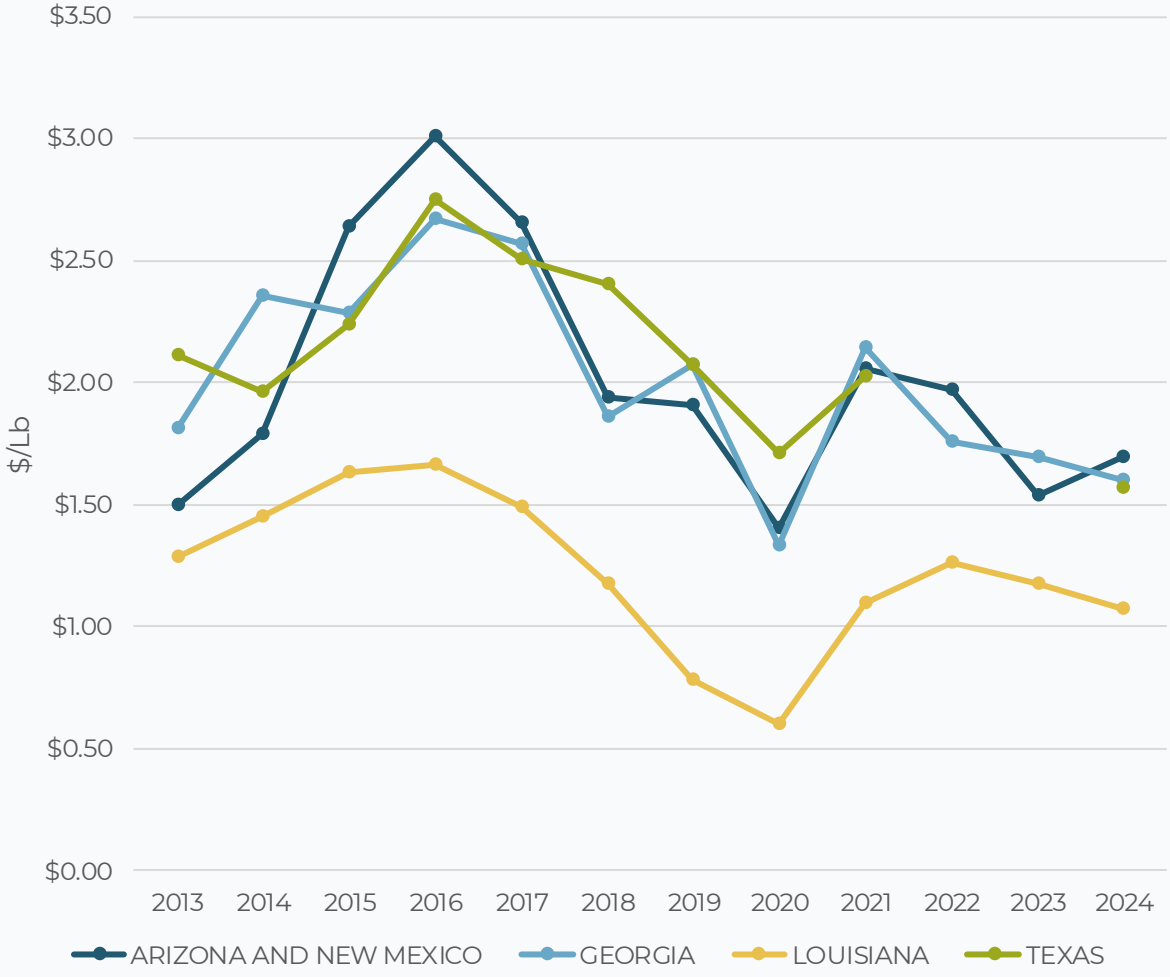
Switching from how pecans are produced to where pecans are produced, **we find only a minimal difference in price. Furthermore, much of that difference can be attributed to other factors.**

Turning first to state level, we see virtually no difference in prices paid to growers.

Unsurprisingly, there is very little pricing data available that breaks out origin, especially on a state level. However, USDA's shipping point data is reported based on the marketing region. From that data, there appears no consistent premium between Georgia, Texas and Arizona/New Mexico.

Louisiana crop is at a notable discount to the other origins (as is Oklahoma but data is not as consistently available to gather a data series). However, that divergence largely reflects the primacy of native pecans in those two states. Based on USDA census data, over 40% of the reported pecan acreage in Louisiana is native, while over 80% of Oklahoma's reported bearing acreage is native.

Figure 5.15



Source: USDA Shipping Point

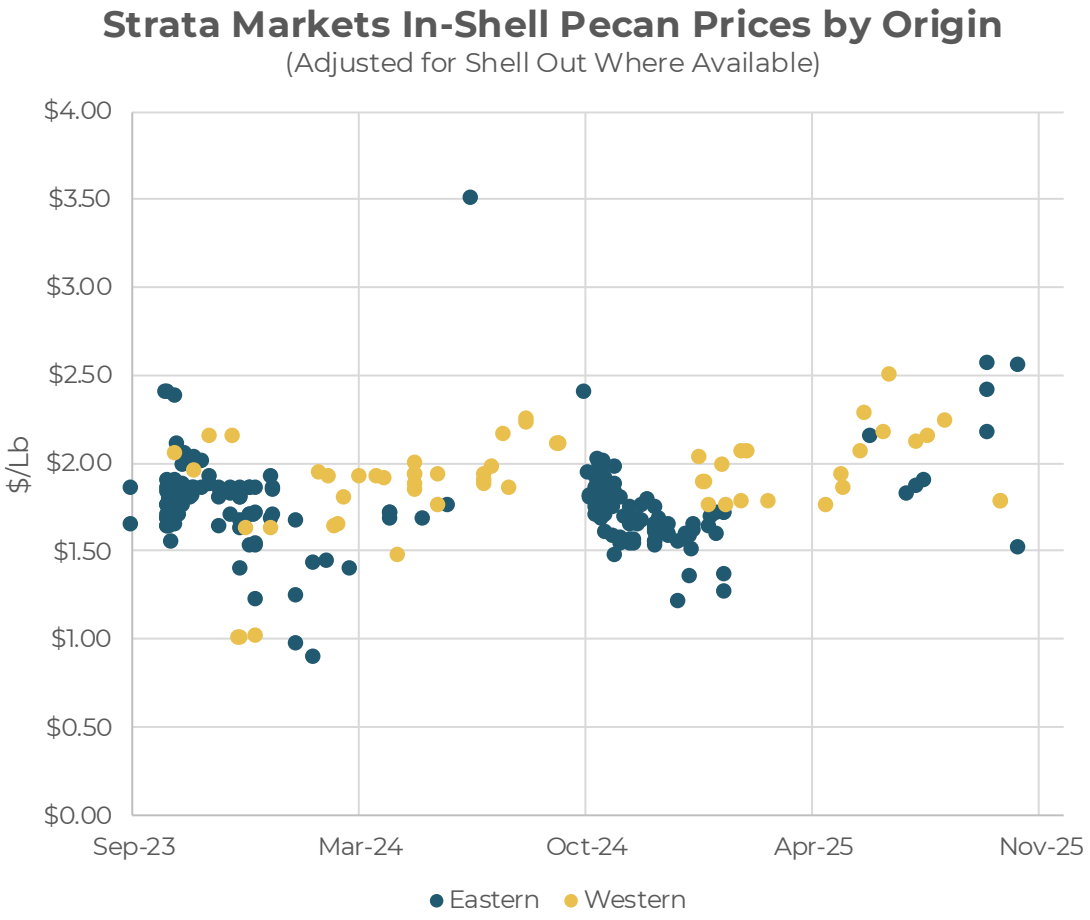
PRODUCT DIFFERENTIATORS: ORIGIN (STATE, IN-SHELL)

Examining Strata markets data over the last two years, a similar trend appears to be borne out. After adjusting for shell-out, native varieties, and seasonality, there is no discernible difference between pecans grown in eastern states versus western states.

However, one interesting finding is that almost all of the in-shell pecans in the Strata market data series that were sold in the offseason (March to September), were from the West. While that could simply be a result of the limited dataset, the finding would suggest that farms in the West are more likely to access and utilize cold storage facilities, giving western growers more potential to capture the higher prices available during the offseason. Still, given that Eastern growers are better able to capture the gift pack and holiday demand at the start of the season, there may be less incentive to hold onto that product in cold storage than out west, which harvests when prices are at their seasonal low ebb.

In short, there appears to be negligible difference in in-shell prices by state of origin that would not more accurately be attributed to variation in shell out or seasonality.

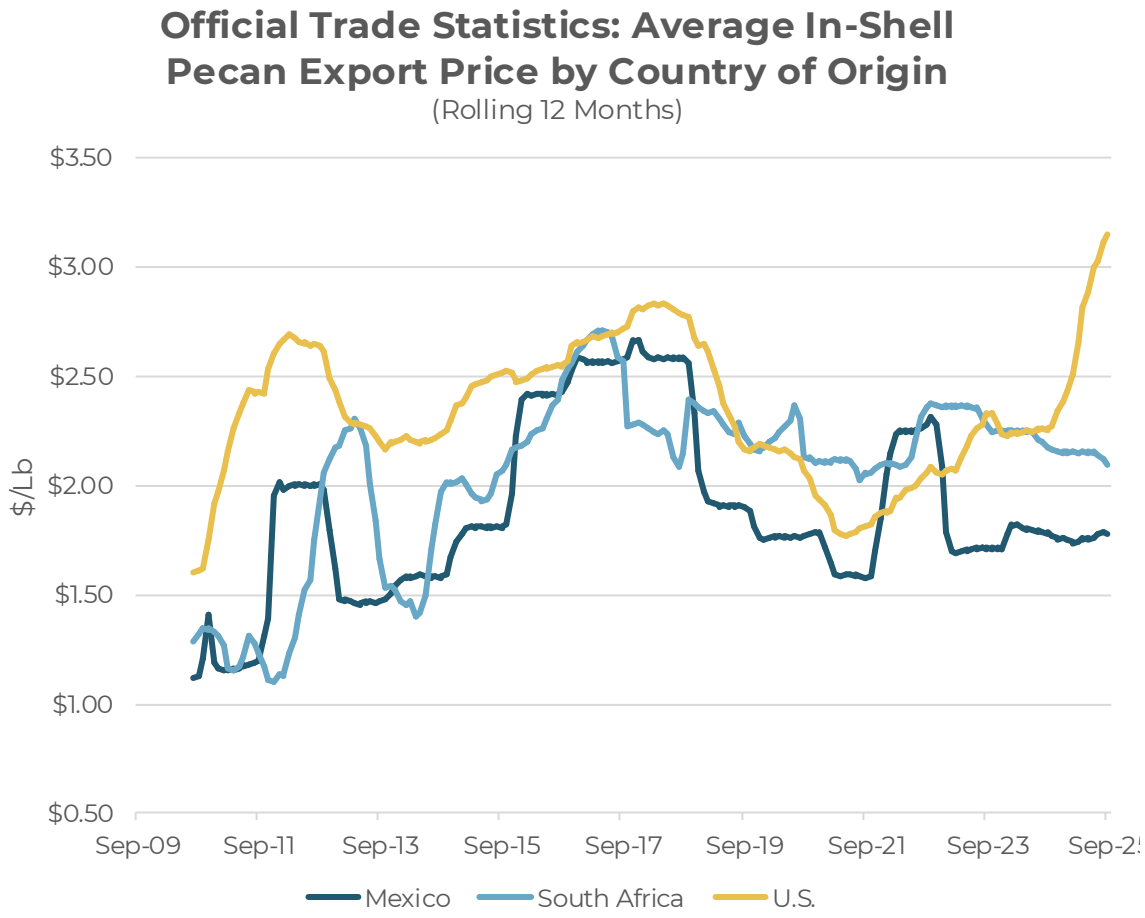
Figure 5.16



Source: Strata Markets

PRODUCT DIFFERENTIATORS: ORIGIN (COUNTRY, IN-SHELL)

Figure 5.17



Source: U.S. Census, Trade Data Monitor

Even as there appears to be little difference in state of origin, **there are notable differences in pecan prices by country of origin and ultimate destination in the international market.**

According to official government statistics (put on a rolling 12-month basis as the month-to-month data is highly volatile), U.S. in-shell pecan prices had often been the highest priced in the global market, a trend that is mirrored in the shelled data (see Figure 5.19).

However, until very recently, the U.S. in-shell premium had been deteriorating as China opted out of sourcing U.S. in-shell and towards South African product. Indeed, for four straight seasons between 2019/20 and 2022/23, South African in-shell were the highest priced pecans in the world despite a low cost of production.

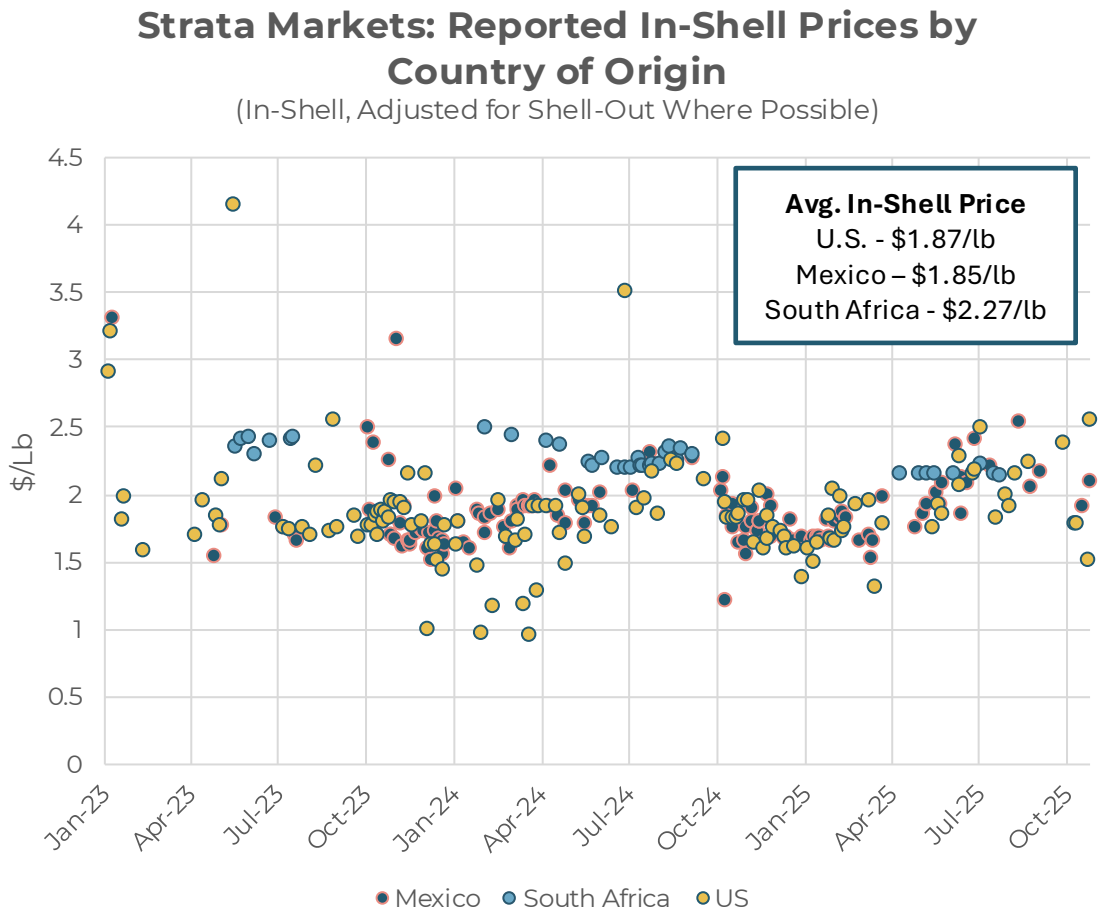
Positively, the U.S.' premium returned in recent months as European buyers have emerged paying a notable premium for U.S.-origin pecans. Interestingly, more than 90 percent of the in-shell exported to Europe was shipped out of Houston, which suggests Western varietals.

Given that the U.S. in-shell exports have been declining, the sudden surge in price relative to other origins could also be a symptom of small sample bias in addition to limited supplies available for export.

In general, because the prices move together but far from perfectly, **the data would suggest that the in-shell markets for U.S., Mexican and South African pecans, while in competition with each other, have some notable distinctions between them, namely a difference in buyers and cost of production.**

PRODUCT DIFFERENTIATORS: ORIGIN (COUNTRY, IN-SHELL)

Figure 5.18



Source: Strata Markets; Avg. prices exclude outliers, defined as prices above $3.00/lb and below $1.40/lb.

Further confirming the trade data findings, according to data from Strata Markets, U.S. and Mexican product are priced relatively close together. However, South African product destined for China was noticeably higher priced than either U.S. or Mexican product until this past summer.

After excluding the notable outliers and adjusting for kernel weight, the average in-shell price for U.S. pecans and Mexican pecans were just 2 cents different at $1.87/lb and $1.85/lb. on an in-shell basis, respectively. By contrast, South African product – almost all of which was destined for China – was sold at $2.27/lb on average.

Despite the divergence compared to the official government statistics at first glance, these two datasets make sense together. Almost all of the price data for U.S. and Mexican in-shell reflect local prices rather than export sales to China or Europe, both of which have consistently paid a premium relative to the domestic market.

Taken together, the in-shell data for both Strata markets and official trade statistics confirm there are notable differences in prices paid by origin. However, the variation appears to primarily reflect differences in customers, rather than an inherent premium in origin beyond China's preference towards South African product and Europe's preference for the U.S.

Still, given that China – the world's largest importer of in-shell pecans – has clearly made South Africa their preferred supplier, **South African in-shell prices are likely to hold a premium to U.S. and Mexican pecans in the global market unless another major in-shell buyer emerges, such as the European Union or India.**

PRODUCT DIFFERENTIATORS: ORIGIN (COUNTRY, SHELLED)

On the shelled side of the equation, the conclusions are fairly clear. **U.S. and Mexican product have maintained a $0.50/lb premium over what little South African shelled product is exported.**

Three factors are driving this trend:

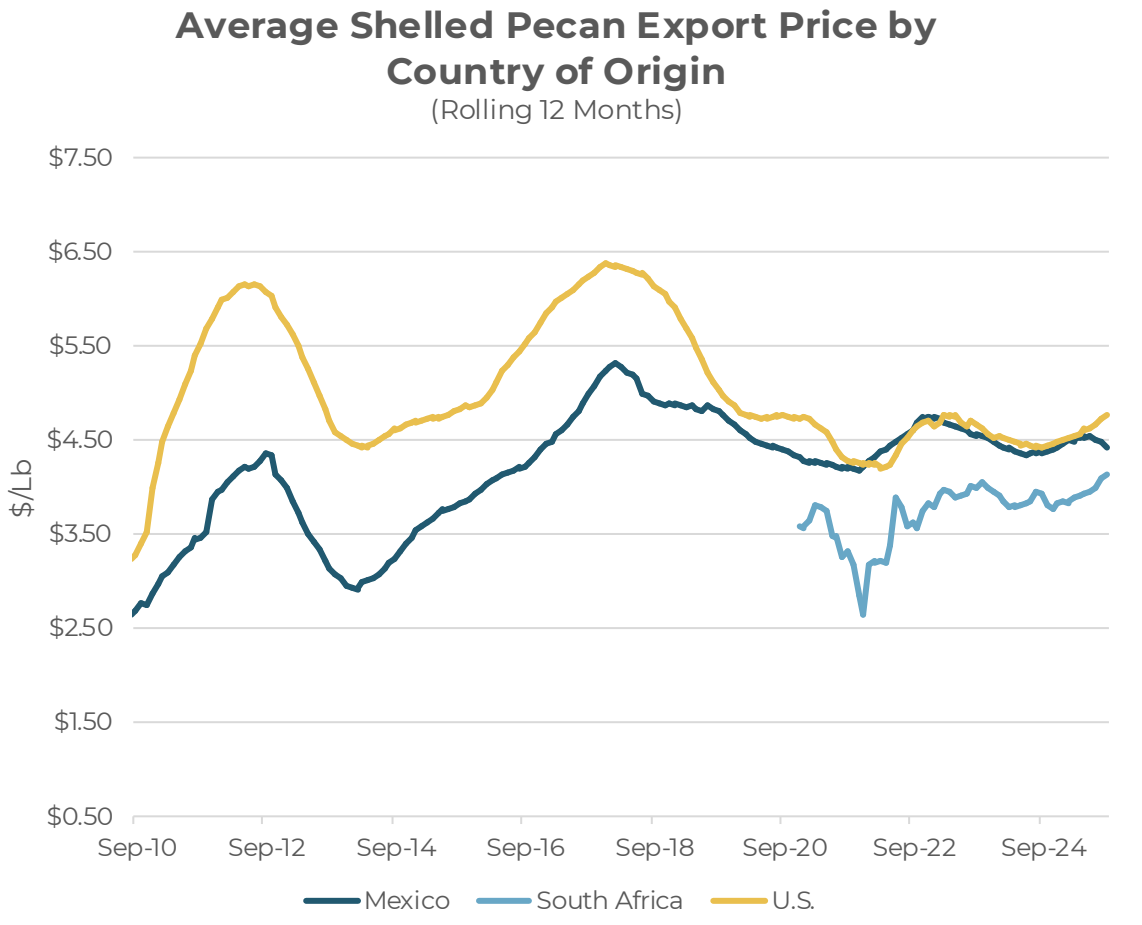
- First, Europe, which buys two-thirds of South African shelled pecans and is the largest buyer for U.S. shelled pecans, is consistently willing to pay a premium for U.S. shelled pecans.
- Secondly, in contrast to in-shell pecans, where China is willing to pay a higher price, shelled pecans prices from South Africa to China are noticeably weaker than most other markets.
- Finally, in addition to Europe, the U.S. has been successful in focusing on high-value, developed markets, like Canada, Israel, Saudi Arabia, and Korea, which helps the U.S. boost its returns on shelled exports.

Looking closer at the data, it is also fascinating that Mexican and U.S. shelled pecan prices have converged over the last five years, which suggests Mexican and U.S. shelled pecans are highly competitive with another in global markets.

Interestingly, U.S-Mexico shelling trade has declined considerably in recent years and, in fact, accounted for less than 7% of total Mexican pecan exports in the 2024/25 marketing year. Meaning, given that prices between the two major pecan growers have converged at the same time that the U.S.-Mexico shelling trade has diminished, **we should conclude that Mexico and U.S. shelled export prices are becoming more correlated with time** with seemingly neither market commanding a premium.

In other words, whether in the U.S. or internationally, **buyers are seemingly ambivalent as to whether those pecans come from Mexico or the U.S.**

Figure 5.19



Source: Trade Data Monitor

Product Differentiators: Destination (In-Shell)

Connected with origin, international trade data can help us identify which markets are willing to pay higher prices for pecans as there are some notable differences.

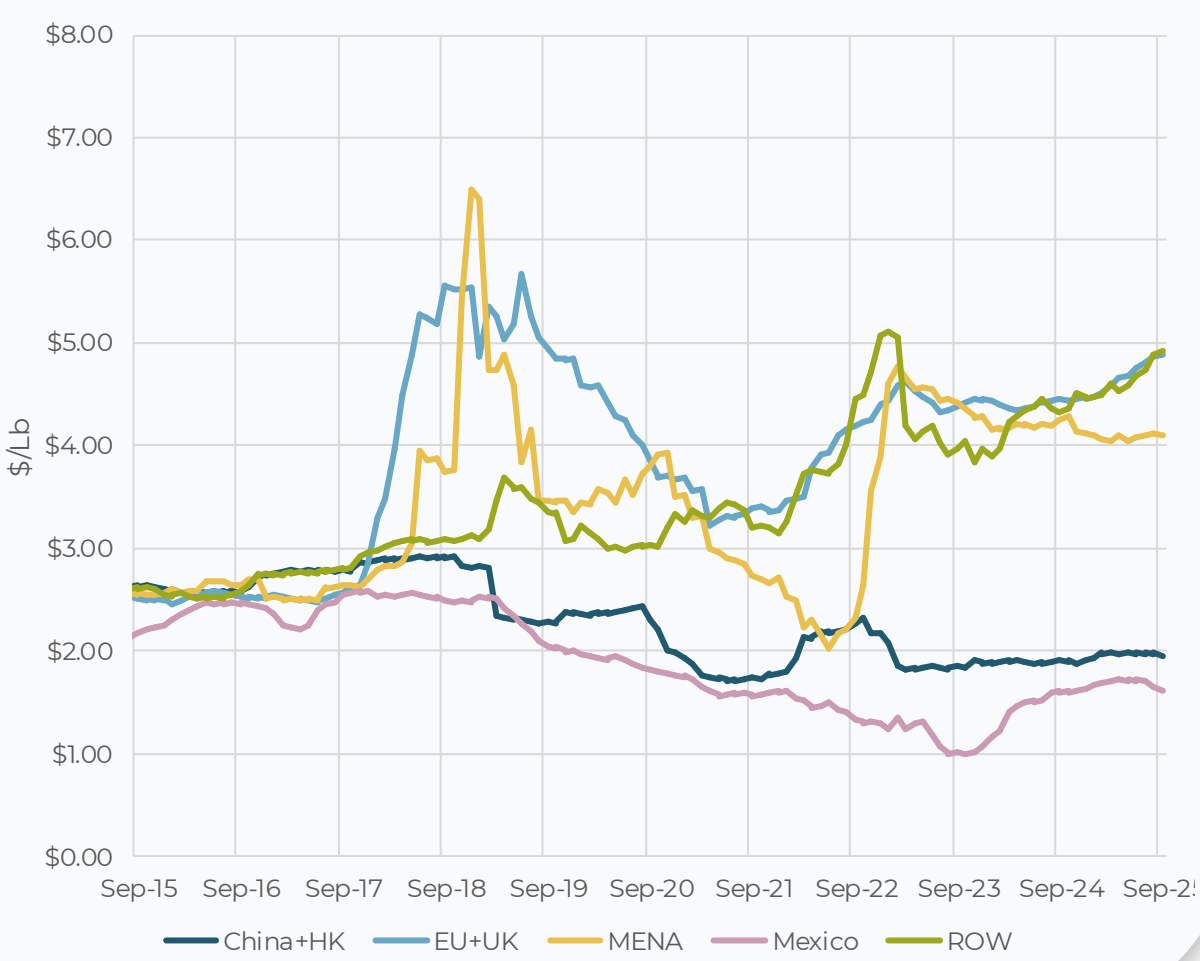
On the in-shell side, **there have traditionally been three main buyers of in-shell: domestic shellers, Mexican shelling operations and China.** Europe's emergence as a potential player could lead to greater competition in the market moving forward, but in-shell volumes are still modest today (see Figures 5.22 and 5.23).

Within that space, **the prices paid by domestic shellers and Mexican shellers have been highly correlated with little difference between the two** as evidenced by cross referencing average prices paid to growers and average export unit value (Figure 5.21).

Given that prices paid by U.S. and Mexican shellers are consistently competitive with each other, the biggest variable is then whether an international player arrives on the scene, increasing competition in the marketplace and willing to pay a premium.

That third buyer has traditionally been China. As evidenced by Figure 5.20, **China is consistently willing to pay a premium for in-shell pecans** over Mexico (and thus we can infer the domestic market as well). However, their buying activity is infrequent at best and usually only buys when South Africa's crop is insufficient. Other markets, like Europe and the Middle East, are much smaller size but are clearly willing to pay higher prices.

Figure 5.20

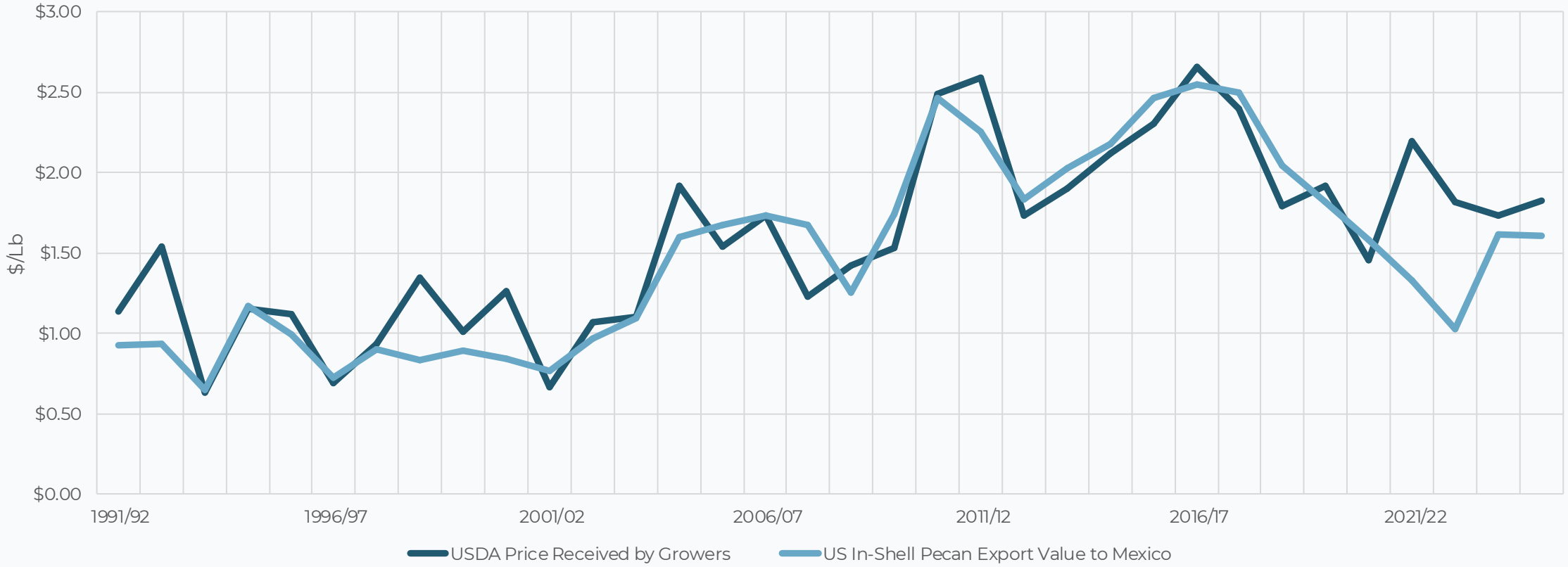


Source: U.S. Census

PRODUCT DIFFERENTIATORS: DESTINATION (IN-SHELL)

Figure 5.21

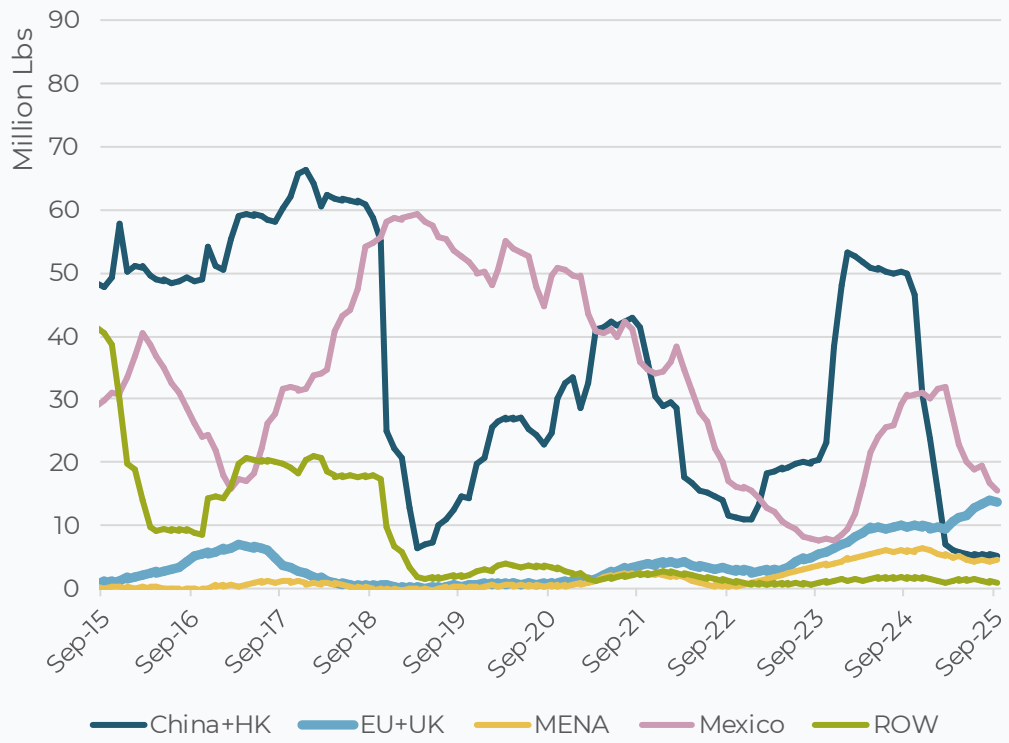
USDA Fruit and Nut Yearbook Price Received by Growers and U.S. Census In-Shell Export Price to Mexico by Marketing Year*



Source: USDA Fruit and Tree Nut Yearbook, U.S. Census

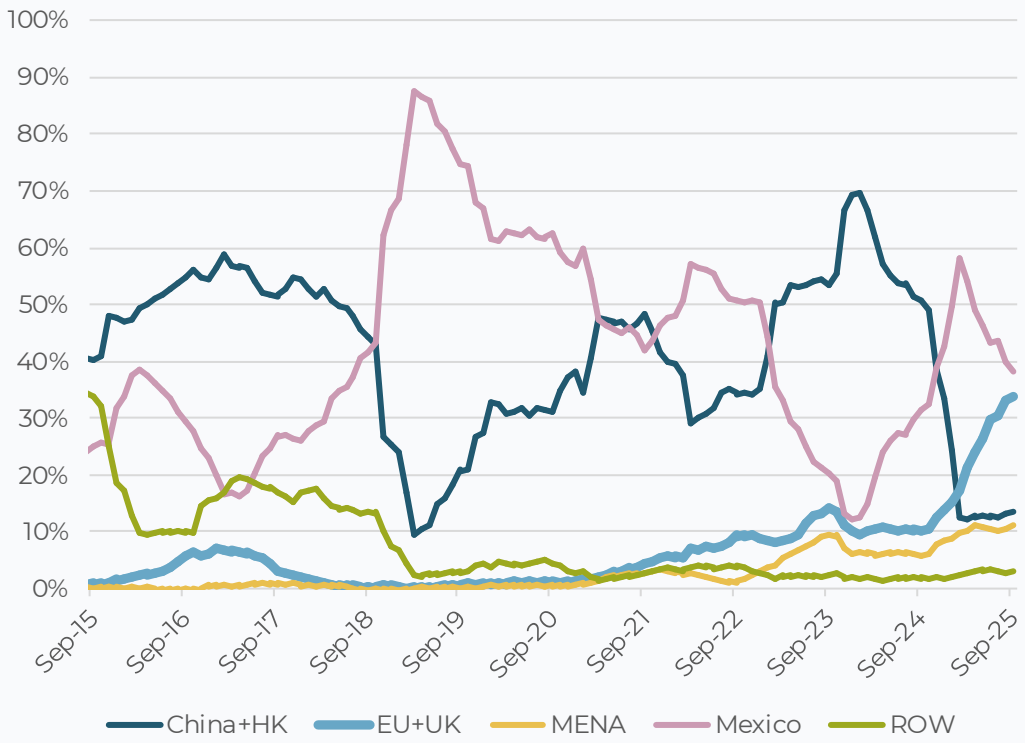
U.S. IN-SHELL EXPORTS BY DESTINATION: VOLUME & SHARE

Figure 5.22



Source: U.S. Census

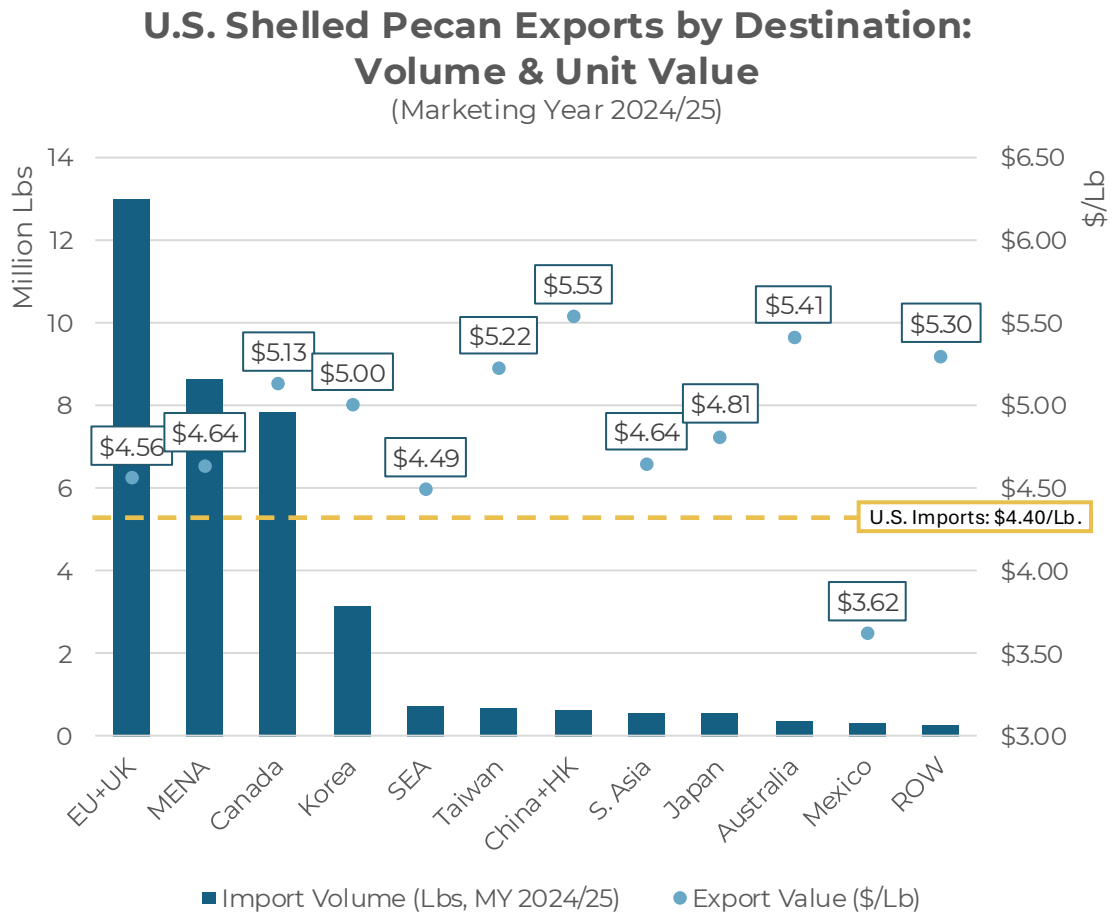
Figure 5.23



Source: U.S. Census

PRODUCT DIFFERENTIATORS: DESTINATION (SHELLED)

Figure 5.24



Source: U.S. Census

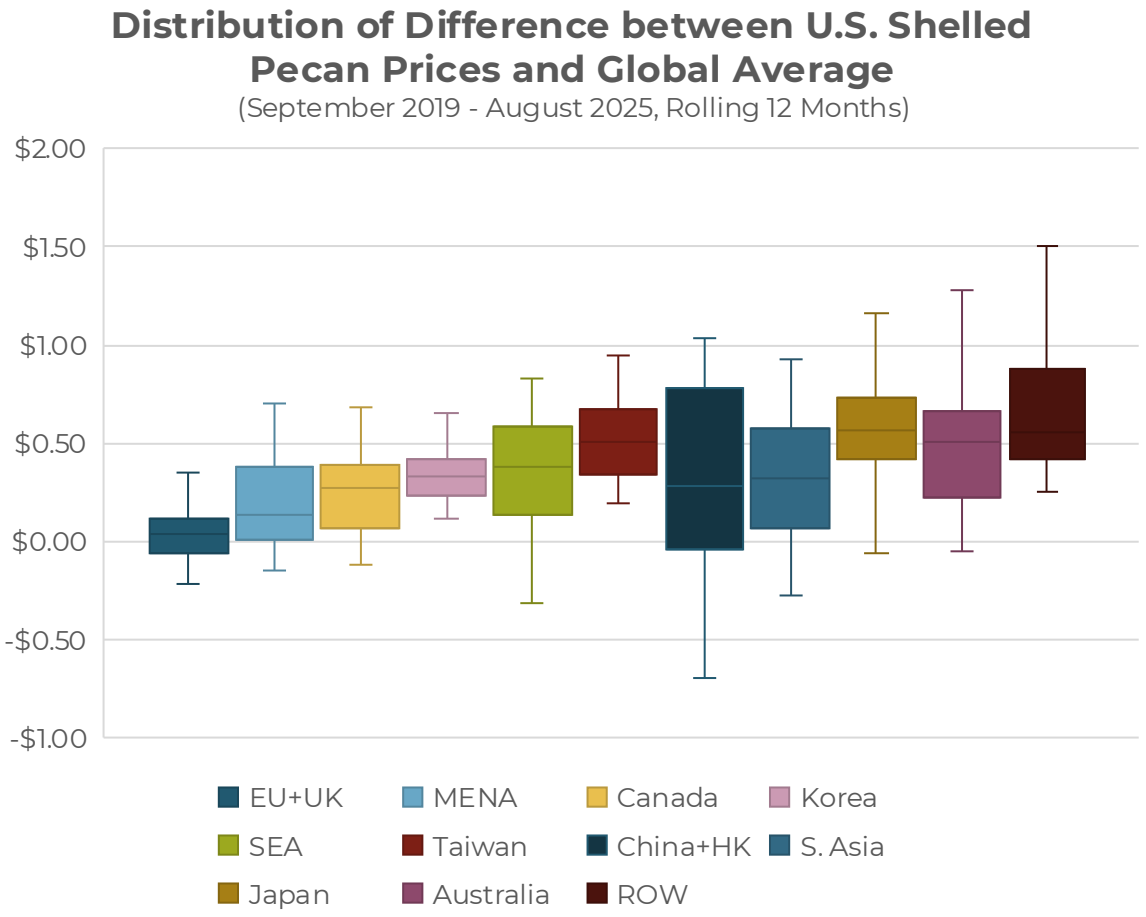
Turning to shelled pecans, there are some notable differences among different export destinations in terms of price. However, the most obvious finding is that, with the exception of Mexico, **international destinations paid a higher price on average than imported pecans into the U.S. – our proxy for the domestic market price.**

Admittedly, the unit value of the exported product will typically be higher than the domestic market on account of costs like freight, documentation, and testing that may not be required for domestic sales that are then incorporated into the sales price. However, even accounting for the additional export costs, there are clearly markets that are willing to pay top dollar for U.S. pecans even if they don't buy substantial volumes.

Of note, in the cases of Canada, Korea, Taiwan and China, **the difference between the export value of U.S. shelled pecans and product imported into the U.S. exceeded $0.50/lb. during the last marketing year.**

PRODUCT DIFFERENTIATORS: DESTINATION (SHELLED)

Figure 5.25



Source: U.S. Census

Digging into the differences between markets, the markets that consistently pay the highest premium relative to the global average have been economically developed markets. Given that pecans tend to be a relatively expensive nut, this finding is unlikely to be particularly surprising to readers.

Figure 5.25 on the left shows the statistical distribution of U.S. export values to the different regions relative to the U.S.' global average. The square box for each of the regions reflects the middle 50% of data; the "whiskers" reflect the high and low outcomes. Putting this in simpler terms, over the last five seasons, U.S. export sales to Europe were between $0.06/lb. below the global average and $0.11/lb. above 50% of the time. However, prices to the EU+UK did range from $0.22/lb. below to $0.35/lb. above the global average.

Taking this analysis a step further, we can identify that over the last five years:

- **European buyers generally set the average export price as the largest pecan market outside of the U.S.**
- **Korea and Taiwan have consistently paid above the world market**, averaging a $0.33/lb. and $0.52/lb. premium, respectively, over the last five years.
- **Smaller markets, like Japan, Australia and the many small players that make up the 'Rest of World' bucket, have been paying some of the highest prices for U.S.-made pecans.** However, that premium likely reflects that there is not a well-developed trade lane for pecans to those countries, necessitating a higher price to service those markets.
- Conversely, of the major markets, **China has been notable in its volatility and is far less consistent of a premium player with over 25% of the time paying below the global average rate when buying from the U.S.**

ORIGIN & DESTINATION: CONCLUSIONS

Overall, not all markets are created equal.

The state of origin seems to have no measurable impact on the price paid for the pecan (once you account for seasonality, yields and the native discount). Similarly, U.S. retailers and consumers are seemingly ambivalent about whether pecans are sourced from the U.S. or Mexico.

However, different international customers are clearly willing to pay different prices for pecans, and some of those customers do have a clear preference for origin. China's preference for South African in-shell results in higher prices compared to U.S. or Mexican in-shell. Conversely, Europe's preference for U.S. (or Mexican) shelled results in a higher price paid for North American pecans.

Additionally, the U.S. has been able capture a large share of some of the highest value pecan markets – a necessity given the U.S. has the highest cost of production and cost of shelling among the three major pecan exporters. However, many of these markets, namely Korea, Taiwan, Japan and Australia, are still small even as they possess significant growth potential.

Pecans (from all sources, not just U.S.) represent less than 3% of the Korean imported tree nut market, 2.5% of the Taiwanese market, less than 0.5% of the Japanese market, and just 1.3% of the Australian market. Additionally, those four markets combined represented just 13% of total U.S. shelled exports (with Korea accounting for most of that volume). **Growing demand in international markets where consumers are able and willing to pay U.S. pecan's premium prices should improve margins throughout the pecan supply chain, especially if it can enable shellers to diversify away from today's retailer-centric model.**

SECTION 5

Product Differentiators

SECTION 5.6

Conclusions

PRODUCT DIFFERENTIATORS: CONCLUSIONS

Taking a step back, there are many nuanced factors affecting the price paid on an individual pecan trade beyond the base, commodity value as reflected by market fundamentals or the industry structure.

After examining six key factors, our team found that:

- **Shell-out, or kernel fill, has a clear correlation with the price paid for U.S. in-shell pecans,** reflecting the primacy of weight in U.S. pecan consumption.
- Conversely, **the size of the pecan had only a minimal impact on the in-shell price** with China being the lone exception. However, **the size of the pecan kernel did have a positive impact on the price,** though the primary price difference was determined by whether the pecan met the criteria for a junior mammoth.
- After accounting for other factors, **the variety of pecan had no measurable impact on U.S. in-shell prices.** Once again, China was the exception though with a preference for Wichita over Choctaw when sourcing from South Africa.
- **Organic pecans do command a premium** over conventionally produced pecans, but this represents a very minor segment of the overall pecan market.
- **The state of origin has no measurable impact on price** after accounting for other factors. The country of origin – particularly North American versus South African pecans – can influence prices, but usually only for certain customers.
- **Various international destinations are willing to pay premium prices for pecans.** Positively, the U.S. has been able to supply many of the higher value, but lower volume, markets, like Korea and Taiwan.

SECTION 6

WEIGHTING OF PRICE DRIVERS

WEIGHTING OF PRICE DRIVERS: INTRODUCTION

After a comprehensive look at “What Drives U.S. Pecan Markets?” the most difficult challenge is how to weight the impact of the various factors. As we’ve shown many times throughout this report, many factors are inextricably linked.

For instance, the reason why harvest size has virtually no impact on shelled prices until the following season is because many of the major retail contracts have already been signed by the time harvest begins.

In order to synthesize the data and qualitative analysis outlined in the prior three sections, our team identified whether a “price driver” had a **major**, **modest** or **minimal** influence on pecan prices for both in-shell and shelled. While these classifications are admittedly imprecise, they can help isolate which factors the American Pecan Council can influence in order to generate increased profitability for the pecan industry as a whole.

WEIGHTING OF PRICE DRIVERS: RESULTS

PRICE DRIVER		IN-SHELL	SHELLED	NOTES
Supply & Demand	Harvest Size	Major	Minimal	Impact on shelled prices is only seen in the following year
	Inventory	Modest	Modest	Changes in inventory only matters in the following season or during the off-season
	Imports	Minimal	Modest	
	Int'l Demand	Minimal	Major	Most years int'l demand has only a minimal impact on in-shell prices, but it can be a major determinant if a player like China enters the market
	Dom. Demand	Minimal	Modest	
	Competition	Minimal	Minimal	
	Seasonality	Major	Modest	
Industry Structure	Lack of Data	Modest	Modest	Mostly dampens price movement rather than moves it
	Limited Competition	Major	Major	Arguably the biggest factor for both in-shell and shelled, impacting many of the other price drivers listed
	Lack of Capital	Modest	Modest	
	Contract Terms	Major	Major	For in-shell, contract calendar results in changes to the market balance not being reflected in price until the following year; For shellers, it reduces bargaining power
Product Differentiators	Shell-out	Major	N/A	
	Size	Minimal	Modest	In-shell size only has a major price impact for China; halves size do matter but mostly on the junior mammoth-jumbo divide
	Varietal	Minimal	Minimal	
	Organic	Major	Modest	Significant price difference but a small market
	Origin	Modest	Modest	Only matters in country of origin rather than state
	Destination	Major	Modest	

WEIGHTING OF PRICE DRIVERS: CONCLUSIONS

When holistically examining the factors that influence in-shell and shelled pecan prices, many of the themes identified earlier in the report become clear.

- Supply and demand fundamentals are far from the only determinants of price, but they do play a critical role in influencing pecan prices. Additionally, their influence varies between in-shell and shelled pecans.
    - Supply has the largest influence on in-shell prices. Notably, our analysis found that for every additional 10 million lbs. of pecan kernels harvested, in-shell prices move $0.15/lb. ($0.30 per point) lower.
    - By contrast, demand, particularly internationally, plays a much larger role in halves and pieces prices. For every additional 10 million lbs. of pecan halves and pieces exported, shelled prices increased by $0.33/lb. on average.
- Yet undergirding the entire pricing structure is an industry wherein limited competition for both in-shell and shelled pecans mutes market fundamentals. Unique facets of the pecan industry, including lack of data, limited working capital and a mismatch in contract terms further reduce the influence supply and demand. However, when a major external buyer – typically from abroad – disrupts the market, prices can react quickly.
- Finally, not all pecans or pecan trades are alike. Prices can certainly vary from transaction to transaction on account of quality factors (shell-out, size), how it is produced (e.g. organic), where it was grown and where it was sold.