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Selling the Harvest: What Drives Farmers' Use of Grain Marketing Tools?

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Volatility in grain prices is a persistent feature of agricultural markets, driven not only by weather but factors such as input costs, supply and demand forces, economic conditions, and international competition (Meade et al., 2016). Prices for agricultural commodities are also vulnerable to exogeneous shocks, whether economic or geopolitical. As a result, the timing and channels for commodity sales are critical; marketing decisions impact farm earnings and, importantly, farmers' ability to manage price risk. More recently, US political developments and global events have heightened uncertainty for American grain farmers. For instance, tariffs imposed by the US on China in 2018 prompted retaliatory measures against US agriculture which unsettled US grain markets (Taheripour and Tyner, 2018; Adjemian, Smith, and He, 2019: Grant et al., 2021). Further, Russia's invasion of Ukraine in 2022 disrupted global wheat markets (Devadoss and Ridley, 2024). More recently, newly proposed tariffs by the Trump administration, whether implemented or suspended, target countries that collectively account for over 70% of US corn and soybean exports and 57% of wheat exports (Gardner, 2025). Thus, domestic and international political uncertainty could further fuel grain price speculation and volatility.

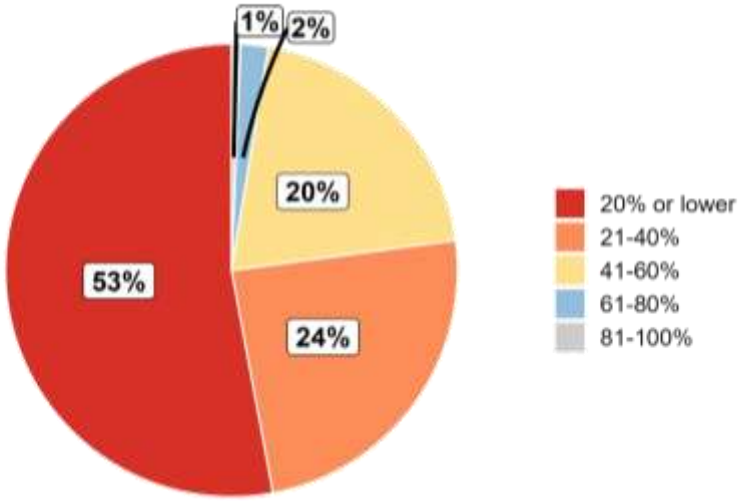
For American grain farmers, these factors compound the challenges of a post-COVID-19 economic recovery which have been marked by high interest rates and, until recently, high rates of inflation. Collectively, these pressures underscore the importance of strategies to mitigate market risks. While the advancement of agricultural technologies has been instrumental in lowering yield risks relative to past decades, navigating market risks will continue to be an ongoing challenge for farm businesses (Baptist, Kabo-Bah, and Bannor, 2025).

At a minimum, grain farmers can sell to local elevators or processors to avoid the complexity of futures contracts and other hedging instruments, but the unpredictability of spot prices and basis remains a disadvantage of selling in cash markets. Although more complex grain marketing tools can reduce price risk, they do not eliminate basis risk, highlighting the importance of diversified marketing strategies that use a mix of instruments. Even with numerous channels to market grain, previous work indicates that only a minority of American farmers use marketing instruments such as futures contracts in grain marketing (Prager et al., 2020). While not the primary focus of this study, recent events such as the uncertainty in international trade markets may have amplified grain marketing concerns among US grain producers. Anecdotal evidence suggests that some producers sold grain in anticipation of tariff enactment, only for tariffs to be delayed (personal communication, 2025).

This article addresses these issues by examining grain farmers' use of marketing tools, their knowledge of these tools, and how utilization mitigates or exposes their operations to risks across several states outside of the Corn Belt. We focus on grain farmers in two US Mid-Atlantic states, Delaware and Maryland, and Kentucky in the South to highlight these issues in regions with agricultural landscapes different from the Midwestern states. The bulk of Delaware's grain crop is sold to its large poultry industry. Similarly, Maryland has a thriving livestock industry, which provides markets for grain farmers alongside elevators associated with the poultry industry in the Delmarva region. In Kentucky, livestock feeders, ethanol plants, food processors, and distillers are all potential domestic market outlets for grain produced in the state. The varied agricultural economies of these states present both opportunities and challenges and could offer valuable insights into how grain producers use marketing tools as part of their risk management strategies.

Survey data were gathered from farmers via a postcard with a QR code and additionally from multiple Cooperative Extension and farmer events in Delaware, Maryland, and Kentucky between July and December 2024. Participant recruitment yielded a total of 156 survey responses. Nearly half of participating farmers

Figure 1. Approximation of Debt-Asset Ratio



Source: USDA (2025).

were from Delaware (48.72%), 19.23% were from Maryland, and the remaining 32.05% were sampled from Kentucky. The sample was thus largely concentrated in the Mid-Atlantic region. While Delaware and Maryland share more similar agricultural landscapes than Kentucky, grain marketing outlets differ due to the poultry and livestock industries. The survey captured farm characteristics, risk perceptions, knowledge, and utilization of grain marketing tools. In addition to cash markets, the grain marketing tools examined in the study included forward contracts, futures contracts, options, and hedge-to-arrive contracts. Given that grain marketing issues are typically studied in the Corn Belt states of the US Midwest (see, e.g., Wilson and Dahl 2011), this study's focus on regions outside that traditional geographic area represents a key contribution, offering insights from states that are often overlooked in the context of grain marketing.

Participant Demographics, Farm Characteristics, and Farm Financial Health

The study sample was overrepresented by male farmers, comprising 90% of respondents compared to the national average of 63.7% (USDA-NASS, 2022). By state, the proportion of male farmers in our sample was 91% in Delaware (66% state average), 93.10% in Maryland (62%), and 85.11% in Kentucky (65%) (USDA-NASS, 2022).

The overall age distribution closely mirrored national trends for farmers, particularly for the 55–64-year category (24.36% for our sample and 25.25% nationally in 2022). Respondents from Delaware and Kentucky reported similar proportions in this age group (26.32% and 28.00%, respectively), while Maryland had a lower proportion (13.33%). Participants were more likely to be college graduates, or with a graduate degree, representing a combined proportion of 42%. It is worth acknowledging that the demographic composition of the sample (e.g., being more highly educated) may skew toward farmers who are more likely to use "complex" grain marketing tools or marketing instruments that require brokerage accounts.

Farm sizes were relatively diverse and indicated good variation across operations, with the highest proportions for farms between 641 and 1,280 acres (21.15%) and greater than 1,920 acres (22%). Corn and soybeans were the most commonly planted grains in the 2022/23 crop year, accounting for approximately 55% of all cash crop acreage. Nearly a quarter of respondents planted wheat on up to 20% of their cash crop land, while only 15% planted barley in the same crop season.

To assess the financial position of farms, respondents identified the best approximation of their farm's debt-to-asset ratio.[1] A debt-to-asset ratio of less than 0.40 is generally considered safe, while a ratio of 0.40–0.70 calls for some caution (Johnson et al., n.d.). As displayed in Figure 1, more than half of participants reported a ratio of 0.20 or less, with another quarter reportedly carrying a ratio of 0.21–0.40. Nearly 3% had a ratio exceeding 0.61. Overall, farms were in good

[1] The survey offered the following definition: Debt/asset ratio measures how much debt the farm carries relative to the value of the farm's assets (total debt or liabilities / total assets).

Table 1. Risk Perceptions of Farm Operations: Which Risks Matter Most?

	Overall	Delaware	Maryland	Kentucky
Yield risks	8.39%	5.26%	27.59%	2.17%
Price risks	38.06%	36.84%	17.24%	47.83%
Yield and price risks are equal	53.55%	57.89%	55.17%	50.00%

financial standing, with minimal reported debts relative to assets. This is consistent with observed financial strength of farms in the US, with an average debt-to-asset ratio of 13.1% for large farms and 4.3% for small family farms (Giri and Subedi, 2024). On the other hand, this may reflect the relatively limited number of younger farmers in our sample, a group that arguably tends to carry higher debt relative to their farm assets (Giri and Subedi, 2024).

Perceived Risk and Crop Insurance Use in Grain Marketing

To better understand market risks, participants identified whether yield risks, price risks, or both posed the greatest challenge to their operations. Participants could only select one option. In general, less than 10% of participants selected yield risks as their primary concern, while 38% weighed price risks to be a greater challenge (see Table 1). Approximately 54% of participants considered yield and price risks to be equally challenging. Responses varied across states, with Maryland farmers perceiving yield risk as a greater challenge and price risks as less concerning compared to farmers from Delaware and Kentucky. While the reason for this disparity is not immediately clear, relatively stable markets largely driven by consistent feedlot demand may contribute to the perception among Maryland farmers that yields represent a greater source of risk. Still, 50%–58% of farmers in each state identified both risks to be equally challenging.

In the context of risk management, participants also reported their crop insurance coverage level for corn and soybeans, with summarized results shown in Table 2. Roughly a third or more of participants had insured 75% of their total potential liability, while a fifth had an 80% insurance coverage. Yield or revenue insurance coverage levels of 70%–75% are more popular among farmers (USDA-ERS, 2025). Coverage for corn was slightly higher than for soybeans at the 75% coverage level and beyond. Approximately 17% and 20% of participating farmers had no insurance for corn and soybean, respectively.

Crop insurance as a risk management tool provides production coverage and serves as a financial safety net for farmers in bad planting years. However, the extent to which it influences marketing decisions and farmers' choice of marketing tools is not well understood, with findings from limited studies noting lower farmer incentives in utilizing marketing contracts when crop insurance terms or payments are favorable (Katchova and Miranda, 2004; Du et al., 2015).

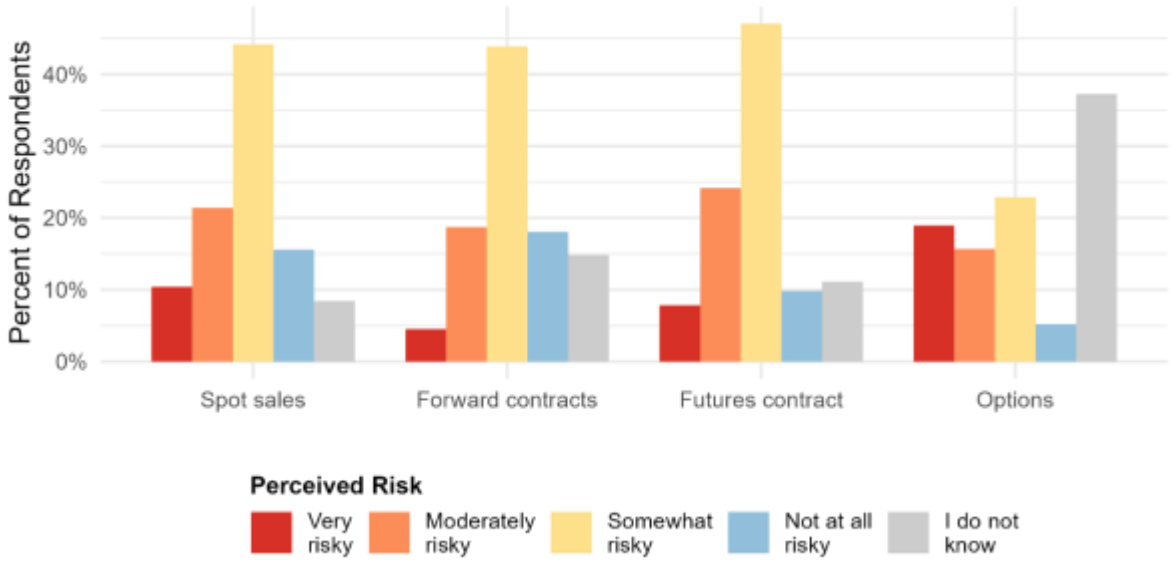
Participants further responded to questions on risk perceptions of different grain marketing tools or channels, with results summarized in Figure 2. Options and spot sales were viewed as the riskiest tools, with options carrying the greater perceived risk. More than a third of participants indicated a lack of knowledge about options, potentially signaling limited understanding of the marketing instrument. Fewer than 10% of participants perceived futures contracts as very risky, and an even smaller proportion did so for forward contracts.

Although options were frequently rated as very risky, they received comparatively lower ratings in the "moderately risky" category, ranking below several other marketing tools. Approximately 20% of respondents rated the other marketing tools as well as selling in cash markets as moderately risky, with a lower proportion for options within this category. The bulk of the distribution was concentrated in the "somewhat risky" category, with slightly more than 40% of participants rating cash markets, forward contracts, and futures contracts as somewhat risky, in contrast to the approximately 20% for options. While fewer participants overall (less than 20%)

Table 2. Participants' Crop Insurance Coverage

Insurance Coverage	Corn	Soybean
85%	5.77%	4.52%
80%	20.51%	19.35%
75%	37.18%	33.55%
70%	15.38%	16.13%
65%	2.56%	2.58%
60%	0.64%	1.29%
50%	1.28%	2.58%
No coverage	16.67%	20.00%

Figure 2. Risk Perceptions of Grain Marketing Instruments



believed that selling in cash markets or using other marketing instruments did not pose any risks to their operations, they were closely tied for spot sales and forward contracts and less for futures and options.

In general, cash markets and forward contracts were viewed rather favorably in terms of their riskiness, with options viewed as the riskier alternative. In addition, the results also suggest that different farmers perceive risk in different ways. For example, forward contracts allow farmers to lock in their full price and hence eliminate all price risk. Still, about 5% of farmers indicated that these contracts are "very risky." On the other hand, when farmers choose spot sales, they are fully exposed to price volatility as neither futures price nor basis are locked in. Yet approximately 15% of farmers indicated that spot sales are "not at all risky." Differences in how farmers perceive or identify risk can also help explain their use of marketing tools.

Producer Knowledge of Grain Marketing Tools and Contracts

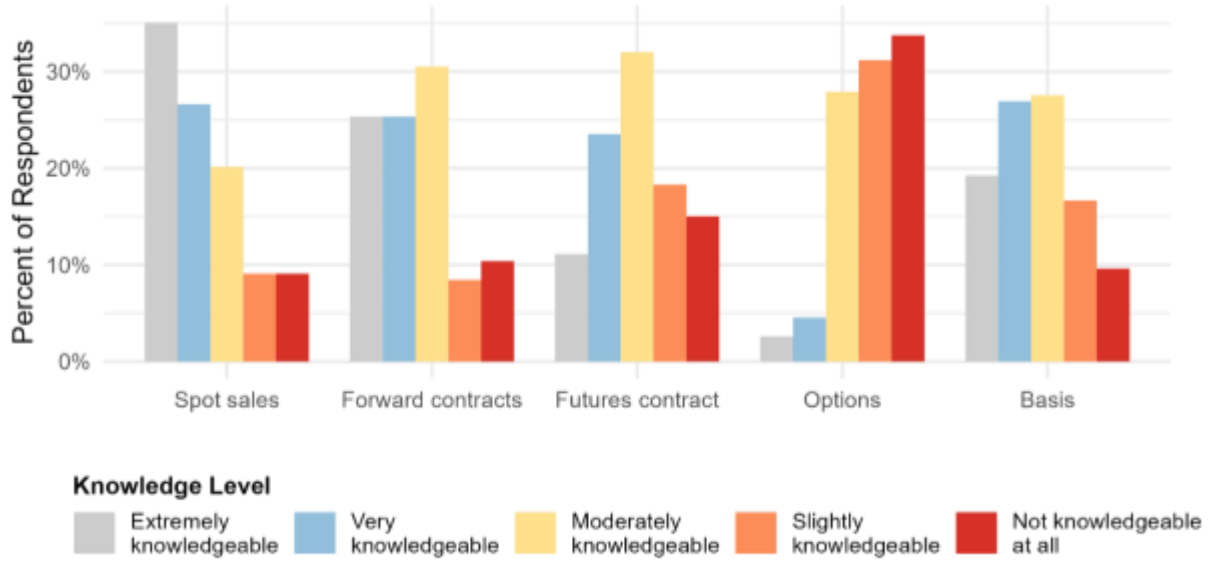
The sample exhibits notable variation in self-reported knowledge levels of cash markets, grain marketing tools, and basis with a graphical summary displayed in Figure 3. Knowledge levels shed more light on previous findings on risk perceptions, with lower perceived risk corresponding with higher levels of self-reported knowledge. Approximately 60% of participants reported being extremely or very knowledgeable about spot sales, with this proportion only slightly decreasing to 50% for forward contracts in the same categories. While knowledge ratings for basis lagged forward contracts and cash markets, farmers were at least moderately familiar, with slightly less than 10% indicating they were not knowledgeable at all. Knowledge ratings for futures contracts were low on average, with 10% reporting to be extremely knowledgeable and about a quarter of participants indicating they were very knowledgeable. A majority of the sample reported moderate to low knowledge about futures.

Consistent with previous results, very few farmers declared they understood options, with just about 7% of participants reporting being extremely or very knowledgeable. More than 60% of participants indicated having slight knowledge, or not knowledgeable at all about options, highlighting a potential priority for extension and outreach among grain farmers.

Patterns of Grain Pricing: Preferences for Cash and Forward Contracts

Figure 4 summarizes the share (not quantity) of annual grain sales marketed under spot sales, contracts, or other marketing tools during the 2022/23 crop marketing year. Respondents were specifically asked the percentage (or share) of grain yield they sold utilizing various marketing tools. For example, the first bar in Figure 4 indicates that about 12% of the farmers in our sample did not sell any grain on the spot market, about a quarter sold a small share (1%–20% of their grain) and one-fifth sold a moderate share (21%–40% of their grain) through spot delivery. It is also important to clarify that this approach reveals farmers' general preferences with respect to marketing different quantities of their grain, an aspect that is clearly nuanced given varying farm sizes and yields. The results displayed in Figure 4 do not indicate overall grain quantities, as a smaller proportion of large-scale farmers using a marketing tool may account for more volume than a larger share of small-scale farmers using the same tool.

Figure 3. Knowledge of Cash Markets and Other Grain Marketing Instruments



Consistent with previous results, spot delivery and forward contracts were the most common avenues for grain sales. For all other marketing tools, at least half of the farmers reported not having used them (Figure 4). Directly comparing the two marketing tools, only 4% of farmers locked in 81% or more of their crop via forward contracts, compared to the approximately 16% who sold similar quantities through spot sales. More than half of respondents did not utilize futures contracts to set the price for their 2022/23 crop; about 18% of respondents used them to price 1%–20% of their crop, but pricing more than 20% of crop with futures was far less common than using forward contracts or spot market sales.

Options and hedge-to-arrive contracts were even less commonly used, with only 19% and 23% of participants, respectively, reporting having used them to sell any portion of their crop. Similarly, farmers were also less likely to use "Other elevator marketing contracts," as 28% indicated having used these other contracts in 2022/23. These results depict the popularity of selling directly in cash markets for spot delivery or locking in forward contracts compared to other avenues of marketing grain. This underscores the importance of investigating factors motivating these decisions, and how grain pricing tools fit into broader risk management strategies.

Grain Marketing Approaches: Use of Professional Services vs. Independent Selling

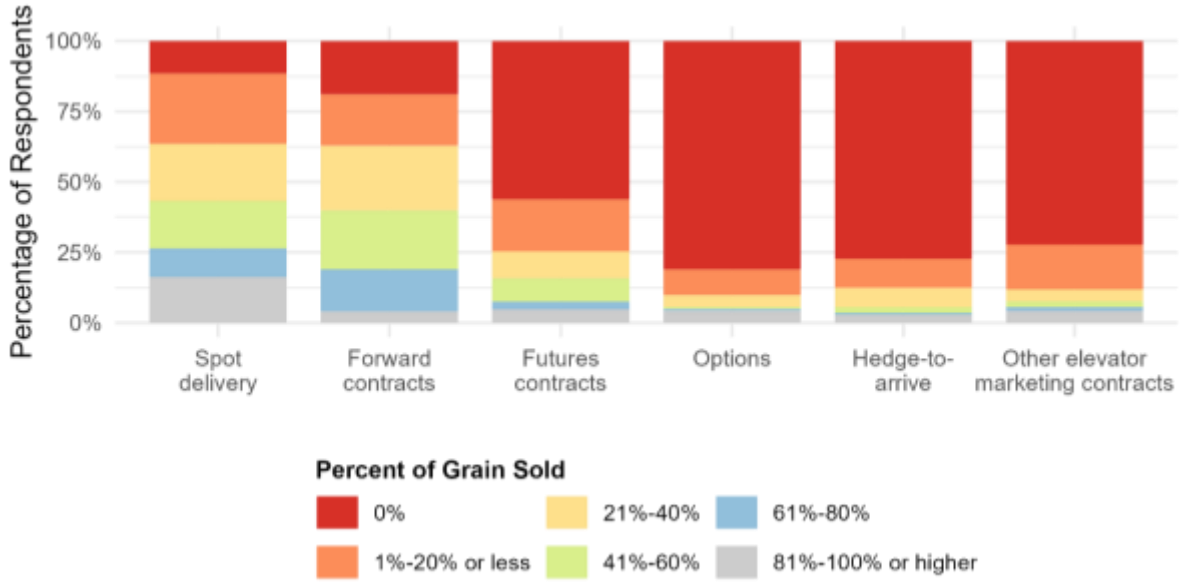
The final section of the survey examined how farmers market their grain, from selling independently to utilizing professional services, with results displayed in Table 3. Nearly half of all respondents reported selling grain independently (without professional advice), although this varied by state: More farmers in the two Mid-Atlantic states sold grain without consulting a professional, relative to approximately 30% of Kentucky respondents. About one-quarter of all participants indicated they sold grain jointly with other members of their operation. This proportion was slightly lower in Maryland and somewhat higher among Kentucky participants, although the variations were modest. On average, 74.34% of the farmers in our sample sold grain by themselves or with other members of their operation without any support from professional services (this proportion is slightly above 80% in Delaware and Maryland and close to 60% in Kentucky).

Table 3 also shows a larger share of Kentucky farmers, relative to their Mid-Atlantic counterparts, either subscribing to professional advice or combining independent sales with occasional use of marketing professionals. However, this group accounted for less than a quarter of respondents in the two Mid-Atlantic states and overall. A rather small proportion of our sample (less than 3%) fully outsourced grain marketing to professional firms, with little variation across states. In general, these findings demonstrate varied approaches to grain marketing, with professional services or advice being sought sometimes and less so by participants from the Mid-Atlantic regions.

Summary

Grain price and market volatility remain ongoing challenges for farmers each crop marketing year. Recent global disruptions such as the pandemic, the war in Ukraine, and trade tensions have only intensified price volatility. Whether these shocks have prompted broader adoption of varied grain marketing tools remains

Figure 4. Share of Annual Grain Sales Marketed Under Different Contract Types



uncertain. While this study explores grain marketing preferences among farmers in Maryland, Delaware, and Kentucky using survey data, it only presents a cross-section of responses.

A majority of farmers perceived price volatility and yield risk to be equally concerning. Among marketing tools, forward contracts and spot sales were viewed to be less risky than futures contracts and options. These perceptions were mirrored in self-reported knowledge: Most farmers expressed limited familiarity with futures contracts and options but felt more confident using spot sales or forward contracts.

Use of futures contracts and options remains minimal; while this is consistent with national trends, it may be masking regional variation. In parallel, most farmers in the study sold grain without professional advice. However, roughly a quarter of participants sought some form of professional advice or engaged the services of professionals (either completely or sometimes) in selling grain, with Kentucky farmers being more likely to use professional help than their Mid-Atlantic counterparts.

In general, these findings point to persistent gaps in knowledge and limited utilization of marketing tools beyond spot markets and forward contracts. This underscores the need for continued extension education on grain marketing tools, especially in the Mid-Atlantic regions. As price volatility remains a structural feature of agricultural markets, broader adoption of diverse marketing strategies will be increasingly important.

Table 3. Farmer Grain Marketing Approaches: Independent Versus Professional Engagement

Grain Marketing Approach	Overall	Delaware	Maryland	Kentucky
I sell grains by myself and do not use professional grain marketing services	48.68%	55.26%	62.07%	29.79%
I sell grains in combination with other members of my operation	25.66%	25.00%	20.69%	29.79%
I outsource my grain marketing to a professional grain marketing firm	2.63%	1.32%	3.45%	4.26%
I sell grains myself but subscribe to professional marketing advice	12.50%	10.53%	6.90%	19.15%
Sometimes, I sell grains myself and use marketing professionals at others	10.53%	7.89%	6.90%	17.02%

For More Information

Adjemian, M.K., A. Smith, and W. He. 2021. "Estimating the Market Effect of a Trade War: The Case of Soybean Tariffs." *Food Policy* 105:102152. https://doi.org/10.1016/j.foodpol.2021.102152

Baptist, J., W. Kabo-Bah, and R.K. Bannor. 2025. "E-Commerce Among Grain Traders and Its Impact on Marketing." *Sustainable Technology and Entrepreneurship* 4(1):100090. https://doi.org/10.1016/j.stae.2024.100090

Devadoss, S., and W. Ridley. 2024. "Impacts of the Russian Invasion of Ukraine on the Global Wheat Market." *World Development* 173:106396. https://doi.org/10.1016/j.worlddev.2023.106396

Du, X., J. Ifft, L. Lu, and D. Zilberman. 2015. "Marketing Contracts and Crop Insurance." *American Journal of Agricultural Economics* 97(5):1360–1370. https://doi.org/10.1093/ajae/aav024

Gardner, G. 2025, April 9. "Major Players in US Trade and Grain Market Volatility." *Southern Ag Today* 5(15.3). Available online: https://southernagtoday.org/2025/04/09/major-players-in-us-trade-and-grain-market-volatility/

Giri, A.K., and D. Subedi. 2024. "Farm Businesses Well-Positioned Financially Despite High Interest Rates." *Amber Waves*. https://doi.org/10.22004/ag.econ.356099

Grant, J.H., S. Arita, C. Emlinger, R. Johansson, and C. Xie. 2021. "Agricultural Exports and Retaliatory Trade Actions: An Empirical Assessment of the 2018/2019 Trade Conflict." *Applied Economic Perspectives and Policy* 43(2):619–640. https://doi.org/10.1002/aepp.13138

Johnson D.M., B.V. Lessley, and J.C. Hanson. n.d. *Assessing and Improving Your Farm Solvency*. University of Maryland Cooperative Extension Fact Sheet 540. Available online: https://www.arec.umd.edu/sites/arec.umd.edu/files/files/documents/Archive/Asessing and Improving Farm Solvency_0.pdf

Katchova, A.L., and M.J. Miranda. 2004. "Two-Step Econometric Estimation of Farm Characteristics Affecting Marketing Contract Decisions." *American Journal of Agricultural Economics* 86(1):88–102. https://doi.org/10.1111/j.0092-5853.2004.00564

Meade, B., E. Puricelli, W.D. McBride, C. Valdes, L. Hoffman, L. Foreman, and E. Dohlman. 2016. *Corn and Soybean Production Costs and Export Competitiveness in Argentina, Brazil, and the United States*. USDA Economic Research Service Economic Information Bulletin EIB-154.

Prager, D., C. Burns, S. Tulman, and J. MacDonald. 2020. *Farm Use of Futures, Options, and Marketing Contracts*. USDA Economic Research Service Economic Information Bulletin EIB-219.

Taheripour, F., and W.E. Tyner. 2018. "Impacts of Possible Chinese 25% Tariff on US Soybeans and Other Agricultural Commodities." *Choices* 33(2). https://doi.org/10.22004/ag.econ.273330

US Department of Agriculture, National Agricultural Statistics Service (USDA-NASS). 2022. *Census of Agriculture Survey*.

US Department of Agriculture, Economic Research Service (USDA-ERS). 2025. *Farm & Commodity Policy – Title XI: Crop Insurance Program Provisions*.

Wilson, W.W., and B. Dahl. 2011. "Grain Pricing and Transportation: Dynamics and Changes in Markets." *Agribusiness* 27(4):420–434. https://doi.org/10.1002/agr.20277

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