

# *The Big Shrink*

## Best Trade Friends Forever?: Part 1

By Matt Clark



For anyone involved in agriculture during the mid-1990s to early 2000s, every crop conference, Extension meeting and farm radio show etched into our memories a common message: The U.S. farmer needed to rise to the occasion and feed, fuel and clothe the world as globalization opened new export markets. Doing so had a side benefit of helping to keep stockpiles at manageable levels as productivity on the farm rose.

Talk became reality. From 1990 to 2024:

- The U.S. farmer produced 63% more tons of corn, soybeans, wheat and sorghum.
- The inflation-adjusted export value of those crops increased 52%, while the inflation-adjusted cash receipts of those crops increased 44%.
- Total farm sector equity increased 150%.<sup>1</sup>

Farmers more than met the challenge.

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But, can the same growth paradigm carry the industry for another 30 years and successfully transition the farm to the next generation?

My research finds the following:

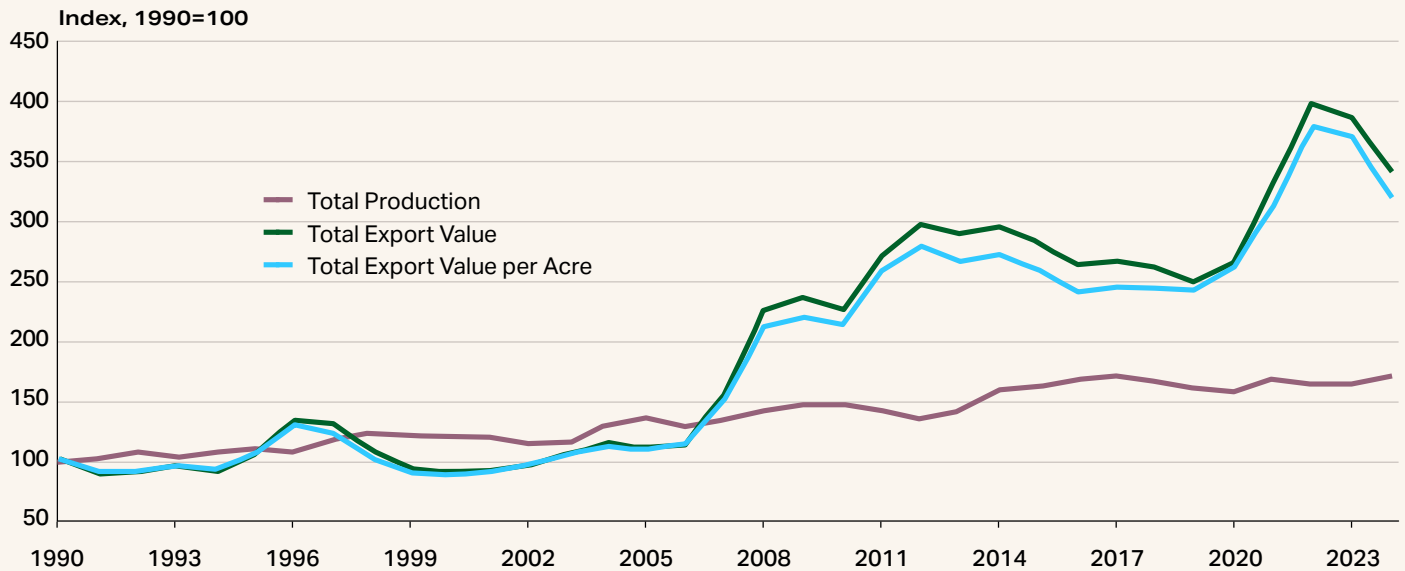
- The corn industry has already transitioned past the “Feed the World” paradigm and is best positioned for future growth because of continued focus on value-added products and high-quality trade partners.

- The soybean industry faces significant medium-term trade risk and medium- to long-term risk from slowing population growth of top trade partners and would strongly benefit from continued focus on bioenergy.
- The wheat industry faces limited risk from slower population growth but faces significant trade risk in the medium and long term due to potential trade partner instability. For wheat, a renewed focus on developing higher-value products could significantly mitigate these trade risks.
- The sorghum industry faces significant risk from a slowing population in the medium and long term due to a strong overdependence on China.
- The soybean and sorghum industries need to continue to develop domestic outlets for their product, focus on developing high-value products, and diversify their current trade partnerships. Without significant changes, both commodities may struggle to compete for acres in the long run.

#### **A LOOK BACK: CROP PRODUCTION AND EXPORTS EXPLODE, LANDSCAPES SHIFT**

Trade groups, export promotion and market development partners, and grower associations for corn, soybean, wheat and sorghum (with assistance from the USDA) boosted the value of exports by 52% from 1990 to 2024 in inflation-adjusted dollars

## Export Dollars Outpaced U.S. Production Growth



Sources: USDA, Terrain

and over 260% in non-inflation-adjusted dollars.<sup>1</sup> As growth in export dollars outpaced the U.S.'s production growth and acreage growth, the value per acre and per ton produced also increased over time as the message and the system worked for the U.S. farmer.

*Export growth didn't happen by accident. It corresponded with a prolonged period of large investments of financial, social and time capital.*

Export growth didn't happen by accident. It corresponded with a prolonged period of large investments of financial, social and time capital. Waves of USDA trade missions, private market explorations, trade deals and the like significantly expanded the stomachs (human and livestock) that U.S. farmers were able to fill with exports.

For instance, the USDA reports that in 1990, corn, soybean, sorghum and wheat were exported to 136 trading partners. By 2024, that number was 158.<sup>2</sup> During the same period, global production, minus the U.S., for corn, soybeans, sorghum and wheat increased 116%. The U.S. was able to find additional export markets even though the world expanded production.

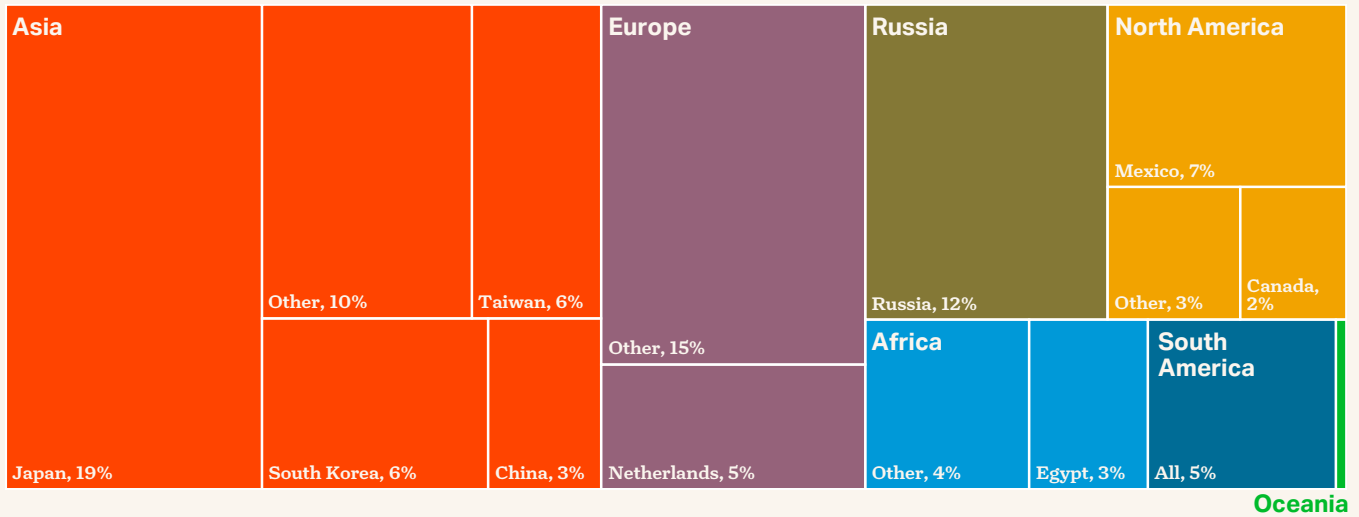
The landscape of trade flow also shifted over time. In 1990, Asian countries, led by Japan, bought about 44% of U.S. corn, soybean, sorghum and wheat exports. Europe was a distant second at 20%, followed by Russia and North America, which consumed about 12% each.<sup>1</sup>

By 2024, the landscape tilted closer to Asia, with Asian countries accounting for 51% of exports, North America accounting for 29%, and Europe's share dwindling to 8%. China specifically led the way, increasing market share from about 3% in 1990 to 24% in 2024.

This shift corresponds with a shift in population growth. According to the United Nations, from 1990 to 2024, the population of Europe increased only 3%, whereas the population of Asia increased 50%.

## ■ We've Already Seen the Shift in Exports: 1990

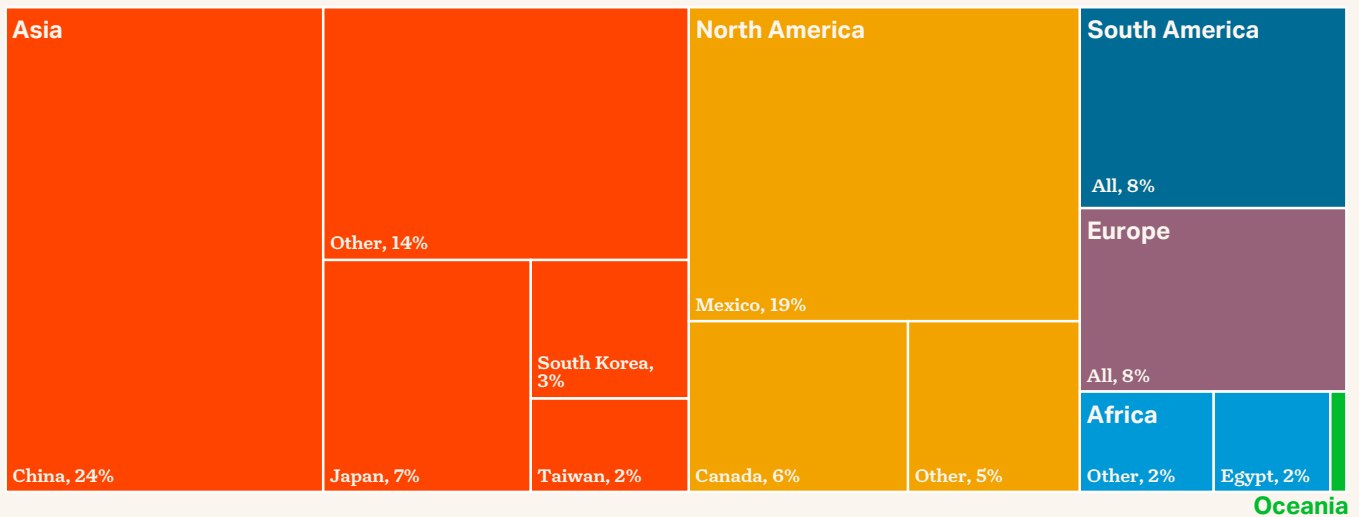
### Corn, Soybean, Wheat and Sorghum Export Destinations



Note: Percentages are in dollar terms, not volume.  
Sources: USDA, Terrain

## ■ We've Already Seen the Shift in Exports: 2024

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## TRADE PARTNERSHIP RISKS IN THE NEXT DECADE

Export markets will continue to play a vital role for U.S. farmers in the coming decade; however, each commodity faces a unique set of risks and challenges. In this section, I highlight the risk of slowing population growth, the risk to financial stability, concentration risk, and “trade friendliness” risk. If action is not taken to mitigate these risks, the U.S. farmer is likely to see continued pressure on demand.

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### ■ Global Population Risk

Each commodity export portfolio faces a challenge from slowing global population growth. However, this challenge is most obvious for sorghum and soybeans. China, the top trade partner for both commodities, already reached peak population in 2021.

In 2024, more than 58% of soybean complex exports and 87% of sorghum exports went to countries that have already experienced population peak or are expected to experience population peak in 2025. This includes key export partners such as China, Japan, South Korea, Russia (for sorghum) and some European nations.

By 2035, the share increases for each commodity, implying that more of our current trade partners are hitting peak population.<sup>3</sup>

The impact to soybeans and sorghum is unlikely to be felt in the 2025 marketing season, as most of these countries have just entered a period of depopulation. However, the impact will compound throughout the next decade (and beyond). Commodity prices for soybeans and sorghum will likely reflect how declining populations start to take a

toll on demand, unless new markets — export or domestic — can be found. Developing new markets takes time, so investment and focus are needed now.

## How Soon Does Population Matter?

Percentage of Exports Shipped Today to Countries Where Population Will Have Peaked by 2035

Corn and Corn Products	39%
Soy Complex	62%
Sorghum	87%
Wheat and Milled Products	40%

Sources: United Nations World Population Projections 2024 (Low Variant), USDA, Terrain

Corn and wheat are primarily exported to countries that are still growing; still, a third of corn’s export partners and around 35% of wheat’s export partners are already in population decline.<sup>3</sup> Over the next decade, that number will grow slightly to around 40% for both commodities, which should give both industries time to adjust. Corn also exports a fraction of total production compared with other commodities, which should lessen the blow significantly.<sup>3</sup>

### ■ Concentration Risk

Soybeans and sorghum also carry a much stronger concentration risk of export partners into the next decade. A high concentration of export partners adds to the risk of slower population growth, flare-ups in political disagreements, economic instability, or other shocks to consumption.

A method to measure market concentration is the Herfindahl-Hirschman Index (HHI). HHI is typically used to calculate a firm's market share to determine market competitiveness. When the HHI score is above 2,500, a market is highly concentrated, and when the HHI is below 1,500, the marketplace is competitive. By applying the same mathematical process to export destinations by commodity, I developed a market concentration proxy.

The soybean complex slipped into high-concentration territory in 2011, 2012 and 2016. In each of these years, China purchased greater than 50% of the total value of soybean and soy product exports.<sup>1</sup> As China's purchases have slowed to the lower 40% of total soy exports, the HHI metric has moved from highly concentrated to moderately concentrated. Still, even at the moderately concentrated level, factors such as China's declining population can have significant implications for soybean export purchases in the next decade.

Sorghum is the obvious outlier. From 1990 to 2013, Mexico bought an average of 60% of the sorghum crop, and from 2014 to 2024, China bought more than 80% of the crop.<sup>1</sup> For sorghum, the

concentration risk of export partners is significant over the next decade, particularly given the demographic, economic and potential political issues surrounding its top export destination.

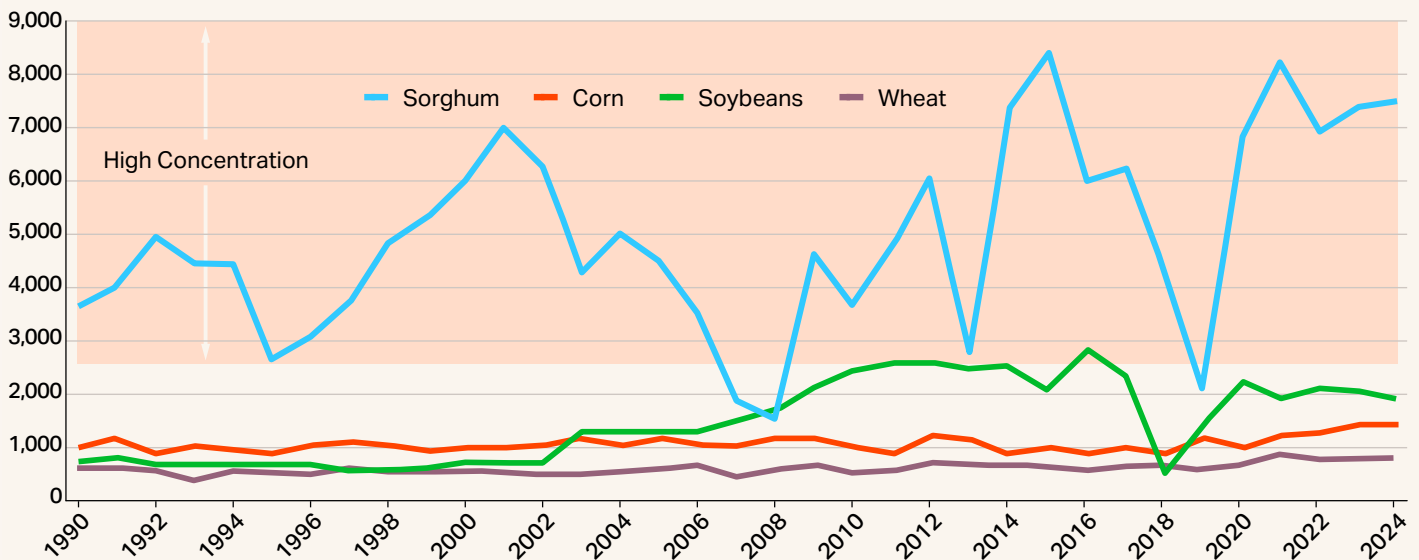
Since 1990, wheat and corn have maintained a diverse mix of trade partners and maintained a concentration score below 1,500. This highlights that both commodities have a well-distributed export partner base with much less individual-country risk over the next decade.

### ■ Financial Stability Risk

The financial stability of trade partners is also a key risk factor over the next decade. At an aggregate level, I created a proxy by weighting each country's share of U.S. exports against their own credit risk ratings using sovereign credit ratings.<sup>4,5</sup> Sovereign credit ratings are simply a measure of an individual country's ability to repay its debts, like a personal credit rating when an individual applies for a bank loan. In my proxy scores, any rating of BBB- or better indicates an "investment-grade" score, and anything below BBB- is considered "speculative."

## ■ Sorghum's Trade Highly Reliant on the Future of a Few Countries

Herfindahl-Hirschman Index for Export Partners



Sources: USDA, Terrain

*As the country risk increases, so to do the transactional costs, which eventually work their way back to the price a U.S. farmer gets paid (typically in the basis).*

This is an important risk assessment for several factors.

First, as a country is deemed less financially stable, the value of its currency against the U.S. dollar typically weakens. As that happens, the country's purchasing power declines, as does the purchasing power of importers within the country, hampering their ability to buy U.S. commodities.

Also, sovereign debt ratings are often used in determining the risk in letters of credit, shipping rates and insurance costs.<sup>6</sup> As the country risk increases, so to do the transactional costs, which eventually work their way back to the price a U.S. farmer gets paid (typically in the basis).

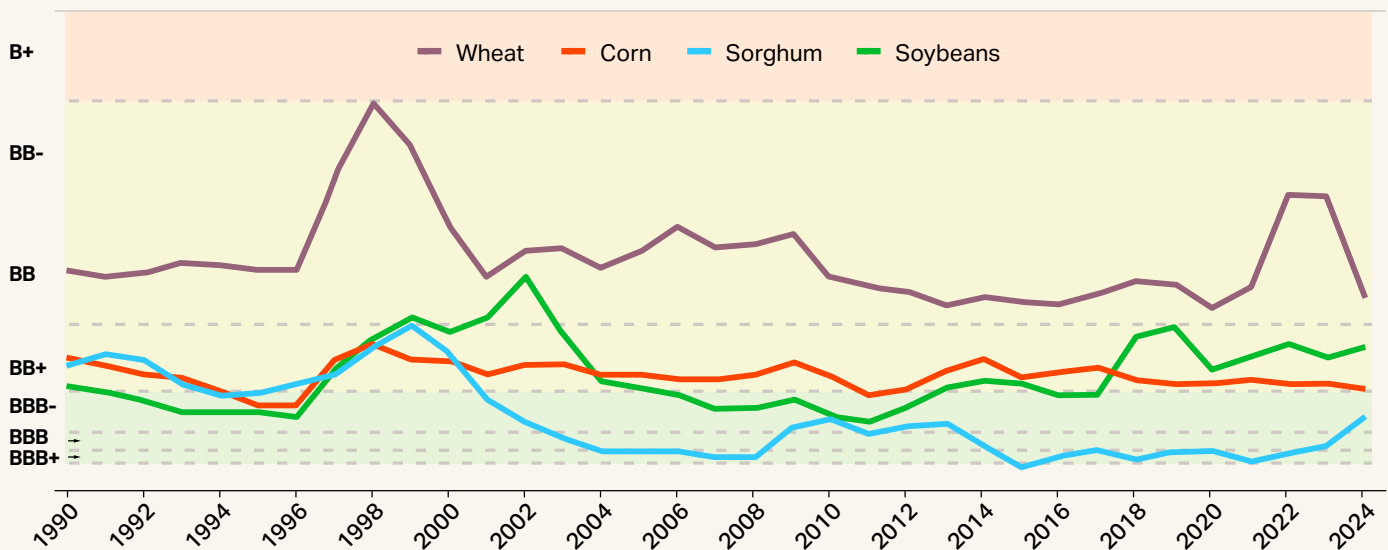
The weighted score for corn is right at BBB- but at times has ventured into the BB+ rating. In either case, the credit rating for corn's trading partners indicates financial stability. The ability of the corn industry to build an unconcentrated mix of trade partners with strong financials is a great model for other industries and bodes well for continued medium-term export success.

Soybeans, too, have generally maintained BBB- to BB+ ratings. However, some recent weakness due to struggles of long-term trading partners, including Venezuela and Egypt, has nudged the weighted probability of default slightly higher. The financial stability of partners such as Japan, South Korea and Germany helps to offset some of the risk associated with their declining populations. If these countries can stay financially strong, it could give the soybean industry a longer runway to develop new demand outlets.

Because of its heavy dependence on China (86% of exports in 2024), sorghum has long maintained a great weighted credit rating. In the short term, the strong financial conditions provide a counterweight to the extreme population issues; however, the extent that

## ■ Although Diversified, Wheat's Export Partners Face Financial Risks

Terrain Proxy Ratings of Trade Partners' Financial Stability



Sources: USDA, S&P Global, Fitch Ratings, Trading Economics, theglobaleconomy.com, Yahoo Finance, Terrain

strong financial conditions can outlast the continued decline in population is highly questionable.

The outlier in this analysis is wheat. More than 45% of U.S. wheat exports in 2024 went to countries with a sovereign debt rating below investment grade.<sup>1</sup> The cost of doing business through letters of credit, insurance, exchange rate risk and the like can be elevated, and the swings to the lowest-cost producer can at times be large. Countries with a lower cost of production and cost of doing business than the U.S., such as Russia, can quickly gain the upper hand. This may in part explain why harvested wheat acres are down more than 40% from 1990, as these export costs have eaten into the farmer price.

### ■ Trade Friendliness Risk

A stronger trade-friendly metric should result in some near-term stability in exports. A base of stable, trade-friendly countries today should help limit the volatility in friction costs while also allowing commodity associations to use their resources to develop a longer-term transition in cases where new export partners, products or domestic outlets need to be developed. In cases where commodities are heavily

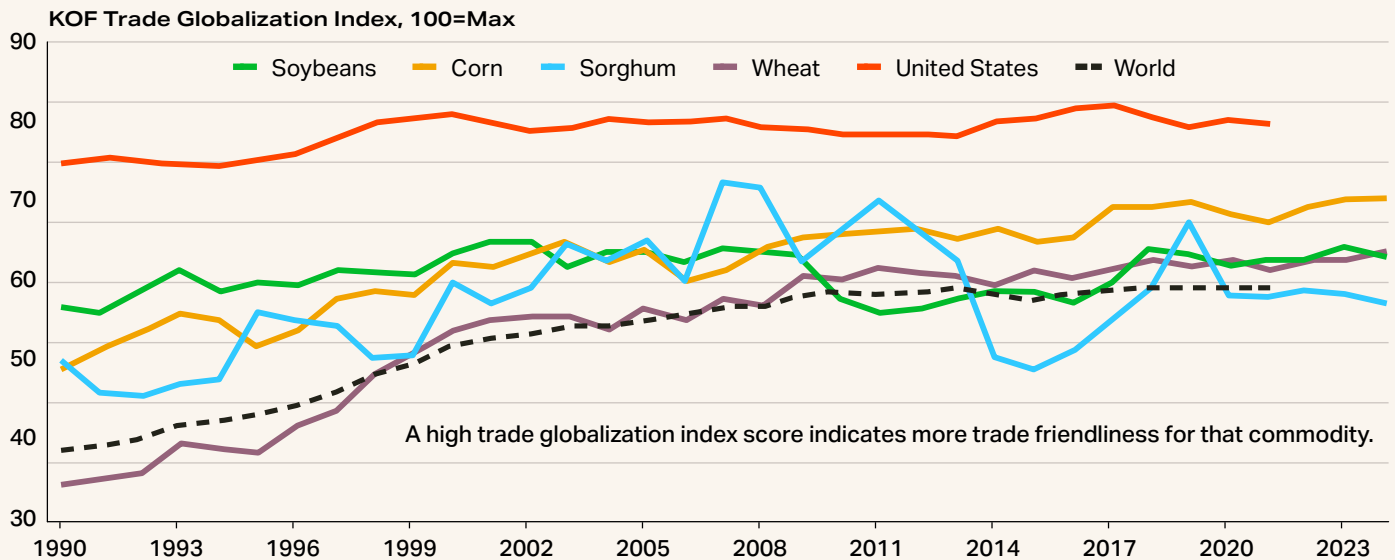
partnered with countries that are not trade-friendly, industry resources are more likely to be used putting out fires or maintaining the status quo.

The KOF Swiss Economic Institute has an index of trade globalization to measure trade friendliness.<sup>2</sup> A higher index score indicates that the country has fewer trade regulations, fewer barriers to entry, fewer tariffs, and more open trade agreements. Therefore, commodities with a higher trade-weighted score simply have fewer barriers to overcome and easier access to export markets.

The trade-weighted score for countries receiving corn is excellent. For corn, many of the U.S.'s top export markets such as Canada, Mexico and South Korea are generally considered trade-friendly. As evidence, the U.S. has free-trade agreements with Canada and Mexico (USMCA), South Korea (KORUS), Colombia (US-Colombia TPA), and a trade agreement with Japan (USJTA). These trade partners take more than 60% of the corn and corn products exported since 2020.

According to my estimates, the trade partners of wheat and soybeans grade slightly above the KOF's index

## ■ Corn's Export Partners Very Friendly, Sorghum's Not So Much



Note: Public data are through 2022; 2023 and 2024 are estimated by holding the KOF scores constant and letting the export mix vary.  
Sources: KOF Swiss Economic Institute, Terrain





score for the world average, and both crops' scores have showed some progress over the past few years.

Sorghum's dependence on China is likely also problematic for the crop's cost of doing export business. Fighting for continued and greater access to Chinese markets likely consumes a lot of resources and provides limited bandwidth to develop new markets. Given China's shrinking population and poor trade globalization score, the near-term risk to sorghum exports is very high.

### LONG-TERM OUTLOOK FOR EXPORTS

"Best Trade Friends Forever?: Part 2" will cover the long-term risk horizon for corn, wheat, soybeans

and sorghum as well as considerations for a path forward for U.S. agriculture as the impact of global population decline begins to really bite. Key topics in Part 2 will include:

- The role of high-value products and biofuels
- A road map for expanding export markets
- Considerations for farm revenue

For more background information on "The Big Shrink" series, read the first report, "[How Will Agriculture Navigate the Baby Bust?](#)"



### ABOUT THE AUTHOR



**Matt Clark** is Terrain's senior rural economy analyst, focusing on the impacts of interest rates, land values and other macroeconomic trends on agriculture. He previously worked as a senior industry analyst with American AgCredit and as an assistant economist at the Federal Reserve Bank of Kansas City. Matt earned his B.S. and M.S. degrees in agricultural economics from Kansas State University.

### ABOUT TERRAIN

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## ENDNOTES

- <sup>1</sup> Calculated using data from the USDA's National Agricultural Statistics Service, Foreign Agricultural Service and Economic Research Service, as well as the Bureau of Labor Statistics. (2024 cash receipts are not final.)
- <sup>2</sup> Generally, the USDA uses “trading partners” to define countries or groups of smaller countries.
- <sup>3</sup> United Nations World Population Projections 2024, USDA FAS - Global Agricultural Trade System. Given the work of Terrain analysts Matt Woolf and Don Close in “[How Will Agriculture Navigate the Baby Bust?](#)” I chose the “low variant,” as it seems like both a more likely scenario and one that the U.S. agricultural industry must hedge against.
- <sup>4</sup> Data from each country was individually sourced using Microsoft CoPilot and verified by supporting links from S&P Global, Fitch Ratings, Trading Economics, [theglobaleconomy.com](#) and news articles from Yahoo Finance. If an S&P Global rating was used when S&P and Fitch did not match, interyear changes were averaged across the calendar year.
- <sup>5</sup> The idea for this topic was based on the online article “Letter of Credit Risks in Uncertain Financial Times,” published by Shipping Solutions on March 22, 2009, <https://www.shippingsolutions.com/blog/letter-of-credit-risks-in-uncertain-financial-times#:~:text=There%20are%20eight%20country%20risk,with%20changing%20country%20risk%20profiles>. Due to historical data availability and conversations with exporters in the U.S., sovereign debt ratings were used over other practices such as the OECD's Country Risk Assessment Method.
- <sup>6</sup> An example of this conversation process can be found in “Credit Quality of Kansas Farms” by Allen Featherstone and Michael Langemeier, Kansas State University Department of Agricultural Economics, November 2015, <http://www.agmanager.info/KFMA/Newsletters/Research/Credit.pdf>.
- <sup>7</sup> Specifically, I used the KOF's “de jure” trade globalization metric, which includes components on nontariff trade barriers, compliance costs of importing and exporting, income tax on trade, tariff rates, and the number of trade agreements. More information can be found here: [https://ethz.ch/content/dam/ethz/special-interest/dual/kof-dam/documents/Globalization/2023/KOFGI\\_2023\\_variables.pdf](https://ethz.ch/content/dam/ethz/special-interest/dual/kof-dam/documents/Globalization/2023/KOFGI_2023_variables.pdf). A deeper discussion on the index can be found in this article: Savina Gygli, Florian Haelg, Niklas Potrafke, and Jan-Egbert Sturm, “The KOF Globalisation Index – Revisited,” 2019, *The Review of International Organizations* (No. 3; Vol. 14, pp. 543–574), <https://doi.org/10.1007/s11558-019-09344-2>.

