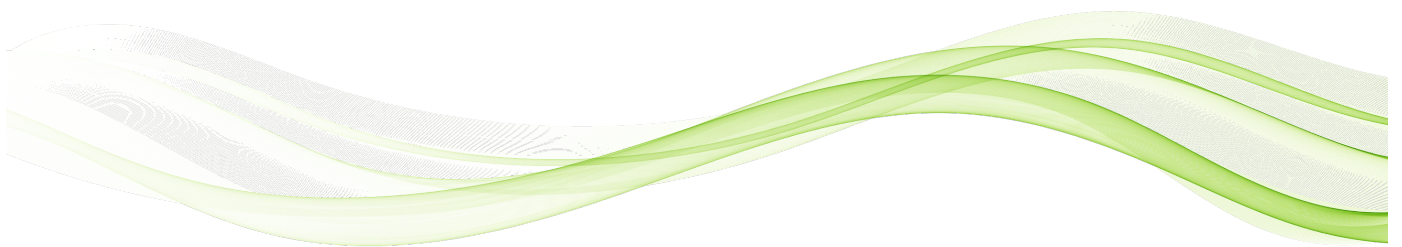




CANADIAN FERTILIZER MARKET CONCERNS

Prepared by: Josh Linville, StoneX

Prepared For Grain Farmers of Ontario by StoneX
August, 2024



Canadian fertilizer market concerns

Fertilizer is estimated to be responsible for over half of the world's food production. Its importance in feeding and providing critical nutrients for a growing global population cannot be overstated. For the past four years, the global fertilizer markets have been in disarray and have been plagued by high prices, tight inventories, uncertainty regarding regional conflicts, attacks on shipping lanes, and self-imposed Canadian restrictions to free trade. While many of the most pressing and daunting Black Swan events of the last few years have subsided and helped fertilizer values to correct, there remain substantial issues that continue to threaten global fertilizer supplies today. It is not out of line to forecast a future where fertilizer production/inventories are impacted severely enough that global food supplies are threatened.

Today, the world is still contending with:

- Russia's invasion of Ukraine possibly causing fertilizer exports to cease.
- Middle East tensions remaining high and could see drastic loss of all major fertilizer exports from the region.
- Major shipping lanes such as the Red Sea remain uncertain/high risk.
- Chinese government restricting exports of nitrogen and phosphate to maintain high domestic inventories and lower domestic values than the rest of the world.

In addition, the Canadian government continues to put into place import duties against Russian-produced fertilizer while many of its peer countries have not. This has placed an unnecessary burden on Canadian farmers as Russia represents the largest global nitrogen exporter, the fourth largest phosphate exporter, and the third largest potash exporter on the planet. While the intention of the duties was to punish Russia for its invasion of Ukraine, Canada is one of the very few governments to put the duties into place. That has resulted in Canadian farmers bearing the brunt of tighter inventories and higher costs.

With that, Canada continues to be in a unique position to help alleviate several of these issues:

- New domestic nitrogen production could be supported, which would not only make Canada less reliant on troublesome global regions in the future (more supply confidence) but would also build global supplies which should help lower global values and lower food costs.
- Removal of duties against Russian fertilizers would put Canadian farmers back on an even playing field with the rest of the world. While new production would take time, this could see an immediate impact.
- Partnering with phosphate-producing nations around the world. Until/unless more sizable domestic phosphate rock reserves are found in Canada, the country will continue to be reliant on the world. However, investing and partnering with other nations could give a more guaranteed supply and hopefully lower pricing.

While there will always be issues/conflicts around the world, Canada remains in a unique position to place itself as a leader in making sure a growing global population eats.

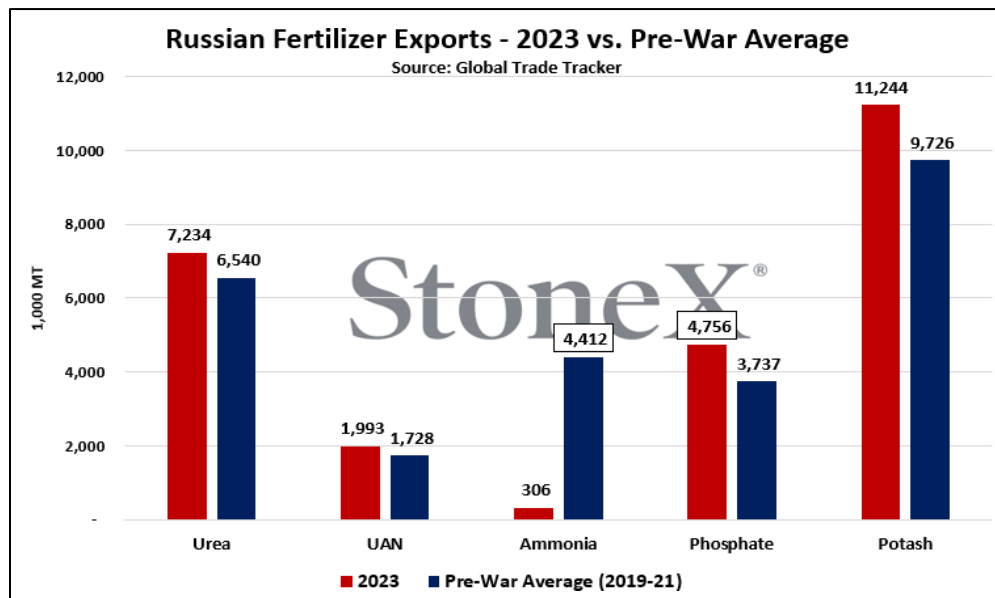
Russia/Ukraine War - two years in, what's changed?

After Russia launched a full-scale invasion of neighbouring Ukraine in late February 2022, global fertilizer markets were sent into turmoil. A run of black swan events in the two years leading up already had fertilizer markets on edge, with prices running higher as global supplies tightened, and the outbreak of war was the event that brought those issues to a head. Russia's importance in overall fertilizer trade cannot be overstated, with the country at the time being the world's top exporter of nitrogen (#1 in urea, UAN, and ammonia), the second-largest exporter of potash and the fourth-largest exporter of phosphate (DAP/MAP). In the wake of the invasion, fears of losing this supply, whether due to production and logistics being impacted by the war or due to sanctions reducing Russian exports, drove large levels of panic buying and helped push fertilizer prices to all-time highs in the spring of 2022, as can be seen in the accompanying chart.



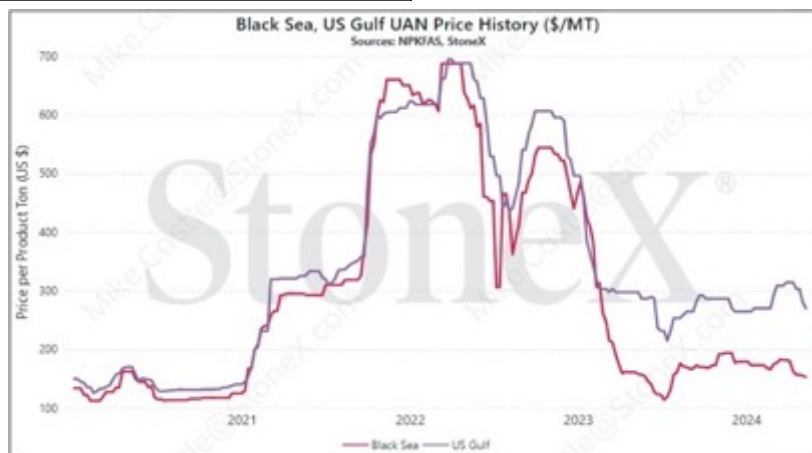
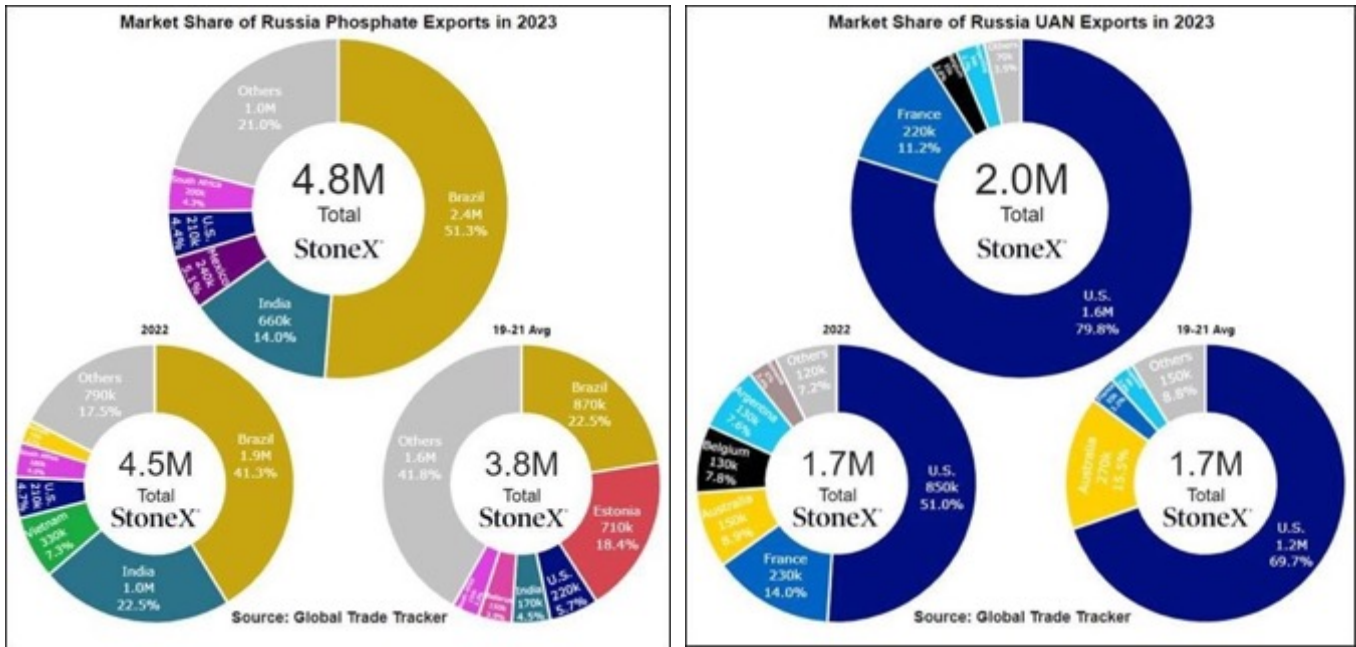
Did these fears of losing Russian supply come to fruition? Not really. Exports out of Russia were disrupted slightly in the immediate aftermath, mostly due to the uncertainty of the impact of impending sanctions. However, those disruptions did not last long. Some buyers were quick to take advantage of the uncertainty, stepping in to buy up cheaper, displaced Russian tons with others unwilling to do so.

In fact, Russia's exports of urea, UAN, phosphate (DAP/MAP), and potash are now larger than they were before the war's outbreak. As seen in the chart below, Russia's 2023 exports of these products were well above their pre-war (2019 – 2021) average, playing a major role in moderating global fertilizer prices as they fell from their record highs.



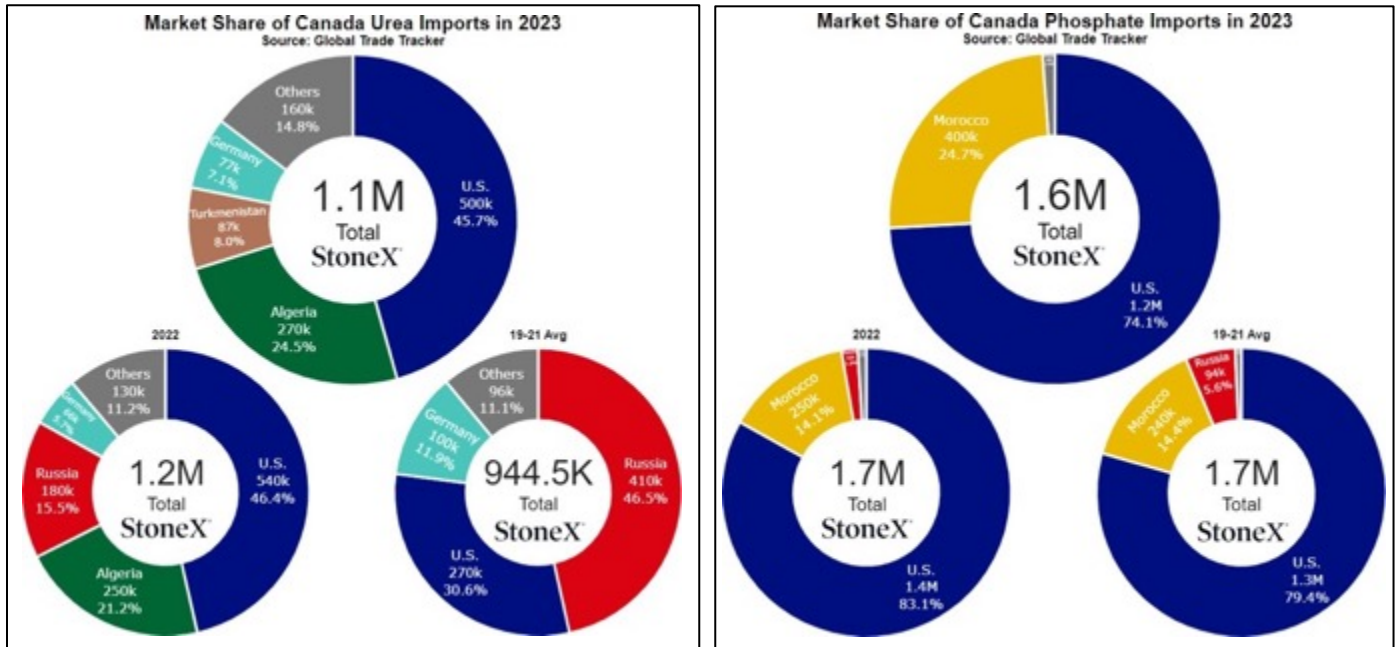
Overall, what we've seen in the last two years is not a reduction in overall fertilizer supply out of Russia but rather a shift in trade flows. A big part of why Russian fertilizer exports have increased despite their isolation from many of the world's major economies is the growing ties between Russia and their geopolitical allies. With global geopolitical tensions continuing to rise and many countries "choosing sides," Russia has put more importance on the growing BRICS alliance. The reason this has been so beneficial to their fertilizer industry is because two of these allies, India and Brazil, are two of the world's largest importers of fertilizer.

The destinations for Russian exports have shifted somewhat dramatically compared to their pre-war averages, as shown below. For example, the share of Russian DAP/MAP exports going to Brazil and India has grown from a combined 2019 – 2021 average of 27% all the way to 65.3% in 2023. On the UAN side, with many of the world's major buyers, including Canada, unwilling to do business with Russia, they have become very reliant on the U.S. as a buyer with no tariffs in place, with nearly 80% of their 2023 UAN exports going to the U.S. With their outlets limited, Russian producers are forced to offer fertilizer at lower prices to entice buyers. UAN is a perfect example of this, as can be seen in the chart below, which shows just how cheap tons from Russia (via the Black Sea) are in comparison to the U.S. Gulf.



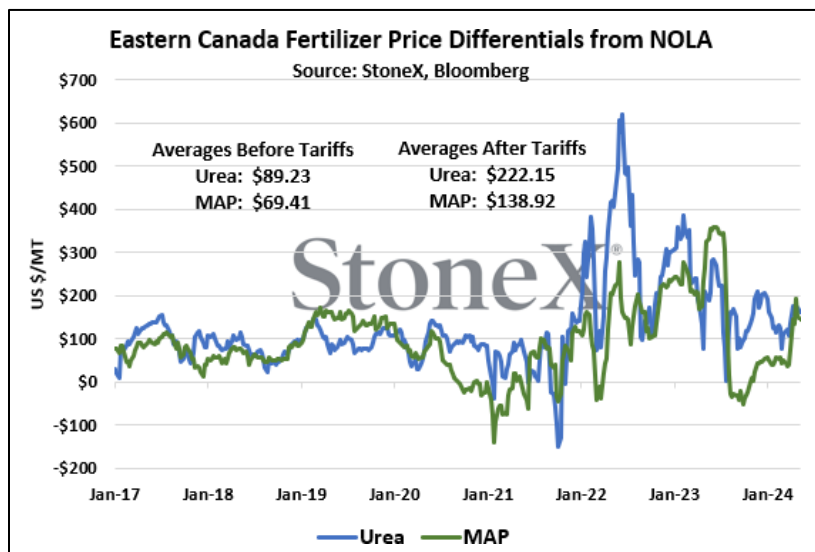
How does this impact Canada's fertilizer market?

Canada's 35% tariffs on Russian imports have effectively removed any supply coming from Russia, formerly Canada's #1 source for urea imports, #2 source for UAN imports, and #3 source for phosphate (DAP/MAP) imports. While the goal of Canada and its allies, who have taken similar measures to hamper Russia's ability to finance its war effort, is commendable, it has come at a cost to the Canadian farmer. To replace this lost supply, Canada has turned to relying more heavily on the U.S., as can be seen below.



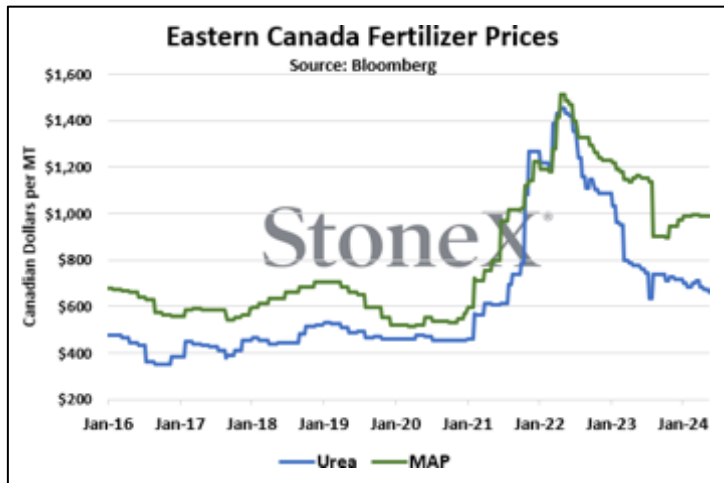
These tariffs, subsequently increasing reliance on the U.S., have led to higher retail fertilizer prices in Canada. As can be seen in the accompanying chart, since the introduction of these tariffs in early March 2022, the differential between fertilizer prices in Eastern Canada and New Orleans (the main U.S. fertilizer pricing benchmark) has risen sharply. In that span, the average urea differential has increased by a factor of nearly 2.5X, while the average MAP differential has effectively doubled.

The issues with relying on the U.S. are two-fold. First, the fallout of the Russian invasion of Ukraine has drastically increased export demand for U.S. nitrogen, forcing Canada to compete with other buyers. On the phosphate side, the U.S.'s countervailing duty case on Russia & Morocco, coupled with weak domestic production, has artificially inflated U.S. phosphate prices compared to the rest of the world, which is then passed on to Canada.

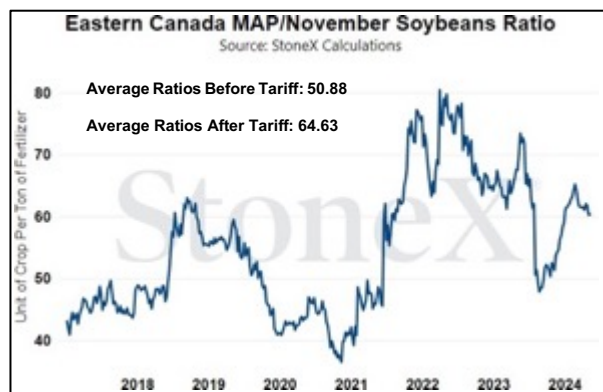
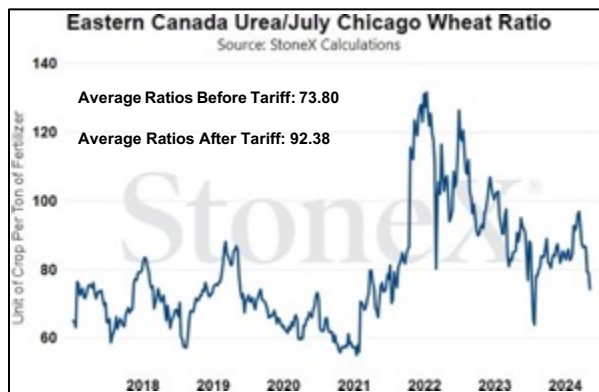
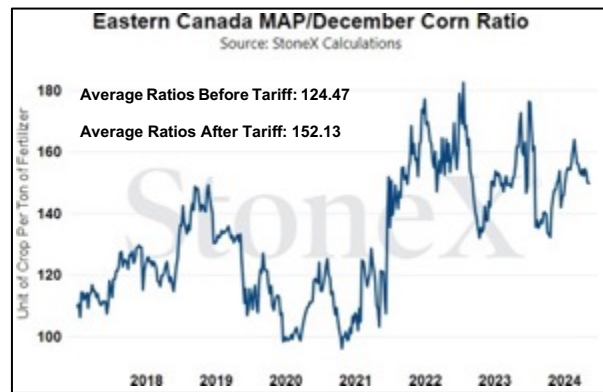
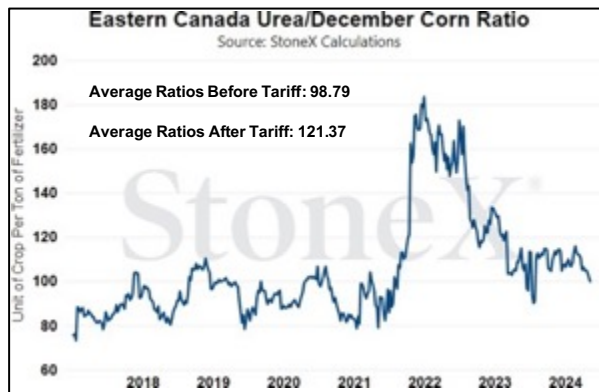


Eastern Canadian producer margins are being squeezed

As can be seen in the accompanying chart, although fertilizer prices have fallen from their record highs set back in 2022, Eastern Canada prices remain quite elevated relative to pre-war levels. A big reason why Eastern Canada, specifically Ontario and Quebec, has been heavily affected is the region's reliance on imports. With much of these imports formerly coming from Russia and now having to be replaced with more expensive supply from the U.S., as outlined above, the Eastern Canadian farmer is paying the price.

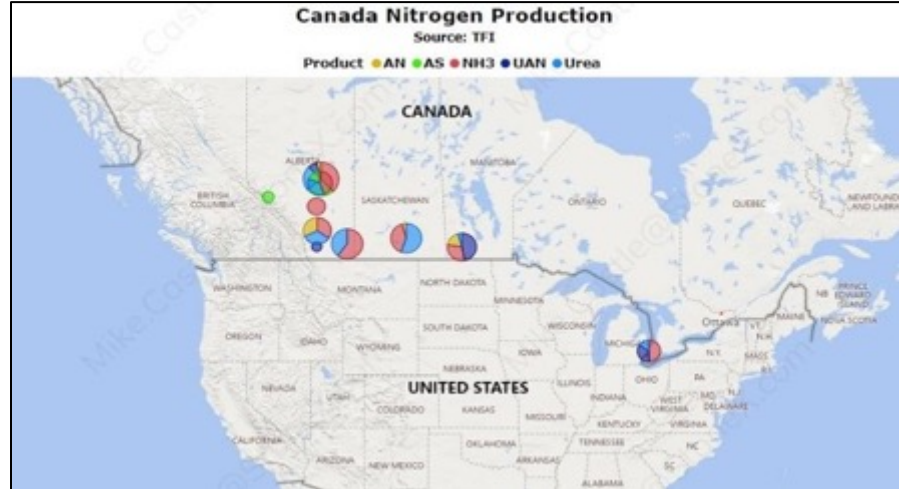


Exacerbating the issue at the farm level is the drop in grain prices seen during this time. Even with fertilizer prices falling, the affordability of fertilizer relative to the grain it's being used to produce has worsened in the last few years. An approximation used to illustrate this is a ratio of the two, simply dividing the cash price of fertilizer in Eastern Canada by the futures price of the most common grains produced in the region. In the examples below, the elevated ratios (i.e., worse affordability) since the introduction of the tariffs can be seen. With urea prices correcting, urea ratios have improved markedly, but the reliance on U.S. urea contributed to poor affordability over the last two years. On the phosphate side (MAP), the situation is still quite poor due in large part to the reliance on expensive U.S. phosphate imports.

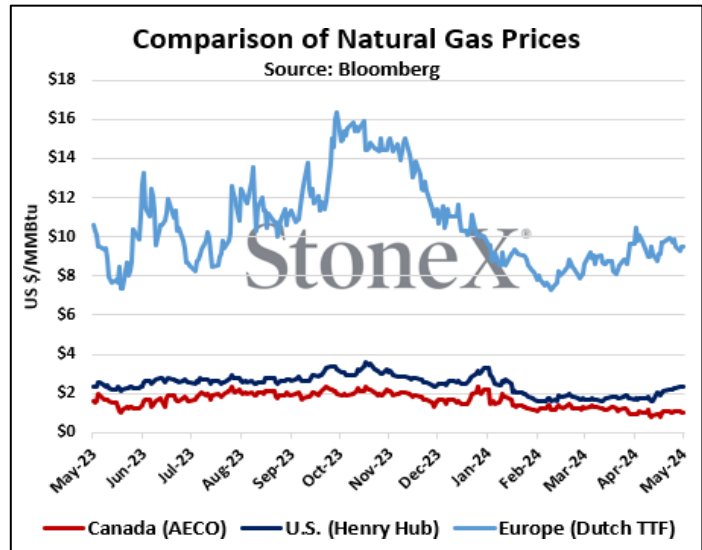


Potential for investment in domestic alternatives

One of the main reasons for this reliance on imported fertilizer in Eastern Canada is the lack of local production. Although Canada produces a solid amount of nitrogen, the vast majority of that production is in Western Canada, with the lone Eastern Canadian plant being CF Industries' Courtright, Ontario plant.



As the world's fifth-largest natural gas producer, Canada has a plentiful supply of the main feedstock for nitrogen production, meaning the opportunity to become less reliant on imports exists. Canada's natural gas is very low priced compared to much of the rest of the world because of the large supply, as can be seen in the accompanying chart. Canada's natural gas reserves are almost exclusively in the west, which is why existing fertilizer production is concentrated in Alberta. However, it is possible to transport this gas to the east, such as through the existing TransCanada pipeline, or to develop additional routes.



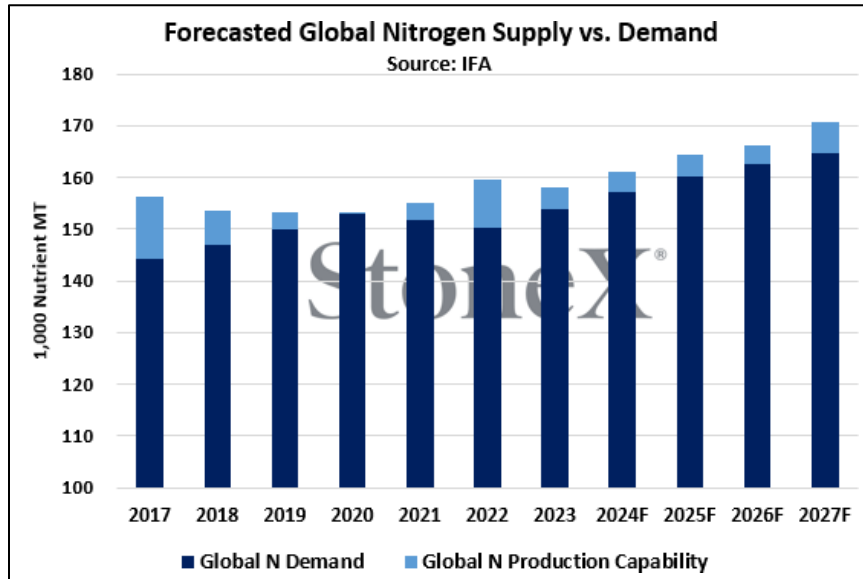
A prime example of Canadian self-reliance in the fertilizer sector is potash (potassium). Canada is the world's top producer and exporter of potash, utilizing its vast natural reserves to ensure plentiful domestic supply and affordable prices for Canadian farmers. Through domestic nitrogen production and supply chain investments, Canada can provide similar benefits to the farmers who help generate food, fuel, and fibre for the country. Additionally, despite Canada's relatively small phosphate rock reserves on a global scale, developing potential projects like the Lac à Paul Project, a site of phosphate rock reserves located in rural Quebec, could pay dividends by reducing the country's reliance on imports.

Overall, Canada is a country with great natural resources that present wide-ranging opportunities for development. The Russian invasion of Ukraine and its subsequent impact on the Canadian farmer highlights the importance of not relying too heavily on one origin for supply, especially when it comes to something as vital as the resources needed to feed the population.

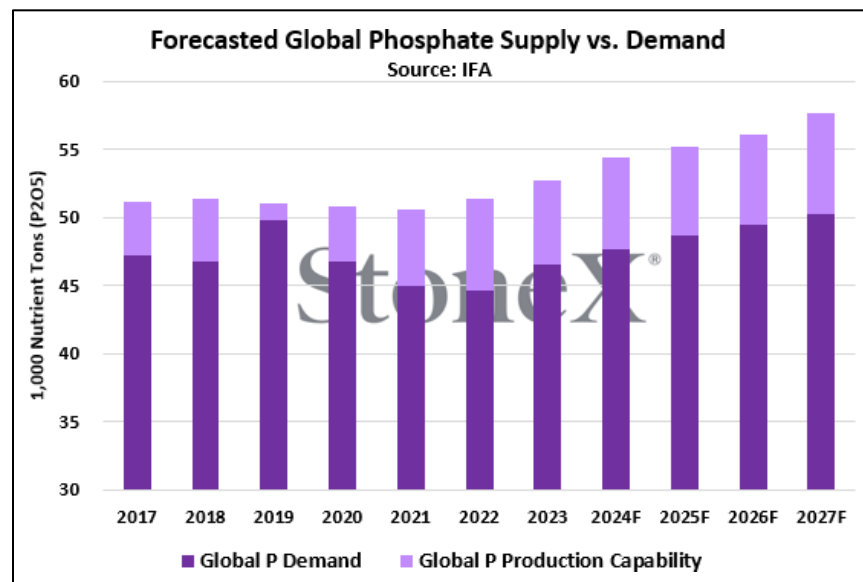
Global supply and demand forecasts

According to the most recent projections from the International Fertilizer Association (IFA), expectations are for global fertilizer demand to continue growing in the years ahead, as can be seen in the charts below.

The amount of excess nitrogen production capability relative to demand is expected to tighten into 2026 to its tightest level since the squeeze seen in 2020 & 2021, potentially putting strain on import-dependent countries before a range of new projects expected to be completed in 2027 eases the tightness. Additionally, a sizable amount of the planned new production capacity expected to come online by the end of 2027 is in Russia (20.1% of ammonia, 35.2% of urea). Investing in Canadian nitrogen production could help alleviate the potential tightness expected in the years ahead and would also avoid having to compete with buyers for more limited non-Russian-origin nitrogen.



The phosphate side paints a more favourable picture, with production capability expected to outpace demand growth. Additionally, not shown in IFA projections is the upcoming development of Norway's phosphate industry, which is set to boom in the decade ahead after the discovery of massive untapped reserves of high-quality phosphate rock. This represents a great opportunity for Canada to grow ties with an ally country while also diversifying its origins



of the country's phosphate supply and reducing reliance on the U.S. in the environment of artificially inflated prices.

Conclusion/final remarks

While global fertilizer markets have improved remarkably from their 2022 highs, there remain plenty of dangers that could unfold in the future. The Canadian government is in a unique place to be ahead of any such dangers and ensure that not only the Canadian people have sufficient food supplies, but also the world.

From our perspective, these steps should be taken:

Short term

- **Elimination of duties on Russian fertilizer imports** – While the initial implementation of duties on Russian fertilizers was widely supported by the world, Canada was one of the very few that proceeded to put them into place. For instance, the neighbouring U.S. opted not to put tariffs in place and have, in fact, ramped up their nitrogen imports from Russia. These duties have cut a major manufacturer/exporter from coming directly to Canadian farmers and have caused unnecessary inventory tightness, which in turn results in higher costs for farmers. By eliminating these duties, natural global trade flows would be able to be reestablished and put Canadian farmers back on a level playing field. In our view, this is the best option to alleviate high prices in the short term.
- **Build relationships with key global fertilizer-exporting countries** – In addition to the elimination of duties, Canada should diversify its fertilizer trade flows. Currently, Canada relies heavily on the U.S. for both urea and phosphate. Diversifying the market share will give Canada access to a much larger and more price-competitive global market. Middle Eastern and North African countries have a much lower cost of production compared to the U.S. and Europe. Some countries Canada could consider for urea are Qatar, Saudi Arabia, Oman, Egypt, and Algeria. For phosphate, Canada should focus on Morocco and Saudi Arabia.
- **Implement subsidies for fertilizer** – Canada can consider researching the feasibility of a subsidy program that provides support for farmers when there is volatility in the fertilizer market. The program can utilize an affordability index comprising of ratios showing how many bushels of certain crops are needed to purchase one ton of fertilizer, and the subsidies are activated when the index crosses a certain threshold. Having a subsidy program based on affordability provides a safety net to farmers when prices are high and give Canada time to implement longer-term initiatives that are beneficial to Canadian farmers.

Long term

- **Support new nitrogen facility builds** – A growing world needs sufficient food supplies, and today, that is only possible with nitrogen fertilizers to boost yields. By the Canadian government supporting new nitrogen production facility builds it helps to meet growing demand. By increasing domestic production it also reduces our reliance on nations/regions that have become much less reliant for stable supplies. Given Canada's substantial natural gas reserves, boosting production is a logical strategy.
- **Incentivize existing Canadian nitrogen producers to upgrade ammonia** – Investing in additional nitrogen production capacity would be a major step in helping Canada become less reliant on imports to avoid their current situation, but taking advantage of existing production is important as well. Currently, much of Canada's ammonia is simply exported to the U.S. instead of being

upgraded to urea/UAN/etc. Incentives could be proposed to encourage these producers to upgrade their production rather than send it out of the country.

- **Improve Canada's fertilizer supply chain** – In addition to expanding domestic production, the Canadian government should also take steps to address the country's fertilizer supply chain. The vast majority of Canada's current nitrogen production is located in western Canada, with large transportation costs to get supply to farmers in Ontario. Investing in additional east/west rail capacity would allow Canada to become more efficient and less reliant on imports for their fertilizer supply. Other steps include policies aimed at increasing the country's trucking capacity, expanding fertilizer storage at the port and inland levels, and looking at potential strategic reserves.
- **Invest and partner with phosphate-rich nations** – while it is possible that in the future, substantial phosphate reserves might be found within Canadian borders, today, that is not the case, and hope is certainly not a strategy. Until that day might come, partnering with nations that do have such reserves makes strategic sense. Partnering with nations such as Saudi Arabia and Norway could see the Canadian phosphate market develop direct relationships with more guaranteed supply.

There are plenty of other options that could be put into place to offset growing global supply concerns. However, the time to act is growing short. If the Canadian government hopes to be seen as a world leader in food supply, action must be taken soon.