April 2022

AEGON Asset Management

COMMODITIES AT WAR SERIES: FERTILIZER PRICES ARE A GROWING CONCERN FOR FARMERS

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Higher prices supported by a considerable percentage of global production coming from Russia and Ukraine have caught many commodities in the crosshairs of the Russian-Ukraine war. Concerns are growing over the ability to source these commodities from outside of Ukraine and Russia. In this series, we explore the implications of the war on specific sectors and the possible ripple effects that may potentially be felt throughout other industries.

Fertilizers

Fertilizer prices have risen rapidly following the Russian invasion of Ukraine. Russia is a material producer and exporter of fertilizer. The combination of sanctions, shipping firms avoiding the Black Sea region and Western banks, and traders shunning Russian supplies has created significant uncertainty for farmers regarding their ability to secure adequate fertilizer supply. In most cases, the largest fertilizer-consuming countries (Brazil, India, the US and China) lack self-sufficiency and therefore rely on substantial fertilizer imports. In this first article in the series, we explore the war's implications on the fertilizer markets and highlight our expected impacts.

Understanding the fertilizer industry

The global fertilizer industry produces three main plant nutrients:

1. **Nitrogen** is produced from natural gas and may be applied to the soil in gaseous form (ammonia) or more commonly solid (urea, ammonium nitrate) or liquid form. The use of nitrogen is critical and must be applied every growing season for most crops (soybeans can fix some nitrogen from the atmosphere). China, the US, India and Russia are the largest producers of nitrogen fertilizer.
2. **Phosphate** production requires mined phosphate rock, sulfur and ammonia. Farmers can choose to reduce some phosphate application; however, it is the second most-consumed plant nutrient. It is important as it encourages proper root growth. Phosphate rock is concentrated in China, Morocco, the US and Russia which together account for the majority of production.
3. **Potash** is a derivative of potassium which is an element that occurs naturally in seawater or in a number of minerals. Potash is mostly mined from ore deposits deep within the earth. Farmers can skip potash applications for one or two planting seasons depending on the soil composition; however, yields fall significantly after that. It can take several years to replenish the soil with appropriate potash content. Potash production is primarily controlled by Russia, Belarus, Canada and China due to the availability of potash ore in these regions.

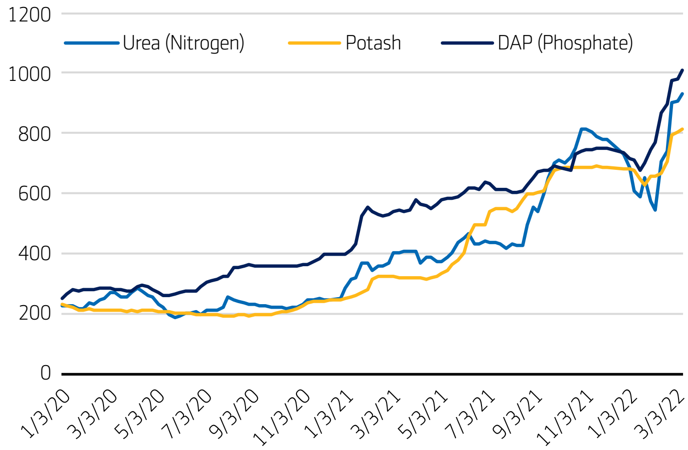
Supply across all three primary fertilizers was challenged prior to Russia's invasion of Ukraine. Chinese export bans on nitrogen and phosphate had already tightened those markets. Potash supply was impacted by Belarus's only potash miner, Belaruskali, declaring force majeure in mid-February. Potash supply has been most affected following the invasion as Russia and closely-aligned Belarus together account for approximately 40% of global potash production. Phosphate production is less concentrated in Russia, however, the country still accounts for a meaningful 11% of global production.

With respect to nitrogen fertilizer, Russia accounts for around 14% of global urea production, adding to the Chinese tons that have been taken out of the export market. Additionally, the Russia-Ukraine war has led to spiking natural gas prices in Europe, which relies on Russian exports of natural gas. Nitrogen and phosphate prices have accelerated in sympathy because natural gas is a key input into production. The US natural gas supply and pricing are much more insulated and also less influenced by Russian production, therefore, fertilizer production in the US has a distinct advantage over European producers who must absorb the higher costs.

With these price increases, fertilizers have become less affordable for farmers (exhibit 1). When viewed in terms of the bushels of corn required to purchase a metric ton of fertilizer, the price to corn ratio is up 23%, 54% and 57% for phosphate, urea and potash, respectively. With fertilizer availability a concern and farmers potentially applying less fertilizer to their crops given the higher costs, global crop production is at risk of being affected, introducing risks around food shortages and further crop commodity inflation.

Overall, the current environment is resulting in a cash windfall situation for fertilizer producers, generally speaking, and more specifically for feedstock-advantaged producers of nitrogen, i.e., the United States and Middle East. It is also a negative for users/consumers of fertilizers and the supply of crop commodities. We believe these dynamics in the fertilizer industry could persist over the next year or two; the actual timeframe depending on the duration and outcome of the war as well as ongoing sanctions.

Exhibit 1: US Gulf NOLA Fertilizer Spot Prices (USD/short ton)



Source: Bloomberg. As of March 25, 2022.

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Adtrax: 4615573.1GBL
Exp. date: March 31, 2024