



BRIEFING

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International Agricultural Fertilizer Trade

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Introduction

Agricultural fertilizers are global commodities that are produced in many countries and used by agricultural producers throughout the world. Fertilizer producers manufacture a broad range of products, but each usually contains some combination of the most widely applied plant nutrients -- Nitrogen (N), Phosphorus (P), and Potassium (K) -- as well as other micronutrients.

For the most part, fertilizers are produced in countries that have the natural resource inputs required for manufacturing them. That is, countries with relatively large natural gas supplies (for ammonia and nitrogen production) and mineral ore deposits (for phosphate and potash production) produce the largest amounts of fertilizers. The United States, for example, has large deposits of natural gas and phosphate ore deposits. As a result, it ranks third in nitrogen production, fourth in ammonia production, and second in phosphate production (International Fertilizer Industry Association). The United States, however, has relatively limited supplies of potash ore deposits. Consequently, it ranks eighth in potash production.

Because of the size of the U.S. agricultural sector, the United States is one of the world's major fertilizer importers (even though it is also a major producer). This briefing paper

describes recent global patterns in nitrogen, phosphate, and potash trade.

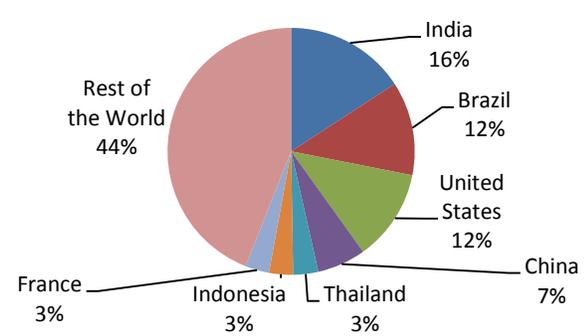
Global Fertilizer Trade

Fertilizer is a heavily traded commodity. For example, on a world-wide basis, 37 percent of all fertilizer production is traded (The Fertilizer Institute). That share is higher than for many major crops such as rice (6 percent), corn (11 percent), cotton (28 percent), wheat (21 percent), and soybeans (36 percent). Because of specific mineral resource requirements, phosphate and potash are more heavily traded than nitrogen.

World and U.S. Fertilizer Imports

Globally, 78 million tons of fertilizer nutrients were imported by 110 countries in 2011. The United States is one of the top three fertilizer importers along with India, Brazil, and China (Figure 1). The United States imports over 50 percent of its nitrogen fertilizer needs and 85 percent of its potash needs.

Figure 1: Fertilizer Importers, 2011



Source: IFIA

Objective

Analysis For

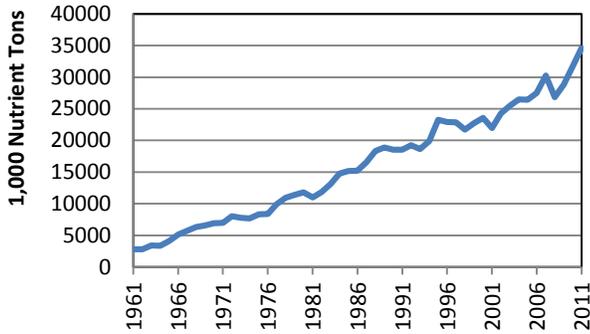
Informed

Decision Making

U.S. Nitrogen Imports

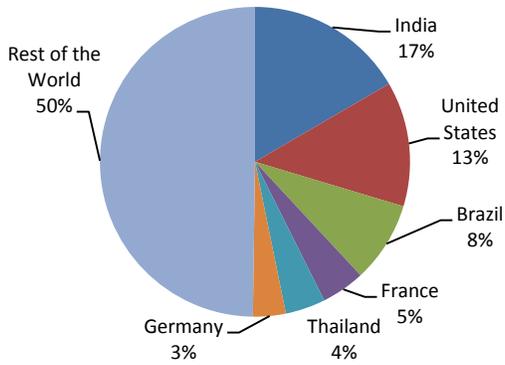
Between 1960 and 2011, world trade in nitrogen (reflected by import data) has steadily increased (Figure 2). The United States increased nitrogen imports substantially over this period. In 2011, U.S. nitrogen imports accounted for 13 percent of world trade with approximately 61 percent of the nitrogen fertilizer imports being in the form of anhydrous ammonia and 26 percent in the form of urea (Figure 3).

Figure 2: World Nitrogen Imports, 1961-2011



Source: IFIA

Figure 3: Nitrogen Fertilizer Importers, 2011



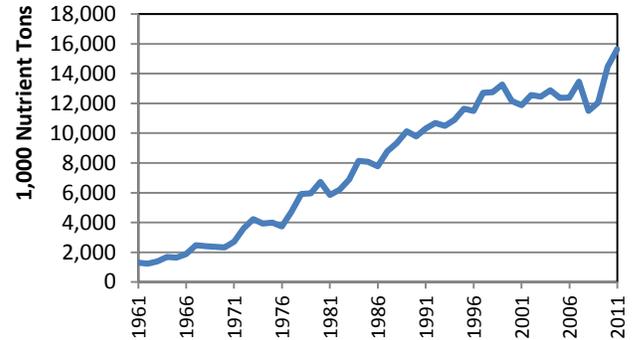
Source: IFIA

Seventy percent of total U.S. nitrogen imports come from two countries: Trinidad and Canada. Both countries are geographically close to U.S. markets, have large amounts of natural gas reserves, and produce more fertilizer than their domestic markets require. The other 30 percent is sourced from Russia, Egypt, and Venezuela.

U.S. Phosphate Imports

Global trade in phosphate fertilizers has also increased substantially over the past fifty years (Figure 4).

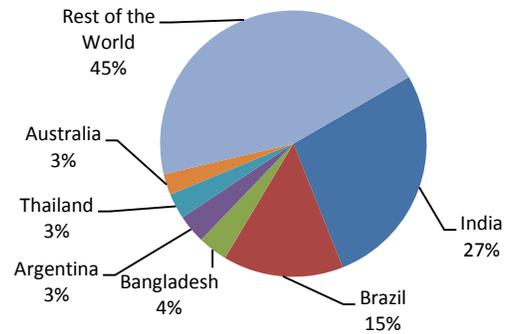
Figure 4: World Phosphate Imports, 1961-2011



Source: IFIA

India and Brazil are the largest importers of phosphate-based fertilizers (Figure 5). The United States has large phosphate ore deposits and produces far more phosphate fertilizer than is needed domestically. Hence, the United States is a net exporter of phosphate fertilizers.

Figure 5: Phosphate Fertilizer Importers, 2011

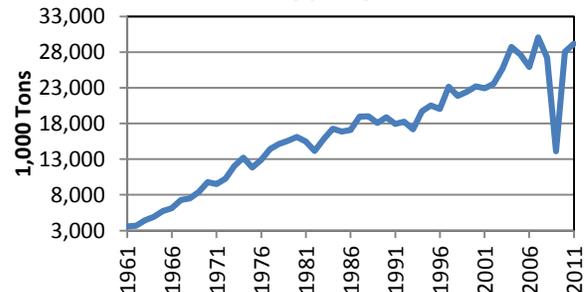


Source: IFIA

U.S. Potash Imports

World trade in potash has increased substantially since 1961 with a brief decline in 2009 (Figure 6).¹

Figure 6: World Potash Imports, 1961-2011

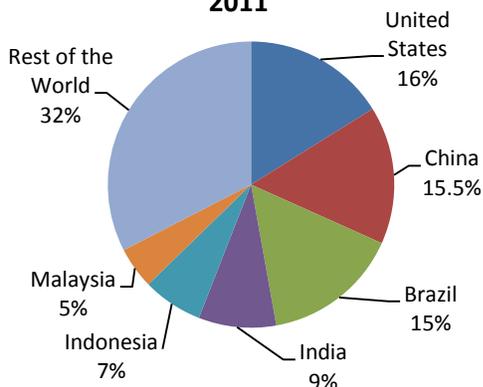


Source: IFIA

¹ The 2009 decline in imports was a response to reductions in potash production, high potash prices, and a decision by India (the largest importer of potash in the world in 2009) to reduce potash usage in response to high prices.

The United States was the world's largest importer of potash in 2011, followed by China and Brazil (figure 7). Approximately 90 percent of U.S. potash use is imported generally as potassium chloride. Canada is the primary supplier to the United States because of its large potash deposits in Saskatchewan and New Brunswick. Almost 90 percent of total U.S. potash imports come from Canada.

Figure 7: Potash Fertilizer Importers, 2011



Source: IFIA

U.S. Fertilizer Trade and Market Issues

Since 2000, the United States has increasingly relied on imported fertilizer. This increased reliance has raised concerns about both short- and long-term supply chain logistics and increased supply risks (Lamp 2013). For example, fertilizer imports are generally shipped from the Gulf of Mexico on Mississippi river barges to distribution facilities upstream. Both high- and low-water flows on the Mississippi and Missouri rivers can cause fertilizer shipments to be off-loaded at unplanned locations and then transported by truck or rail to their end-use destinations. These unanticipated changes in deliveries increase supply chain costs, generate delays, and stress transportation infrastructures.

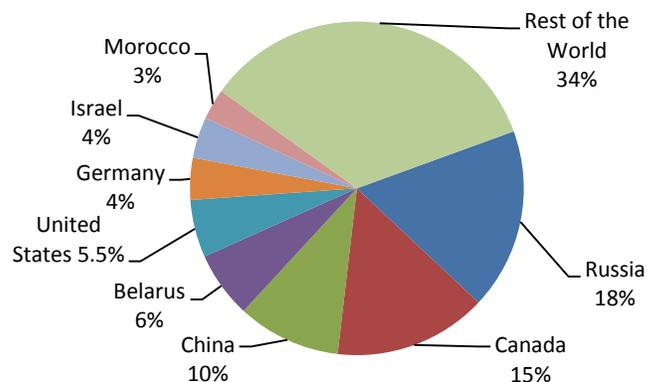
The lengthy and somewhat unpredictable delivery systems associated with fertilizer imports from countries such as Russia can also reduce the efficiency and effectiveness of the domestic fertilizer distribution system. Further, most distributors place fertilizer orders between 40 and 65 days in advance of delivery, which requires them to make potentially inaccurate predictions about local demand conditions well before they sell products to agricultural producers.

Global Fertilizer Exports

Total world trade in fertilizers amounted to 78 million material tons in 2011. Russia, Canada, and China were the

largest fertilizer exporters in that year (Figure 8). The United States was the fifth largest fertilizer exporter (4.4 million tons). Most U.S. exports consisted of phosphate fertilizer products.

Figure 8: Fertilizer Exporters, 2011

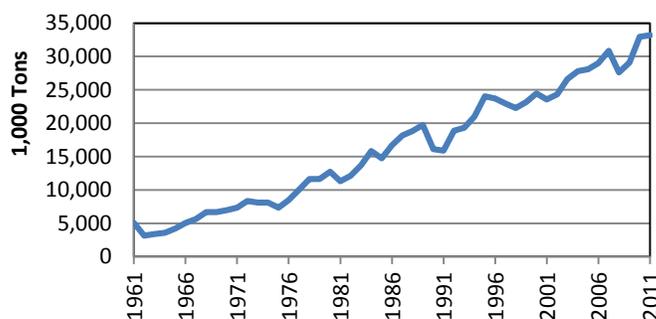


Source: IFIA

World and U.S. Nitrogen Exports

World nitrogen exports have been steadily increasing since the early 1960s in response to increased fertilizer use (Figure 9).

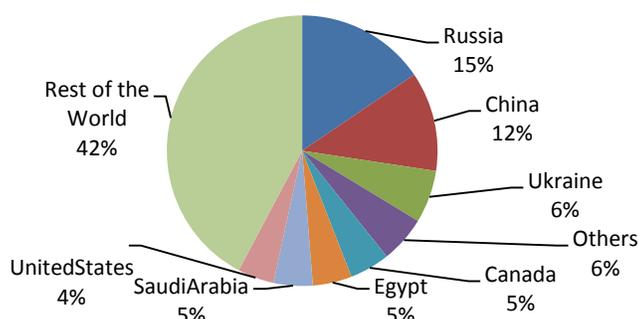
Figure 9: World Nitrogen Exports, 1961-2011



Source: IFIA

In 2011, Russia and China were the largest exporters of nitrogen fertilizers (Figure 10). The United States accounted for only about four percent of world nitrogen exports.

Figure 10: Nitrogen Fertilizer Exporters, 2011

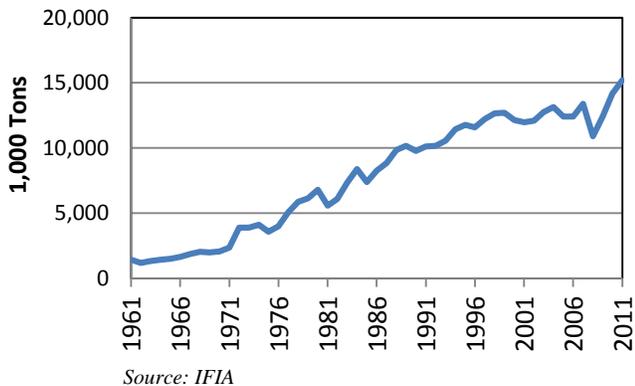


Source: IFA

World and U.S. Phosphate Exports

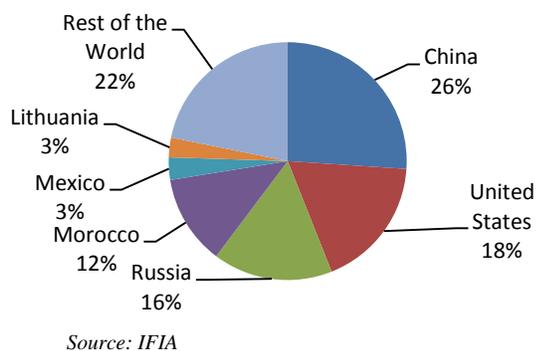
World phosphate exports have also increased substantially since the early 1960s (Figure 11).

Figure 11: World Phosphate Exports, 1961-2011



The four major phosphate exporters are China, the United States, Russia, and Morocco (Figure 12). The United States accounted for 18 percent of total world exports in 2011. U.S. phosphate destination markets include India (35 percent of U.S. exports), Canada (11 percent of U.S. exports), Brazil (11 percent of U.S. exports), Australia (6 percent of U.S. exports), and Argentina (5 percent of U.S. exports).

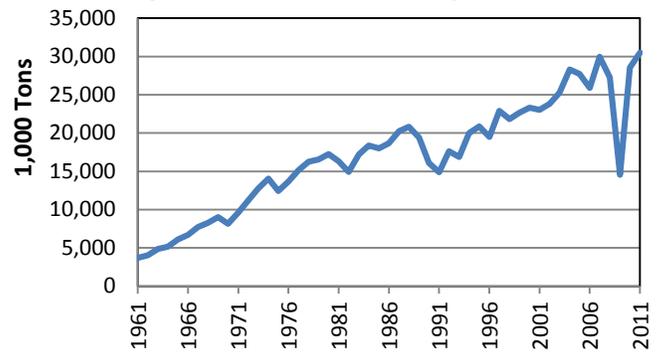
Figure 12: Phosphate Fertilizer Exporters, 2011



World and U.S. Potash Exports

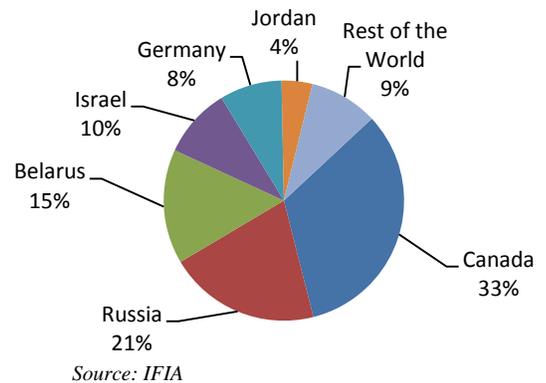
World potash exports have also increased substantially over the past 50 years, albeit with temporary declines in 1990, 1991, and 2009 (Figure 13).²

Figure 13: World Potash Exports, 1961-2011



Canada, Russia, Belarus, Israel, and Germany were the five major potash exporters in 2011 (Figure 14). Because the United States produces only small amounts of potash, it exports very small quantities (234,900 tons in 2011) primarily to Mexico and Brazil.

Figure 14: Potash Fertilizer Exporters, 2011



Summary

Fertilizer products are global commodities that are produced in many countries and used throughout the world. Countries with access to either low cost natural gas (for nitrogen and ammonia production) or large mineral ore deposits (for phosphate and potash production) are typically major fertilizer producers. Although the United States has a large nitrogen fertilizer industry, it is also a major nitrogen fertilizer importer because domestic needs exceed production capacities. U.S. nitrogen fertilizer imports are primarily sourced from Trinidad and Canada. If nitrogen fertilizer plants currently being planned are eventually built, the United States is likely to reduce its reliance on nitrogen imports and could possibly become a net nitrogen exporter. The United States is also a major producer and exporter of phosphate because of relatively large phosphate ore deposits. The United States, however, produces very little potash because of limited access to useable potash deposits.

² The 2009 decline in potash exports was driven primarily by decreases in production by both Canadian and Russian producers.

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