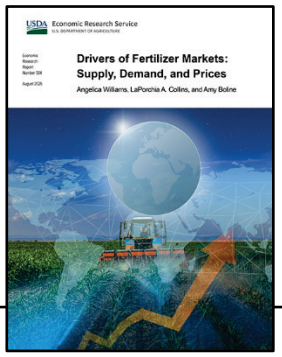
A report summary from the Economic Research Service



Drivers of Fertilizer Markets: Supply, Demand, and Prices

Angelica Williams, LaPorchia A. Collins, and Amy Boline

Key Points

- Global production and trade volumes in fertilizer increased by 27.4 and 18.8 percent, respectively, between 2006 and 2022. Meanwhile, the U.S. share of global production, imports, and exports each declined by 25 percent or more over the same period.
- In 2022, the United States produced 36.6 million metric tons of nutrient fertilizer, 8.4 percent of the world total by volume. Between 2006 and 2022, U.S. fertilizer production declined by 5.1 percent, driven by a 10.3 million metric ton reduction in phosphate production.
- Because fertilizer is a major cost in the U.S. production of corn and wheat, increases in fertilizer prices affect farmers' crop management decisions.
- U.S. fertilizer consumption dropped meaningfully in 2021, in part due to a rapid increase in fertilizer prices, with nitrogen, phosphate, and potash consumption declining 5.8, 12.6, and 16.2 percent between 2020 and 2021, respectively.
- In 2006–22, the composition of U.S. fertilizer production and exports shifted. In 2006, phosphate made up 64 percent of U.S. fertilizer production and 77 percent of exports, but by 2022, nitrogen made up the largest share of production at 61 percent and exports at 54 percent.
- The United States relies on imports to meet demand for potash. In 2022, U.S. potash production was less than 5 percent of that needed for domestic use.

Why Does This Matter?

Most countries rely on imports to meet domestic fertilizer demand. Between 2020 and 2021, fertilizer prices increased substantially when conflicts involving major fertilizer-producing countries (Belarus, Russia, and Ukraine) exacerbated already high fertilizer prices. Global fertilizer prices dropped between 2022 and 2023, but ongoing military conflicts introduced additional volatility in fertilizer prices. This study analyzes trends in U.S. fertilizer supply, demand, and prices and identifies factors that have contributed to changes since 2006. In 2023, U.S. fertilizer costs per acre varied by region. For corn, fertilizer costs per acre were highest in the Southern Seaboard ($238.57 per acre) and lowest in the Prairie Gateway ($127.88 per acre). For wheat, fertilizer costs per acre were highest in the Heartland ($107.42 per acre) and lowest in the Fruitful Rim ($57.98 per acre). Relative to historical averages in 2010–19, fertilizer costs per acre for corn and wheat in 2022 were 110 percent and 141 percent higher, respectively. Fertilizer's share of total operating costs also increased in 2022, with fertilizer costs making up more than 40 percent of operating costs for corn and wheat production each.