



July 15, 2022

Ms. Melissa R. Bailey
Associate Administrator, Agricultural Marketing Service
U.S. Department of Agriculture
1400 Independence Avenue, SW
Washington, DC 20250

Via Regulations.gov Re: Comments on the "Access to Fertilizer: Competition and Supply Chain Concerns" request for public comments (Doc. No. AMS-AMS-22-0027)

Dear Ms. Bailey:

The Fertilizer Institute ("TFI") writes in response to the U.S. Department of Agriculture's ("USDA") request for comments and information ("RFI") regarding "Access to Fertilizer: Competition and Supply Chain Concerns" [Doc. No. AMS-AMS-22-0027]. The RFI was published in the *Federal Register* on March 17, 2022 (87 Fed. Reg. 15191; FR Doc. 2022-05670).

Statement of Interest and Background

TFI represents companies that are engaged in all aspects of the fertilizer supply chain in the United States. Fertilizer is any combination of specific nutrients designed to provide the nourishment essential for growth and maintenance of crops. Three primary macronutrients -- nitrogen ("N"), phosphorus ("P"), and potassium ("K") -- are the major building blocks of most fertilizers and comprise the bulk of all fertilizer produced.

Our industry is essential to ensuring that farmers receive the nutrients they need to enrich the soil and, in turn, grow the crops that feed our nation and the world. Fertilizer is a key ingredient in feeding a growing global population, which is expected to surpass 9.5 billion people by 2050. Half of all food grown around the world today is made possible through the use of fertilizer, hence its importance to farmers and food production.¹

The fertilizer industry in the United States is comprised of producers, importers, wholesalers, and retailers who serve America's farmers. The fertilizer sector supports 487,000 American jobs with annual wages in excess of \$34 billion.

TFI Comments

TFI appreciates USDA's interest in identifying challenges related to fertilizer markets and supply chains, as well as the Department's ongoing interest in policy suggestions that can help.

¹ Stewart, W.M., Dibb, D.W., Johnston, A.E. and Smyth, T.J. (2005), The Contribution of Commercial Fertilizer Nutrients to Food Production. *Agron. J.*, 97: 1-6. <https://doi.org/10.2134/agronj2005.0001>

Over the past two years, multiple events, conditions, and policy decisions, many of them international in nature, have combined to constrain global fertilizer supply and increase production costs at a time when global demand for fertilizers has continued to increase. These factors are reshaping international business and trade flows and directly impacting the U.S. fertilizer industry. The domestic fertilizer industry is working hard to produce and deliver product across the United States.

Fertilizer is a bulk commodity product and as such trades based on both global and local supply and demand balances. While production occurs year-round, periods of consumption are highly seasonal and subject to weather risk and demand destruction. Any period that leads to supply and demand getting out of balance can result in volatility; volatility can translate to either higher or lower prices.

Fertilizer is resource dependent, relying on energy (predominately natural gas) and mineral reserves, so only certain nations can produce it. Yet every nation needs fertilizer for its food production. This means only approximately 65 nations produce key N, P, K fertilizers,² and nearly half (44%) of global production is exported.³

As one of only three nations with 20 or more unique companies that produce fertilizer, the United States is among the most competitive fertilizer markets in the world. The United States has robust domestic production and is the third largest ammonia producer (9% of global production) and third largest global processed phosphate producer in the world (11% of global production).

Given the substantial \$205 billion and growing crop, fruit, nut, and vegetable industry, demand for fertilizer products is rising. U.S. farmers may rely on domestic production as well as imports for many fertilizer products. For some products such as urea, the United States is a major importer because domestic production, albeit significant, is less than U.S. consumption. Over the last three years, the U.S. imported approximately 33% of our nitrogen supply, 27% percent of our phosphate supply, and most of our potash supply due to limited U.S. potash deposits.⁴ Some specialty fertilizers are not produced in the U.S. and are imported. Conversely, some specialty fertilizers are produced in the U.S. and are primarily exported to international markets. Maintaining access to these nutrient products through imports is critical to the competitiveness and profitability of U.S. farmers.

While the United States was the leading global nitrogen fertilizer producer in the 1980s, contractions in the industry due to high natural gas prices and the growth of industries overseas, resulted in the expansion of imports into the U.S. in the early 2000s.⁵ Over the past decade, the United States has started to significantly reduce its reliance on imports of nitrogen due to industry investment in new and upgraded infrastructure, in significant part due to abundant and affordable supplies of natural gas, as well as billions of dollars of investment to improve efficiencies and ensure safe and reliable production.

International supply and demand conditions, as well as international competition and input and transportation costs strongly influence prices globally and in the United States. The U.S. has the

² International Fertilizer Association (IFA), Supply Production & Trade Database – Production (2020), accessed at <https://www.ifastat.org/databases/supply-trade>. Countries included that produce more than 100 tons of N, P, or K.

³International Fertilizer Association (IFA), Supply Production & Trade Database – Production (2020), accessed at <https://www.ifastat.org/databases/supply-trade>.

⁴ More than 80% of U.S. potash supply comes from Canada.

⁵ Factors Contributing to the Recent Increase in U.S. Fertilizer Prices, 2002-08 (usda.gov).

advantage of significant domestic production of nitrogen and phosphate fertilizers to rely on even during this period of elevated price volatility and supply challenges. Moreover, our geographic proximity and close relationship with Canada is also an advantage, as Canada has the largest potash deposits in the world in addition to significant production of nitrogen fertilizers. As a result, even during this period of elevated fertilizer prices, prices paid by American farmers are oftentimes the most competitive in the world (with some variation for specialty products).

While it is important to have the natural resources to produce fertilizer, manufacturing the material into usable nutrients for farmers is a capital-intensive process. Typical fertilizer production facilities cost \$1 billion to \$4 billion to build, and more to operate. Substantial capital investment is needed, and investors must carefully consider the short and long-term business dynamics. Acquiring capital and designing and permitting a facility can take a decade.

The key issues impacting fertilizer markets since 2021 are (1) increasing global demand for fertilizer products, (2) global supply disruptions, (3) production costs, and (4) logistical supply chain challenges.

TFI offers the following additional comments in response to USDA's specific questions.

1. *Please describe challenges and concerns with market concentration and power in the fertilizer industries, including the extent of control by any firms over farmers' and business' access to fertilizer, pricing, availability, transportation and delivery, quality, and any other contract terms or other factors. Please describe how these challenges have developed or evolved over time, and any details on geographic or other divergences within various regions of the United States or between the United States and international markets for fertilizer.*

- Fertilizer products are internationally traded commodities manufactured and distributed by hundreds of fertilizer companies around the world and sold in a competitive international marketplace.
- Sixty-five countries produce fertilizer, and the U.S. is one of only three that have 20 or more unique domestic producers of fertilizer. Numerous other U.S. firms help meet demand by sourcing production from abroad.
- While the U.S. fertilizer industry is one of the most competitive and dynamic in the world, it represents a relatively small portion of global production. The industry and farmers are, therefore, impacted by global supply and demand factors, as well as energy price shocks, foreign trade practices, and geopolitical events, each of which can significantly influence the domestic fertilizer business. Substantial changes in market conditions and trade flows in other countries can affect prices in the United States.
- Related to nitrogen production, we have seen four additional companies and 13 additional plants open in the U.S. since industry lows in 2008 and 2010,⁶ at a time of

⁶ Calendar year 2008 was a low for ammonia production facilities and calendar year 2010 was a low for *companies* producing ammonia.

record high natural gas prices. Today, the U.S. is producing nearly as much nitrogen as we did in 1999, prior to the rise in natural gas prices. Abundant and affordable supplies of natural gas from the shale gas revolution helped drive billions of dollars of investment to expand domestic fertilizer production.

- In assessing any domestic industry, availability of substitutes (in this case other fertilizer products), availability from other sources (imports), barriers to entry, and technological economies of size are important when assessing market concentration.⁷
 - In addition to TFI's comments, a recent study from Iowa State University⁸ highlights how these supply and demand factors -- as referenced throughout TFI's comments -- have affected the market over the last two years. This study may also be helpful to USDA as it reviews "Access to Fertilizer."
2. *Please comment on both long and short-term trends in fertilizer prices. What role have fertilizer, crop prices, or availability of key raw materials and manufacturing played in any changes? Has price volatility increased and if so, what accounts for this increase in volatility? Please comment on any trends and the relationship of fertilizer prices to prices of relevant crops, such as corn and soybeans.*

Commodity Markets/Prices

- Fertilizer is a critical input for crop yields and must be applied seasonally. Supply and demand in commodity crop markets have a significant impact on fertilizer markets and prices. As a crop input, demand for fertilizer closely tracks crop commodity demand. Corn, for example, accounts for nearly 50% of U.S. nutrient use. As farmers seek to increase production to capture additional revenue from high or increasing crop prices, additional acreage is brought into production, and this further raises the demand for fertilizer. Increasing or high global grain prices, which generally track together with domestic prices as a commodity, also increase demand for fertilizer from farmers around the world. Crop commodity markets were strong in 2021 and look to remain strong this season.
- While fertilizer prices typically track closely with grain markets, there are times when crop and/or fertilizer markets are strongly influenced by other factors, particularly those that impact demand or supply, such as drought (crops) or major weather events (crops and fertilizer) or energy price spikes (fertilizer). For example, crop prices increased between 2002-2005 and 2012-2013, and fertilizer prices remained low in those years. The reverse happened in 2008-2009 and 2015-2016.

Raw Materials

⁷Monopoly Pricing Power and Fertilizer Prices. *April 13, 2022.* <https://farmdocdaily.illinois.edu/2022/04/monopoly-pricing-power-and-fertilizer-prices.html>

⁸Crespi, J.M., C.E. Hart, C.C. Pudenz, L.L. Schulz, O. Wongpiyabovorn, and W. Zhang. 2022. "An Examination of Recent Fertilizer Price Changes." Staff report 22-SR 117. Center for Agricultural and Rural Development, Iowa State University.

- Natural gas is the key feedstock and energy source for ammonia which is the building block of all nitrogen fertilizers. Ammonia is also needed as part of the production process for phosphate fertilizers. Natural gas, depending on price, accounts for between 70% to 90% of the total ammonia production costs, with 40% of gas used as fuel and 60% as the feedstock. Natural gas prices doubled in the United States in 2021 and went up even more in Europe, for example, resulting in significant production curtailments that reduced global supply as demand continued to increase.
- Under fair competitive conditions, world prices must be high enough for the marginal producers to break even or else they will cease production. Generally, those who have the highest input costs are the marginal producers in a global market. For example, China was considered the highest cost “marginal” producer in urea for years as production costs from coal is generally higher than production costs for natural gas. In the last eight months, Europe has become the marginal producer for nitrogen due to high natural gas costs. Due to particularly high European natural gas price spikes that started in 2021, producers in the region have curtailed production, reducing global supply and increasing import demand into Europe.
- Any analysis of today’s market must examine both national and international factors. A recent Texas A&M white paper⁹ selectively looked at one specific period of time related to natural gas input costs and fertilizer production. The study completely ignored the international nature of the fertilizer market, and the fact that natural gas cost increases in Europe resulted in the reduction of production, impacting supply and therefore prices. Excluding other key international and domestic supply-related disruptions -- which have had as much if not more of an impact on the current situation -- misconstrues the complex elements of fertilizer supply-demand that must be considered to understand the current market. As articulated in the Iowa State University study, fertilizer markets and prices are closely tied to the price of natural gas.¹⁰
- Beyond natural gas, the price of sulfur, which is a critical input for ammoniated phosphates has gone up 198%, between March 2021 and March 2022, along with labor, machinery, electricity, and fuel.

Other Cost Increases

- As explained further in this document, other costs, including fertilizer distribution, have been increasing over time.

3. *Please share your views on whether the existing fertilizer market is sufficiently competitive. If you believe it is not, how do competition problems manifest themselves? For example, is there evidence of collusion, market manipulation, or other anticompetitive practices among competitors, buyers of farm products, commodity traders or related financial firms to fix or alter*

⁹ Agricultural & Food Policy Center, Texas A&M University. “Economic Impact of Higher Fertilizer Prices on AFPC’s Representative Crop Farms.” January 2022. <https://afpc.tamu.edu/research/publications/files/711/BP-22-01-Fertilizer.pdf>.

¹⁰Crespi, J.M., C.E. Hart, C.C. Pudenz, L.L. Schulz, O. Wongpiyabovorn, and W. Zhang. 2022. "An Examination of Recent Fertilizer Price Changes." Staff report 22-SR 117. Center for Agricultural and Rural Development, Iowa State University.

prices, allocate markets, or restrict from where a farmer buys inputs and sells product? Is there evidence of private or public communications by fertilizer companies relating to price, output or supply that appear to go beyond those necessary to communicate important information to customers?

- As previously stated, a total of 65 countries and hundreds of companies produce and distribute fertilizer, and the United States is one of only three that have 20 or more unique producers of fertilizer. While the U.S. fertilizer industry is one of the most competitive in the world, this does not shield the industry or farmers from inflationary pressures and geopolitical or global events, which can significantly impact international markets. Fertilizer prices are interconnected globally, such that significant changes in market conditions and trade flows in other countries can affect prices in the United States.
 - U.S. farmers rely on domestic production as well as imports for many fertilizer products. For some products, such as urea, the United States is a major importer given that domestic production, albeit significant, is less than U.S. consumption. Over the last three years, the U.S. imported approximately 33% of our nitrogen supply, 27% percent of our phosphate supply, and most of our potash supply due to limited U.S. potash deposits.
 - International competition -- as reflected in import volumes and prices -- strongly influences prices for fertilizers around the world. U.S. farmers have the advantage of being able to rely on significant domestic production of nitrogen and phosphate fertilizers during this period of elevated fertilizer price volatility and supply challenges.
4. *What effect have these mergers had on a merged firm's market power and the ability to squeeze farmers or squeeze out competitors? Are there indications that firms have made it harder for new fertilizer firms to start up and grow? Is there evidence that firms have controlled or reduced supply to keep supply low and prices high? Have certain mergers allowed the acquisition of technologies or businesses that produce, transport, or retail fertilizer that competitors rely on, with the effect of lessening competition? Is there evidence of merged firms using their market power to price below cost or run losses in certain segments to undercut competitors or potential new market entrants?*
- Mergers and acquisitions happen in every industry and often undergo thorough analysis and, if consummated, approval by governmental authorities. Past mergers or acquisitions in the fertilizer sector have not resulted in any noncompetitive conditions. As previously stated, domestic producers compete amongst themselves and amongst a highly competitive global fertilizer business. Nearly half of all the fertilizer that is produced around the world is exported to world markets.¹¹
 - Mergers have helped balance the supply and demand from a macro perspective. For example, one company without sufficient storage assets facing constant threats of production curtailments merged with another entity that had surplus storage. The net effect of that union was more stability for the merged entity and their customers. It is

¹¹ 44% of all fertilizer is exported to world markets.

logical that each independent company evaluated adding storage and production assets pre-merger to balance their own systems, but economics proved more supportive to merge.

- TFI regularly briefs The White House, U.S. Congress, USDA and other federal and state regulatory entities, and welcomes the opportunity to continue educating policymakers, and end-users on the key factors impacting fertilizer markets.
5. *What role do contractual or sales practices in fertilizer play with regard to producer access or prices paid to fertilizer? Have contractual or sales practices changed recently, or over time? Has the duration of these contracts changed over time and if so, how? Do some contracts require farmers to buy or use fertilizer from one supplier? Is there evidence of fertilizer companies preferentially pricing products differently for some farmers or dealers and not others? To what extent and in what ways do buyers of farm products influence farmers' use of fertilizer?*
- Generally speaking, contracts are used to reduce risk by defining mutual expectations for the parties, whether producers, distributors, retailers, or growers. Entities often offer various contracting or purchasing options that tend to correlate to the underlying risk for the parties involved. The most lenient contracts might include no firm commitments for either price or supply from either party. The most complete contracts define all aspects of the transaction including product, origin, destination, price, volume, payment terms, ship period, and liability for non-performance on either side. Buyers and sellers negotiate these terms based on their unique vantage points and business outlooks.
 - As a trade association, TFI does not have specific information pertaining to private company contracts.
6. *Please describe any requirements or inducements to bundle a main product (fertilizer) with another product or service, and any impacts on competition. For instance, does such a practice induce a farmer's lock-in or allow the firm offering the main product (fertilizer) with the secondary product (e.g.,; pest management chemical or seed) to exclude competitors from offering the second product? What impacts do any of the contractual requirements listed above or any other contractual or sales practices have on competition?*
- As a trade association, TFI does not have specific information pertaining to such requirements.
7. *How do transportation and delivery affect fertilizer competition and access to fertilizer? For instance, the U.S. receives imports of fertilizer derivatives through the Gulf of Mexico, and ships fertilizer product up the Mississippi River. To what extent does market power by fertilizer or applicable firms over these or other key transportation channels affect competition and farmer's access to fertilizer? What risks relating to supply chain, labor or other disruptions are most relevant?*
- The use of fertilizer requires just-in-time deliveries to farmers since it is generally applied in a very short window of time. Fertilizer moves by rail, truck, barge, pipeline, and ocean

vessels, and most fertilizer touches multiple modes of transportation.

- Fertilizer companies do not own the shipping companies (barges, ocean vessels, railroads, motor carriers) that distribute fertilizer and other commodities, nor do they control the channels through which fertilizers and other commodities are shipped. A small few have their own fleets of trucks and drivers. Some companies maintain a small number of specialized river barges. Most fertilizer shippers have substantial private rail car fleets. This is required for rail transportation amongst all commodities, for which about 75% of rail cars are shipper-owned or leased assets. For rail tank cars, 100% are shipper-owned or leased assets.
- U.S. ports and rivers provide competitive transportation options for bulk commodities such as fertilizer. Terminals on our nation's coasts and inland river systems provide opportunities for efficiently delivered fertilizer which promotes competitive pricing of fertilizer products. Congress needs to continue robust funding for inland waterway infrastructure to improve port backlogs and modernize the lock system on the Mississippi and Illinois Rivers to 1,200 feet. Some of the locks are well past their engineered design life, too small for a modern 15 barge tow. This results in shipping delays and higher transportation costs, which, in turn, hurts the global competitiveness of the fertilizer industry and the broader agricultural economy.
- More than half of all fertilizer moves by rail. Over the past 20 years, rail rates to ship anhydrous ammonia have increased 206%, which is more than triple the average increase for all commodities combined. Beyond rail rates, disruptions in rail service have limited the ability to move fertilizer. Currently, rail carrier cycle times are far worse than they were last year. Therefore, the industry is unable to ship as much fertilizer in the same timeframe, which negatively impacts domestic production facilities that have limited site storage. Moreover, TFI and our members continue to actively engage rail carriers due to severe service problems and recent curtailments of fertilizer shipments. This matter is articulated well in an opinion editorial published in May.¹² As one example of what TFI members are facing -- to meet customer needs for this Spring planting season -- one fertilizer shipper was facing \$800,000 in additional freight costs because of poor service on just one rail carrier.
- The U.S. and Canadian cross-border vaccine mandates on transporters of essential commerce is further raising costs and complicating deliveries. Approximately one-third of cross-border drivers have been removed from the supply chain. This impacts the volume of fertilizer that can be transported across the border and has raised costs by approximately 30% to 40%. TFI has had extensive discussions with the Administration about the supply-cost impact of this policy, which in April was extended indefinitely. There is a great deal of potash and nitrogen fertilizer production in Canada just north of the U.S. border. The most efficient way to reach farmers in the northern tier states is via truck. The cross-border vaccine mandate on transporters of essential commerce

¹² Landry, Jeff. "Trouble on the tracks is adding to America's woes." Daily Advertiser. May 6, 2022. <https://www.theadvertiser.com/story/opinion/2022/05/06/louisiana-attorney-general-jeff-landry-trouble-tracks-adding-americas-woes/9678373002/>

continues to raise costs and constrain supply, particularly for this region.

8. *Please comment on the U.S. agricultural system's reliance on foreign supply of some fertilizers and global supply chain risks that could result from trade disruptions. Please comment on how the conflict in Ukraine may be impacting fertilizer markets. If other supply chain or trade disruptions have been experienced, please describe the effects and challenges in dealing with such events. Would greater availability of domestic or North American options mitigate risks? Would reducing dependence on suppliers from any one country or region mitigate risks? What tools might be deployed to achieve those ends?*

- Fertilizers are globally traded commodities, and their prices are influenced by worldwide supply and demand factors. Supply disruptions in other geographies impact the U.S. either through supply, price, or both. There are several ongoing global challenges that are limiting fertilizer production and supply globally. These disruptions have reshaped traditional trade patterns, resulting in increased costs (e.g., raw materials and shipping) and prices, as well as supply challenges. Current disruptions include the following:
 - Belarus represents 21% of the global supply for potash. Sanctions levied upon Belarus have reduced the world's supply of potash by approximately one-fifth.
 - China's October 2021 export ban on phosphate fertilizer as well as some nitrogen fertilizers continues to put pressure on the global fertilizer business by limiting supply availability outside of China. China accounted for 25% of global processed phosphate exports and 10% of urea exports in 2020.¹³ China has historically been the largest producer of phosphate and nitrogen fertilizers. While it consumes much of this production, China historically has also been a top exporter of these products. Its self-imposed export ban has drastically reduced global supply of these essential crop nutrients.
 - Russia set six-month quotas (not a full ban) on exports of some nitrogen and phosphate fertilizers in November 2021. In the last month, following its invasion of Ukraine, many nations have levied sanctions against Russia, making fertilizer exports from the country very difficult. In 2020, Russia accounted for 10% of global phosphate exports, 23% for ammonia, and 14% for urea.
 - Russia's invasion of Ukraine has exacerbated a global supply-shock on fertilizers and resulted in natural gas price escalations that are affecting European nitrogen fertilizer production (9% of global ammonia production). While fertilizer is generally exempt from the global sanctions, Russia's invasion has disrupted Black Sea ship loading and, thereby, exports. Moreover, financial, transportation-related, and other economic sanctions on Russia have increased risks and hurdles to exports. Resulting high natural gas prices, particularly in Europe, have led

¹³ While the U.S. imposed section 301 tariffs on China have limited Chinese exports into the United States, China's export bans are limiting supply to other parts of the world and, thereby, limiting global supply.

to curtailments of European nitrogen fertilizer production, further constraining supply. This follows similar production constraints from the fall of 2021 when natural gas price spikes in Europe resulted in nitrogen fertilizer production declines and production shutdowns, some of which are ongoing, resulting in further supply challenges. In addition to its impact on global nitrogen and phosphate markets, Russia accounts for 21% of global potash supply, so global potash markets are also being negatively impacted by the war in Ukraine.

- While the war in Ukraine is further constraining global fertilizer markets, it is important to note that numerous geopolitical and supply chain challenges were already present prior to Russia's invasion. And the compilation of these various underlying factors continues to be the primary points of stress on the global fertilizer business. For example, prior to the war, Russia had already imposed export restrictions on its own fertilizer products. Moreover, natural gas prices were also already high, especially in Europe, which, as previously stated, was forced to curtail its fertilizer production.

9. *Please comment on sustainability, climate, and other environmental concerns and risks relating to fertilizer markets. Have market concentration and power exacerbated these challenges and risks? Have they facilitated sectoral adjustment for climate and sustainability purposes? Would shifting fertilizer production to countries with high standards on labor and environmental protection improve competition, better manage sustainability risks, or otherwise improve public interest outcomes? What other strategies may exist to raise sustainability standards along supply chains?*

- As previously stated, the U.S. fertilizer industry is one of the most competitive in the world. It also proudly adheres to and implements some of the most stringent environmental and safety standards in the world. Our members' strong commitment to safety is why the fertilizer industry is twice as safe as its industry peers in the United States.¹⁴
- Meeting strong environmental standards and promoting energy-efficiency have long been priorities for the domestic industry, making ammonia production in the U.S. among the least carbon-intensive in the world. Our members are also investing in new technologies and facilities to reduce and eliminate carbon emissions, including through the development of carbon capture and sequestration projects ("blue ammonia") and projects using electrolyzers ("green ammonia").
- High purity carbon dioxide ("CO₂") is a byproduct of ammonia production. The industry captures much of the process CO₂. Some of that captured CO₂ is used in the production of downstream nitrogen fertilizers. Captured CO₂ is also sold as a byproduct for other industrial uses, such as enhanced oil recovery, the carbonization of soft drinks, and the production of diesel exhaust fluid, which helps reduce nitrous oxide emissions of heavy-duty trucks by up to 90%. Several manufacturers have also announced or begun projects

¹⁴ "Sustainability Report", The Fertilizer Institute, updated (month of last update) 2020, <https://www.tfi.org/sustainability>

to use carbon capture and sequestration (“CCS”) to further reduce emissions.

- As mentioned earlier, the production of fertilizer requires energy, either in the form of natural gas or other fuels, electricity, or steam. To reduce their energy footprint, fertilizer manufacturers cogenerate energy or seek to use other low-impact energy sources, such as solar or steam from waste heat. Forty percent (40%) of total energy use was generated using waste heat.¹⁵
- Sustainable water use is a key element in the industry’s conservation efforts as water is a significant resource in the production of fertilizer. Many fertilizer manufacturers have set water efficiency and zero-discharge goals for their operations. Overall water use efficiency per ton of fertilizer produced has improved each year since 2013. Most of this efficiency occurs in nitrogen production, with a 54% decline in water used per ton of fertilizer produced.
- Phosphate and potash are produced from mineral deposits in the ground. The fertilizer industry uses the most innovative products and processes to mine and extract the mineral so it can be used as a fertilizer. These products and processes improve the efficiency of the extraction and extend the life of existing mines.
- TFI supports continued work by the U.S. government to help strengthen the domestic fertilizer industry and supply chain. Our food security and the resilience of the U.S. agricultural sector is inextricably tied to fertilizer availability. Promoting free and fair trade and a strong and competitive domestic industry are complementary goals.

10. What obstacles exist to the financing and development of new fertilizer capacity that would enhance the competitiveness of fertilizer markets? Would new or expanded domestic manufacturing, mining, processing, or alternative fertilizer production capacity help promote access to and affordability of fertilizer for agricultural producers? Are there existing “shovel ready” manufacturing, mining, or other processes that could or should be adjusted to facilitate new fertilizer production? Are there other potential new entrants in the near or medium-term? How might USDA best support investment in new fertilizer capacity in the U.S.?

- Fertilizer production facilities typically cost between \$1 billion and \$4 billion to construct and more to operate. For ammonia and nitrogen production, an abundant and affordable supply of natural gas is perhaps most important. As previously noted, domestic fertilizer production was at a low between 2008 and 2009 due to high natural gas costs. As the U.S. supply and affordability of natural gas improved, the domestic fertilizer sector underwent an expansion that continues today. One important way to encourage new and expanded domestic nitrogen capacity is to promote an abundant and affordable supply of natural gas.
 - It is important to note that between 2003-2008, high U.S. natural gas costs were

¹⁵ “Sustainability Report”, The Fertilizer Institute, updated (month of last update) 2020, <https://www.tfi.org/sustainability>

a major driver of U.S. nitrogen production reductions as well as bankruptcies.¹⁶ During that period, ammonia producers reduced production facilities from 37 to 22. This drastically reduced our nation's production capacity and made U.S. farmers more reliant on imports. However, as U.S. development of natural gas improved and the cost of natural gas went down, domestic fertilizer production expanded.¹⁷

- Phosphate and potash are produced from mineral deposits in the ground. We urge the U.S. Geological Survey (“USGS”) to ensure that both are included in its definition of “critical minerals.” Historically potash has been included, but most recently was disappointingly removed. We continue to urge USGS to include phosphate rock as a critical mineral. Being included on the list will help to ensure a streamlined and more reliable permitting process.
 - Additionally, the recent revisions to the National Environmental Policy Act (“NEPA”) have only increased uncertainty and caused significant delays in the federal permitting process and will make domestic fertilizer production more difficult.
- Phosphogypsum (“PG”) is a byproduct of phosphate fertilizer production and is currently required to be stored in above-ground stacks at a cost of hundreds of millions of dollars. PG is increasingly being safely recycled for a variety of uses in Europe, South America, Asia, Africa, as well as in Canada, and, according to the International Atomic Energy Agency, should not be restricted in such uses as agriculture, road construction, or marine environments. The U.S. Environmental Protection Agency (“EPA”) recently reversed itself and removed its approval for PG to be used in the U.S. for limited road construction projects. The U.S. should rejoin the rest of the world in making an allowance for the safe, sustainable, and environmentally conscious use of byproduct that is currently being managed as a waste.
- In 2019, TFI filed a Petition request seeking EPA’s approval of the use of PG in government road construction projects. In 2020, EPA approved TFI’s request with certain conditions, but then in 2021 withdrew their prior approval. EPA’s withdrawal was due to a non-risk related matter, an EPA regulation requiring project specific data (e.g., quantity of PG, location to be used, etc.) to be submitted prior to approval.
- TFI respectfully requests that USDA engage EPA to reconsider the withdrawal of the conditional approval for reuse of PG as a roadbase material. To help facilitate broader adoption, EPA should also amend 40 CFR § 61.206 to allow for an industry-wide PG petition.

¹⁶ From the late 1990s onward, increasing foreign capacity growth also impacted the domestic industry’s competitiveness, including new capacity supported by foreign subsidies or developed, as in China, by state-owned enterprises.

¹⁷ See Bekkerman, A., G.W. Brester, and D. Ripplinger. 2020. “The History, Consolidation, and Future of the U.S. Nitrogen Fertilizer Production Industry” Choices Quarter at 2, https://www.choicesmagazine.org/UserFiles/file/cmsarticle_742.pdf.

11. *How can USDA further support more efficient use of fertilizer? Are current precision agriculture tools effective at reducing fertilizer application rates without impacting yield? Could sub-field management of application rates improve economic resiliency of farms? Are there tools that USDA could support to facilitate better application rates, timing, and appropriate use of existing fertilizer sources? How could risk management tools such as crop insurance help with yield gaps from reduced nitrogen application rates, for example? How could USDA's working lands and other conservation programs better support more target and efficient use of fertilizer? How might adverse community, labor, and environmental costs arising from the production of fertilizer in certain geographies be better factored into USDA grants, loans, or regulatory programs? Are there ways USDA could support more effective use of other fertilizers (e.g.: manure) from livestock? Could considering these factors improve competition in certain markets? Please share your views.*

- A variety of technologies and materials help support efficient fertilizer production and utilization. These can include a range of products and techniques from floatation applications at mineral extraction to coatings that increase uniform distribution when applied on the field.
- Land grant funding for fertilizer research has struggled to keep pace with the demand by modern agriculture. The trend can be viewed as flat and if inflation is considered it could be viewed as down. Research focused on soil/plant interactions is continuously needed to improve our efficiency of use, environmental management, and to improve the economic resiliency of farms.
- Agricultural retailers are an important resource for farmers when it comes to providing agronomic recommendations and nutrient-management planning. The 2018 Farm Bill aims to enhance the Technical Service Provider (“TSP”) program by directing the USDA to streamline the process through which qualified employees in commercial entities, such as agricultural retailers and farmer co-operatives, could become certified. The bill also provides authority for these nonfederal entities to act as a certifier of technical service providers. Further streamlining of this program is needed for the program to improve participation. As an example, the Conservation Security Program (“CSP”) could allow a certified crop advisor (“CCA”) plan as documentation for producers implementing certain enhanced conservation activities. Sign up for CSP requires a producer to choose from a list of enhancement activities to implement on their fields.¹⁸
- The CCA program is what makes conservation and nutrient management happen on most farms in the United States. The result of implementing program enhancements will be more acres with nutrient-management plans, a win for the environment and America’s farmers. USDA should overhaul the TSP program to allow CCAs to write 590 nutrient management plans with the ability for agricultural retailers to directly pay farmers for 4R nutrient stewardship practice implementation.¹⁹ In this regard, USDA should encourage

¹⁸ Like Water Quality Enhancement Activity – WQL04, Plant tissue tests and analysis to improve nitrogen management, WQL05 – Apply nutrients no more than 30 days prior to planned planting date, and WQL07 – Split nitrogen applications, 50% after crop emergence or pasture green up.

¹⁹ The 4R's stand for (1) right source, (2) right rate, (3) right time, and (4) right place and serve to guide farmers to the management practices that help keep nutrients on and in the field.

farmers to work with a CCA to create nutrient management plans that focus on responsible and efficient use to ensure maximum yields while also minimizing environmental impacts. Farmers in the United States are the global leaders in nutrient use efficiency (the ratio of fertilizer applied to crop nutrient uptake). When growers use 4R Nutrient Stewardship, their performance in both environmental and economic measures jumps yet again.²⁰ In 2021, TFI members committed to ensuring that 70 million acres of land are farmed using 4R practices by 2030.

- USDA’s Environmental Quality Incentives program (“EQIP”) assists producers and landowners to adopt conservation activities on agricultural and forest lands to protect and improve water quality and quantity, soil health, wildlife habitat, and air quality. TFI supports directing at least 10% of funds at managing the source, rate, timing, and placement of fertilizer on land.
- Nutrient management based on source, rate, time, and placement of nutrients was identified as a high-priority research initiative in the 2018 Farm Bill. TFI urges the Department to maintain appropriate funding levels for the Agriculture and Food Research Initiative to ensure that U.S. farmers have the information they need to continue the upward trajectory of fertilizer use efficiency.

12. *Are there concerns or challenges related to data— e.g., to collection, privacy, accessibility, control, concentrated market power, or any other aspect—as it affects affordability, accessibility, and use of more targeted application of fertilizer? For instance, to what extent does the expanded application of targeted site-specific crop management using data from sensors, climate readings, or mechanical systems in agriculture impact competition and farmers' access to fertilizer or other agricultural inputs? Is there evidence of firms with market power using information obtained regarding farmers' farming practices to adversely affect farmers or competitors? Are there ways that USDA or other agencies can safeguard a farmer's control of data and enhance competition and fair access?*

- Data collected by USDA from producers should be considered proprietary and confidential to the producer. Only deidentified and aggregated data sets of a size large enough that individuals cannot be identified should be used for trend analysis of program implementation.

13. *Please comment on the availability and accessibility of market information and data for fertilizers. Which public or private sources do you rely on to receive information on fertilizer prices and other related markets? Are you able to access timely, accurate, and comprehensive information on spot prices of fertilizers in local, regional, and national markets? If not, how can USDA further facilitate price reporting information and transparency for market participants? Beyond price reporting, what other market related information would be helpful that is currently limited or not accessible?*

- There are widespread sources of data on these issues, including from USDA. The Department could improve its data reports in the following ways:

²⁰ 4R Nutrient Management Case Studies, 2019. The Fertilizer Institute. <https://www.4rfarming.org/case-studies/>.

- Full Annual Survey of Farm Fertilizer Application Rates/Use. USDA had previously conducted an annual report but moved away from an annual survey to every five years. At TFI's request back in 2008, USDA agreed to survey every two years but in practice the survey is not that frequent. A full annual survey would improve transparency in the market.
- USDA Support for State/County Commercial Fertilizers Report. USDA should work with the Association of American Plant Food Control Officials ("AAPFCO") to support their data collection on demand, which is based on state tax records. Due to funding and lack of more widespread participation, these data sets are not consistently prepared. USDA support and funding would make this valuable resource more available.

14. *In what other ways can USDA support farmers' ability to adapt to variability in fertilizer costs? How might USDA assist small producers in hedging or otherwise mitigating sudden, unexpected jumps in the spot price of fertilizer? How might USDA better support modes of production that rely less on fertilizer, or support access to markets that may pay a premium for products relying on less fertilizer? How can USDA further facilitate appropriate conservation of land, and/or support farmers' flexibility in starting up and sustaining other farm enterprises?*

- USDA should consider broader support for innovative technologies currently on the market or on the verge of introduction. For example, biostimulants increase nutrient use efficiency, thus reducing the amount of fertilizer that is needed. Further, use of enhanced efficiency fertilizers ("EEFs") allows plants to access the necessary nutrients over the growing season when they are most needed, thereby increasing crop yields and decreasing loss to the environment. Finally, some biological products make important nutrients available to the crop, often referred to as biofertilizers. EEFs, biostimulants, and biofertilizers have the unique characteristics to mitigate climate impacts through increased storage of carbon, reduced nitrous oxide emissions, and/or increasing a plant's ability to adapt and recover from abiotic stress. These products also increase plant nutrient uptake, which can reduce nutrient loss to waterways.
- USDA should consider making the following changes:
 - Allow biostimulants to be specifically listed as eligible for the Natural Resources Conservation Service ("NRCS") programs (cost-share, grants, etc.) and allowable practices in 590 nutrient management plans.

15. *What other tools, investments, or programs could USDA or other agencies deploy to enhance the competitiveness of fertilizer markets? Please suggest any other actionable steps that USDA or other agencies could take to help address any identified concerns.*

- TFI urges the following actions, which especially impact fertilizer relative to the entire agricultural sector.

- Cross-border vaccine mandate: As previously mentioned, the Administration should immediately rescind its cross-border vaccine mandate on transporters of essential commerce which is raising costs and constraining cross-border trade flows.
- Rail service: Fertilizer leans heavily on rail carriers for distribution.²¹ Implementation of Precision Scheduled Railroading (“PSR”) has compromised rail carrier operational elasticity and the ability to handle unexpected issues such as sudden weather and the COVID pandemic. Fertilizer shippers are paying hundreds of thousands more in freight costs to meet customer needs this planting season. Ongoing scrutiny and oversight of rail operations and service is much needed as are reforms to enhance rail service and competition.
- Natural gas supply: Promote policies that encourage abundant and safe supplies of natural gas. An extended period of elevated natural gas costs and lack of investment could threaten viability of domestic fertilizer production.
- Permit reform:
 - *USGS List of Critical Minerals*: USGS should include phosphate and potash in its definition of “critical minerals.” USDA should engage USGS regarding the need to recognize these fertilizers as “critical minerals.”
 - *NEPA Reform*: Access to mineral deposits of phosphate and potash is hampered by NEPA regulations, and cumbersome hurdles put in place by the Department of Interior, Army Corp of Engineers, EPA, Fish and Wildlife Service, and excessive litigation. The Council of Environmental Quality has proposed modifications to NEPA that will make it even more difficult to increase domestic fertilizer supply. These challenges stretch over multiple Administrations. For example, over the past 10 years, one TFI member has spent over \$20 million on required permits and has still not received the final permit.
 - *Permit Streamlining for New Construction*: The Administration in coordination with the Federal Permitting Improvement Steering Council (“FPISC”) should work with fertilizer producers to expedite safe and responsible permits to expand domestic fertilizer production capacity as soon as possible.
 - *CCS Permitting*: The Administration should also work to expedite safe and responsible permits for Class VI geological sequestration wells, as well as the pipelines to move CO₂ to those wells, to provide fertilizer producers the ability to permanently sequester their emissions.

²¹ Over half of all fertilizer moves by rail.

- Phosphogypsum Use: The inability to use PG constrains domestic phosphate production. U.S. policy should allow PG to be reused. More progressive reuse policies currently exist in Canada, Europe, India, South America, Russia, and 100% reuse now occurs in Brazil. TFI respectfully requests that USDA engage EPA to reconsider the withdrawal of the conditional approval for reuse of PG as a roadbase material. To help facilitate broader adoption, EPA should also amend 40 CFR § 61.206 to allow for an industry-wide PG petition.
- Trade: TFI supports free trade policies that open markets and foster a level playing field for our products and our farmer customers that depend on them.

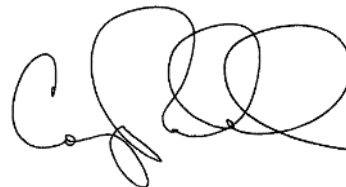
Conclusion

Thank you again for USDA's interest in the fertilizer market and supply chains. Fertilizer, which is essential to our food security, is experiencing perhaps the most serious supply chain disruptions in many generations.

Fertilizer is a globally traded commodity that is influenced by global supply and demand factors, as well as domestic conditions. Because fertilizer is a resource-dependent commodity, relying for example on natural gas and mineral deposits of potash and phosphate, only about 65 nations have the resources necessary for its production. Competition here at home is significant: the U.S. is one of only three nations with 20 or more unique producers of fertilizer. We also import many types of fertilizers in significant volumes. Moreover, the fertilizer industry is globally intertwined. As such, supply disruptions caused by increasing energy prices, foreign trade policies and geopolitical events (Belarus, China, Russia-Ukraine) can affect price and supply conditions in the United States. Consequently, a combination of events over the last two years have resulted in farmers in the United States and abroad experiencing fertilizer input cost increases, and just a few years after global conditions led to a sustained period of low input costs.

TFI welcomes USDA's assistance as we work with the Administration and farmers to strengthen our nation's domestic production and smooth out domestic and international supply chains. Please reach out to [me](#) or [Justin Louchheim](#) of my staff with any questions.

Sincerely,

A handwritten signature in black ink, consisting of several large, overlapping loops and a trailing end, characteristic of a cursive signature.

Corey Rosenbusch
President and CEO
The Fertilizer Institute