90% of global nutrient use is outside of the United States.

Source: International Fertilizer Association (IFA).
Share of World Crop (2020/21) and Fertilizer Products (2020) Traded

- 604 MMT Crop Exports
  - Average = 21%

- 176 MMT Fertilizer Exports
  - Average = 44%

Source: U.S. Department of Agriculture and International Fertilizer Industry Association. Averages computed as total exports (crop or fertilizer material) divided by total production.
<table>
<thead>
<tr>
<th>Global Consumers - 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nitrogen</strong></td>
</tr>
<tr>
<td>1. China</td>
</tr>
<tr>
<td>2. India</td>
</tr>
<tr>
<td>3. USA</td>
</tr>
<tr>
<td>4. Brazil</td>
</tr>
<tr>
<td><strong>Phosphates</strong></td>
</tr>
<tr>
<td>1. China</td>
</tr>
<tr>
<td>2. Brazil</td>
</tr>
<tr>
<td>3. USA</td>
</tr>
<tr>
<td>4. India</td>
</tr>
<tr>
<td><strong>Potash</strong></td>
</tr>
<tr>
<td>1. China</td>
</tr>
<tr>
<td>2. Brazil</td>
</tr>
<tr>
<td>3. USA</td>
</tr>
<tr>
<td>4. India</td>
</tr>
</tbody>
</table>

Source: International Fertilizer Association (IFA).
Global Producers - 2020

1. China
2. Russia
3. USA

Ammonia

Source: International Fertilizer Association (IFA).

31%
14%
6%

Urea

41%
14%
11%

Processed Phosphates

1/ DAP, MAP, and TSP.

32%
19%
17%

Potash

Members - only
Global Importers - 2020

1. India
2. USA
3. Morocco

Ammonia

Source: International Fertilizer Association (IFA).

20%
14%
10%

1. Brazil
2. India
3. USA

Urea

20%
16%
6%

1. Brazil
2. India
3. USA

Processed Phosphates 1/

1/ DAP, MAP, and TSP.

20%
17%
9%

1. Brazil
2. USA
3. India

Potash

Members - only
Global Pandemic
Production Planning

IFA GLOBAL FERTILIZER DEMAND FORECASTS

Outlook Declines Significantly!

Source: International Fertilizer Association (IFA).
Fertilizers

The World Bank’s Fertilizer Price Index dropped 4.5 percent in the first quarter of 2020 (q/q), the seventh consecutive quarterly decline. A fall in potash and urea prices, owing to a slump in demand, pushed the index lower. However, phosphate prices increased as the COVID-19 outbreak in China severely hampered production and disrupted supply chains. In 2020, the index is projected to fall by 9.9 percent as global fertilizer supply remains plentiful. Risks to this outlook are broadly balanced. Upside risks include prolonged widespread supply disruptions, while downside risks include a slower-than-expected recovery in demand.
Production Planning

Members - only
Turnarounds

3–4-year maintenance schedule

=> 25-33% of the industry down for some time annually
Weather Events
### Monthly Production - Nitrogen (nutrient tons)

<table>
<thead>
<tr>
<th></th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source: The Fertilizer Institute (TFI)</td>
<td></td>
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</tr>
</tbody>
</table>

-5% less short tons N in February vs. the average of 2017/18-2019/20.

Nitrogen production down 2% in FY2020/21 compared to FY2019/20.
Natural Gas as a Share of Ammonia Production Cost

~33 MMBtu per material ton ammonia

~ 40% for fuel

~ 60% for feedstock

Source: TFI Production Cost Surveys
Henry Hub Natural Gas Spot Price  
(March 1, 2021 – February 1, 2022)

Prices Doubled between March and November

Source: Energy Information Administration (EIA).
Dutch TTB Natural Gas Futures Prices
(January 4, 2021 – February 7, 2022)

European Natural Gas Prices Hit New Record on December 14th!

Every $1/MMBtu increase in natural gas, increases ammonia cost of production by $32/t.
## Cost of Major Inputs into DAP Production

<table>
<thead>
<tr>
<th>Material</th>
<th>June 2020</th>
<th>Jan 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphate Rock</td>
<td>$129</td>
<td>$298</td>
</tr>
<tr>
<td>Sulfur</td>
<td>$121</td>
<td>$23</td>
</tr>
<tr>
<td>Anhydrous ammonia</td>
<td>$43</td>
<td>$228</td>
</tr>
</tbody>
</table>

Cost of inputs triples! [Source: Weekly prices reported in Green Markets (A Bloomberg Company).]
Hurricane Ida - August 26 – September 4

EIA expects higher natural gas prices as production reductions remain following Hurricane Ida

Hurricane Ida contributes to higher natural gas prices

by Jeff Della Rosa (JDellaRosa@nwaaj.com)  September 8, 2021 1:39 pm  191 views

Hurricane Ida Hit An Important Oil And Gas Hub, Which Will Likely Drive Up Gas Prices

September 1, 2021 - 4:49 PM ET
Heard on All Things Considered

U.S. farmers face supply shortages, higher costs after Hurricane Ida

By Pj. Huffstutter and Mark Weinraub
Trade Disruptions
EU sanctions expected to hit Belarus's potash, oil and finance

UPDATE 1-Belarus potash exporter says sanctions will increase global prices

Belarus Sanctions

Global Potash Exports

Belarus 21%

Rest of the World 79%

Belaruskali Named in Biden Sanctions
China Curbs Exports

Global Phosphate Exports
- China: 25%
- Rest of the World: 75%

Global Urea Exports
- China: 10%
- Rest of the World: 90%

China customs to inspect fertilizer exports from 15 Oct

Chinese urea futures slide from record highs on new export measures
Russia Restricts Exports

- **Global Phosphate Exports**
  - Russia: 10%
  - Rest of the World: 90%

- **Global Urea Exports**
  - Russia: 14%
  - Rest of the World: 86%

- **Global Ammonia Exports**
  - Russia: 23%
  - Rest of the World: 77%

- **Global Potash Exports**
  - Russia: 21%
  - Rest of the World: 79%

Members - only
**Additional Market Impacts**

**India Approves $3.8 B Increase in Fert Subsidy**

India will provide an additional 286.55 billion rupees ($3.8 billion) to fertilizer companies as compensation for selling products at lower than market prices to farmers, according to Bloomberg citing a government statement said.

A cabinet meeting chaired by Prime Minister Narendra Modi approved the enhanced subsidy for winter-sown crops late Tuesday. The subsidy on DAP is being raised by 438 rupees per bag and 100 rupees per bag for nitrogen, phosphorus and potassium fertilizers.

=> Artificially holds up demand!  => Supply Disruption!

**Egypt: Tighter regulations imposed on fertilizer producers**

Fresh regulations have been imposed on Egyptian fertilizer producers to ensure domestic supply, according to local sources.

![Global Urea Exports](pie_chart.png)

- Egypt 9%
- Rest of the World 91%

**⇒ Market tightens further!**
Commodity prices, like fertilizer, tend to converge globally!

Source: Monthly averages computed from weekly prices reported in Green Markets (A Bloomberg Company).
Global Fertilizer Prices
(February 4)

Members - only
Corn – Season Average Price Forecast by USDA

Lowest S.A. Price Since 2006/07

Source: WASDE, USDA.
Corn – Season Average Price Forecast by USDA

- **Lowest S.A. Price Since 2006/07**
  - 17/18: $3.36
  - 18/19: $3.61
  - 19/20: $3.56

- **Highest S.A. Price Since 2013/14**
  - 20/21: $4.30

Source: WASDE, USDA.
Monthly Average Crop and Fertilizer Prices,

Fertilizer Price Index - 2011 = 100

Price Correlations:
Fertilizer and 3-crops: 0.888
Fertilizer and corn: 0.847
Fertilizer and wheat: 0.858
Fertilizer and soybeans: 0.861

USDA Fertilizer Price Index
Average of monthly corn, wheat, and soybean prices

Corn, wheat, and soybean plantings drive U.S. fertilizer demand and it is this influence that results in crop and fertilizer prices being highly correlated! That is, when crop prices rise, fertilizer prices also generally rise as fertilizer demand increases!
However, despite the high correlation between crop and fertilizer prices, supply side factors are just as important and ultimately, it is both demand and supply factors which determine the market price of crops and fertilizer. Thus, as can be seen in the chart, crop and fertilizer price changes do not always track one another!
Rising Crop Prices

USDA Forecasts Rising Crop Prices for Second Year!
Fertilizer Prices: Jan 2007 – February 4, 2022