SUSTAINABILITY in the fertilizer industry

 tfi.org/sustainability
 Featuring data from 2021, collected in 2022
The Fertilizer Institute members are committed to the safe, secure, and sustainable production, distribution, and use of plant nutrition.

The fertilizer industry prioritizes the efficient use of natural resources. The industry is continuously working towards more sustainable operations, including efforts to decarbonize and mitigate environmental impacts—both at the points of fertilizer production and application.

Fertilizer is vital to food systems and food security around the world. To feed a global population of 10 billion by 2050, fertilizer is playing a critical role in increasing food production and land use efficiency in agriculture in a sustainable way. While the fertilizer industry can contribute to many of the UN’s 17 Sustainable Development Goals, fertilizers directly impact the advancement of Goal 2, Zero Hunger: “End hunger, achieve food security and improved nutrition and promote sustainable agriculture”. Fertilizer’s role in feeding the world also contributes to global stability and national security.

This report tracks fertilizer industry performance on environmental, economic, and social indicators across the entire value chain. Now in its eighth year, TFI’s Sustainability Report seeks to measure and evaluate industry efforts to identify successes and target areas for improvement.
ABOUT the report

Participating Companies

16 of these companies manufacture:

92% of total nitrogen, phosphate, and potash production in the U.S.

24
companies

All quantitative data in this report represent TFI member-related products (nitrogen, phosphate, and potash materials produced in, imported to, or transported within the United States).

Across the entire value chain:

18 retailers, wholesalers, and distribution companies

33% of the U.S. fertilizer retail industry represented

Retailers Wholesalers Distribution Companies

AdvanSix, Inc.
American Plant Food Corp.
CALAMCO
CF Industries, Inc.
CHS Inc.
Coffeyville Resources
Compass Minerals
Dakota Gasification
Gavilon
GROWMARK
ITAFOS
J.R. Simplot Company
Koch Ag & Energy Solutions
LSB Industries
Morral Companies
Nutrien
Rio Tinto
SQM North America
Tessenderlo Kerley Inc
The Mosaic Company
Trademark Nitrogen
Wilbur-Ellis
Winfield
Yara North America

Don’t see your company listed? Contact Alice McKinnon at amckinnon@tfi.org to learn how to get involved.
TFI established an industry-wide goal towards achieving 70 million acres under 4R Nutrient Stewardship management by 2030.

Nutrient Stewardship
Acres managed using the 4R framework incorporate practices that use the right fertilizer source at the right rate, at the right time, and in the right place. When the 4Rs are put into practice, growers can achieve higher yields, lower input costs, and build soil health, while reducing nutrient losses as nitrous oxide emissions.

Innovative Products
Members of TFI have invested in the development of innovative products such as enhanced efficiency fertilizers (EEFs) and biostimulants, which enable increased nutrient uptake and use efficiencies. In 2023, TFI will launch a national biostimulant certification program establishing minimum efficacy, safety, and composition standards for these products. This voluntary biostimulant label will signify products have undergone a process to meet minimum industry conformance standards.

Agronomic Expertise
Fertilizer industry experts provide growers with recommendations, including 4R-based nutrient management plans, which foster positive environmental outcomes and improve farmer performance and profitability. With the technical advice of their ag retail agronomist, Wyatt Harris’ fourth-generation family farm in Kansas went from intermediate to advanced 4R practices. Growing corn and soybeans on rotation, he decreased CO₂ equivalent greenhouse gas emissions by 19.8% over a four-year period. See more case studies at 4RFarming.org.

TFI coordinated 16 researchers across eight sites in the North Central Corn Belt.

25% reduction in average nitrous oxide emissions from 4R and other sustainable farming practices.

4,300+ agronomic professionals employed by TFI members

$897M+ in USDA Climate-Smart Commodities partnerships awards to TFI members in 2022

*TFI coordinated 16 researchers across eight sites in the North Central Corn Belt.
SAFETY and security

Safety is a top priority for TFI member companies.

Employee Stewardship

2021 was the second safest year for TFI members since 2013. When compared to the Department of Labor’s data for similar companies in wholesale, mining, and manufacturing, the fertilizer industry had:

1.6x fewer work-related injuries

2.3x lower lost time incident rate

In 2021, both the recordable rate and the lost time incident rate were the second lowest since the survey was launched in 2013:

- **Recordable Rate**: number of work-related injuries per 100 full-time workers
- **Lost Time Incident Rate**: number of recordable injuries and illnesses per 100 full-time employees that resulted in days away from work, restricted work activity, and/or job transfer

### 2021 Recordable Rate

<table>
<thead>
<tr>
<th>Rate PER 100 FULL-TIME EMPLOYEES</th>
<th>Wholesalers</th>
<th>Mining</th>
<th>Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>2014</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>2015</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>2016</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>2017</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>2018</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>2019</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>2020</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>2021</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
</tbody>
</table>

### 2021 Lost Time Incident Rate

<table>
<thead>
<tr>
<th>Rate PER 100 FULL-TIME EMPLOYEES</th>
<th>Wholesalers</th>
<th>Mining</th>
<th>Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>2014</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>2015</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>2016</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>2017</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>2018</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>2019</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>2020</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>2021</td>
<td>0.89</td>
<td>0.89</td>
<td>0.89</td>
</tr>
</tbody>
</table>

**Industry Benchmark**

- **2021 Recordable Rate**: 1.10
- **2021 Lost Time Incident Rate**: 0.49

ResponsibleAg

ResponsibleAg is an industry-led initiative that helps ensure participating businesses are compliant with environmental, health, safety and security regulations to keep employees, customers and our communities safe through a federal regulatory compliance assessment.

2,440 industry facilities participating in the program
The industry is conserving resources and energy that would otherwise need to be purchased or supplied by fuel combustion.

Energy
Fertilizer manufacturers are working to decarbonize their manufacturing sites by increasing energy efficiency, investing in carbon capture and sequestration initiatives, using electrolyzers, and more.

Greenhouse Gases
12.8 million CO₂ equivalent captured and not emitted is equal to the amount of carbon sequestered by 211 million tree seedlings grown for 10 years, or the amount of carbon sequestered by 15 million acres of U.S. forests in one year.

Water
TFI Members recycled enough water to fill 1.6M Olympic-sized pools

Percentage of GHGs Captured Per Nutrient Ton Produced

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2017</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHGs</td>
<td>9%</td>
<td>24%</td>
<td>31%</td>
</tr>
</tbody>
</table>

31% of GHGs were captured and not emitted in 2021

368% increase of GHG emissions captured since 2013

Total Water Use Per Ton of Nitrogen Produced (Gallons per Ton)

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2017</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>8,549</td>
<td>8,425</td>
<td>7,608</td>
</tr>
</tbody>
</table>

10% reduction in water use since 2017
Capital Investment
From 2019 through 2021, companies in this report invested an average of $1.19 billion annually in capital investments to help the industry meet sustainability goals. These investments increase production efficiencies, reduce energy and water use, reduce greenhouse gas emissions, and strengthen the U.S. economy to meet current and future agricultural needs.

Sustainability in Action

**CF Industries** accelerated its decarbonization journey by entering into the largest-of-its-kind commercial agreement with ExxonMobil to capture and permanently store up to 2 million metric tons of CO₂ emissions annually from its manufacturing complex in Donaldsonville, Louisiana. CF Industries is investing $200 million to build the CO₂ dehydration and compression unit, and ExxonMobil will transport and permanently store the captured CO₂ in its secure geologic storage in Vermilion Parish, Louisiana.

**Wilbur-Ellis’ Total Nutrition System**, or TNS, helps agronomists and producers identify what nutrients are needed on a field-by-field basis over the course of a season. TNS is a proprietary web-based platform for reporting water, soil, and plant tissue analytical data from independent agricultural laboratories in an easy-to-read graphical format. Using TNS allows producers to pinpoint what nutrients are needed and when to minimize waste that could otherwise have negative impacts on the environment and human health.

**Compass Minerals** engages with and supports the communities where its employees live and work through charitable giving and volunteering. Compass employees volunteer many hours at Boys & Girls Clubs of Greater Kansas City to assist young students in learning to read and improving their literacy skills, and a Compass Minerals employee serves on the organization’s corporate board of directors.

**TFI Members** are developing a low carbon ammonia protocol for North American industrial ammonia and fertilizer production. A precise, unified specification will help consumers understand carbon intensity quickly. The protocol is expected to be completed in 2023.