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Fertilizer Focus

Atome's Villeta Project

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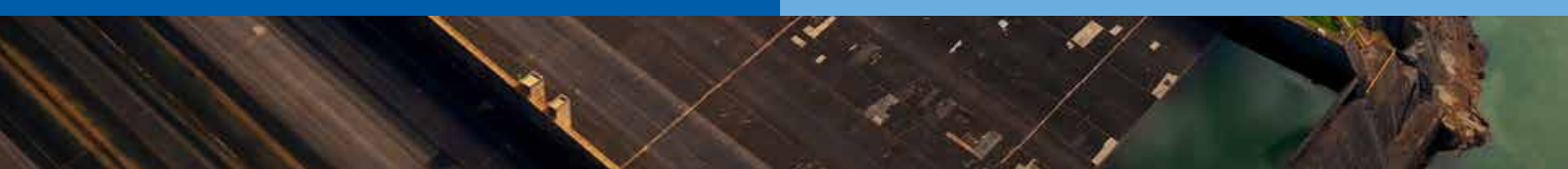

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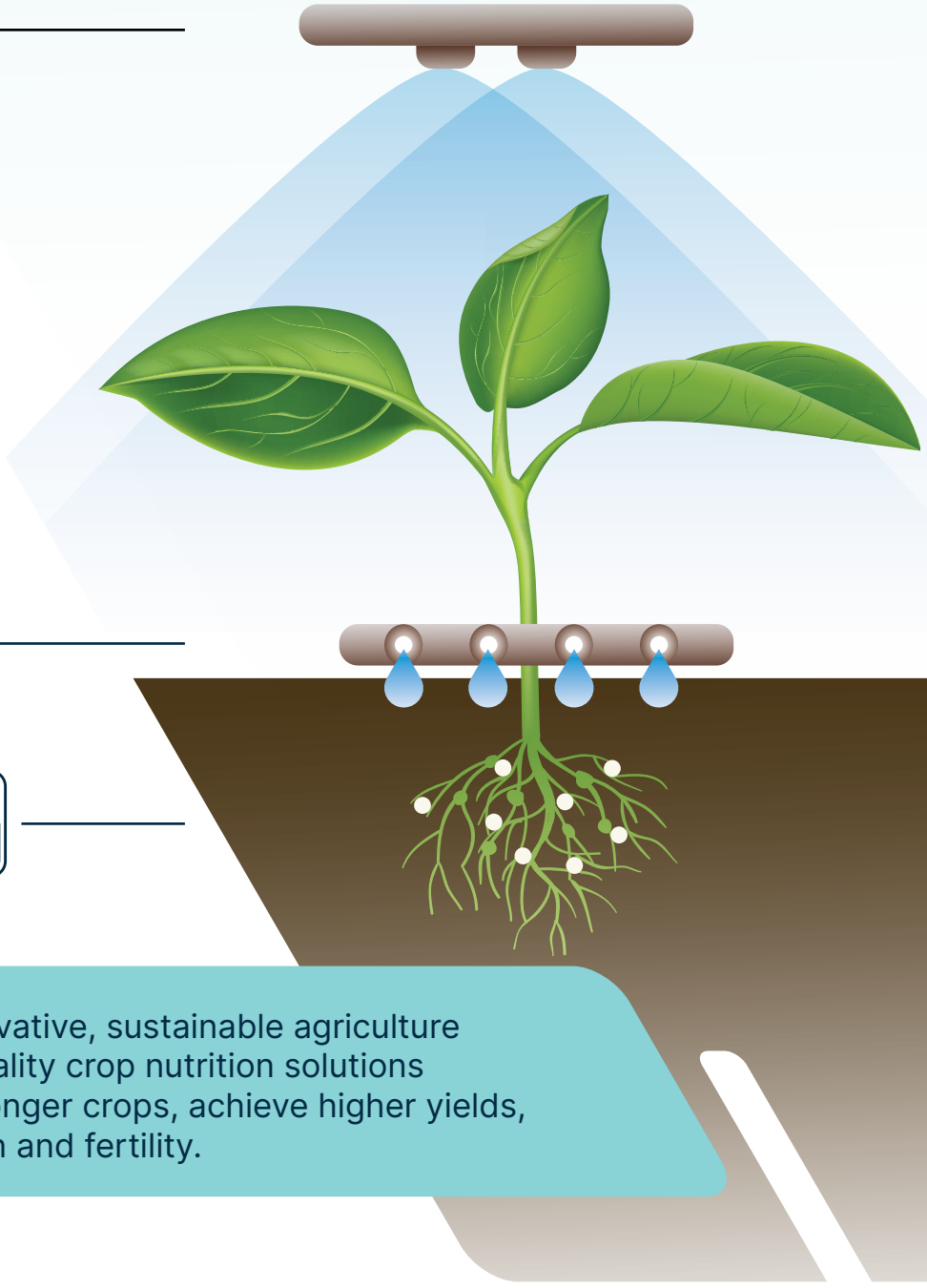

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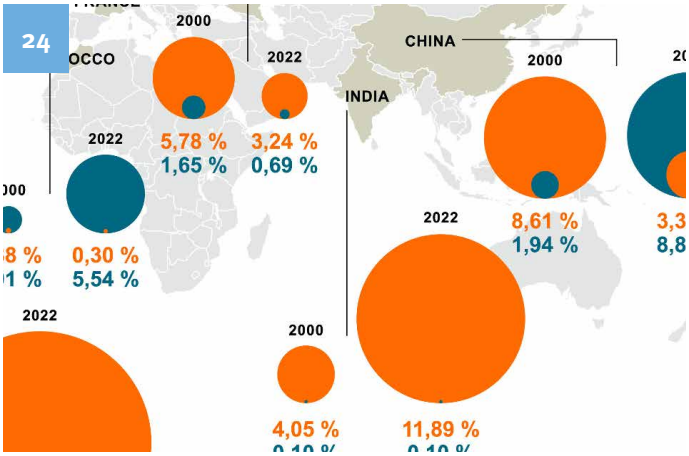

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Times, trends and new solutions in the fertilizer world

Atome's Villeta Project

Fertilizer Focus speaks with Terje Bakken, Director for Ammonia and Fertilizer Markets at ATOME, about the company's Villeta Project in Paraguay, a first-of-its-kind, industrial-scale green fertilizer facility. This 145MW, 260,000 tpa Calcium Ammonium Nitrate (CAN) project will run off 100% renewable energy – using low-cost, renewable hydropower. The project is underpinned by the recently announced binding long term offtake agreement which ATOME have signed with Yara International for the entire Villeta production, a key milestone to deliver the USD630 million low-carbon fertilizer project.

Fertilizer Focus (FF): The fertilizer industry has undergone significant changes over the years, how do you perceive these changes?

Terje Bakken (TB): As you say, the industry has undergone radical transformations in recent decades, from being highly supply driven to now being more market driven, focusing on more efficient energy and agronomic solutions, and now, its role in global decarbonisation adds a new dimension.

Terje Bakken, Director for Ammonia and Fertilizer Markets at ATOME

Firstly, we can look at the transition from centralized cartels to a fragmented, volatile Market. 40-50 years ago, the industry was defined by powerful, state companies and export cartels, such as Sojusagrochim in the Soviet Union, Gulfert in the AG or Nitrex Complex in Europe, focusing on control of supply and price stability. The breakup of the Soviet Union brought about tremendous changes to the global fertilizer trade, not only through more cargo holders entering the market, but also with domestic FSU consumption falling from 11 million tonnes of fertilizer nutrients in 1990 to 1.4 million tonnes, a few years later, radically increasing exports. The negative effect on fertilizer prices were dramatic, further propelled by lower European consumption and changes in Chinese imports in the same decade. Prices crashed to historic lows and part of the industry was 'gasping for air' as a result.

Then there is the term 'stranded gas' – an afterthought to an energy linchpin. For decades, ammonia production was a way to monetise 'stranded' natural gas. That changed dramatically with the entrance of liquified natural gas (LNG), which became a fast-growing market alternative. More downstream energy consumption also emerged.

Less available gas supply in the U.S. in 2001 showed that fertilizers was now inextricably linked to global energy markets. An ammonia project in 2000 had a forecast price of around USD130/tonne, but when the first cargo was sold a few years later, it went for more than five times that price. Changing global energy markets also changed the fertilizer industry. The entrance of shale gas a few years later saved the U.S. nitrogen industry, but still it became clear that nitrogen prices were now highly dependent on competition for natural gas.

In addition, the industry has moved from a pure volume game to a focus on agronomic efficiency and decarbonization. In 1960 we had a population of 3.0 billion people. Today, we have to feed a population of 8.2 billion, which has been met through a new agricultural revolution – with fertilizer playing a key part. While that need remains, the finite farmland and growing environmental focus now calls for better Nutrient Use Efficiency (NUE) and decarbonisation. The challenge is no longer just how much we can produce, but how efficiently and cleanly we can do it. This now sets the stage for the next generation of fertilizer solutions.

ATOME's Villeta Project uses 100% baseload renewable hydroelectric power from the Itaipu Dam to produce green hydrogen

FF: ATOME just announced its offtake agreement for its Villeta Project with Yara. How important is this agreement and how does it symbolize a change?

TB: Having Yara as an offtaker and long-term marketing partner is unique. Yara is the largest nitrate producer in the world and their market approach focuses on segmentation, and farm centric positioning. For ATOME, the partnership provides downside price protection whilst bringing opportunities to maximise value and market potential, capturing a premium for our low-carbon CAN fertilizer.

Yara has been a frontrunner in promoting more efficient plant nutrients to farmers in South America, focusing on improving both yield and quality of farm produce. In Mercosur, our partnership is a union of two first-movers. Yara is leading the change to provide low-carbon farming solutions to food majors, and ATOME is providing the critical green inputs needed for this sustainable transition.

FF: What fundamental challenges does the fertilizer industry face in improving nutrient use efficiencies and reducing its environmental footprint, and how is ATOME's Villeta project responding to these issues?

TB: The need for efficient energy and food production go hand in hand, both fundamental drivers that support ATOME's Villeta Project. Better fertilizer products are needed to bring better farming efficiency. According to the IFA only 55% of nitrogen fertilizers applied are effectively absorbed by plants today. This means 45% of nitrogen fertilizers are wasted to water and air - an inefficient use of nitrogen production, which also creates secondary negative effects such as ammonia pollution and eutrophication. The key is to support more efficient farming and fertilizer solutions, and to be able to decarbonise at the same time.

FF: How will ATOME's Paraguay project help to address gaps in the market?

TB: The Villeta project is located in the heart of Mercosur, one of the top food exporting regions in the world. While Brazil is the largest net food exporter globally, it imports 95% of its nitrogen requirements.

ATOME's position in Paraguay – having Argentina on side of the river and Brazil a few hours drive away, represents what we now refer to as "decentralised ammonia" and in our case "decentralised local nitrates". As we are already in the market, we can focus on tailor made products, whilst also having significant logistical advantages over imported nitrogen products.

ATOME's CAN fertilizer uses ammonia produced at industrial scale, made only from renewable power and water. The process virtually eliminates harmful emissions at the point of production, leading to the potential displacement of up to 12.5 million tonnes of CO_2e [carbon dioxide equivalent] over Villeta's life. Additionally, compared with more widely used urea fertilizers, which cannot effectively be decarbonised, CAN brings better nitrogen efficiencies and also has no acidifying effects on soil, meaning CAN is better positioned for what is required ahead.

FF: Does this mean CAN is the fertilizer of the future and urea the fertilizer of the past?

TB: Well, this isn't an "either/or" situation. Urea will continue to be the dominant nitrogen fertilizer in the world

A computer-generated rendering of the 145MW green fertilizer Villeta Project

simply because of its existing position, volume requirements and lower costs. But fertilizer markets are about segmentation and positioning, and I certainly believe green CAN fertilizers will continue grow their total fertilizer value share. Decarbonised nitrates are positioned well for what leading brand holders need and what consumers are willing to pay for, and farmers will then have incentives to buy more effective green fertilizers the same way.

FF: While green nitrogen projects typically struggle to get ends to meet, you expect ATOME's project in Paraguay to be profitable from day one without subsidies. Why is that?

TB: There are a few important stars that are aligned for our project. We have low cost, "plug and play" renewable energy; we have an attractive inside "competition pocket" with logistical advantages versus imports; and with Yara we can access existing nitrate market segments where we expect to see continuing growth.

According to the IFA, consumption of CAN in Brazil and Argentina was about 1 million tonnes in 2021 and has grown at a CAGR of 14% over a 10-year period. In developed agricultural areas such as Europe, nitrogen application rates are usually close to both economic and environmental optimums, and that also signals headroom for growth in our markets. More nitrogen fertilizers can be used per hectare to optimise existing farmland. For wheat, nitrogen fertilizer application rates in Paraguay are around three times lower than in Brazil and Argentina, implying a large potential growth uplift. The difference is less exaggerated in maize but still, Brazilian application rates are two times that of Paraguay and 40% higher than in Argentina. Perhaps the more compelling story is that fertilizer application rates are 2-3 times lower in Argentina and Brazil than they are in France, altogether demonstrating a continuing strong growth potential for fertilizer consumption in Mercosur.

FF: Finally, ending where we started, what do you think is needed to bring effective low carbon fertilizer solutions to food processors, brands, retailers and consumers?

TB: We need the market driven gamechangers that understand agronomy and Nutrient Use Efficiency to be open to bringing more efficient solutions to market, rather than pushing the same old fertilizer products. Yara is in a league of its own here, as it works proactively with food majors and brand holders, having announced cooperation with leading sustainability companies such as PepsiCo and chocolate manufacturer, Barry Callebaut.

Elsewhere, initiatives from the Hydrogen Council and McKinsey, are working on building pioneering Buying Clubs among sustainability-oriented food majors and CPG [Consumer Packaged Goods] companies are helping to bring effective solutions to market. Europe should also take the announced step of bringing a new sustainable label to products, instead of hanging on to the not-fit-for-purpose green organic leaf that promotes old, inefficient philosophies. QR codes and carbon footprint labels will address the factors that customers need to make shifts. I expect large, multinationals will spearhead these changes as they prepare to meet the demands set by a new generation of consumers. ■

Nano approach to plant feed will improve crop productivity, farm profitability and sustainability

Written by

Dave Rogers, *Public Relations Manager,* ***Nottingham Trent University, UK***

Cutting-edge nanotechnology will drive a new generation of fertilizers aimed at addressing UK food security by improving the nutritional value, performance and health of crops and plants.

Scientists at Nottingham Trent University are working with the company Micromix Plant Health as part of the three-year knowledge transfer partnership, being funded by Innovate UK. It will involve incorporating nanotechnology-enhanced formulations to plant feed, allowing targeted and increased absorption of essential nutrients directly into plant roots and through the leaves. This 'precision agriculture' approach is expected to result in increased yields, reduced harvest times, and prevent against pests, as well as reducing reliance on imported chemicals often used in less effective traditional fertilizers.

(left) Gareth Cave, Professor in Advanced nanotechnology and sustainable chemistry in Nottingham Trent University's School of Science and Technology; *(right)* Tom Mawhood, Director, Micromix Plant Health

The work will involve embedding advanced nanotechnology expertise initially developed at Nottingham Trent University for the pharmaceutical industry into commercially viable plant feed and will benefit UK commercial agriculture and horticulture sectors.

It is thought to be the first time commercially accessible plant biostimulant has been produced using bespoke nanotechnology that has the capacity to correct trace mineral deficiencies as a way of improving both crop productivity and nutrition.

The project will also address two major environmental challenges in modern agriculture by minimising fertilizer waste and reducing environmental runoff containing possible pollutants. In turn this will also help improve the farmers' profitability with a reduced cost of treatment to achieve the yield increases required to maintain commercial viability.

Plant performance trials

Nano-minerals will be synthesized and new fortified plant feed will be formulated in both powder and liquid form before a series of plant performance trials across the UK.

"This work will tackle general inefficiencies inherent in traditional

fertilizers and will benefit both farmers and gardeners," said principal investigator Gareth Cave, Professor in Advanced nanotechnology and sustainable chemistry in Nottingham Trent University's School of Science and Technology.

Professor Cave specialises in nanotechnology and its applications across health, materials science and agriculture. He leads research in food security and plant science – involving crop disease control, biofortification, seed-coating technologies and vertical farming to enhance yield, nutrition and sustainability – as well as green and sustainable nanomaterials, designing environmentally friendly nanotechnologies to support health, agriculture and industrial applications.

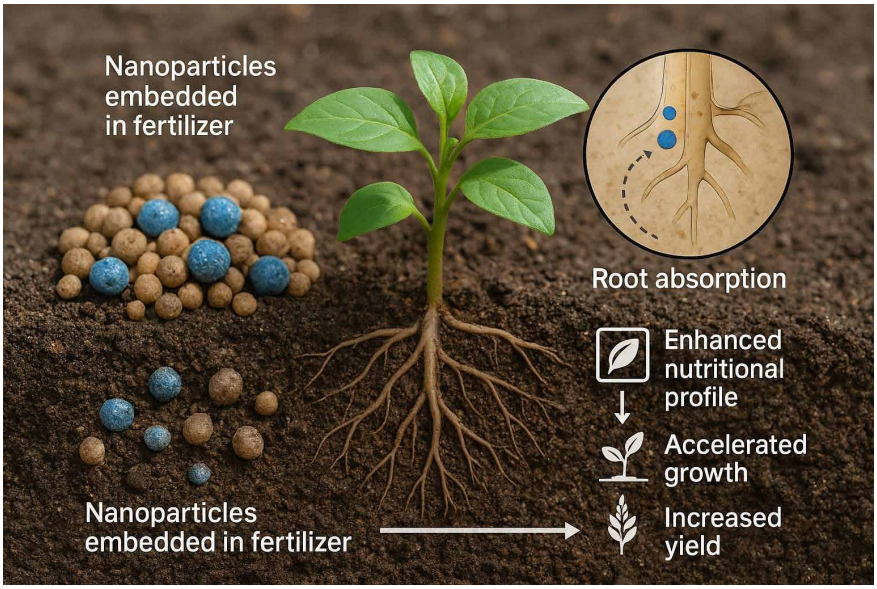
"Our technology can help drive agricultural productivity and resilience by accelerating crop growth and yield, strengthening plant defences against environmental pressures, and reducing vulnerability to pests. This precision-targeted approach to nutrient delivery will ensure controlled release directly to plant roots, optimising absorption while preventing excess leaching into ecosystems. The result is healthier soil, reduced environmental impact and a shift towards more sustainable farming practices," commented Professor Cave.

Tom Mawhood, Director at Micromix Plant Health, said: "We are excited to commence work with Gareth and his team both to develop new products but also to improve the effectiveness of our existing products. Farmers face considerable financial and practical challenges and we anticipate that these enhanced nano-products will materially improve quality, yield and profitability. There are already some interesting developments we are pursuing for each of cereal crops, oilseeds, potatoes and sugar beet."

Reducing element losses

Micromix Plant Health's philosophy has been built on reducing the need for large amounts of soil applied fertilizers and high pesticide inputs, offering solutions to increase

Figure 1. Nanoparticles potentially offer the technology to create a more 'complete', safe, stable and environmentally friendly formulation



Cutting-edge nanotechnology will drive a new generation of fertilizers

crop health and vigour, from early establishment, provide essential nutrition at the key stages of plant growth, solutions to help with over-wintering, and help the plant deal with the abiotic stresses caused by the extremes in weather and environment.

The efficiency and efficacy of its foliar feed products allows for targeted dose and application timings and much lower application rates than traditional soil applied fertilizers.

Products are designed to be applied in conjunction with the standard farm pesticide treatment programme, offering a number of environmental benefits, from reducing passes through the crop, optimise fuel consumption and minimising cultivations as typically seen with the current trend of a move towards a more 'regenerative' approach to farming methods.

Foliar fertilizers also help reduce essential element losses to the environment, remedy issues with nutrient lockup, variation in soil pH and cation exchange capacity, that effect plant establishment and growth and that can be typical with soil applied fertilizers.

The biostimulant technology in its formulations help stimulate the plant to optimise photosynthesis, increase efficacy of the applied micronutrition, optimise the production of both roots and fine root hairs which in turn stimulates a healthy rhizosphere and help the plant's own natural ability to find essential nutrition and water.

With the predicted climate change issues, Micromix is embracing new technology such as the innovative field of nanotechnology to help growers to increase yield and reliability, whilst reducing environmental risk.

Nanoparticles potentially offer the technology to create a more 'complete', safe, stable and environmentally friendly formulation, with all the nutrition required by a particular crop at a particular time, removing the need for complex tank mixes. ■

MARKET NEWS ›

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News in brief

EUROPE

OCI to update on sale of Europe business by year-end

Fertilizer producer OCI expects to share updates on the potential sale of its European distribution and production assets by the end of the year, it said in its latest quarterly results.

OCI, which is headquartered in the Netherlands, has been in discussions with potential buyers, "which may result in a sale by year-end".

It operates the Geleen nitrogen production plant in the Netherlands, which specialises in nitrates and UAN, but also produces DEF/AdBlue and some other grades. OCI said its facilities are "competitively placed on the continent and for future positive performance" following major maintenance works and initiatives to improve energy efficiency.

The company's European Nitrogen segment reported operating losses of USD23mn in January-June, compared with profits of USD8.2mn a year earlier. Earnings were down because of higher natural gas prices, as well as lower sales volumes.

OCI sold 655,000t of CAN out of its own production in January-June, up by 6% on the year. It also sold 158,000t of UAN, up by 13%. But sales of ammonia out of its own production fell by 35% to 144,000t because of plant outages and planned maintenance.

OCI in recent years has divested a large part of its fertilizer business, as well as other segments. In 2023 it announced the sale of its 50% stake in producer Fertiglobe and its Iowa Fertilizer nitrogen plant, followed by the sale of its clean-ammonia plant in Texas in 2024. OCI announced the completion of the sale of its methanol business last month.

The company is exploring a potential merger with Orascom Construction to establish an Abu Dhabi-based company. As part of the merger, OCI would be liquidated and delisted from the Euronext Amsterdam Stock Exchange.

Norway's Yara still pursuing US ammonia project

Norwegian fertilizer giant Yara remains committed to pursuing equity in US ammonia production assets.

The commitment comes despite Yara's recent decision not to pursue a 1.4mn t/yr carbon capture and storage (CCS) based ammonia plant in the US Gulf with chemical company BASF.

"Taking an equity stake in US ammonia production is still expected to be highly value accretive as it enables us to access low cost gas and production economies of scale, lowering fixed cost and maintenance cost" said chief executive officer, Svein Tore Holsether.

A final investment decision for the firm's other planned CCS ammonia project in the US Gulf with Enbridge is still slated for the first half of 2026, Yara confirmed.

Yara also remains ahead on its cost and capital expenditure reduction plan, achieving further reductions of USD38mn in the last 12 months.

Yara has been restructuring its European production assets under the reduction plan, and confirmed the mothballing of its Terte, Belgium, ammonia plant. The firm first proposed the plants closure in October 2024.

Of the 3mn t/yr ammonia Yara consumes in Europe for nitrates and NPK production, around 50% is already imported, Holsether said. And all of the company's nitrate capacity is now fully flexible on where ammonia is sourced.

"With structurally higher gas costs in Europe and increasing carbon taxation, capitalising on this is key", Holsether added.

More than 40% of Yara's imported ammonia goes to its Norway production plant, the firm said, which will not be subject to a carbon border mechanism until 2027 at the earliest.

Import flexibility will also be integral to the firm's approach following the implementation of the EU's Carbon Border Adjustment Mechanism (CBAM) from 1 January 2026. Yara remains hopeful that an export mechanism will be finalised for EU goods exported outside the bloc before CBAM financial obligations start in 2027.

Yara has produced 5.3mn t ammonia so far this year, largely in line with last years' volumes. Production volumes could fall next year with major turnarounds planned at Yara's Belle Plain plant in Canada and its Pilbara, Australia, facility.

NORTH AMERICA

US, Australia minerals deal aims to bypass China

The US and Australia signed an agreement on Monday that seeks to expand the two countries' production of rare earth and critical minerals, a field where China's dominant position offers potential leverage around trade.

The US and Australia intend to invest "more than USD3bn together" in critical minerals projects over the next six months under the agreement, according to a White House fact sheet. Australian prime minister Anthony Albanese said the deal aligns with a goal for Australia to not just be "digging things up and exporting them", but to expand its domestic supply chains. US president Donald Trump said he was optimistic the agreement will boost production of the minerals, which are a key material used to produce semiconductors and advanced batteries.

"In about a year from now, we'll have so much critical mineral and rare earths that you won't know what to do with them," Trump said.

The minerals deal, a full copy of which was not immediately available, comes as Trump looks for an upper hand in negotiations with China on trade. Beijing said it would extend export controls on rare earths and certain batteries. Trump responded by threatening to increase tariffs on China by an additional 100 percentage points.

Trump has since voiced optimism he can reach a deal with Chinese president Xi Jinping that will avoid a steep escalation in tariffs, which he says would increase to an effective rate of 155% on 1 November absent an agreement. He conceded such a high rate was "not sustainable" in an interview broadcast on Fox News.

"I think we'll make a deal" with China, Trump said. "They threatened us with rare earths, and I threatened them with tariffs, but I could also threaten them with many other things like airplanes.

Trump reiterated his plans to meet with the Chinese president on the sidelines of the Asia-Pacific Economic Cooperation forum in South Korea. US treasury secretary Scott Bessent held a video call with Chinese vice premier He Lifeng to discuss trade and economic issues. The two sides had "candid, in-depth and constructive exchanges" during the call, according to Chinese state news agency Xinhua.

Future of Cinis Ky. SOP project unclear

The future of Cinis Fertilizer's SOP production facility in Kentucky is uncertain following the producer's decision to initiate a strategic review of its operations.

The Swedish-based producer announced its plans in September 2023 to build the 300,000t/yr SOP production facility in Hopkinsville, Kentucky, with a slated on line target of late 2026.

Cinis did not directly comment on the future of the Hopkinsville, Kentucky, plant following the initiation of a company-wide strategic review in September. The review will focus on the company securing financing for its Ornskoldsvik, Sweden, SOP facility that would enable Cinis to hit its production target there of 100,000 t/yr, a goal the company originally hoped to meet by the year's end but has since been removed under the strategic review. The review will also evaluate the financing of projects in other locations, collaborations and potential divestments.

Instead, the company pointed towards US battery-material manufacturer Ascend Elements' decision to pause construction of its adjacent project in Hopkinsville that would have supplied 240,000 t/yr of sodium sulphate to Cinis under a 10-year agreement. The pause in the project was underpinned by "changing market conditions," resulting in Cinis cancelling the USD164mn grant it received from the US Department of Energy.

The Swedish-based producer announced its plans in September 2023 to build the 300,000t/yr SOP production facility in Hopkinsville, Kentucky, and start production in 2026. But between challenges securing feedstock for the plant and the company's increasing focus on Swedish operations, the future of the Kentucky plant is unclear.

Alltech breaks ground on USD4.6 mn biofertilizer production facility in Kentucky

Global agriculture company Alltech broke ground today on a new USD4.6 mn, 15,000-square-foot manufacturing facility that will produce biological fertilizers and crop inputs, providing farmers with an environmentally responsible alternatives to traditional chemical fertilizers and helping reduce reliance on imported, synthetic inputs.

Located on the campus of Alltech's global headquarters, the facility will be the company's first U.S. manufacturing plant dedicated solely to producing crop science technologies. Modeled after Alltech Crop Science (ACS) facilities in Brazil and Spain, the Kentucky site will produce more than 66,000 gallons of biological fertilizers per shift per month and create at least six new full-time jobs. It will also manufacture more than 30 natural products designed to help farmers enhance soil and crop vitality.

The project is supported by a USD2.34 mn grant from the USDA Fertilizer Production Expansion Program (FPEP). The USD500 mn FPEP initiative, launched in 2022 in response to supply chain disruptions and rising fertilizer prices, aims to expand the production, availability and affordability of domestic fertilizer and nutrient alternatives and reduce reliance on imported synthetic fertilizers.

Alltech's project was selected for its innovative approach to soil and crop health. Made with beneficial microorganisms, the company's biofertilizers improve soil fertility, stimulate root development, enhance nutrient uptake and support a healthier soil microbiome, enabling farmers to maintain productivity while reducing environmental impact.

"This facility represents the next phase in scaling our biological innovations for agriculture," said ACS vice president Dr. Steve Borst, who leads the project. "By expanding production here in Kentucky, we can bring farmers natural, science-based solutions that improve soil health, strengthen crops and reduce reliance on synthetic fertilizers. We're grateful to the USDA and to our state and local partners for their support in making this vision a reality."

In addition to supporting U.S. farmers in reducing dependence on imported synthetic fertilizers, the new crop science facility will enable ACS to expand the reach of its natural agronomic technologies across both the U.S. and international markets. Leveraging Alltech's more than four decades of expertise in microbial fermentation and nutrigenomics, ACS delivers environmentally responsible alternatives to traditional chemical applications. These biological solutions restore soil balance, strengthen soil health, maximize crop yields, improve plant resilience, promote stewardship and create long-term value across the food chain.

Nationally, this project's impact enables the export of domestic technologies, driving international uptake of U.S. products and supply chain resiliency for U.S.

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growers. In addition, Alltech's new facility will be instrumental in growing the offering of its in-market sustainable technologies domestically and internationally.

SOUTH AMERICA

Brazil's Unigel files for bankruptcy protection

Brazilian petrochemicals group Unigel filed for bankruptcy protection in Sao Paulo state's bankruptcy court.

The request comes after Unigel concluded its extrajudicial reorganization in early 2025. The company said it aims to readjust its capital structure and to preserve its activities.

Unigel is focusing operations on the styrene supply chain and its sulphuric acid project, claiming that the bankruptcy protection request will solve its capital structure issues.

In January 2025, Unigel reduced its financial leverage by 50% after converting its R5.1bn (USD930mn) debt into new financial instruments that were not disclosed.

The company also announced in early 2025 a USD100mn credit line issuance, of which 30% would be used to complete the 450,000 t/year sulphuric acid unit in northeastern Bahia state's Camacari industrial complex. The project is in the final stage of construction and is expected to start operations by January 2026.

The company left the fertilizer market in April 2025, when Brazilian state-controlled Petrobras' approved an agreement to take back control of two fertilizer plants, also known as Fafens or Fabricas de Fertilizantes Nitrogenados, in Camacari and Laranjeiras, Sergipe state, which were leased by Unigel in 2019 with initial plans to continue through 2030. They have a combined capacity of 900,000 t/yr of ammonia and 1.1mn t/yr of urea.

MIDDLE EAST

Ma'aden plans to triple fertilizer production

Saudi Arabia's Ma'aden will triple its fertilizer production by 2040, the producer said.

The company plans to leverage Saudi Arabia's ready access to the key raw materials of phosphate rock, natural gas and sulphur, Ma'aden's vice-president for phosphates strategy and business development, Faisal Abdulaziz al-Jandal, said at the Gulf Petrochemicals and Chemicals Association conference in Abu Dhabi.

The expansion is likely to include new DAP/MAP/NP/NPKs facilities, including the company's ongoing Phos 3 expansion, as well as some merchant ammonia, although no details could be confirmed.

The 3mn t/yr Phos 3 project is ramping up in two phases from 2027-29.

Argus estimates Ma'aden produced around 3.5mn t of DAP, 1.5mn t of MAP and 0.4mn-0.5mn t of NP/NPKs last year.

The company intends to continue expanding production beyond traditional products such as DAP and MAP as it expects demand growth rates to be stronger in NP/NPKs and micronutrients.

Demand growth is unlikely to keep pace with the increase in supply from Saudi Arabia, implying some competitive readjustment to global trade flows. Argus forecasts demand growth at less than 0.5% P2O5/yr, although Ma'aden expects growth of 1.4-1.5%/yr, al-Jandal said.

The company had the lowest DAP production costs in the world last year, Argus estimates, driven by its phosphate rock and ammonia production costs.

AFRICA

Angola starts construction on second fertilizer plant

Construction has begun on a three-train, 1.5mn t/yr fertilizer plant in Angola's coastal Bengo province, led by east African producer Itracom. It is the second fertilizer facility in the country, following a 180,000 t/yr granulation plant by local conglomerate Noble Group, which is scheduled to start operations next month.

The first train of Itracom's organomineral plant is expected to cost USD373mn. The company aims to position Angola as a regional fertilizer hub, with export capacity and reduced reliance on imports, according to the Angolan government.

Itracom produces the Fomi brand of organominerals, which includes three main grades — 9-22-4, 11-22-0 and 21-8-0 — and 11 crop-specific blends. The company uses organic matter sourced from manure and also produces dolomite lime. Calcium and magnesium are key components of the Fomi brand.

Itracom began fertilizer production in Burundi in 2019 with a 350,000 t/yr plant, and expanded to Tanzania in 2021, citing access to raw materials in "Africa's second-largest livestock keeper". It now operates a 200,000 t/

yr phosphate mining and processing site and a 1mn t/yr fertilizer plant there, commissioned in June.

The Angolan plant is part of a wider expansion programme for Fomi manufacturing, Itracom said. The company recently signed a USD180mn agreement with the Ugandan government for a 250,000 t/yr plant due by February 2027. A USD290mn facility in Kenya is also planned, alongside manufacturing expansions in Ghana and Nigeria.

Angola's secretary of state for industry Carlos Rodrigues said the Itracom project reflects investor confidence and the government's commitment to attracting private capital and promoting sustainable development. The government plans to make over 74mn ft^3/d of natural gas available for fertilizer production from next year.

Noble Group's 180,000 t/yr granulation plant — the country's first — is located in southern Benguela province and is expected to start in October. Its subsidiary FertiAfrica signed an agreement in August to granulate, bag and warehouse Primeiro-branded fertilizer for Australia's Minbos, which has a phosphate project in Angola's Cabinda exclave and a green ammonia project in Capanda.

US engineering firm KBR is also managing the USD2bn Amufert plant in Zaire province, which is expected to produce 840,000 t/yr of ammonia and 1.5mn t/yr of urea for local conglomerate Opaia Group. That plant is scheduled to start in 2027.

Itracom's first train in Angola is expected to come online by May 2026.

AUSTRALASIA

Highfield raises USD6.45mn for Spanish potash mine

Australian prospective potash producer Highfield Resources has secured an additional AUSD10mn (USD6.45mn) of capital for its 1.3mn t/yr Muga potash project in northern Spain.

The extra investment will come from existing shareholders and be used to address matters related to a permit for the Goyo mining concession, which is part of Muga, and allow the firm to continue wider work at the mine.

Highfield received an environmental permit for Muga in 2019 and began construction at the mine in 2022.

The additional capital comes soon after major China-based potash producer Qinghai Salt Lake pulled out of its planned acquisition of Highfield in August.

Australia approves Ammaroo phosphate mining licence

Australia's Northern Territory (NT) government approved a mining licence for Verdant Minerals' 2mn t/yr Ammaroo phosphate project on 8 October, the firm announced on the same day.

The approval of the mining licence is the next step towards construction and mining operations at the 1.14bn t deposit of phosphate rock. It also comes after the NT government granted two mineral leases to Verdant Minerals earlier this year.

Ammaroo is one of the world's largest undeveloped phosphate resources and is located 1,300km south of NT capital Darwin. Once operational, Verdant expects the project to produce up to 2mn t/yr of phosphate rock over a 25-year lifetime.

"With this approval secured, we will now move swiftly to finalise project funding with our lenders and partners, paving the way for a final investment decision and a targeted construction start in 2027," Verdant Minerals managing director Chris Tziolis said in a press statement.

Fertiglobe buys Wengfu's Australian fertilizer assets

UAE-based chemicals and fertilizer supplier Fertiglobe completed its acquisition of Chinese-owned Wengfu Australia's distribution assets on 1 October, expanding further into Asia-Pacific.

Fertiglobe now owns Wengfu's distribution assets including eight warehouses across five ports on Australia's east coast with 700,000-800,000 t/yr of distribution capacity, which Fertiglobe said it may scale up to 1.1mn t/yr.

Fertiglobe can produce 6.6mn t/yr of saleable urea and ammonia from its operations in the UAE, Egypt and Algeria. The acquisition, first announced in May, will widen Fertiglobe's business to include phosphate and potassium-based fertilizers alongside the existing nitrogen products.

The firm has announced plans to sell lower emissions fertilizers into the Australian market. Australia's federal Labor government recommended sustainable fertilizer products, such as nitrification inhibitors, in its agriculture and land sector plan released in September as part of its legislated 2035 emissions reduction target.

Fertiglobe completed the acquisition on the same day that Australian explosives manufacturer Dyno Nobel sold its fertilizer distribution arm to Australian agri-business Ridley. ■

Argus Insight:

The collapse of phosphate output in Oceania

What comes next?

Despite having extensive natural reserves of phosphate rock, Australia's phosphate fertilizer production is in a state of collapse because of rising natural gas prices, transportation costs and more competitive imports. Since 2019, three phosphate production facilities have shut down and there are none in the pipeline.

But as many as five phosphate rock projects have been proposed in Australia, which could help revive Australia's phosphate fertilizer production and reduce producers' exposure to rock imports that are subject to volatility in the global market — if they come to fruition.

The Australian government plays a pivotal role in supporting domestic phosphate projects to ensure the success of local production. Developers also need to carefully consider their supply chains and find reliable transportation methods from project to port.

This paper examines the changes in the Australian and New Zealand phosphate fertilizer landscape in terms of production, logistics, policy and competition from imports. The paper will also discuss current rock projects in Australia, and the logistical and distribution challenges that rock producers face in the country.

Australia faces decline in phosphates production

Australia's domestic phosphate fertilizer supply has declined dramatically since 2019, with the shutdown of two single superphosphate (SSP) plants — CSBP's 100,000 t/yr Kwinana plant and Incitec Pivot's (IPL) 180,000 t/yr Portland plant. The Kwinana plant closed because of reduced SSP demand, international competition and rising production costs. IPL did not provide reasons for the Portland shutdown.

A number of phosphate rock projects are in the pipeline in Australia

IPL will also shut down its 350,000 t/yr Geelong SSP production at the end of 2025.

Two phosphate fertilizer facilities are currently operational in Australia — Dyno Nobel's 740,000-800,000 t/yr Phosphate Hill, producing MAP and DAP, and Impact Fertilizer's 150,000-200,000 t/yr SSP facility. Dyno Nobel's fertilizer distribution arm, IPL, was acquired by agribusiness Ridley in May 2025, but the deal did not include Phosphate Hill.

Phosphate Hill is undergoing a strategic review that will be completed by the end of this year. The site has struggled because of its reliance on the temperamental and expensive Mount Isa railway. And the project relies on sulphuric acid from the nearby Mount Isa copper smelter, which is set to close in 2030. Its operator, Glencore, is seeking a government bailout to extend the mine's life. Without financial aid to rebrick the smelter in 2026, the smelter may have to cease operations earlier than its expected retirement in 2030. The Mount Isa copper mine stopped operations in July 2025.

Importing sulphuric acid rather than taking it from Mount Isa would result in additional freight costs and longer transit times for Phosphate Hill. Australia's sulphuric acid imports in recent years have primarily come from South Korea, Japan and China, where spot prices can be quite volatile. Argus assessed the sulphuric acid spot price at USD80.50/t fob China on 11 September, up from USD50.50/t on 3 January. The South Korea/Japan spot price has followed a similar trend, although China has held a USD3-13/t premium in 2025.

If Phosphate Hill is still operational by the end of 2025, Australia's phosphate fertilizer production capacity will be 970,000 t/yr, down from 1.6mn t/yr in 2019. Without Phosphate Hill, the total will be just 170,000 t/yr from Impact's Tasmania plant.

Increasing reliance on imports

The decline in Australian phosphate fertilizer production has already increased its reliance on imports.

Fertilizer use and imports in Australia are seasonal. MAP and DAP imports are generally low in May-September, with an uptick in October. February and March tend to witness the highest imports. Demand for phosphate-based fertilizer is dependent on the soil, crops and affordability.

MAP imports were below 100,000t in 2017-19, before rising significantly to almost 1.5mn t in 2024. IPL's Portland plant shut down in 2019, the first of the recent closures. DAP imports have not been as affected by closures, although there was a drop in 2022 and 2023. All fertilizer imports fell after Russia invaded Ukraine, which affected global fertilizer supply chains, and Russia and China reduced their fertilizer exports.

SSP imports follow a similar trend to MAP but make up only 2% of total phosphate fertilizer imports, and were less than 40,000t in the record 2024 year.

Australia imported MAP and DAP mainly from Morocco, China, Saudi Arabia and the US in 2024. There is an element of risk importing from these regions due to geopolitical tensions and changing regulations such as taris and export restrictions. Australia imports phosphate rock from South Africa, Togo, Jordan and Algeria, according to data from the Australian Bureau of Statistics.

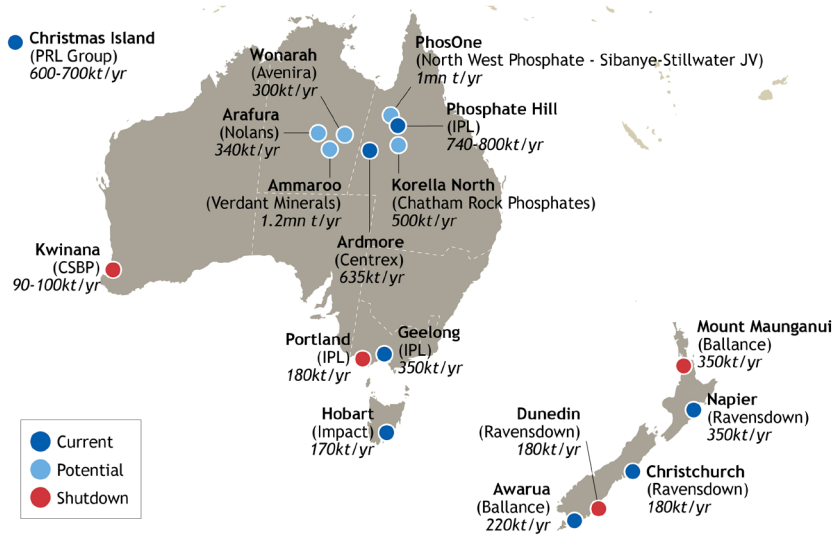
SSP requires phosphate rock containing phosphorus of less than 10%, which is not mined in Australia. Because of this, SSP production is reliant on phosphate rock imports. Australia imported 280,000t of phosphate rock in 2024, down by 42% from 414,500t in 2022.

Local MAP, DAP and SSP production will become even less attainable and will probably shut down completely without a local stream of phosphate rock supply. In the meantime, there is a large pipeline of phosphate rock and concentrate projects that could help support phosphate fertilizer production in the long term.

Phosphate rock on the up

A number of phosphate rock projects are in the pipeline — Avenira's 25,000 t/month Wonarah mine and Verdant Minerals' 2mn t/yr Ammaroo mine, both in the Northern Territory (NT), as well as North West Phosphate's 1mn t/yr PhosOne joint-venture project with mining processing group Sibanye-Stillwater in Queensland.

Figure 1. Closed, current and proposed Australian projects



Source: Argus Media

Avenira expects its first shipment in October-December 2025, while PhosOne expects first exports in April-June 2027. Verdant Minerals has not provided a timeline for its production.

Australian rare earths developer Arafura's 340,000 t/yr Nolans rare earth project also plans to produce phosphate rock in the NT. Arafura aims to take a final investment decision in 2026, followed by 37 months of construction.

Australia's first phosphate rock producer Centrex and its subsidiary Agriflex's 635,000 t/yr Ardmore phosphate mine started commercial production and exported its first cargo in 2022 but went into voluntary administration in March 2025. The company did not provide any reason for this but did note a 145% increase in freight expenses in its 2024 annual report to shareholders.

Phosphates Resources (PRL) began the process of acquiring Centrex, including Ardmore, in April 2025. After meeting PRL requirements including organising a deal with rail operator Aurizon, PRL completed the takeover on 11 September. Operations at the mine had restarted by 4 September and customer shipments are expected by the end of 2025.

These will add to PRL's over 600,000 t/yr Christmas Island rock phosphate operation. The project has a mining lease to 2034. PRL exports rock primarily to Malaysia, Indonesia, Australia and New Zealand.

Australia's phosphate rock resources are found inland, far from ports and often without existing rail or road infrastructure. Avenira's Wonarah mine, for example, requires the construction of a gas supply line, power station and slurry pipeline as well as a 105km rail spur. Multiple companies have cited the high cost of using the Mount Isa railway as a factor in their project's struggles.

Transport challenges

The Mount Isa railway runs for 1,000km from Mount Isa to the port of Townsville in Queensland. The Queensland government announced that it would introduce an incentive package to reduce access charges to the line in May 2025, specifically focused on emerging rock phosphate producers.

The railway is also susceptible to flooding, while Townsville has insufficient facilities to export large amounts of raw materials. The port can export refined products like MAP

The New Zealand phosphate market is facing high gas costs

and DAP, but not phosphate rock. The Glencore-owned port has one berth with the capacity to handle ore.

New Zealand-based Chatham Rock Phosphates (CRP) is conducting a study into developing an alternative railway, RailPhos, that could facilitate 10mn t/yr of phosphate product exports through the port of Karumba in north Queensland. This would also connect the company's 1.5mn t/yr Korella North Mine, expected to reach full production by 2028.

But CRP intends to export primarily to international buyers producing lithium iron phosphate batteries, it tells Argus. Other phosphate projects could benefit from this privately owned and operated railway if it succeeds, including North West Phosphates, Avenira and PRL Ardmore.

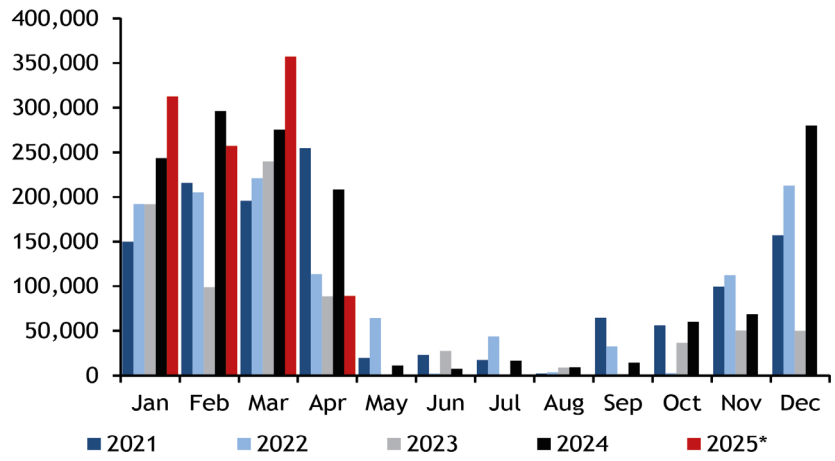
PhosOne plans to use slurry pipelines rather than rail to transport phosphate rock due to the high cost of rail. Like CRP, PhosOne will export rock from Karumba.

Government support

Glencore is seeking government support to continue operating its Mount Isa copper smelter and refinery, with no success yet. But there has been significant support from the pro-mining state governments in Queensland and the NT for some developments, with Ammaroo receiving major project status and PhosOne being declared a prescribed project.

Phosphorus is on the federal government's list of strategic minerals for its use in lithium iron phosphate batteries that will contribute to the global push to net zero. This means that the government will probably support the processing and extraction of phosphate rock to help meet its net zero target.

Figure 2. MAP import seasonality*(t)*



Source: Argus Media

New Zealand's phosphate projects

While Australia primarily uses MAP, New Zealand growers prefer DAP. New Zealand imported close to 195,000t of DAP and only 765t of MAP in 2024, according to data from New Zealand Statistics.

Two New Zealand phosphate projects have or will shut down in 2025, leaving it with one in operation and none in the pipeline. Ravensdown's 180,000 t/yr Dunedin site shut down in January and Ballance Agri-nutrients' 350,000 t/yr Mt Maunganui plant will shut down by the end of 2025. Both cited overcapacity for the closures. Ballance's 220,000 t/yr Awarua SSP plant will be the country's only SSP source by the end of this year.

New Zealand's fertilizer production costs have risen of late as the country's gas prices have jumped on dwindling reserves.

Supply outlook

Australia's phosphate fertilizer industry is struggling as plants shut down and costs increase. Imports of MAP, DAP and SSP will probably continue to rise, leaving the market at the whims of global supply chains prone to geopolitical complications. But the phosphate rock projects set to start up in the coming years may reduce this reliance.

Yet this rock supply could also be exported for fertilizer or lithium iron phosphate batteries. And the projects are under strain with little government support, high transport costs and remote locations.

The New Zealand phosphate market is facing high gas costs and an oversupply of SSP, resulting in the closure of multiple manufacturing plants. A reliable source of phosphate rock from Australia would benefit New Zealand's remaining SSP production. But New Zealand will be reliant on imports of fertilizers and/or rock from other regions such as the Middle East without Australian supply. ■

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Price watch

*These market insights are provided by **Argus Fertilizer Analytics team***

AMMONIA

Surplus expected in the months ahead

Global ammonia markets are due to remain firm through the next quarter, with prices supported by persistent supply constraints and accelerating seasonal demand for fertilizers. Outages at several key supply hubs including the Middle East, Indonesia, north Africa and Trinidad, continued through September from August. A particularly severe issue for Ma'aden in Saudi Arabia has impacted short-term sentiment as the 1.1mn t/yr unit affected will be offline for the rest of the year. The October Tampa contract settled at USD590/t cfr, marking a fourth consecutive monthly increase and highlighting the market's heightened sensitivity to production volatility as seasonal demand begins to peak. But we believe the largest Tampa price rises are behind us, with only a marginal firming forecast for November as the residual tightness keeps some upwards pressure on prices, but there are hopes that sentiment will begin to shift towards bearish with the start-up of the Texas City-based Gulf Coast Ammonia plant, followed by Woodside's Beaumont plant.

Regional supply is poor — north African fob prices have surged, with Algeria's Sorfert selling out until mid-November and other producers facing production challenges. Egypt and Libya have resumed exports, but volumes are insufficient to ease the tightness. The threat of another round of severe Trinidadian gas curtailments looms large, after deep cuts were pushed back in both September and October. The hope is that when they come, the peak US fertilizer season will have passed and new US Gulf supply will be up and running, mitigating the impact. But it remains an upside risk to our forecast if the cuts come in October instead, with Trinidad's supply key for the US, Europe and Morocco.

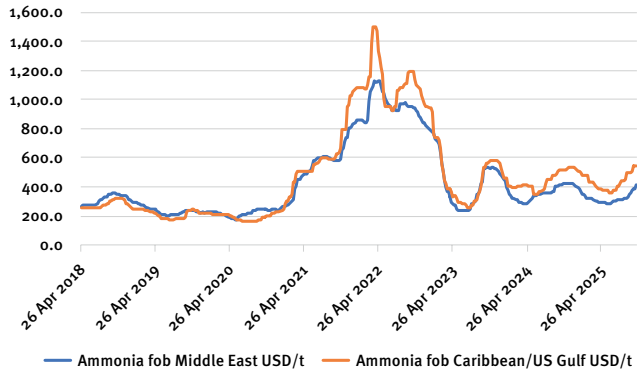
Limited spot availability and rising seasonal demand have pushed European delivered prices to nine-month highs. Russia's exports from Ust-Luga offer some relief, but infrastructure risks remain. US domestic demand is firming ahead of the autumn application season, while production outages and limited merchant availability continue to restrict supply. The looming gas curtailment in Trinidad is expected to add further supply-side pressure.

East-of-Suez prices also remain under upwards pressure, as a prolonged shutdown at Ma'aden's MPC-1 unit has removed over 100,000 t/month from the merchant market and is expected to last into the new year at least. Iranian volumes will tighten further as Hengam prepares to shift to urea production with the commissioning of that unit. Indian buyers are testing the market for October-November deliveries because of rabi season demand and curtailed contract flows. Substantial firming is therefore expected in the near term at all our east-of-Suez benchmarks, but particularly at India cfr.

The situation will be very different in 2026. Alongside the two US plants, Russian exports will improve after Eurochem expands its Ust-Luga terminal this quarter. After netting off the Middle East downstream expansions and a handful of smaller projects, we expect that global merchant capacity will grow by 1.6mn t/yr in 2026 compared with 2025, or 9% of the seaborne traded market. This extent of additional supply will be a strong bear factor globally, but especially in west-of-Suez markets where the expansions are concentrated.

Prices at all our forecast benchmarks will soften continually from November 2025 until June 2026 where they will stabilise. But the seasonal firming that has occurred in every year since 2022, whereby rising demand causes prices to rise from July to late in the year, will be far less pronounced next year. On average, we expect prices at the Middle East fob benchmark to be USD325/t in 2026, down from USD337/t this year. Across the Suez, the Caribbean fob benchmark will average USD400/t in 2026 from USD460/t in 2025.

Ammonia historical pricing



There are of course risks to our forecast. In particular, these include delays to one or both of the worldscale projects in the US anticipated for the fourth quarter, or another round of coincidental outages in the Middle East, north Africa and Trinidad in the early part of next year. But should only one of these outcomes come to fruition, there will be enough excess supply to maintain the bearish trend, albeit at a slower rate than in our base-case forecast.

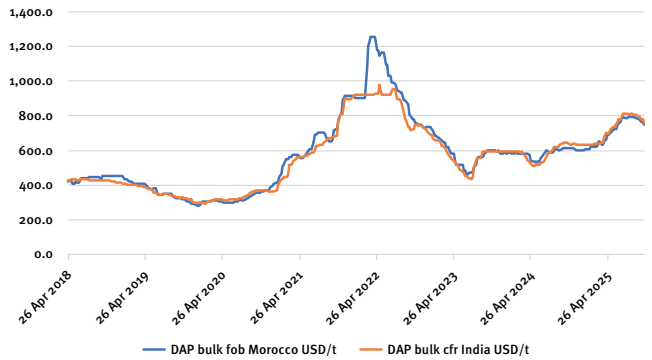
PHOSPHATES

Australian MAP buying delayed as prices fall

Phosphate prices are under pressure globally because of declining seasonal demand, high inventory levels, delayed tender activity and shifting trade flows. A downward price trend is expected over the outlook period, but structural supply risks, geopolitical tensions and Chinese export restrictions are likely to keep overall prices historically elevated in 2026. DAP prices in India continue to soften, driven by limited alternative outlets, delayed tender activity in Bangladesh and Ethiopia and incoming supply from Morocco and Saudi Arabia that is already committed. This has improved India's stock position and given buyers leverage to push prices lower in the offseason, even with healthy buying. In April-May 2026, efforts to maintain stock levels ahead of the kharif season, combined with ongoing restrictions on Chinese exports, will create a global DAP deficit and firm prices.

Chinese export activity has slowed, with traders struggling to find reliable demand. Prices across southeast Asia are weakening, reflecting soft seasonal demand and high inventory levels. Buyers in the region remain cautious, contributing to limited market liquidity and downward price pressure. Buyers in Bangladesh and Ethiopia are using the closing export window and healthy competition to negotiate lower prices, successfully driving down offers. DAP fob China prices are expected to continue declining through the end of the year, before stabilising across the first quarter, as export activity pauses and the domestic season continues. A return of Chinese exports to India is assumed in the third quarter of 2026, which will add pressure and weigh on regional prices. Meanwhile, Australian MAP demand remains subdued as farmers face affordability challenges and delay purchases in the hopes of further price reductions. This cautious buying behaviour is likely to exclude Chinese supply for the coming season and shift demand towards OCP and Ma'aden.

Phosphates historical pricing



West of Suez, the broader European market remains in a holding pattern, with buyers following a trend of delaying purchases until closer to spring, and benefiting from sliding prices in the interim. We anticipate that Russian suppliers will move product into Europe for the coming spring, but at reduced levels following the imposed tariffs. When the additional cost is applied by July, we expect the bulk of supply will be redirected to other, more attractive markets. Europe will then possibly incur higher prices from a more concentrated pool of suppliers.

Phosphate prices in the US continue to decline at a time of slowing trade and persistent demand uncertainty. Expectations of subdued autumn demand, coupled with supply carryover, are contributing to downward price pressure. Affordability issues, cash flow constraints and logistical bottlenecks are exacerbated by the ongoing federal government shutdown, which is further muddying market sentiment. Larger farms are likely to weather these challenges, but smaller operations will reduce phosphate application to manage costs. But we expect spring demand will show notable signs of recovery, and growers will have more pressure to replenish nutrients in the soil, having skimped this season.

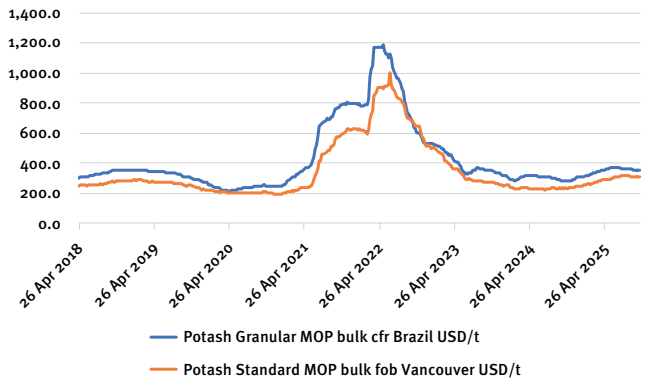
Brazilian buyers remain on the sidelines, waiting for further price declines and using the offseason to extend downward pressure. Interest in MAP imports is minimal. Prices are expected to continue softening over the next several months, with weak offseason demand reinforcing the trend. Even during seasonal demand ramp-ups in 2026, elevated interest in super-phosphates is likely to limit price gains.

POTASH

Price sentiment expected to soften

The global potash market is entering the final quarter of the year with a cautious tone, shaped by varying inventory narratives, seasonal demand slowdowns, and shifting macroeconomic conditions. Some regions are seeing renewed tender activity, but overall market momentum remains subdued, with pricing reflecting a mix of stability and weaker sentiment. The market is shaped by a

Potash historical pricing



delicate balance between strong supplier commitments, particularly in Asia-Pacific, and subdued demand in key western regions. Commitments for MOP continue to be supported by stock replenishment in China and India, despite the seasonal demand lull. Tender activity in Indonesia and Malaysia is adding some support, but the bulk of interest reflects demand for 2026. These commitments have provided a buffer against broader market softness, allowing suppliers to hold prices steady despite mounting pressure in other regions. This remains the largest factor preventing prices from declining at a faster pace over the next three months. At the same time, most importers have time on their hands, particularly where product is not required until next year. The fourth quarter is typically the weakest for potash sales, and unless demand picks up in key markets we expect prices to remain under pressure. Suppliers appear comfortable, supported by earlier commitments, with limited pressure to adjust pricing. But trading activity remains low, and liquidity is constrained as buyers shift their focus towards nitrogen and phosphate products.

The northwest Europe MOP market remains quiet and buyers have delayed granular purchases, following a trend of procurement closer to spring and leveraging the stronger euro to push for lower prices. Suppliers are resisting, but the lack of liquidity and seasonal weakness are keeping pressure on prices. Notional prices for granular MOP have edged up on limited spot activity, but a more stable-to-soft pricing narrative is anticipated as market engagement resumes by the end of the year. Meanwhile, in the US, some spot buying is expected to resume as the harvest progresses, but purchasing is likely to remain cautious and follow a more hand-to-mouth strategy. US imports are trailing behind typical volumes, although a developing premium to Brazil suggests the market may become more attractive in the near term. Brazil's affordability is benefiting from a strengthening real, although demand remains seasonally weak, and strong imports so far this year allow buyers to pull back and be patient while turning their attention to 2026. Additionally, elevated prices and limited urgency suggest that further softening will be needed to stimulate significant demand.

On the supply side, we are still seeing strong exports from the Former Soviet Union. We expect record exports from Russia while Belarus will breach its highest levels since sanctions were imposed in 2022. On the demand side, firm growth in 2026 will be more than offset by new capacity and strong exports, resulting in a lower overall price across our forecast period compared with 2025.

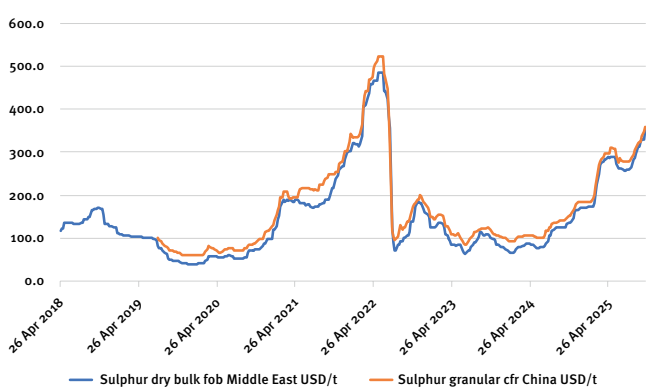
SULPHUR

Morocco back in the sulphur market

Global pricing is continuing on its rapid run up, with previous firming factors expected to persist as offers breach the USD360/t cfr Indonesia and USD334/t Middle Eastern fob levels at the high end. The lack of supply from the countries of the former Soviet Union is pushing regular offtakers to alternative sources, generating competition for mainstream tonnes, with reduced availability from Russia, Kazakhstan, Iran and the US. The threat of reciprocal tariffs from Brazil on the US, and counter-tariffs from China on US vessels coming into Chinese ports will drive up cfr values in the near term. A USD352/t Middle East fob high-end ceiling is expected in mid-November, with market participants expected to wait on the sidelines for pricing to come off its bull run if even further firming materialises. We therefore expect pricing to soften into late November onwards, weighed down by softening DAP prices, muted demand in the fertilizer off-season, and some buyers already being out of the market and waiting for more favourable pricing to emerge.

In Russia, ongoing fires and outages at refineries because of conflict-related damage across September and October, combined with an already-tight market from domestic fertilizer demand and lack of export cargoes because of

Sulphur historical pricing



constrained port logistics, has squeezed availability further. This tightening has depleted a key line of supply for offtakers of lower-priced volumes, including Egypt, Morocco, and Brazil. Further geopolitical concern is emerging with Chinese port fees in response to US tariffs lifting import prices and increasing freight costs. Even if the tariffs do not materialise, the uncertainty generated in the market is expected to drive up cfr pricing in the short term at least. This is the same sentiment for the Brazil-US reciprocal tariffs, where despite the tariffs not being officially announced, sentiment is driven up regardless because of the risk to trade routes and the need to secure product in an increasingly tight market, leading to elevated prices being accepted.

Towards the end of November, demand is expected to become more sluggish, with China's phosphate export allocation window coming to a close, Brazil coming out of the fertilizer application season, Unigel's burner is due to ramp up from January, deferring the immediate requirement for supply, and two sulphur burners in Indonesia being pushed into start-up in 2026 at nickel high-pressure acid leach sites. This will ease competition for pricing and bring high-end offers down, as well as a natural market correction from the rapid run up in pricing.

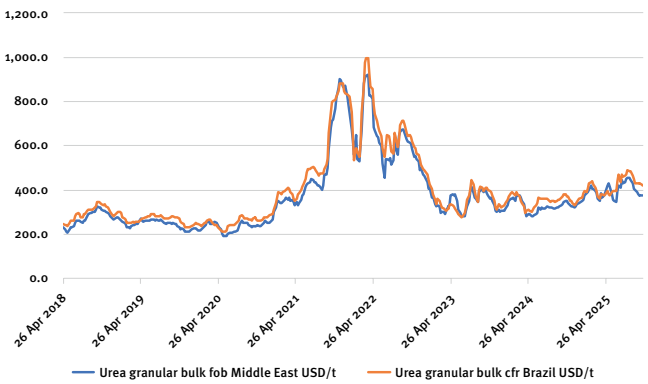
Additionally, DAP prices have edged down recently and are expected to continue to soften through the end of the year and the first quarter of 2026, according to Argus data. There is pressure on downstream end-user margins, with no equivalent rise expected for end-product prices that can be passed on to absorb the cost of sulphur, indicating buyers may move to the sidelines if pricing continues to firm. We expect the tightness in the FSU to remain, and the risk generated from US tariffs and retaliations from Brazil and China to keep freight rates high, providing a floor to the expected market softening from November onwards. During 2026, we expect increased Middle Eastern capacity gradually emerging in the latter part of the year, DAP price softening, and a surplus in the global sulphur trade balance from February to bring sulphur prices downwards. But the deferred demand from Indonesian nickel producers and Brazilian fertilizer producers, as well as geopolitical risks, will keep fob pricing above the USD230/t Middle East fob high-end mark.

NITROGEN/UREA

Deficit forecast for the first quarter of 2026

Urea prices have fallen slightly further than forecast in our September report in most regions, as buyer reluctance outweighs the demand pull from India. With many markets unwilling to purchase, some available

Urea historical pricing



supply has built up. Of the active destinations, Brazil saw prices fall to USD420-430/t cfr, while the US, based primarily on incoming Russian urea, eased to USD415-420/t cfr equivalent. But India issued another tender to buy urea and this stopped the price slide. Uncertainty over whether China will issue further export allocations could mean there is a reduced quantity of urea offered in this tender, compared with the past two, which have been oversubscribed. China supplied about 600,000 t of urea to India under the August tender and a similar quantity is likely to ship under the September tender. Attracting 2mn t in the absence of this amount of China urea will be challenging, implying a price of about USD430/t cfr to pull urea away from other markets. But there is reason to believe that China will approve additional export allocations. The domestic price for urea has fallen to its lowest since February, equivalent to USD240-250/t fob for export. Urea production is close to 200,000 t/d — the domestic market requires 170,000-180,000 t/d on average. Relations between China and India have improved. Unfortunately, given the current holiday period in China and the opaque manner in which decisions are communicated. India will need to tender again for a further 2mn t of urea for December-January shipment.

Beyond India, affordability remains an issue in many countries, but the price drop has helped and buying has taken place for Europe at levels down to USD420/t fob Egypt, and for Brazil at prices reflecting USD380/t fob Baltic. Prices for urea remain about USD60/t above the levels of October 2024, while crop prices are the same or lower. We expect these to be floor levels and expect prices to rise in the near term, bolstered by India and the need to purchase urea ahead of peak season requirements. Our trade balance shows a small deficit of export supply for November and December, but with a larger deficit forecast for the first quarter. This implies a slow firming in prices to the end of the year, followed by a spike in pricing — driven by the huge US requirement for February-March shipment — in the first quarter. ■

Special focus

THE FERTILIZER ECONOMY ›

How geopolitics and decarbonization are disrupting fertilizer supply chains

Written by

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The role of fertilizers in global agricultural production has grown steadily over the past 60 years. Global consumption increased from 31 mn t in 1961 to nearly 195 mn t in 2021, raising its role as a globally traded commodity. In many parts of the world, it has contributed to boosting agricultural productivity, though its use remains uneven. While fertilizer use is below 5kg per hectare in some African countries, it reaches up to 1,000 kg per hectare in places such as Ireland and New Zealand. While very low levels of fertilizer use may constrain productivity growth, inefficient fertilizer use and overfertilization can have damaging environmental impacts.

These questions around fertilizer use and misuse have been debated among industry stakeholders and agricultural experts for decades and are well-understood and documented. More recently, however, fertilizer markets have taken on a new kind of political salience, placing the industry at the heart of rising geopolitical conflicts and trade disputes. The following analysis unpacks how shifts in the global economy, geopolitical shocks and the mounting threat of climate change are beginning to reshape the landscape of global fertilizer production.

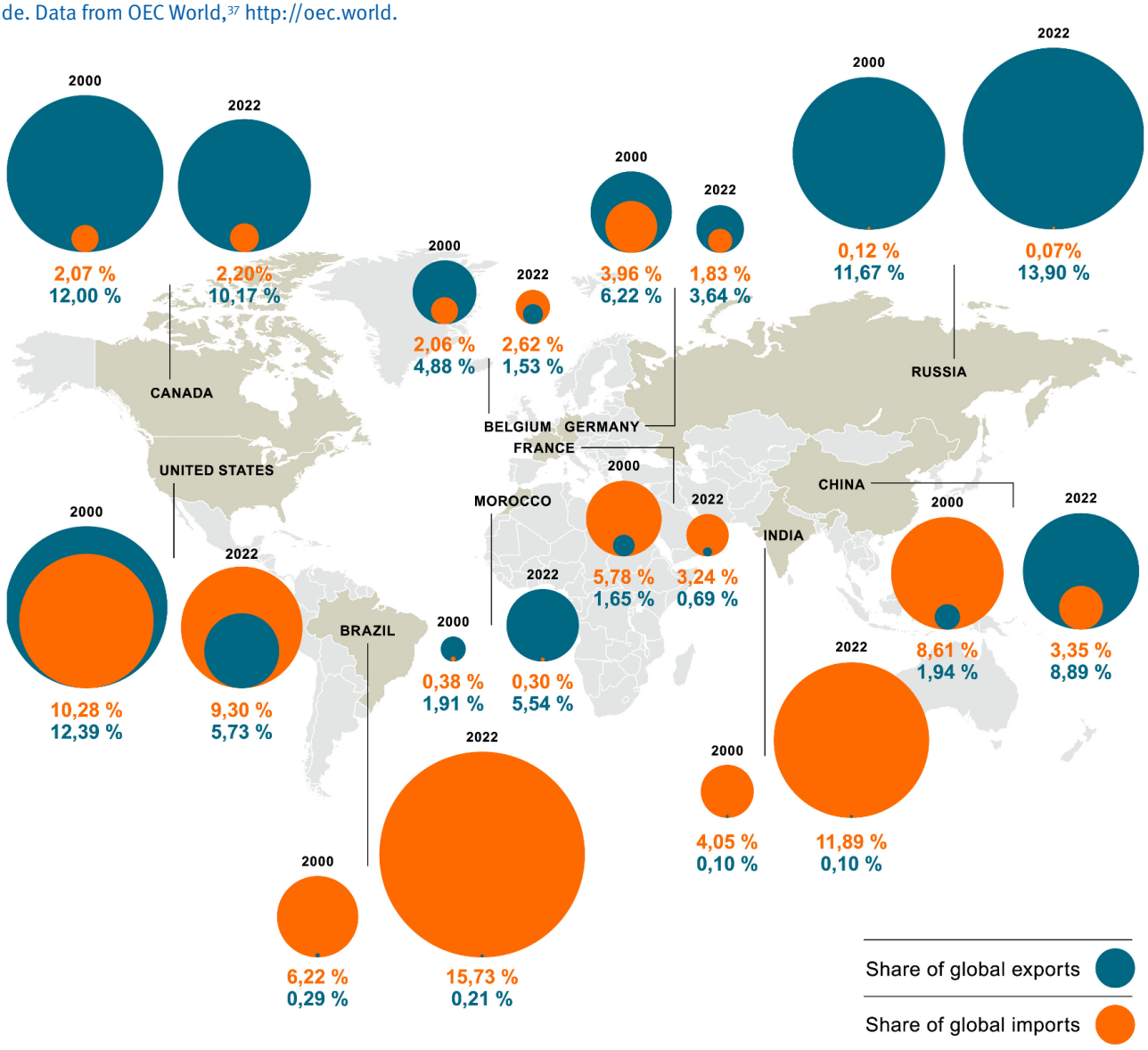
China's rise as the dominant producer shifts global fertilizer supply chains

Historically, the geography of global fertilizer production has followed the distribution of raw materials needed for the three main fertilizer types, i.e. phosphorus (P), potassium (K) and nitrogen-based (N) fertilizers. With about two-thirds of global phosphate reserves, Morocco leads global exports in this market segment, while Canada, Belarus, and Russia dominate potash output due to their vast potassium deposits. Nitrogen fertilizer depends on ammonia as a feedstock, which is produced most cost-effectively from natural gas. Hence, countries with abundant natural gas reserves have emerged as market leaders, most notably Russia.

Over the past 20 years, however, China has emerged as a new production powerhouse, leading in phosphate and nitrogen fertilizers. This comes in spite of the fact that China does not have an abundant supply of natural gas. To boost self-sufficiency in fertilizer production, it has increased ammonia production by using coal as feedstock. Despite a higher CO_2 emissions and production costs, 85% of Chinese ammonia production relies on coal. Efforts to boost self-sufficiency have transformed China from one of the biggest importers to the largest exporters of fertilizers with substantial sway in global fertilizer markets (see figure 1).

Figure 1. Changing shares of global fertilizer trade, top five exporters and importers in 2000 and 2022

This figure displays the share of global fertilizer exports and imports by trade value for the top five exporters and importers in both 2000 and 2022, based on HS code 31, indicating important shifts in the relative position of different countries in global fertilizer trade. Data from OEC World,[37] http://oec.world.



Source: Quitzow, R., Balmaceda, M., Goldthau, A. (2025) The nexus of geopolitics, decarbonization, and food security gives rise to distinct challenges across fertilizer supply chains, One Earth, Vol. 8(1), 101173

The rise of China in fertilizer market goes hand in hand with its rise as a global economic superpower. Similarly, other large emerging economies have significantly increased their footprint in global fertilizer markets. In both countries, increasing food production is accompanied by rising fertilizer use. Since the turn of the century, Brazil's export-oriented agricultural economy has driven a tripling of fertilizer consumption. India has increased its share of global fertilizer use from 5% to 15%, underpinning rising food production to serve its growing population. Unlike China, however, this has not been matched by growth in domestic fertilizer production. Instead, both countries are increasingly exposed to international fertilizer markets, accounting for more than a quarter of global imports (see figure 1).

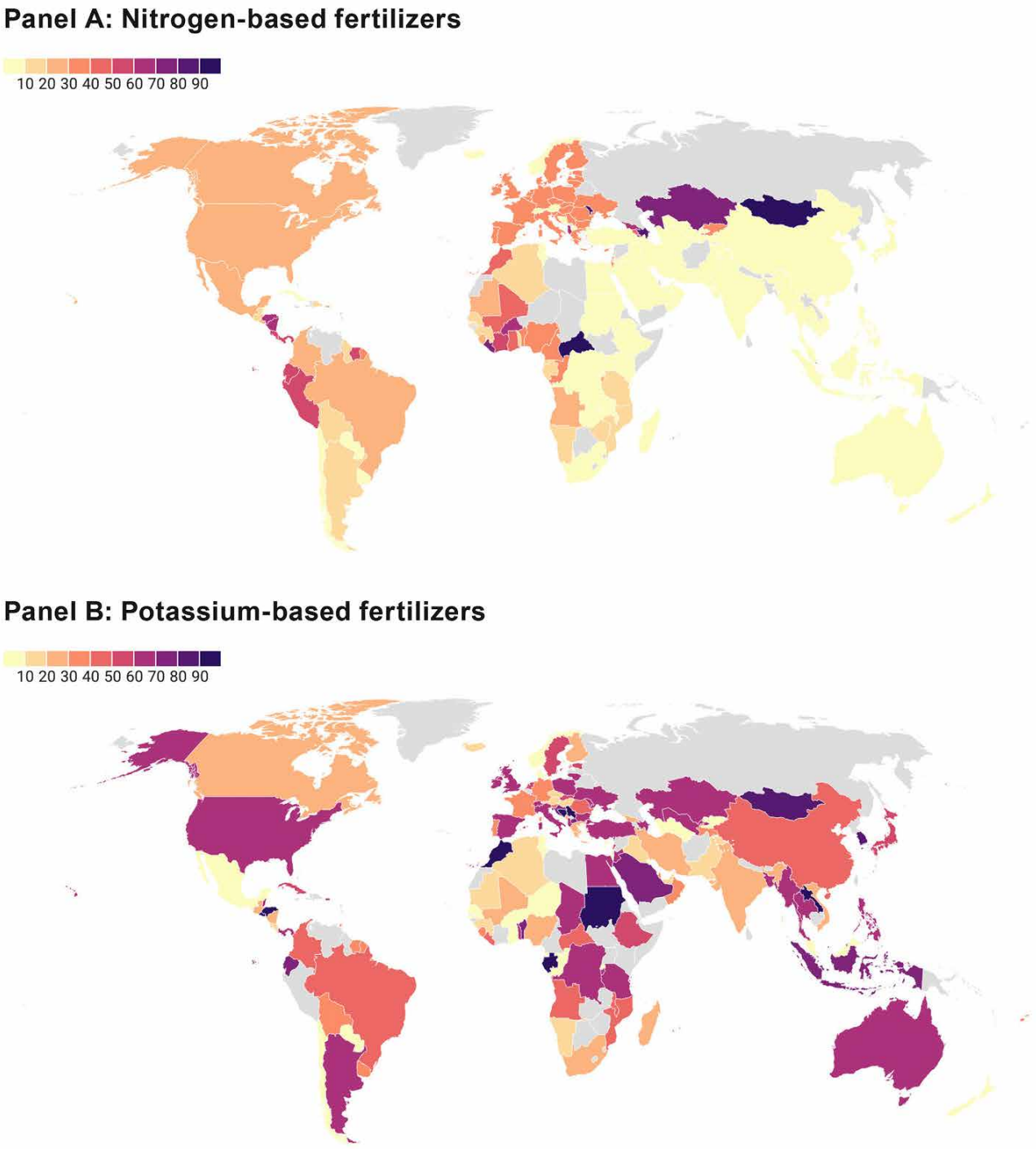
The war in Ukraine disrupts fertilizer markets

When it comes to P-fertilizers, the concentration of phosphate rock has long raised concerns regarding security of supply. While Morocco holds the majority of global reserves, China controls 40% of mining activities. This uneven supply structure is compounded by the fact that Morocco's phosphate mining

The rise of China in the fertilizer market goes hand in hand with its rise as a global economic superpower

Figure 2. Share of fertilizer imports from Russia and Belarus (2018–2020)

(A and B) The shading of countries in this figure indicates the share of nitrogen-based fertilizer (A) and potassium-based fertilizer (B) imported from Russia and Belarus in the respective country during the time period 2018 to 2020. A higher share of imports translates into a higher degree of dependency on these two countries in the fertilizer sector. Based on Glauber and Laborde.[20]



Source: Quitzow, R., Balmaceda, M., Goldthau, A. (2025) The nexus of geopolitics, decarbonization, and food security gives rise to distinct challenges across fertilizer supply chains, One Earth, Vol. 8(1), 101173.

Implications for the fertilizer sector

- Diversify supply chains and mapping out vulnerabilities
- Engaging with policy instruments such as CBAM
- Leveraging forward markets – hedging strategies and long-term offtake contracts to stabilize costs
- Investing in green capacities as green ammonia gains traction, as this ends fossil fuel dependence for power generation, particularly for N fertilizers
- Building regional capabilities, specifically in LATAM and Africa

operations are partly located in the geopolitically sensitive occupied Western Sahara. Moreover, demand for phosphate has further increased, as it is a key component in lithium-ion batteries, which are crucial for the transition to electric vehicles.

The full-scale invasion of Ukraine by Russia in 2022 send shock waves through K and N fertilizer markets. Black Sea trade routes were disrupted, and the EU imposed sanctions on Belarus as well as selected Russian oligarchs in the sector. Directly, following the invasion, Russia redirected output toward other markets. Most notably, India doubled its Russian fertilizer purchases, becoming Moscow's largest single buyer. Moreover, the crisis in natural gas markets had knock-on effects on European ammonia production, leading to reductions in supply. The confluence of these factors drove sharp increases in global prices. While prices have decreased since the onset of the war, they remain volatile and unpredictable.

Given high one-sided dependence on fertilizer trade - especially from Russia and Belarus (see figure 2) – these developments have raised alarm bells in many importing countries, most notably in Africa and Latin America. Indeed, Brazil, where almost 90% of fertilizers are imported has responded with a national fertilizer strategy, aiming to reduce imports to 45% by 2050. At the same, Russia has utilized fertilizer donations to African countries as new tool of geopolitical influence.

Geopolitical tensions have transformed fertilizers into a highly sensitive commodity

From market volatility to increasing government intervention

As geopolitical tensions and war have transformed fertilizers into a highly sensitive and strategic commodity, trade policy and subsidies have emerged as new tools of government intervention in the sector. In the wake of the war, the EU started by relaxing its otherwise strict competition rules to allow member states to disburse emergency aid to cushion the impact of soaring prices on its fertilizer industry. While initial sanctions on Russia avoided direct restrictions on food, grain, and fertilizers, the EU has recently moved to impose escalating tariffs on fertilizer imports from Russia and Belarus, aiming to ensure a European fertilizer supply base.

Amid the flurry of trade interventions launched by the Trump administration, fertilizer imports are also seeing increasing trade barriers. In early 2025, Washington announced tariffs on imports from Canada, Mexico, and China—countries that together account for about 80% of U.S. fertilizer imports, with Canada alone providing the majority share. Beginning in August 2025, the U.S. imposed duties of 10% to 25% on phosphate and nitrogen fertilizers sourced from Morocco, Saudi Arabia, Egypt, Jordan, Israel, Australia, Tunisia, and Lebanon. Interestingly, Russian fertilizer imports have not been affected by these trade interventions. As a result, it has even benefited from the restrictions placed on competitors. Underlining this intention, in March 2025, President Donald Trump announced that the U.S. would help Russia restore its access to global fertilizer markets. Russian fertilizer exports to the U.S. rose through 2024–2025, underscoring Washington's reluctance to restrict critical agricultural inputs amid concerns over food price inflation. China, for its part, has increasingly turned to export restrictions to protect its agricultural sector from the volatility of international markets.

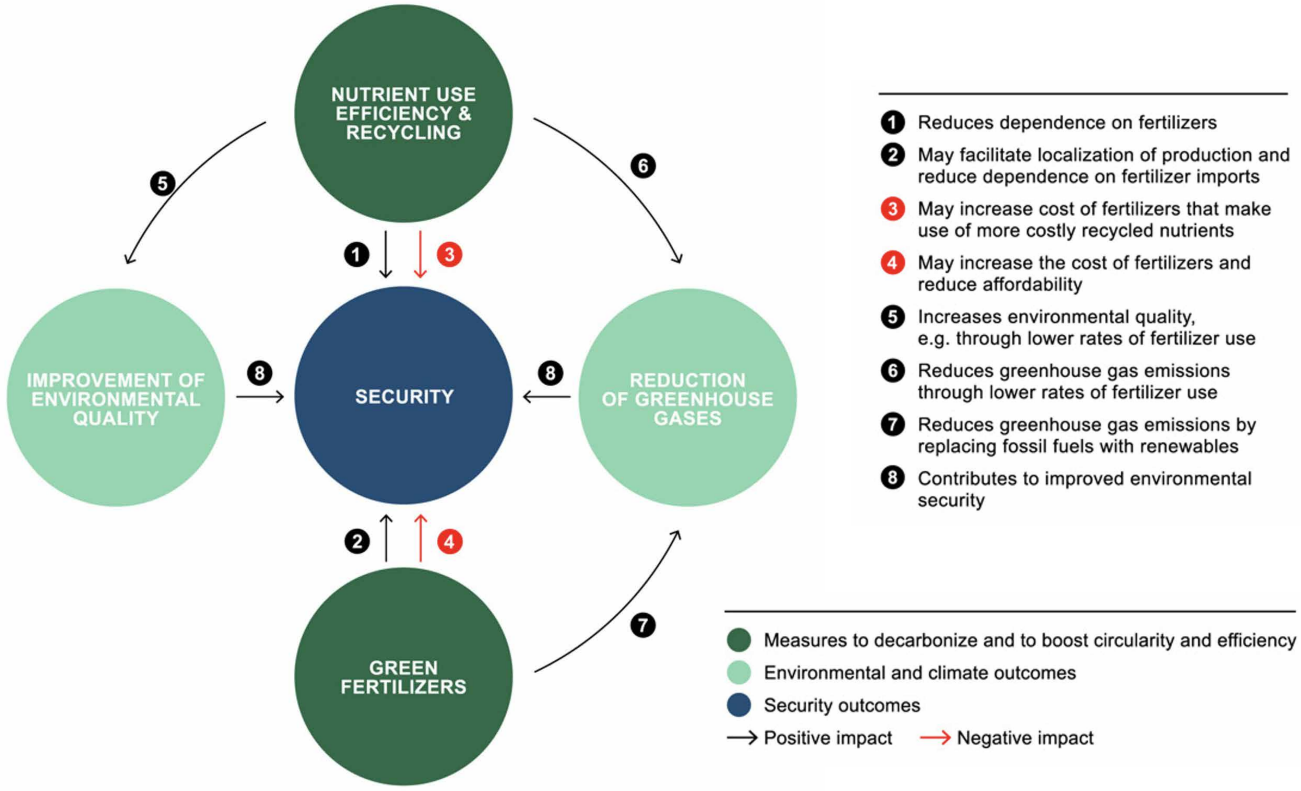
Decarbonization as a driver of long-term transformation of the fertilizer sector

Against the background of these short-term trends, decarbonization is acting as an additional, long-term driver of change in the fertilizer sector, exhibiting important synergies – along with some potential trade-offs – with the emerging security imperative (see figure 3 for an overview). Accounting for more than 2% of global greenhouse gas emissions, its decarbonization is critical to meeting international climate targets. On the supply side, this means replacing fossil fuels, especially natural gas, with renewable hydrogen in ammonia production. However, green ammonia remains costly—over twice as expensive as traditional methods based on 2020 gas prices. While costs are expected to fall, the price gap may persist for some years to come.

Still, decarbonization offers strategic benefits. Countries lacking fossil fuels could reduce import dependency and become competitive in nitrogen fertilizer production, especially those with strong solar or wind potential. This shift could benefit large

Figure 3. Impacts of decarbonizing the fertilizer sector on security

This figure depicts how the reduction of greenhouse gases in the fertilizer sector impacts security, both directly and indirectly via its role in mitigating climate change and enhancing environmental quality. Black arrows indicate a positive relationship; red arrows indicate a negative relationship.



Source: Quitzow, R., Balmaceda, M., Goldthau, A. (2025) The nexus of geopolitics, decarbonization, and food security gives rise to distinct challenges across fertilizer supply chains, One Earth, Vol. 8(1), 101173

consumers such as India or Brazil and allow countries such as Morocco, with rich phosphate reserves, to reduce their dependence on fossil-based ammonia imports while diversifying their fertilizer products and expanding market influence. Natural gas exporters such as Algeria and Egypt may also gain by freeing up gas for export amid rising domestic demand. Decarbonizing fertilizer production could sustain their export capacity and could offer new opportunities for value creation. Finally, it may offer opportunities for decentralized fertilizer production, particularly in areas that have remained underserved by the traditional fertilizer industry, due to challenging logistics or other barriers to accessing regional or international markets.

Trade-based climate policy instruments, like the EU's Carbon Border Adjustment Mechanism (CBAM), are giving a further boost to such strategies. By applying the EU carbon price to energy-intensive imports, including fertilizers, CBAM, scheduled to take effect in 2026, will make carbon-intensive fertilizers less competitive on European markets. This opens a door for renewable-rich nations to enter the market via green ammonia.

Finally, decarbonization also offers an additional incentive for downstream measures to promote more efficient use of fertilizers, thereby, cutting CO_2 emissions and reducing nitrogen and phosphorus pollution. Nutrient recycling and improved nutrient efficiency management-can also reduce import reliance across N, P, and K fertilizers, opening up new opportunities for value creation for firms in the fertilizer sector. Areas of innovation, such as precision farming and the development of tailor-made fertilizers to maximize productivity, while reducing greenhouse gases, represent important pathways for sustaining profitability, while reducing emissions in this new environment.

Acknowledgement: *This article is based in part on findings published in Quitzow, R., Balmaceda, M., Goldthau, A. (2025) The nexus of geopolitics, decarbonization, and food security gives rise to distinct challenges across fertilizer supply chains, One Earth, Vol. 8(1), 101173. The articles has benefited from research support provided by Panya Chakravarty.* ■

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When fertilizer markets freeze

The hidden costs of supply disruptions

Written by

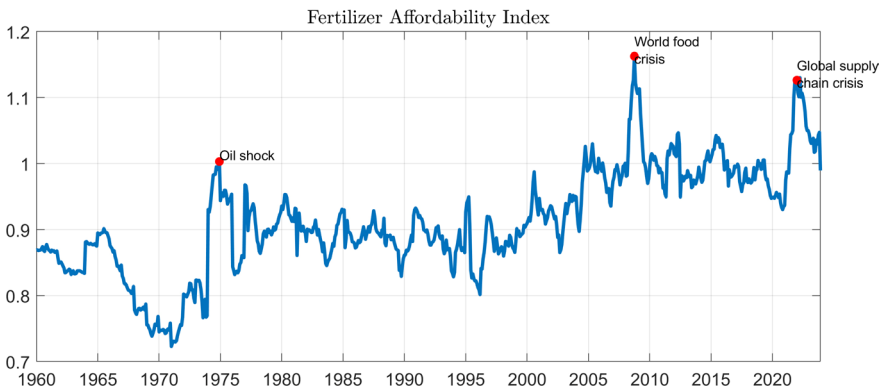
Hugo Morão, *Researcher,* ***ISEG/U Lisbon, Portugal*** and *Adviser,* ***Portuguese Tax Authority***

The fertilizer industry rarely makes headlines—until it does. When Russia invaded Ukraine in February 2022, the world woke up to a reality: a handful of countries control the fertilizers that feed nearly half of humanity. Sanctions on Russia and Belarus, combined with Europe's natural gas crisis, sent fertilizer prices soaring and sparked fears of global food shortages.

But here is what most analyses missed: the real damage was not just the price spike. It was the cascading effects through food supply chains, labour markets, and entire economies. Using a novel approach to track fertilizer supply disruptions across 30 countries over five decades, my research reveals that fertilizer supply shocks behave differently from price increases—they act as supply-side constraints that squeeze economic activity while fuelling inflation.

Prices alone do not tell us whether shortages stem from supply constraints

Figure 1. Evolution of fertilizer affordability from 1960-2025



Note: The fertilizer affordability index is constructed as the ratio of the World Bank's fertilizer price index (a weighted average of DAP, phosphate rock, potassium chloride, TSP and urea prices) and its grains price index (weighted average of maize, rice, barley and wheat prices).

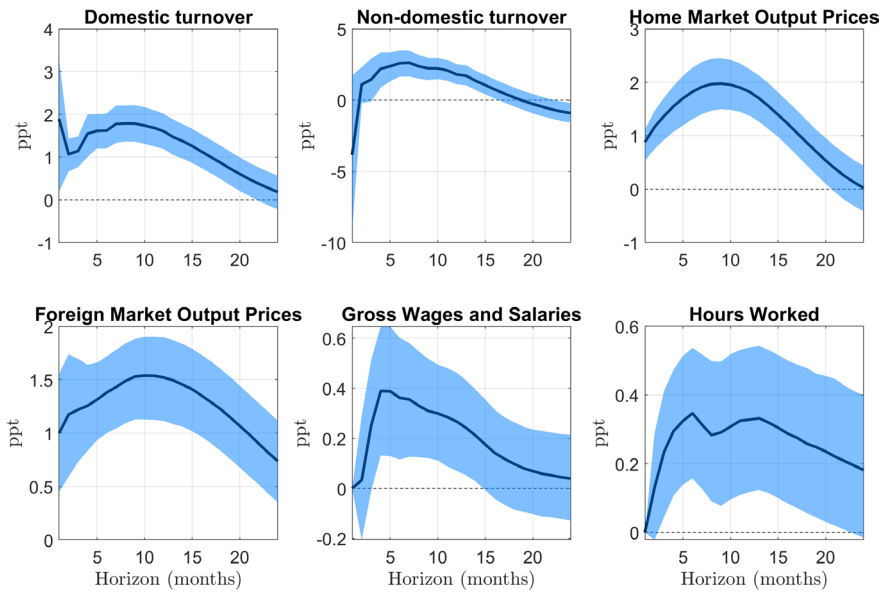
Measuring what matters

The fertilizer industry has struggled with a measurement problem. We track prices, but prices alone do not tell us whether shortages stem from supply constraints, demand surges, or speculation. During the 2007-2008 food crisis, fertilizer prices tripled—but was this due to export bans by China and India, drought-driven demand, or rising energy costs?

To answer this question, the study developed a Fertilizer Supply Index (FSI), a way to identify and measure supply-side disruptions by analysing news coverage from media outlets worldwide. The methodology is straightforward: track articles mentioning fertilizer alongside words like "shortage," "disruption," or "export ban."

Historically, supply disruptions cluster around policy interventions

Figure 2. Response from Portugal's food industry to fertilizer supply shocks over 24 months



Note: The solid black line is the posterior median estimate and the shaded areas are 68% credible

The index captures events that price data misses or delays: export restrictions before they hit markets, announced sanctions, raw material shortages affecting production, and policy changes such as subsidy cuts. The fertilizer affordability index, which compares fertilizer prices to grain prices, shows the long-term trend (see figure 1). Since the 1970s oil shock, fertilizers have become more expensive relative to the crops they help produce, with three major spikes corresponding to the energy crisis, the 2008 food crisis, and the 2020-2023 supply chain disruptions.

Three patterns of disruption

Analysis of major supply events from 1998 to 2023 reveals three recurring patterns. Firstly, supply disruptions cluster around policy interventions: China's 135% export tariffs in 2008, sanctions on Belarus in 2021 and Russia in 2022, and regulatory changes such as the 2010 EPA nutrient pollution limits. Secondly, input constraints disrupt production—natural gas shortages hit India in 2011 and Europe in 2021, while coal shortages affected China in 2004. In addition, geopolitical shocks create cascading effects, from North Korea's 1998 famine to the Ukraine war in 2022.

The 2010 BHP-Potash Corp. bid, while unsuccessful, signalled rising industry consolidation that would amplify supply vulnerability. By 2020-2023, the combination of COVID disruptions, natural gas crises, war, and sanctions created a perfect storm.

How shocks cascade through food systems

Using Portugal as a case study—a small, open economy dependent on fertilizer imports—I traced how supply disruptions propagate through the food industry. Figure 2 reveals the response of Portugal's food industry to fertilizer supply shocks over 24 months.

Output prices respond on impact: When fertilizer supply tightens, food producers face a dilemma; absorb higher input costs or pass them through to consumers. The data shows they choose the latter. Home market prices jump first and peak around month 10, rising 2.0 percentage points. Foreign market prices follow but peak at 1.5 percentage points, reflecting Portugal's limited pricing power in competitive export markets.

Revenues increase despite higher prices: Domestic food industry turnover rises—peaking at 2.0 percentage points above baseline—and persists for two years after a shock. Non-domestic turnover shows a delayed response but then climbs to 3.0 percentage points. Why? Food demand is inelastic—people need to eat regardless of price. Firms pass costs through without losing volume.

Labour markets show delayed adjustment: Wages and hours worked remain flat for 3-4 months after a shock, then both rise, peaking around month 10-12. This delay reflects contract renegotiation timelines, workers' recognition of inflation's erosion of purchasing power, and firms waiting to see if cost increases are temporary.

The labour response hints at deeper structural changes. As fertilizer costs rise, the food industry adapts—

The underlyijng message is clear: fertilizer supply risk is economic risk

shifting toward more labour-intensive techniques, adopting precision agriculture, and changing crop selection.

The macroeconomic damage

Fertilizer supply shocks do not stay confined to agriculture, they spread throughout the economy, triggering stagflation. Industrial production falls on impact and stays depressed for three years. As food prices rise, consumers cut spending on non-essentials to maintain food consumption, creating a recessionary spiral in other sectors.

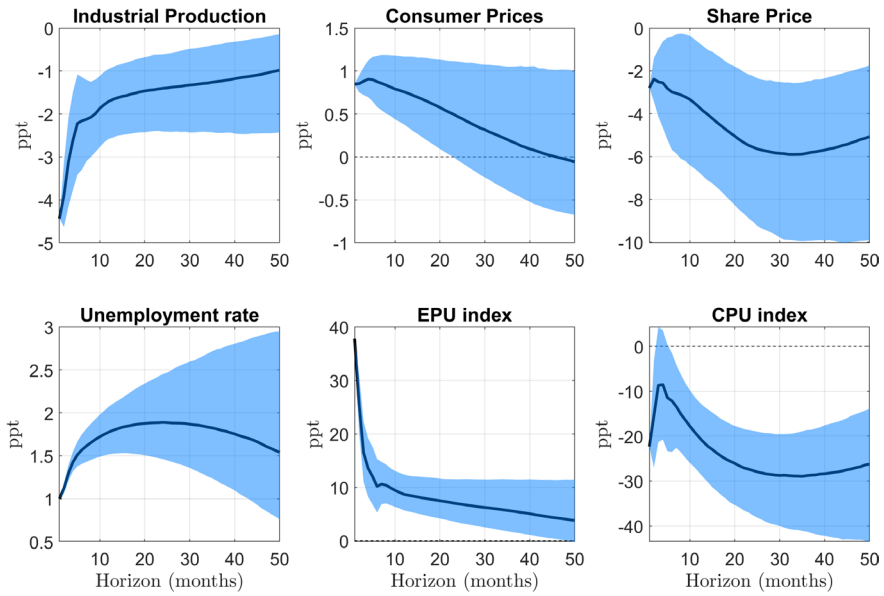
Consumer prices (excluding food and energy) rise, peaking after 10 months as workers demand higher wages and firms pass through rising costs. Unemployment rises in a hump-shaped pattern, peaking in the third year. Stock markets fall as investors mark down corporate earnings expectations.

Climate policy uncertainty falls after fertilizer supply shocks. Governments facing food security threats shelve environmental regulations to avoid straining agriculture—a trade-off of short-term stability for long-term sustainability.

Building resilience

The fertilizer industry faces mounting pressures: geopolitical fragmentation, energy transition challenges, and climate policy constraints. Investments in green ammonia production could reduce dependence

Figure 3. Impulse responses to a fertilizer supply shock



Note: Impulse responses to a fertilizer supply shock, normalized to increase the consumer prices by 1 point on impact. The sold black line is the posterior median estimate and the shaded areas are 68% credible bands.

Fertilizer supply shocks are not confined to agriculture

on natural gas and create more distributed production. Enhanced efficiency fertilizers and precision agriculture can reduce application rates without sacrificing yields.

Governments need frameworks that balance food security concerns with long-term market function. The 2008 wave of export restrictions was rational for individual countries but devastating for global markets. International coordination mechanisms could help prevent destructive policies during crises.

For the food industry, the message is clear: fertilizer supply risk is economic risk. The delayed labour market responses give food processors a 3-4 month window to adjust operations before wage pressures materialize, but only if they are monitoring supply conditions, not just prices.

Maintaining food security

Summing up, disruptions to fertilizer supply do not just threaten food security—they trigger economywide stagflation, disrupt labour markets, and force trade-offs between immediate needs and long-term sustainability. From North Korea's 1998 famine aid negotiations to the 2023 debates over Belarusian transit rights, the pattern is consistent: supply constraints create ripple effects beyond agriculture.

By tracking these disruptions rather than just prices, we can better anticipate shocks, understand their propagation, and build more resilient food systems. As geopolitical tensions persist and climate pressures mount, this capability is essential for maintaining global food security. ■

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Fertilizers under pressure as U.S. tariffs reshape global input trade

Written by

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While food markets often dominate the headlines when trade tensions rise, the fertilizer market offers another way of looking at how agricultural systems absorb and respond to global policy shocks. Fertilizers are the backbone of modern food production, linking global energy markets, industrial supply chains, and agricultural productivity. When trade disruptions hit this sector, the consequences extend far beyond farm costs, influencing yields, price stability, and food security worldwide.

The first months of 2025 brought a renewed wave of trade measures, as the United States reintroduced tariff increases under the 'reciprocal tariff' framework. Although intended to correct perceived trade imbalances, these measures have introduced new volatility into agricultural input markets. Using a scenario-based approach complemented by recent trade and price data, the evidence points to a rapidly evolving landscape in which fertilizer trade flows, sourcing strategies, and input costs are being reshaped by policy rather than market fundamentals.

Fertilizers and the implications of tariff changes

Fertilizer markets are deeply integrated into global trade: for example, fertilizer imports accounts for over half of global agricultural use, and trade captures large shares of nitrogen, phosphorus, and potassium production. This high level of integration is largely due to the fact that the key components needed to produce fertilizer, such as natural gas, phosphate rock, and potash, are extracted from the soil and are geographically concentrated.

Countries without these natural reserves must rely on imports to meet their fertilizer needs. The U.S. remains a significant importer of fertilizer inputs, especially nitrogen and potassium products, while also exporting phosphate-based fertilizers to regional markets.

Figure 1 shows a shift beginning in early 2025. In April, the simple average tariff rate rose sharply, to almost 10%. This reflected the implementation of universal tariffs on most imports outside preferential trade agreements. The trade-weighted average rate, which accounts for the actual composition of U.S. fertilizer imports, had a peak of above 10% in March, declining again and stabilizing around 4% in April signalling a fundamental change in market access conditions.

By midyear, tariffs had stabilized at these new higher levels, introducing a structural cost increase for imported fertilizers. Because fertilizer supply is highly concentrated—dominated by a few major producers such as Russia, China, Canada, and the United States—the scope for substitution is limited. The result is a market highly exposed to trade policy shifts, where uncertainty itself can disrupt procurement and inventory management.

Price volatility adds to structural uncertainty

Fertilizer prices were already rising when the new tariffs were announced. Prices for diammonium phosphate (DAP), urea, and potash have been highly volatile since 2020, reflecting a

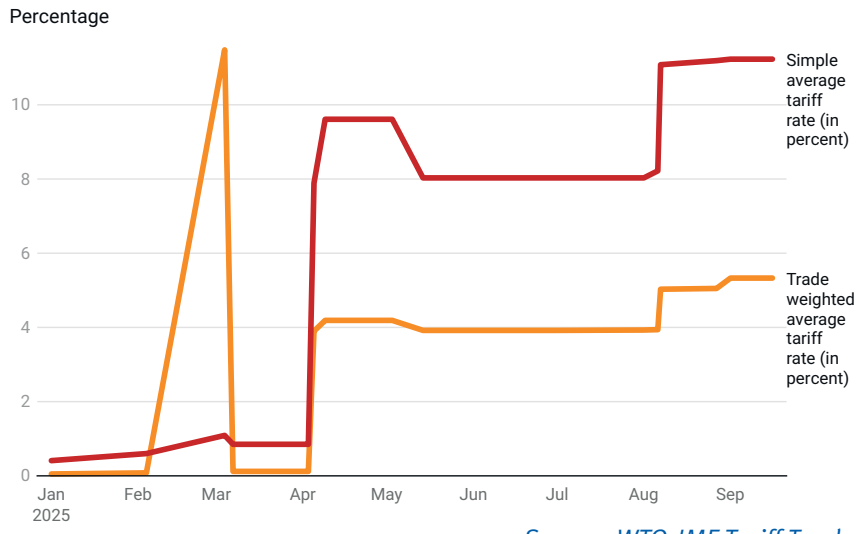
Costs are being reshaped by policy rather than market fundamentals

combination of pandemic-era supply disruptions, energy price fluctuations, and export disruptions linked to the Russia-Ukraine conflict and export restrictions implemented by China.

After a relative stabilization in 2023–2024, fertilizer prices began increasing again in early 2025, particularly for DAP and urea. This change was before the tariff measures, suggesting that the market was already tightening due to energy costs and China restrictions on exports of phosphates and nitrogen-based fertilizers. However, the tariffs have reinforced the upward pressure by constraining import flexibility and signalling potential long-term shifts in trade relationships.

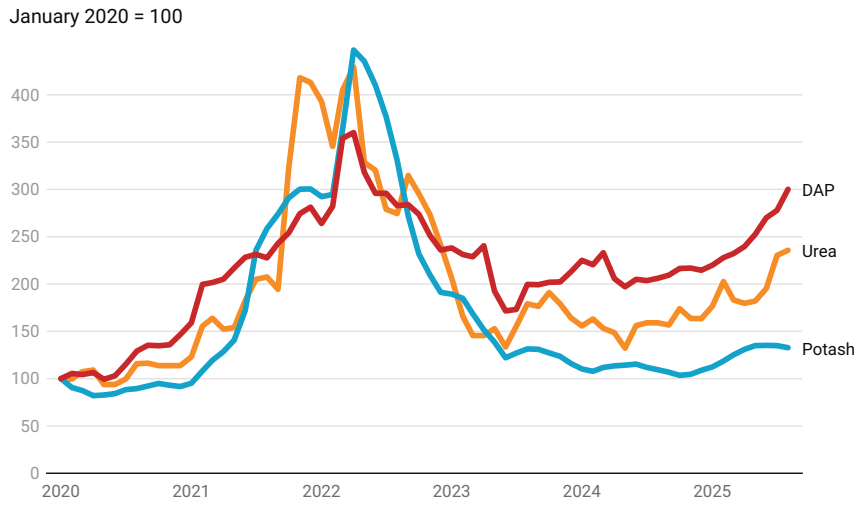
Potash prices have remained relatively lower and more stable, but this reflects increased exports from Russia. In 2021, Belarus accounted for nearly 16% of global exports, but sanctions by the European Union and logistical bottlenecks have cut their exports by about 50% since 2022, and while alternative suppliers such as Canada have increased output, the market remains fragile.

Figure 1. U.S. average tariff on fertilizer imports (2025)



Source: WTO-IMF Tariff Tracker

Figure 2. Fertilizer prices, 2020–2025



Source: World Bank Pink Sheet

An uneven tariff burden across inputs

Not all agricultural inputs are affected equally by the new trade policy environment. When the additional trade-weighted supplemental tariffs are examined across categories, a clear asymmetry emerges (see figure 3).

Fungicides face the highest increase at 22.7%, followed by other pesticides at 18%, herbicides at 15%, and insecticides at 17%. In contrast, fertilizers such as urea and DAP face rates closer to 11%, and potash just over 2%. These differences partly reflect the differential nature of the Trump trade policies. Switzerland, a major supplier of chemical inputs to the United States, now faces a 39% supplemental tariff on its exports to the U.S.

Because fertilizers are used across virtually all crop systems, even modest tariff increases can translate into significant production cost pressures. The resulting rise in input costs affects agricultural competitiveness as a whole, with implications for both domestic markets and trade balances.

Evidence of trade adjustment in progress

Import data for the first seven months of 2025 provide a preliminary picture of market adjustment (see figure 4).

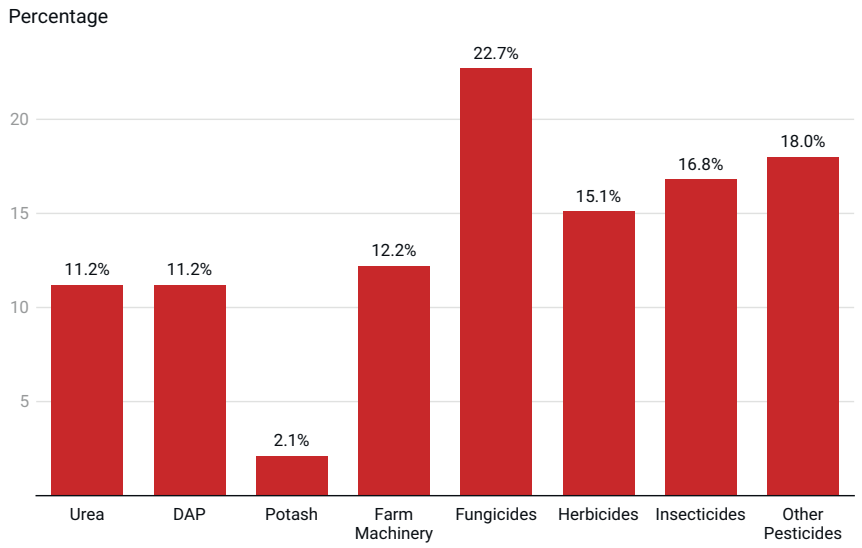
Total U.S. imports of potash fell from 8.6 mn t in 2024 to 7.7 mn t in

2025, a decline of roughly 10%. Urea imports remained relatively stable, increasing marginally from 3.9 mn t to 4 mn t, while DAP imports continued a downward trajectory, from 486,000 t in 2024 to 417,000 t in 2025.

This pattern indicates ongoing substitution and stock management rather than recovery. Importers appear to be adjusting sourcing strategies in response to higher costs and uncertainty, possibly diversifying toward lower-tariff or seeking alternative supply from regions like North Africa. Yet overall import levels have not rebounded to pre-2024 levels, suggesting that the market remains constrained by both policy and logistics.

From a policy perspective, this reflects an early stage of trade diversion. The shift in import shares mirrors broader trends observed in other agricultural sectors under reciprocal tariffs: trade does not stop but reorients, often at higher transaction costs and lower efficiency.

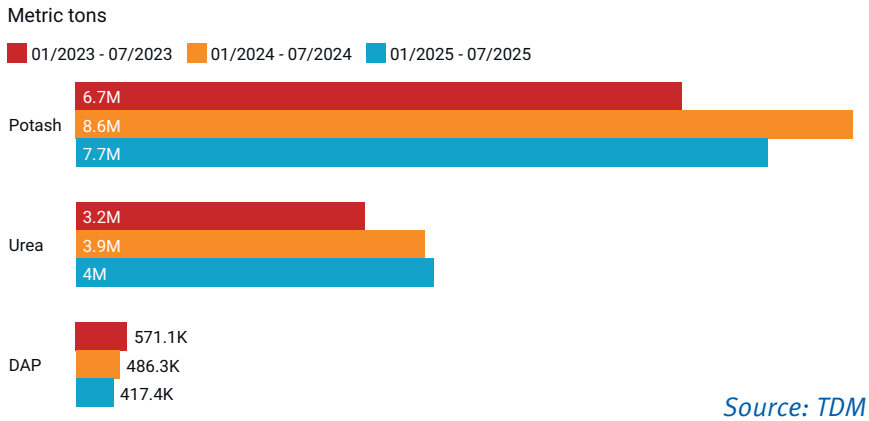
Figure 3. Trade-weighted supplemental tariff rate on U.S. imports of selected inputs (2024)



Calculations by authors based 2024 trade levels.

Source: White House; Trade Data Monitor.

Figure 4. U.S. imports of selected fertilizer inputs, January–July (2023–2025)



Source: TDM

Fertilizers as a driver of wider agricultural adjustments

The ripple effects of fertilizer market disruptions extend well beyond the input sector itself. Higher fertilizer costs can alter cropping patterns, reduce application rates, and affect yields, particularly in regions where margins are thin. In the United States, farmers may adjust planting decisions toward less fertilizer-intensive crops, while in developing economies, the cost pass-through can translate into lower productivity and food supply constraints.

Globally, these dynamics can shift comparative advantages and trade flows in staple commodities such as maize, soybeans, and wheat. Countries with secure access to fertilizer supplies, either through domestic production or preferential trade agreements, gain a relative advantage, while those facing import barriers or higher costs lose competitiveness.

A fragmented global input market

The renewed U.S. tariffs come at a time when global fertilizer trade is already under pressure from multiple disruptions. Export restrictions from China, ongoing sanctions affecting Russia and Belarus, and environmental regulations in the European Union are all contributing to a more fragmented market.

This fragmentation challenges the resilience of global agricultural production. A well-functioning fertilizer market depends on predictable trade flows and transparent pricing. When policy interventions create uncertainty, producers and traders hold back investments in logistics and production capacity. Over time, this can lead to persistent underinvestment and supply rigidities, increasing the likelihood of future crises.

Lessons from the first half of 2025

Six months after the reintroduction of tariffs, several lessons have emerged. Fertilizer trade is highly sensitive to policy changes, even when tariff rates are relatively small in nominal terms. The complexity of fertilizer supply chains means that disruptions at one point—whether due to tariffs, sanctions, or export controls—quickly move across regions.

Early evidence suggests that trade diversion has not yet fully offset the decline in overall import volumes. Instead, import patterns appear to be readjusting, with shifts in the countries of origin. This implies that while the U.S. may maintain access to fertilizers, the global distribution of trade opportunities is shifting, with potential long-term implications for competitiveness.

Even modest tariff changes can have far-reaching implications

Long-term agricultural resilience

The evolving fertilizer market provides an early indicator of how global agricultural trade may evolve under the renewed wave of tariff measures. The data from the first half of 2025 reveal an input market in transition: import flows adjusting, prices rising, and sourcing patterns shifting under the pressure of policy uncertainty. While these trends are still developing, they point to a broader reality: trade in agricultural inputs has become a central arena where economic, geopolitical, and environmental priorities intersect.

The challenge for policymakers is to ensure that short-term trade measures do not undermine long-term agricultural resilience. Predictable, transparent, and open input markets are essential for stabilizing global food systems. As the fertilizer sector illustrates, even modest tariff changes can have far-reaching implications when applied to critical goods at the foundation of agricultural productivity. Managing these linkages responsibly will determine not only the efficiency of global trade but also the sustainability of future food production systems.

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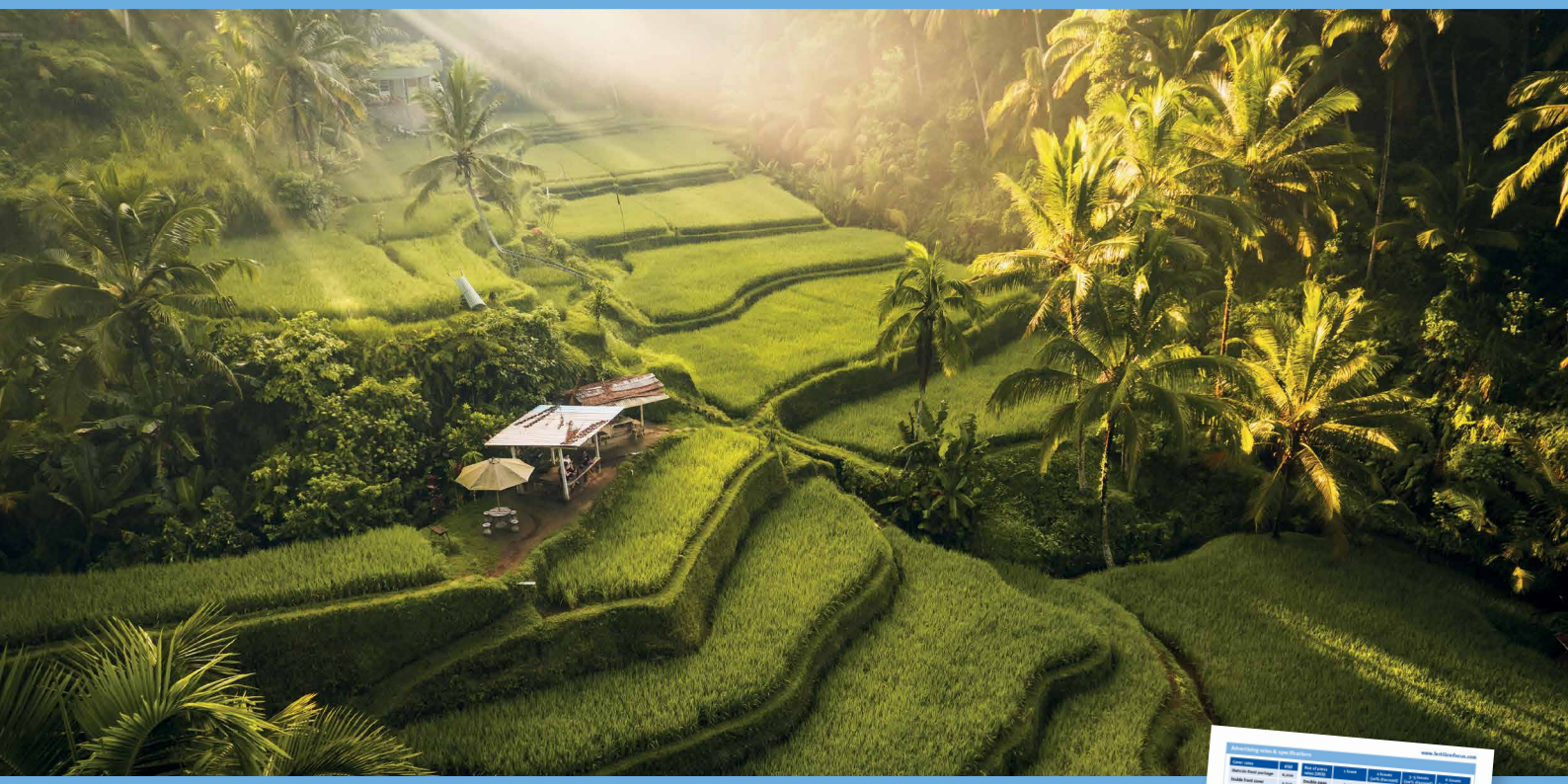

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