

## AMIS fertilizer cost index

Fertilizer prices vary due to a wide range of factors and have impacts on production costs and profitability of farmers. Different crops have different fertilizer requirements, resulting in different total cost, depending on crop and application rates. Tracking fertilizer costs is instrumental to understanding their evolution across the main crop producing areas.

This background note describes the methodology of the AMIS fertilizer cost index featured in the Fertilizer Section of the AMIS Market Monitor since September 2024. The index aims to monitor the evolution of fertilizer costs per hectare depending on the crop, in selected leading crop producing countries. For each country-crop combination, fertilizer costs are obtained by linking selected fertilizer prices at either import or retail level (depending on data availability), with corresponding country-specific application rate by nutrient.

**Purpose:** Monitor the weekly evolution of cost of purchasing fertilizers containing nitrogen (N), phosphate (P) and potash (K), to meet crop needs, according to average application rates as fixed parameters provided by the International Fertilizer Association (IFA).

**Calculation:** For a given country and a given crop, N, P and K nutrients are considered applied to crops using one single nitrogen fertilizer, one single phosphate fertilizer and one single potash fertilizer. Application rates are differentiated for China, Brazil, the United States of America, and the European Union (using France as a proxy), depending on data availability (see table below). The cost of fertilizers for commodity  $c$  in region (country)  $r$  in monetary unit per hectare,  $C_{r,c}$ , is calculated as:

$$C_{r,c} = \sum_{j \in \{N,P,K\}} \frac{P_{i(r,j)}}{Q_{i(r,j)}} \tau_{r,i(j),c}$$

with:

- $P_{r,j}$  the price of fertilizer  $i(r,j)$ , the most widely used fertilizer containing mostly nutrient  $j$  ( $j$  being N, P or K) in region  $r$  in monetary unit per tonne;
- $Q_{i(r,j)}$  the concentration in nutrient  $j$  of the fertilizer  $i(r,j)$  defined as above, in units of nutrient per tonne of fertilizer;
- $\tau_{r,i(r,j),c}$  the application rate of fertilizer  $i(r,j)$ , in region  $r$  for commodity  $c$ , in units per hectare.

The 2019 annual average fertilizer cost is chosen as a benchmark against which the resulting index is normalized.

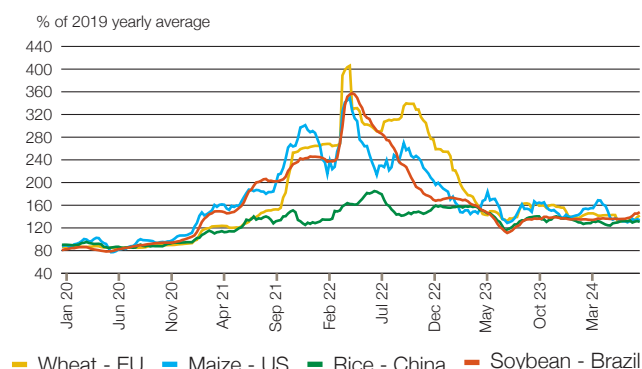
2019 marks the last year before the significant shocks - COVID-19 pandemic and the start of the war in Ukraine - affected the global economy. The indicator is displayed from January 2020 onwards.

**Data:** Selected benchmark values are based on CRU<sup>1</sup> price data while application rates are provided by IFA<sup>2</sup>, at region (country) level.

■ weekly fertilizer price benchmarks as per CRU;

■ application rates as made available by IFA.

**Interpretation:** The higher the index, the more expensive it is to procure the fertilizers required to grow a crop in each region (country), as compared to the corresponding 2019 yearly average cost. Actual purchasing periods may differ over time in each region (country) and the costs of fertilizers will have more influence on decisions to buy fertilizer in times of active buying across the fertilizer value chain.



### Limitations:

- The fertilizer cost index is based on import or domestic price benchmarks and does not reflect actual prices paid by farmers to procure fertilizers. The fertilizer cost index should be considered as an indicator of overall fertilizer cost trends impacting crop production costs.
- Application rates are a fixed parameter in the calculation of the fertilizer cost index.
- The mix of fertilizer products considered to calculate the fertilizer cost index is fixed in time and place.
- The N content of Diammonium (DAP) or Monoammonium (MAP) phosphate are not considered in the calculation of nitrogen costs.

### Choice of fertilizer price benchmarks for each country-crop combination

Region	Crop	Nitrogen fertilizer	Phosphate fertilizer	Potash fertilizer
EU	Wheat	UAN bulk FCA Rouen 30% spot EUR/t	DAP, Bulk, Spot price Benelux, Terneuzen/Ghent, FCA EUR/t	Potash Granular Bulk CIF NW Europe Spot/Contract EUR/t
USA	Maize	Urea Granular Bulk FOB New Orleans barge Spot USD/t	DAP Bulk FOB US New Orleans barge Spot USD/t	Potash Granular Bulk FOB US New Orleans barge Spot USD/st
Brazil	Soybean	Urea Granular Bulk CFR Brazil spot USD/t	MAP Granular Bulk CFR Brazil Spot USD/t	Potash Granular Bulk CFR Brazil Spot USD/t
China	Rice	Urea Pilled Bagged EXW China North Spot CNY/t	DAP Bagged EXW China (excludes export sales) Spot CNY/t	Potash Standard Bulk CFR China Contract USD/t (converted to CNY/t)

1. CRU Group. <https://www.crugroup.com>

2. Ludemann, Cameron; Gruere, Armelle; Heffer, Patrick; Dobermann, Achim (2022). Global data on fertilizer use by crop and by country [Dataset]. Dryad. <https://doi.org/10.5061/dryad.2rbnzs7qh>