

AMIS fertilizer/crop price ratio

This note describes the methodology behind the computation of the fertilizer/crop price ratio discussed in the Fertilizer Section of the AMIS Market Monitor from September 2024 edition onwards. The indicator gauges the affordability of fertilizers compared to crop prices, and reflects the relative evolution of fertilizer prices compared to crop prices since January 2020, indexed to the 2019 annual average. For each combination of country - crop, the price of a relevant fertilizer is compared to the price of one AMIS commodity.

Purpose: Compare the relative development of fertilizer prices to the development of crop prices as a measure of relative “affordability” of fertilizer input prices, at region (country) level, calculated using weekly price points when available.¹

Calculation: For a given region r and a given crop c , we calculate $\Gamma_{r,c}$, the fertilizer-crop price ratio as:

$$\Gamma_{r,c} = \frac{\Pi_{i(r,c)}}{P_c}$$

with:

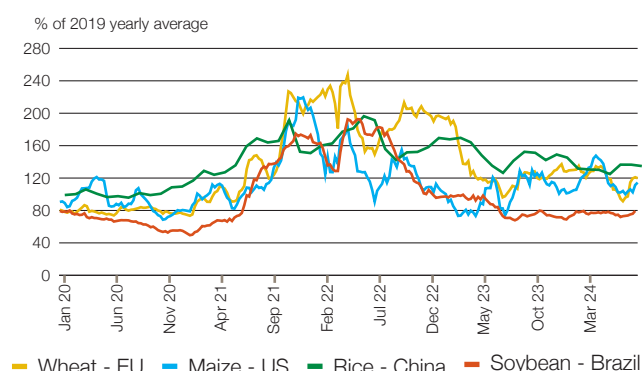
- $\Pi_{i,r,c}$ either the cost and freight (CFR) or retail price of fertilizer i , which is the most widely used fertilizer for commodity c in region r , in monetary unit per tonne;
- P_c the reference price of commodity c on international markets.

For each combination of country-crop, the import or retail price of the most used fertilizer product is weighted against the reference price of the AMIS crops in key production regions (countries). The 2019 annual average fertilizer/crop price ratio is chosen as a benchmark against which the resulting price ratio is compared. The 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: The choice of fertilizer products and price benchmarks is determined by the most widely used nutrient for each crop in each region (country) as per the International Fertilizer Association (IFA)², as well as availability of data on fertilizer prices for key crop producing region (country).

The information source for fertilizer prices is CRU (a provider of fertilizer market information services) while for crop benchmarks, data originate from IGC³, Agricensus⁴, and CNagri⁵ (reported by FPMA⁶). Details of price benchmarks used to compute the fertilizer/crop price ratio are provided in the table below.

Interpretation: The higher the ratio, the more expensive the chosen fertilizer is as compared to the selling price of crops. In other words, when the value of the indicator increases, the affordability of a particular fertilizer input decreases as compared to the 2019 annual average. In such case, the incentive to apply fertilizers declines, implying potential impacts on crop yields. Actual purchasing periods may differ over time in each region (country) and the price ratio of fertilizers and crops will have more influence on decisions to buy fertilizer in times of active buying across the fertilizer value chain.



Limitations:

- The fertilizer/crop price ratio is based on import or domestic prices for both fertilizers and crops and does not reflect actual farm gate prices. This ratio should be considered as an indicator of overall fertilizer affordability trends.
- The choice of fertilizer prices used to compute this indicator is fixed and covers only one fertilizer product for each type of nutrient (nitrogen, phosphate, potash), without considering variations of the fertilizer product mix which farmers might choose depending on the price and crop rotation needs.

Choice of fertilizer and crop price benchmarks for each country-crop set

Region	Crop	Crop benchmark	Source	Fertilizer benchmark	Source
EU	Wheat	Wheat EU (France) Grade 1, Rouen USD/t	IGC	UAN Bulk FCA Rouen 30% Spot EUR/t (converted to USD/t)	CRU
USA	Maize	Maize US, Gulf USD/t	IGC	Urea Granular Bulk FOB New Orleans barge Spot USD/st	CRU
Brazil	Soybean	Soybean FOB Brazil USD/t	AgriCensus	Potash Granular Bulk CFR Brazil Spot USD/t	CRU
China	Rice	Rice China (mainland), National average, Wholesale (Japanica) CNY/t	FPMA	Urea Prilled Bagged EXW China North Spot CNY/t	CRU

1. Mostly in the case of rice price in China.

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.2rbnz7qh>

3. International Grains Council. <https://www.igc.int/en/default.aspx>

4. Agricensus. <https://www.agricensus.com/>

5. CNagri. <https://www.cnagri.com/>

6. FPMA. <https://fpma.fao.org/gIEWS/fpmat4/#/dashboard/home>