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## AGRICULTURAL INPUTS INTERNATIONAL TRADE - RECENT EVOLUTIONS AND IMPLICATIONS FOR THE ROMANIAN AGRI-FOOD SECTOR

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**Abstract:** At the global level, fertilizers and pesticides represent major factor influencing positively agricultural production, replenishing soil fertility, thus contributing to food production. On the other hand, they are important pollutants, and lately they rise serious concerns regarding food safety. Yet, given the significant growth of the global population, they are supporting increasing agricultural outputs. The present paper examines the global, European and Romanian fertilizers production and trade, in terms of exports, imports, and geographical orientation.

### • Introduction

Many scientific and technological innovations helped boosting crop productivity particularly in the second half of the 20th century: mechanical innovation, chemicals, irrigation techniques, genetic applications. Among the most significant scientific and industrial developments were fertilizers that increased significantly crop yields and pesticides helping farmers fighting pests and diseases.

Fertilizers come in various forms: granulated products, powders, liquids, suspensions. Each type is tailored to meet specific crop and soil requirements, optimizing yields while supporting regenerative agriculture practices.

### • Material and method

The paper analyses fertilizer production, consumption and trade, looking as well as to the geographical orientation of the flows, climate change in the contemporary context and highlights its effects on society, with emphasis on its influence on agriculture. The research methodology is primarily based on analysis of statistical data (from recognized sources such as Eurostat, FAO and Romanian National Institute of Statistics), with focus on EU and Romania, accompanied by a large literature review of the most recent bibliographical sources.

### • Results and discussions

Fertilizers production increased globally in the last half century. Nitrogen-based fertilizers are industrially produced from natural gas with use of massive amounts of energy. Phosphatic fertilizers are industrially produced based on phosphate rock, while potassic fertilizers are based on potash ore.

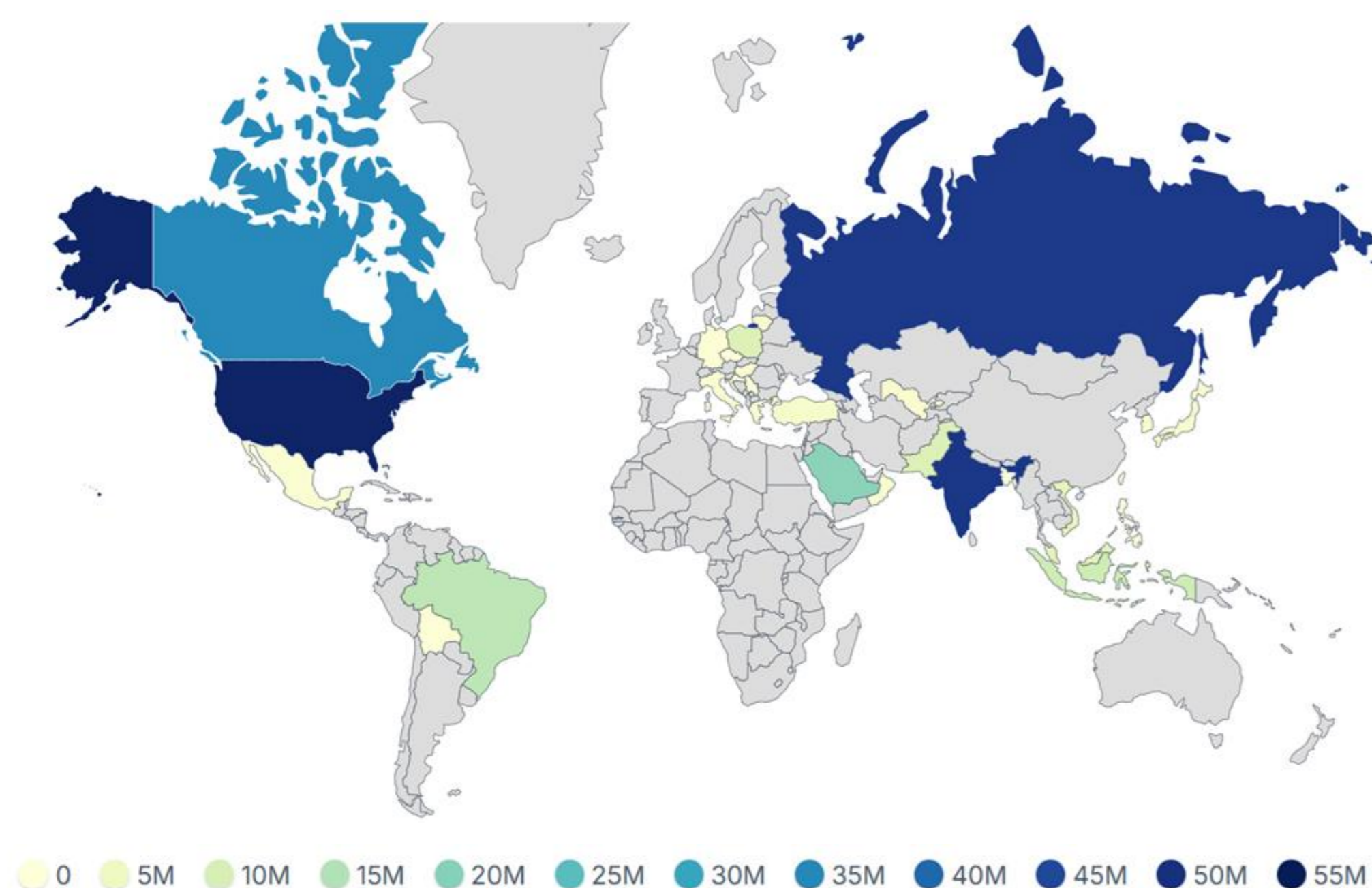


Figure 1. Fertilizer production by country 2025 (source: <https://worldpopulationreview.com/country-rankings/fertilizer-production-by-country>)

According to FAO data, the global fertilizer production in 2022 has been 289 million tonnes. The top producers were: USA (53 million tonnes) India (48.7 mill.t), Russia (48.1 mill.t), Canada (34.9 mill.t), Saudi Arabia (19.3 mill. t), Brazil (13.6 mill. t), Indonesia (11.1 mill. t), Pakistan (9.1 mill. t).

In Europe, in 2022, Poland produced 8.9 mii. T, followed by Turkey (2.6 mill. t), Lithuania (2.4 mill. t), Greece (1.3 mill. t), Italy (1.1 mill. t), Germany (660.6 thousand t), Hungary (640.2 K t), Serbia (618.8 K t) and Croatia (261.8 K t).

Romania had a rather low fertilizer production (mostly nitrogen-based), but the last two companies (Azomures and Navodari) closed in 2024, due to losses generated by the rising gas prices and environmental issues.

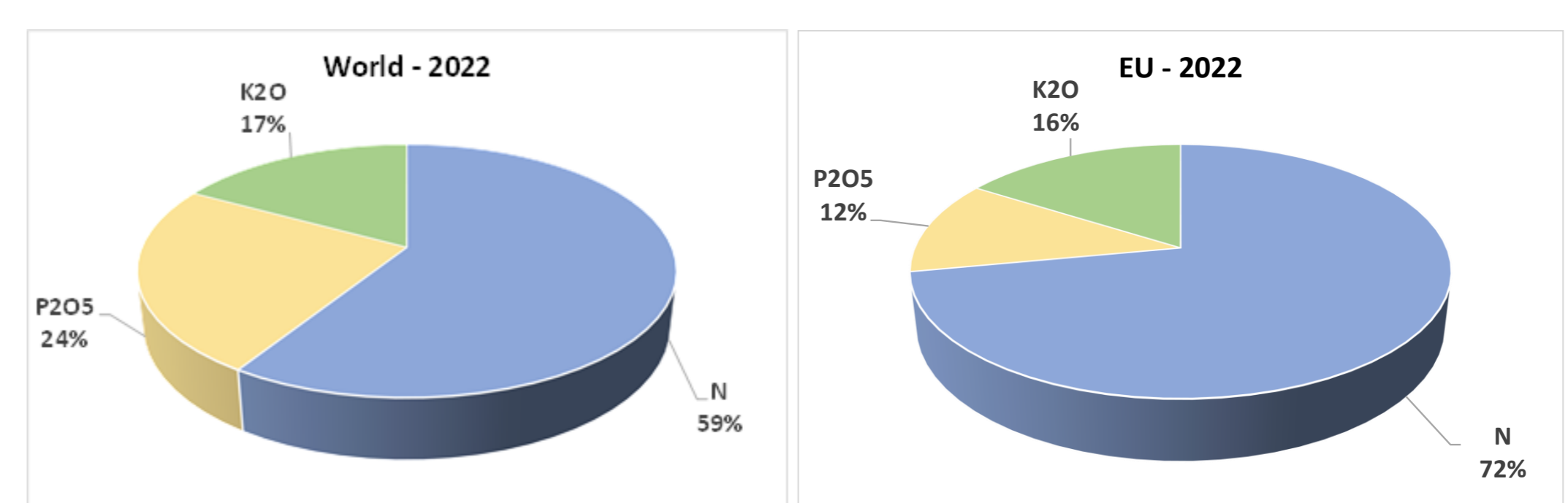


Figure 2. Composition of fertilizer production by nutrient (source: Fertilizers Europe)

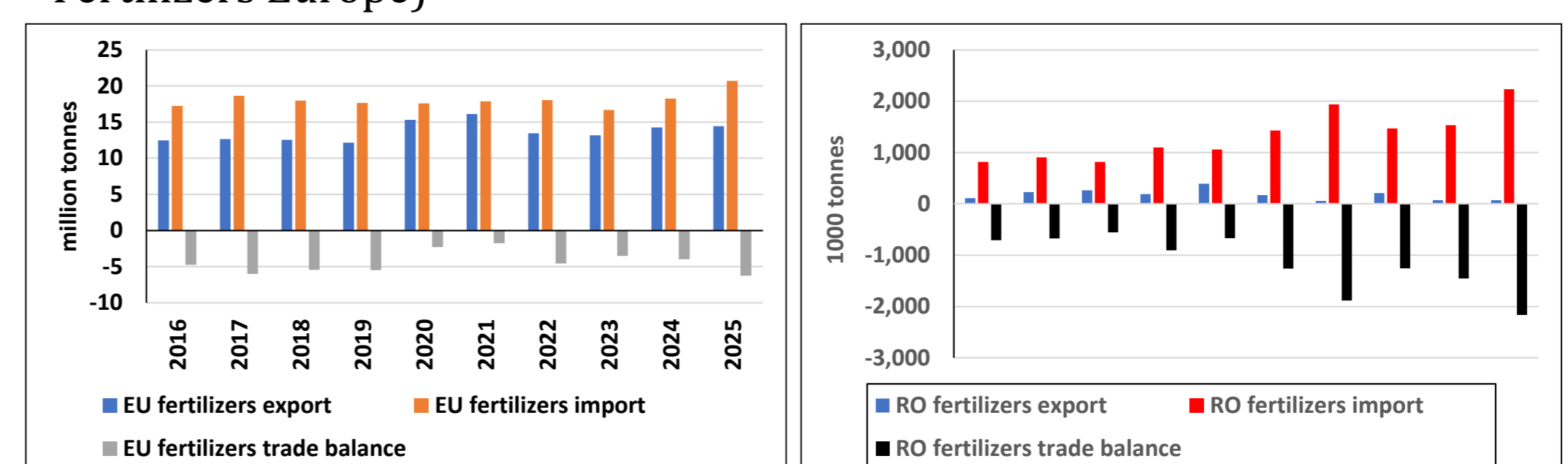


Figure 3. EU and Romanian trade of fertilizers (with non-EU countries) (Source: calculations based on Eurostat data)

At global level, more than half of the fertilizers production is nitrogen-based, followed by phosphatic fertilizers (about one quarter), the remaining share being potassic fertilizers. It is rather important, since lack of P2O5 and K2O in the presence of nitrogen results in important nutritional imbalances for crops, affecting yields and depleting soils.

In EU, fertilizer production is still mostly nitrogen-based oriented, since phosphate rock and potash ore are mostly imported from Russia, Lebanon, Egypt, Algeria, Morocco. In EU, consumption is rather high (16 million tonnes in 2022), and not covered by supply, therefore it is net importer of fertilizers. Phosphatic fertilizers imports originated in 2023 mainly from Mediterranean area (Marocco - 38%, Israel - 24%, Egypt - 23%, Tunisia - 8%, Lebanon - 3%), while potassic fertilizers originated in 2023 mainly from Canada (35%), UK (17%), Israel (17%), Russia (13%), Jordan (8%).

Currently, Romania is also a net importer of fertilizers, with total imports of 3.43 million tonnes in 2025, of which 35% came from EU member states (Hungary, Bulgaria, Slovakia, Netherlands), and 65% from extra-EU countries (China, Egypt, Russia, Turkey). In terms of composition by nutrient, 73% of Romanian imports are nitrogen-based fertilizers, while 24% are complex fertilizers (containing combinations of two or three nutrient elements). The trade deficit in fertilizers was worth 1.25 million EUR in 2025.

### • Conclusions

Fertilizers are essential inputs for agriculture and food production. It is estimated that in the last century, they contributed to increase several times staples production.

EU fertilizers imports are originating mostly from Middle-East and Mediterranean countries, therefore, the tensions in those regions are likely to affect supply and use of those inputs.

In the current geo-political conditions, with natural gas and energy prices surges due to military conflicts, together with the blockage of some essential maritime routes (such as Ormuz strait, which normally channels 30% of the global fertilizer trade), the diminishment of supply, transport and trade, agriculture and food production is jeopardized. Although fertilizer use per hectare in Romania is significantly lower than in the EU, further rise in prices due to diminished supply will have severe implications on the profitability of Romanian farms.