

Forecast
of **food, farming &
fertilizer** use in the
European Union
2022–2032



Fertilizers
Europe

Nitrogen, phosphorus, and potassium are the three primary nutrients for plant growth



Nitrogen (N), captured from the air, is essential as an important component of proteins.



Phosphorus (P), primarily extracted from mined ores, is a component of nucleic acids and lipids, and is a key to energy transfer.



Potassium (K), extracted from mined ores, has an important role in plant metabolism, for photosynthesis, activation of enzymes, osmoregulation, etc.

The nutrients are transformed from naturally occurring raw materials into more plant-available forms by industrial processing and supplied as mineral fertilizers. In this report, the nutrients are expressed as follows:

● nitrogen as a pure element, ● phosphorus as the phosphate equivalent (P_2O_5) and ● potassium as the potash equivalent (K_2O).



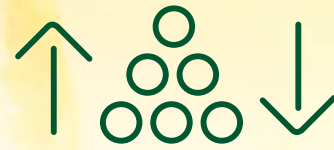


Fertilizer Europe's annual forecast of food, farming and fertilizer use in the European Union has been independently recognized¹ as one of the most trusted inputs into the development of agricultural policy in Europe. Its data is regularly used by many international organizations including the European Commission (DG Agriculture & Rural Development, DG Environment and DG Energy), the Food and Agriculture Organization of the United Nations (FAO), the European Environment Agency (EEA) and the International Fertilizer Producer Association (IFA).

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¹ *Exploring land use trends in Europe: a comparison of forecasting approaches and results: H. van Delden, et al. iEMSs International Congress on Environmental Modelling and Software 2012, Leipzig, Germany.*



Changes in annual fertilizer consumption in Europe by 2032:

N

-4%

in nitrogen consumption, compared to

-5.7%

foreseen last year.

P

-1%

in phosphate consumption, compared to

-3.9%

foreseen last year.

K

+2%

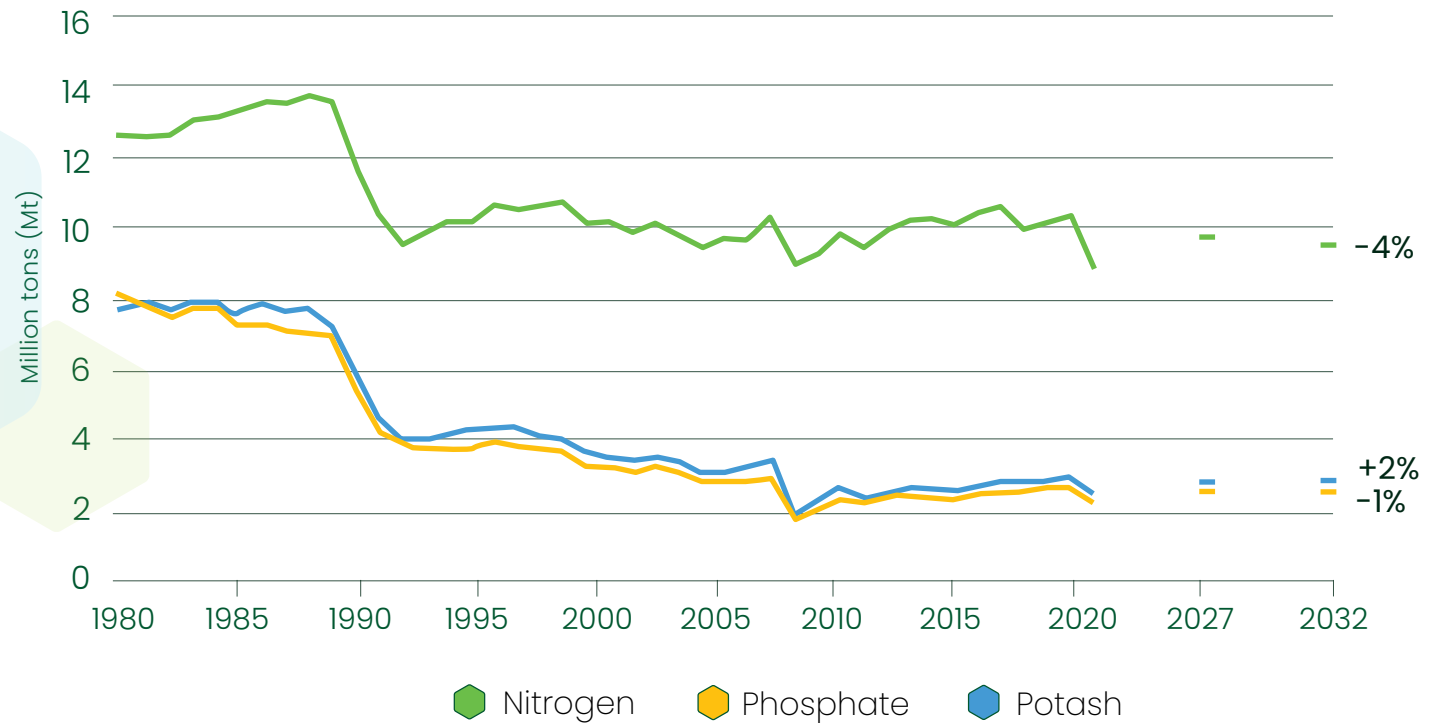
in potash consumption, compared to

-1.4%

foreseen last year.

Fertilizer Consumption in the European Union

Over the season, fertilizers containing an average* of 9.8 million tons of nitrogen, 2.5 million tons of phosphate, and 2.8 million tons of potash were applied to 123.8 million hectares of farmland. 38.7 million cultivable hectares in the EU were not fertilized.



Consideration of the economic outlook and the anticipated evolution of Europe's cropping area has led Fertilizers Europe to expect annual nitrogen, phosphate and potash fertilizer consumption to reach 9.5, 2.5 and 2.8 million tons respectively by the 2031/2032 season, applied to 123.9 million hectares of farmland.

Annual fertilizer consumption over the next 10 years is foreseen to decrease. Nitrogen suffers from the steepest downturn. Phosphate and potash consumption will continue to remain below the levels recorded prior to

the 2008 economic downturn, despite the forecasted increase in potash consumption.

In 2022 consumption of mineral fertilizers in EU-27 suffered from the worst drop since 2009, due to the energy crisis that followed the Russian invasion of Ukraine and severely affected the European industry. Consumption decreased by 11% for nitrogen, 16% for phosphate and 15% for potash fertilizer. In the long-term, a normalization is forecasted.

* Average based on the last three growing seasons: 2019/2020, 2020/2021, 2021/2022.



Arable crops
account for :

62%

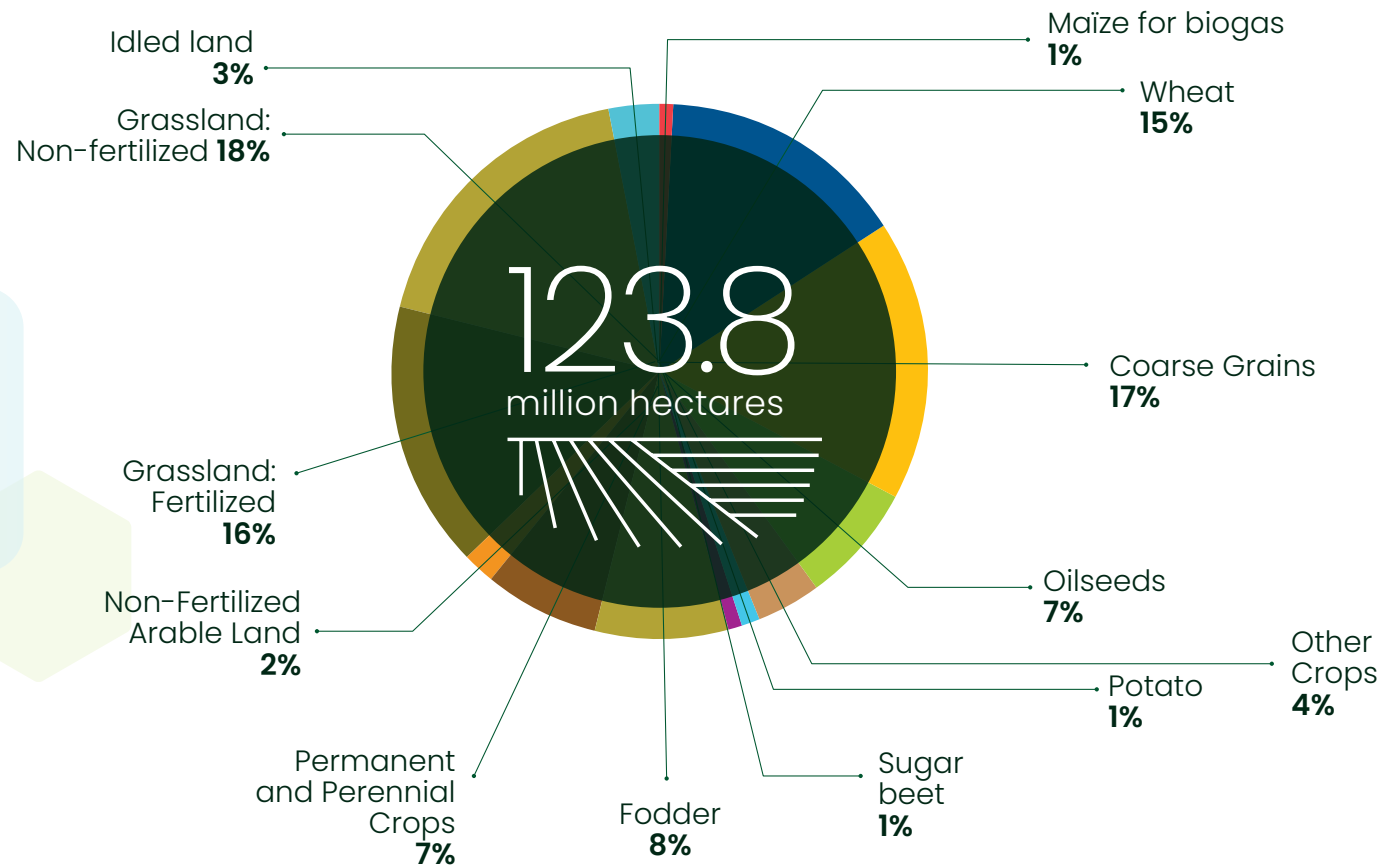
of the fertilized
area in Western
EU countries

87%

of the fertilized
area in Central
and Eastern
EU countries

Agricultural land use in the European Union

Within the total agricultural area of the European Union, the fertilized area comprises 123.8 million hectares.



A further 38.7 million farmable hectares are not fertilized, of which 29.9 million are unfertilized grassland and 8.7 million idle or set-aside land.

Within the fertilized area, arable crops account for 56% (32% cereals, 7% oilseeds, 8% fodder crops). Permanent crops account for 7% of the area and grassland for a further 34%. The unfertilized area is evenly spread across the countries of the European Union but there are significant differences in fertilized crop areas between the countries of Western, Central and Eastern

Europe. In Western Europe (EU-14), the fertilized area comprises 48% arable crops (27% cereals, 5% oilseeds, 8% fodder crops), 9% permanent crops (vineyards, orchards, forests) and 20% fertilized grassland. Agriculture in Central and Eastern Europe (EU-13), however, is far more directed towards arable production, which accounts for 71% of the fertilized area (43% cereals, 11% oilseeds, 8% fodder crops), with permanent crops and fertilized grassland only comprising 2% and 8% of the fertilized area respectively.



The grain sector (wheat, coarse grains and oilseeds) accounts for **63%** of total nutrient consumption, with wheat accounting for **26%**.



Fodder crops and grassland account for **19%** of total nutrient consumption.

Changes in farming food crops 2022-2032



■ Crop area (ha)
 ■ Yield (t/ha)

The anticipated cropping pattern in the European Union over the next 10 years, sees a decrease (-0.9%) in the agricultural area devoted to cereals. This decrease of area is compensated by a slight increase in crop yield (+0.5%). Compared to last year, there is a turnaround in the two main trends. The oilseed rape area will increase (5%), with a consequent increase in yield (1%).

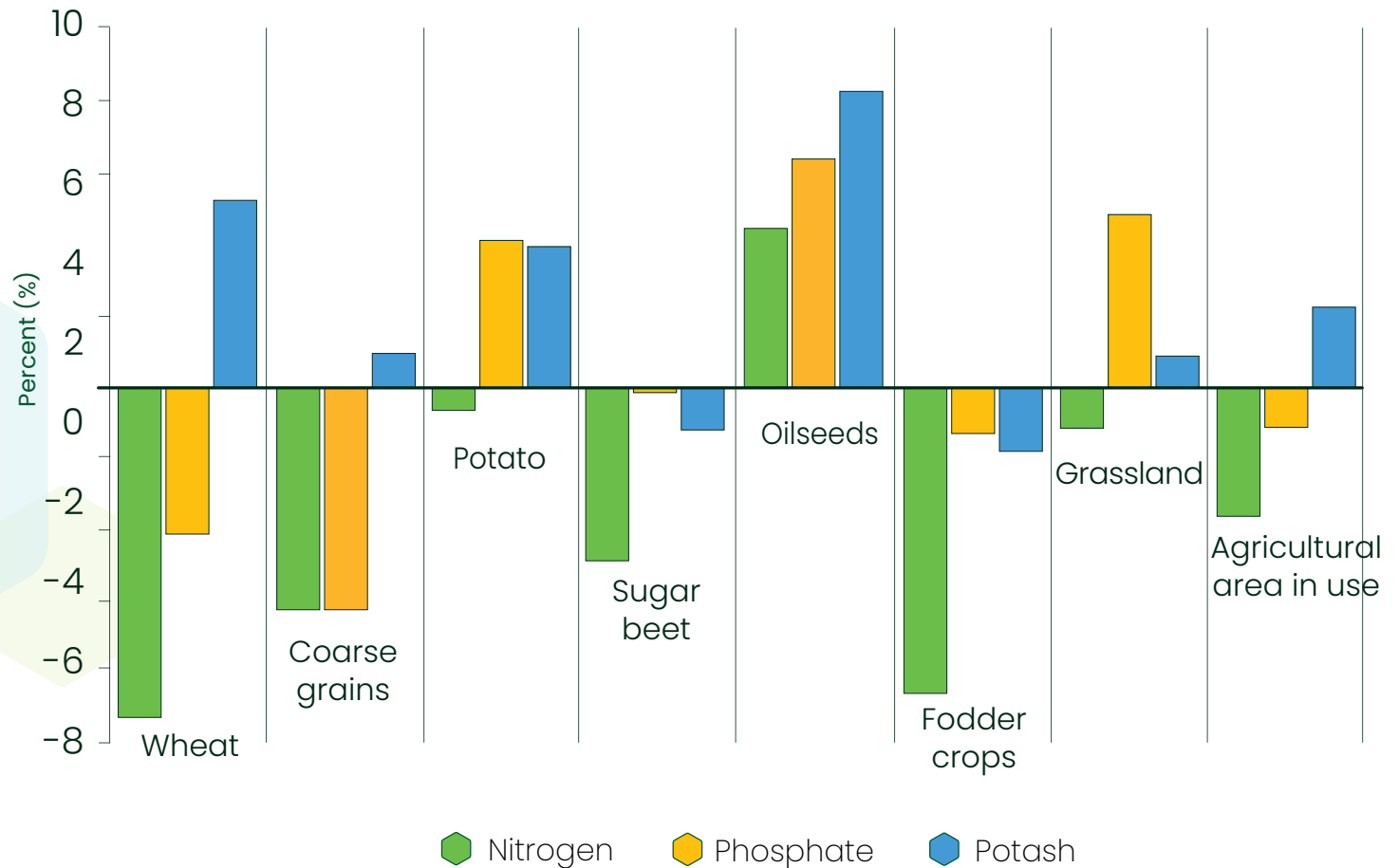
The area for sugar beet is again foreseen to drop (-2%) with a subsequent yield drop (-0.8%). The biggest decrease in yields is foreseen for potato (-5.2%), despite the forecasted increase in the area (2.8%).



Over the next 10 years, only oilseed crops will experience an increase in all three nutrients (N, P and K) consumption.

Changes in fertilizer use by crop 2022-2032

As the forecasted yield development varies significantly according to the crop, the forecasted nutrient consumption follows the same diversified trend.



Nitrogen consumption is forecasted to decrease for all major crops, except for oilseed where a 4.3% increase in consumption is foreseen. The main drivers for this consumption decrease are the tightening of environmental measures restricting fertilizer use. An increase in the frequency of extreme weather occurrences is also having a more regularly negative impact on the agricultural productivity in specific European regions and with it fertilizer use. Phosphate consumption is expected to decrease for most of the major crops

(with the biggest drop forecasted for coarse grains -6.3%), except potato and oilseeds, where an increase by respectively 4.1% and 6.2% is forecasted. The general decrease in nitrogen and phosphate consumption (respectively -3.6% and -1.2% on average) is partially counterbalanced by an overall increase in potash consumption (2.2%) for all major crops (i.e. wheat 5.2% and oilseeds 8.1%), except fodder and sugar beet.

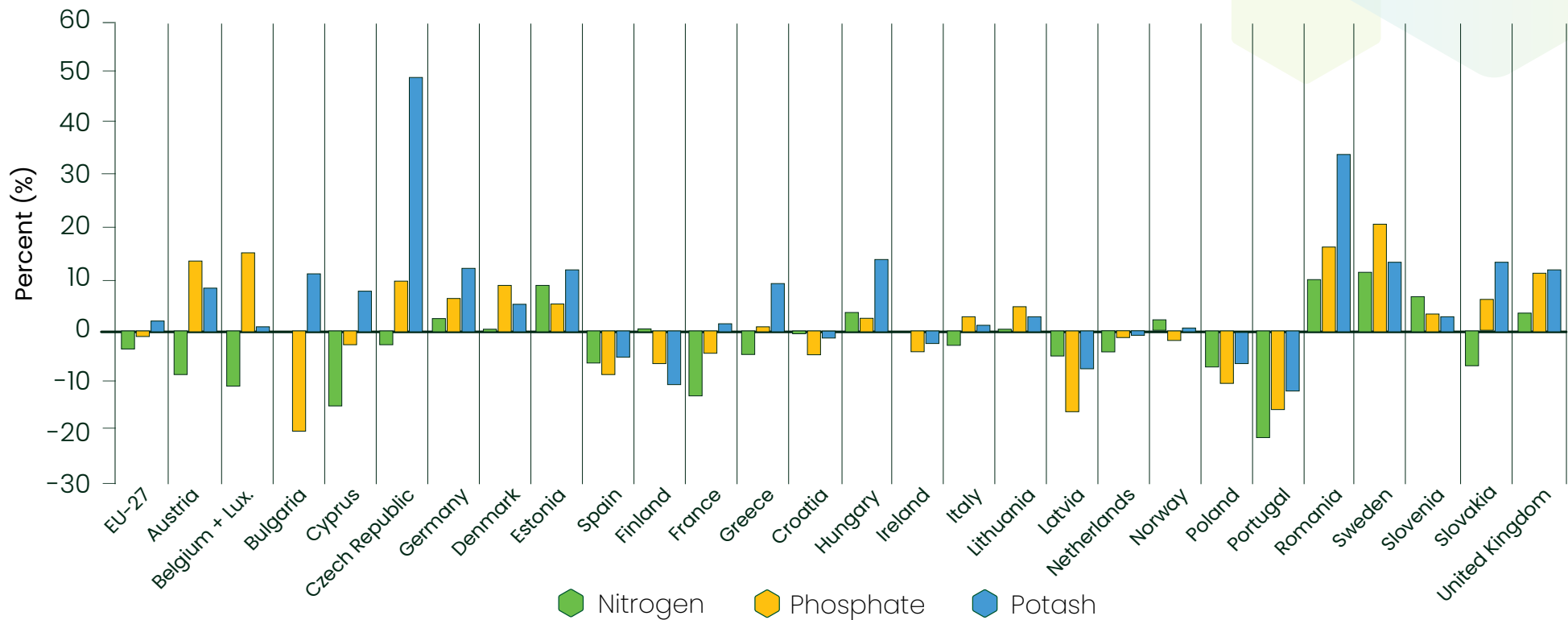


The forecast foresees that Portugal will face an important decrease in nutrient consumption, closely followed by France. Among the main drivers of such trend in addition to national policies that incentivize more efficient use of fertilizers there are changing weather conditions and economic factors.

For the period 2022 - 2032 this decreasing trend is also impacting other Western EU Member States (EU-14 + UK). Most Central and Eastern European Member States (EU-13) confirm their trend for higher nutrient consumption.

Changes in regional fertilizer use 2022-2032

Increased or stable consumption of nitrogen is foreseen in half of the Member States in Central and Eastern Europe (EU-13), while significant decreases are foreseen in the Western European Union Countries (EU-14), with the highest decreases in Portugal, France, Belgium and Austria.



For nitrogen, a -1% decrease in consumption is expected in Central and Eastern European Countries. For Western European, the expected decrease is -4%.

For phosphate, the decrease foreseen in the next ten years is -1% and is driven by Eastern European Countries.

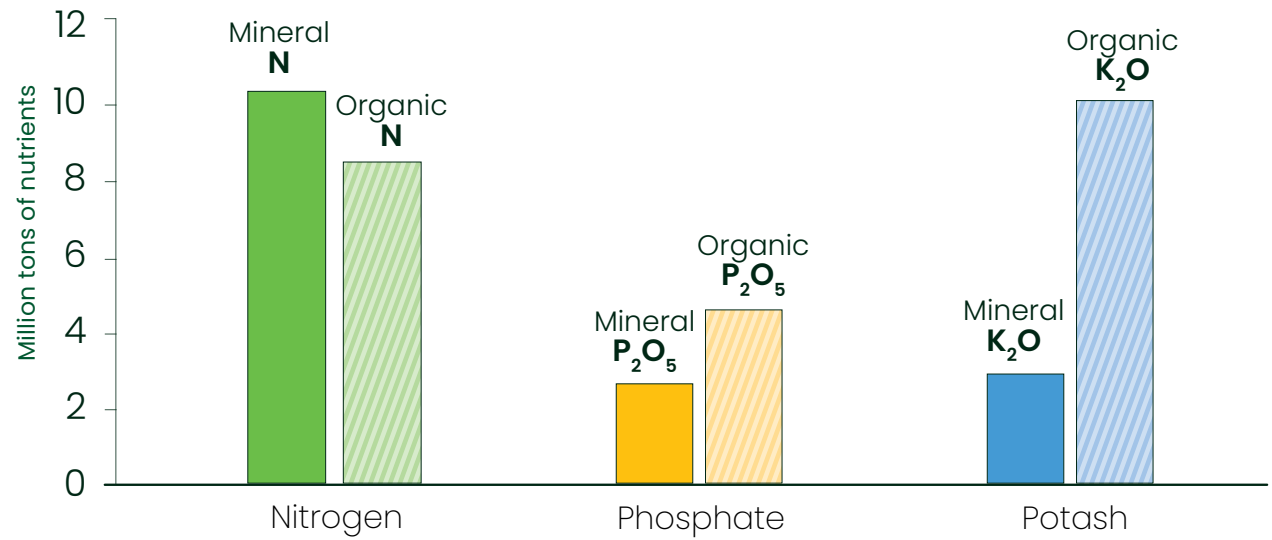
For potash, growth is reported in most European Countries, except Finland, Croatia, Ireland, Latvia, Netherlands and Portugal.

Mineral vs. organic nutrient availability in Europe

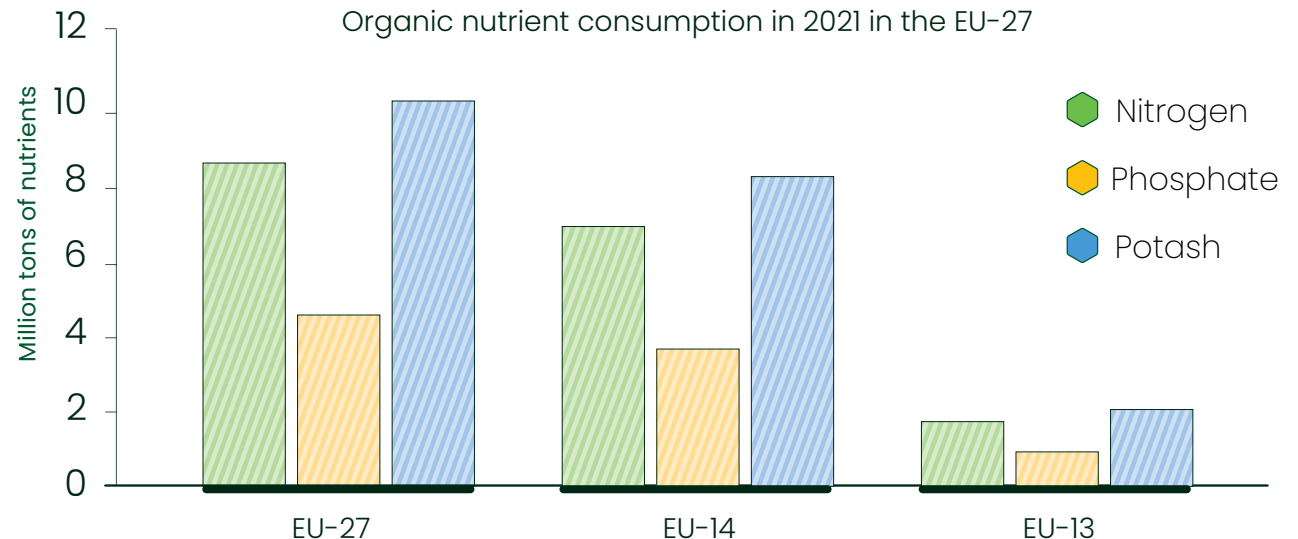
Over the last 10 years, organic nutrient consumption in Europe has remained stable.

In 2021 8.5 million tons of organic-derived nitrogen was applied to European crops, compared to the 9.8 million tons of nitrogen coming from mineral fertilizers applied during the season. For phosphate, 4.5 million tons of organic-derived nutrient were consumed in 2021, complementing the 2.5 million tons of phosphate from mineral fertilizers applied over the season. Organic-derived potash accounted for 10.1 million tons in 2021, in addition to the 2.8 million tons from mineral fertilizers.

Mineral vs organic nutrient availability in Europe in 2021

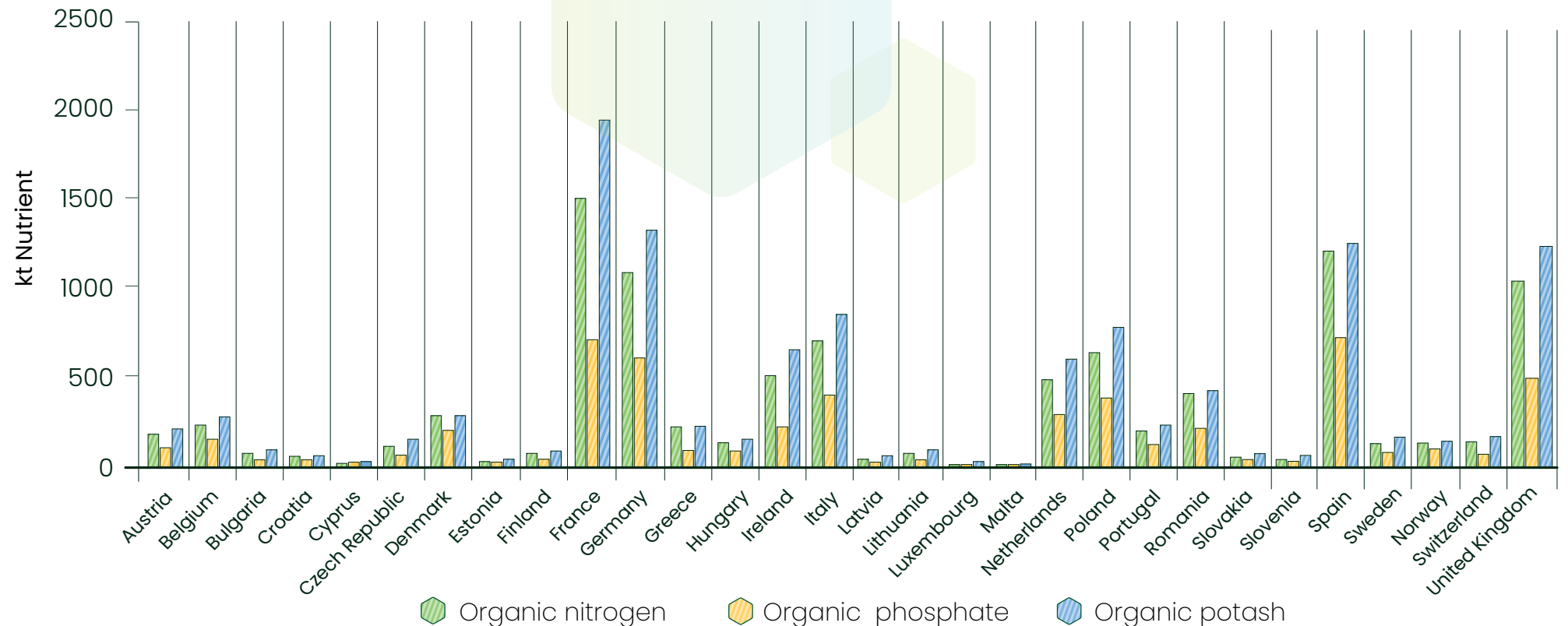


Organic nutrient consumption in 2021 in the EU-27



Differences in regional organic nutrients availability in Europe

Organic nutrients' availability varies significantly across Europe, mainly due to substantial differences in the number of animals present on the national territories.



Higher availability is registered in Western European Countries, with France, Germany, Spain and the United Kingdom showing a higher level of consumption. Limited availability is registered in Eastern and Central European Countries (EU-13), where in 2021 1.6 million tons of Nitrogen,


0.9 million tons of phosphate, and 1.9 million tons of potash from organic sources were consumed, compared to 6.8 million tons of nitrogen, 3.6 million tons of phosphate and 8.1 million tons of potash from organic sources applied in Western European Countries (EU-14).

Database on the availability of livestock-derived nutrients in Europe

How is it made:

To substantiate the discussion around organic nutrients and the role they can play in EU food security, Fertilizers Europe has developed a database on the availability of livestock-derived nutrients in Europe, which represent the vast majority of organic nutrient sources.

The database provides estimates of additions to the soil of major nutrients from non-fertilizers sources. It covers EU27 + Norway, Switzerland and the United Kingdom.



Definition of the numbers of each category of livestock in every country.

Reasonable data is available for most categories* in most countries. Some extrapolation was required in certain cases.

Estimation of the proportion of manure collected for disposal by spreading on land.

This involves estimates of the proportion of the year each livestock category spends in housing.

Estimation of the amounts of nitrogen, phosphate and potash in the collected manures.

based on published or derived figures for typical nutrient contents.

Estimation of the loss of nitrogen as ammonia during storage and during spreading.

based on published figures for typical losses with extrapolation to countries for which there are no published figures.

Calculation of the amounts of nitrogen, phosphate and potash added to soil.

using information from the above points.

* Eurostat database for agricultural products

How the forecast is made

Fertilizers Europe's forecast is an annual exercise that uses the following procedure:

- at the end of each growing season, a general European scenario is established, based on quantitative information (from the FAO-OECD, USDA, FAPRI and the European Commission) and a qualitative analysis made by Fertilizers Europe experts;
- the general scenario is then adapted to the specificities of each country and national forecasts made;
- the national forecasts are then analyzed and discussed by all the experts;
- when the market and economic situation require it, the forecasters carry out a last update of the current situation before integration and publication.

The forecast is an upward crop-based procedure where fertilizer consumption is evaluated by assessing the evolution of the cropping area and the nutrient application rates for each crop. However, two different methodologies are used to achieve this crop-based procedure:

- In the majority of European Union countries, representing the huge majority of its agricultural area and fertilizer consumption, the forecast is an expert-based approach constructed from national forecasts generated by Fertilizer Europe's members.
- In Croatia, Cyprus, and Slovakia, evaluation of the crop area and production as well as application rates used for N, P and K nutrients on each crop is based on a combination of data taken out of the IFA, FAO, and European Commission databases; when precise figures are not available, the evaluation is based on an agronomic model developed by the group of forecasters, for both the current value and the 10 years forecasted value.
- Malta is currently not covered in the forecast.

REFERENCE VOLUMES

The reference volumes used to calculate the percentage changes in fertilizer demand are based on the average value of the last three growing seasons (for the current exercise: 2019/2020, 2020/2021 and 2021/2022). This mitigates the extent to which exceptional years (positive or negative) may impact the calculated evolution of demand.

In this publication, we refer to EU-14 and EU-13 as the following countries:

EU-14: AT, BE (including LU), DE, DK, ES, FI, FR, GR, IE, IT, NL, PT, SE

EU-13: BG, CY, CZ, EE, HU, LT, LV, PL, RO, SI, SK, HR, GB, NO



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Fertilizers Europe represents the majority of fertilizer producers in Europe and is recognized as the dedicated industry source of information on mineral fertilizers. The association communicates with a wide variety of institutions, legislators, stakeholders and members of the public who seek information on fertilizer technology and topics relating to today's agricultural, environmental and economic challenges. The Fertilizers Europe website provides information on subjects of relevance to all those interested in fertilizers contribution to global food security.

Fertilizers Europe asbl
9-31 Avenue des Nerviens
B-1040 Brussels
Tel. +32 2 675 35 50
agriculture@fertilizerseurope.com

 **Group Fertilizers Europe**

 **@FertilizersEuro**

 **www.fertilizerseurope.com**

