



Forecast
of **food, farming & fertilizer** use in the
European Union
2023–2033



Fertilizers
Europe

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

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).

N

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

P

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

K

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



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 AGRI, DG ENVI and DG ENER), the Food and Agriculture Organisation (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 2033:

N

-2%

in nitrogen consumption, compared to

-4%

foreseen last year.

P

+7%

in phosphate consumption, compared to

-1%

foreseen last year.

K

+4%

in potash consumption, compared to

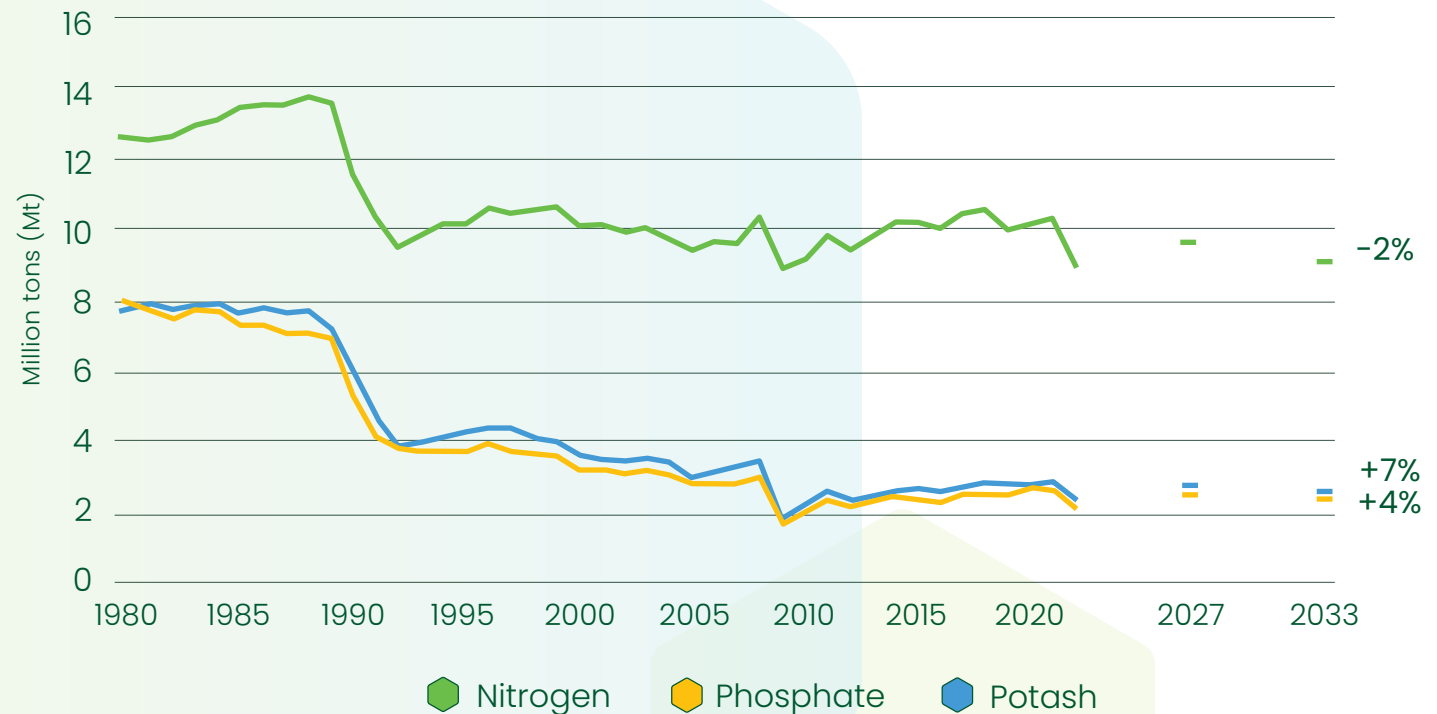
+2%

foreseen last year².

² Consider the exceptional drop in consumption last year due to the Russian invasion of Ukraine when analyzing percentage comparisons.

Fertilizer consumption in Europe*

Over the season**, fertilizers containing an average of 9.3 million tons of nitrogen, 2.3 million tons of phosphate, and 2.5 million tons of potash were applied to 123.8 million hectares of farmland. 38 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 9.2, 2.4 and 2.6 million tons respectively by the 2032/2033 season, applied to 123.7 million hectares of farmland.

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. However, in the long term, some normalization is forecasted.

Nitrogen fertilizers consumption over the next 10 years is foreseen to decrease, reaching 9.1 million tons applied to 123.7 million hectares of farmland. Phosphate and Potash consumption will continue to remain below the levels recorded prior to the 2008 economic downturn, reaching respectively 2.4 and 2.6 million tons.

* Figures cover EU-27, UK and NO

** Average based on the last three growing seasons - 2020/2021, 2021/2022, 2022/2023.



Arable crops
account for:

62%

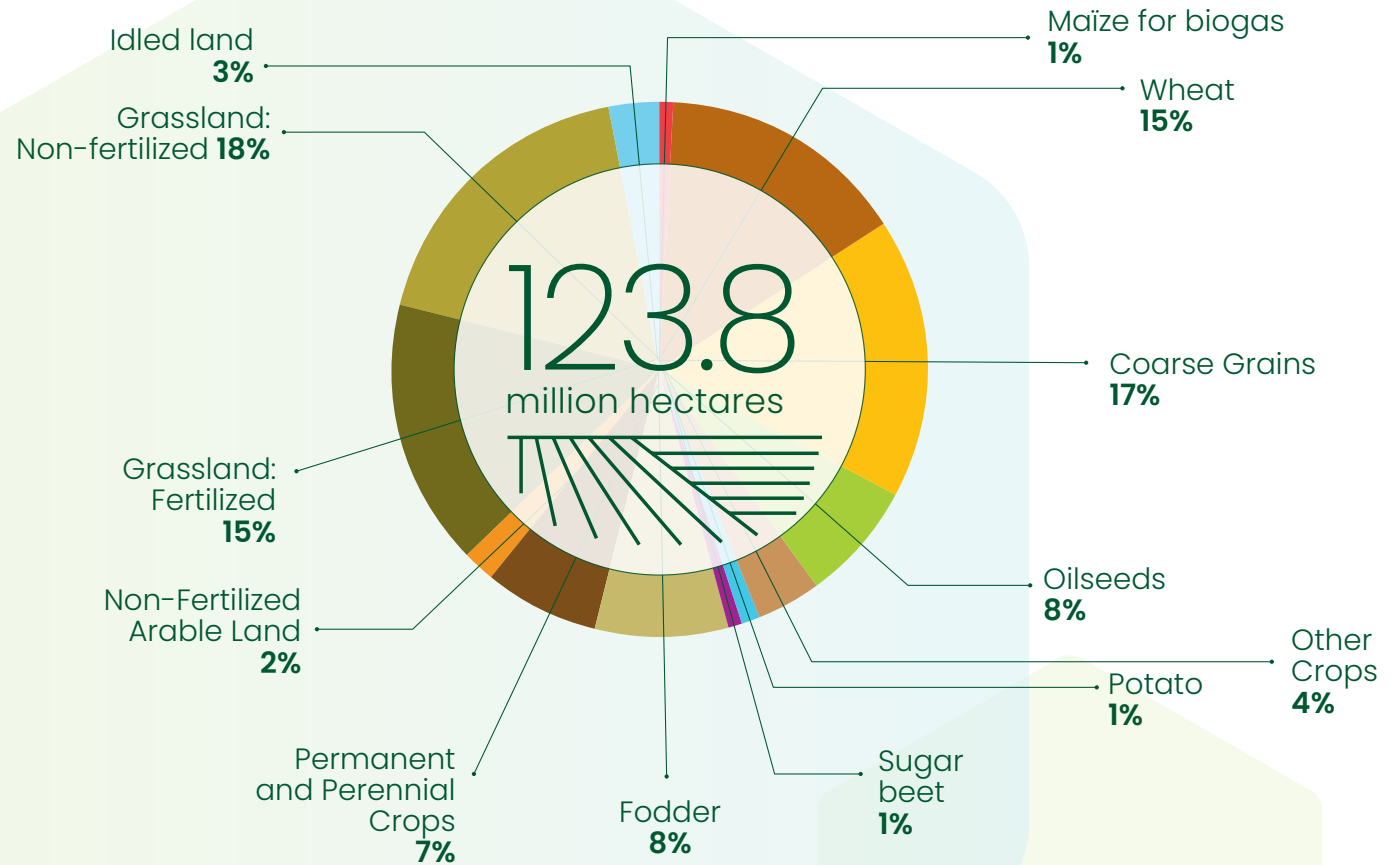
of the fertilized
area in Western
EU countries

88%

of the fertilized
area in Central
and Eastern
EU countries

Agricultural land use in the European Union

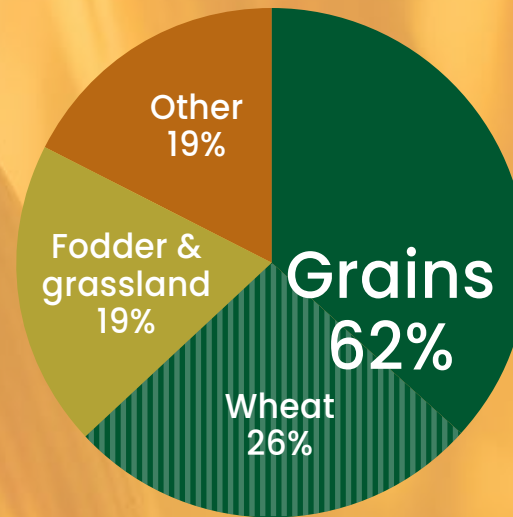
Within the total agricultural area of the European Union, the fertilized area comprises 123.8 million hectares.



A further 38 million farmable hectares are not fertilized, of which 30.2 million are unfertilized grassland and 7.8 million idle or set-aside land. Within the fertilized area, arable crops account for 57% (33% cereals, 8% oilseeds, 8% fodder crops). Permanent crops account for 7% of the area and grassland for a further 33%. 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, and Central and Eastern Europe. In Western Europe (EU-14), the agricultural area comprises 46% arable crops (27% cereals, 5% oilseeds, 5% fodder crops), 9% permanent crops (vineyards, orchards, forests)

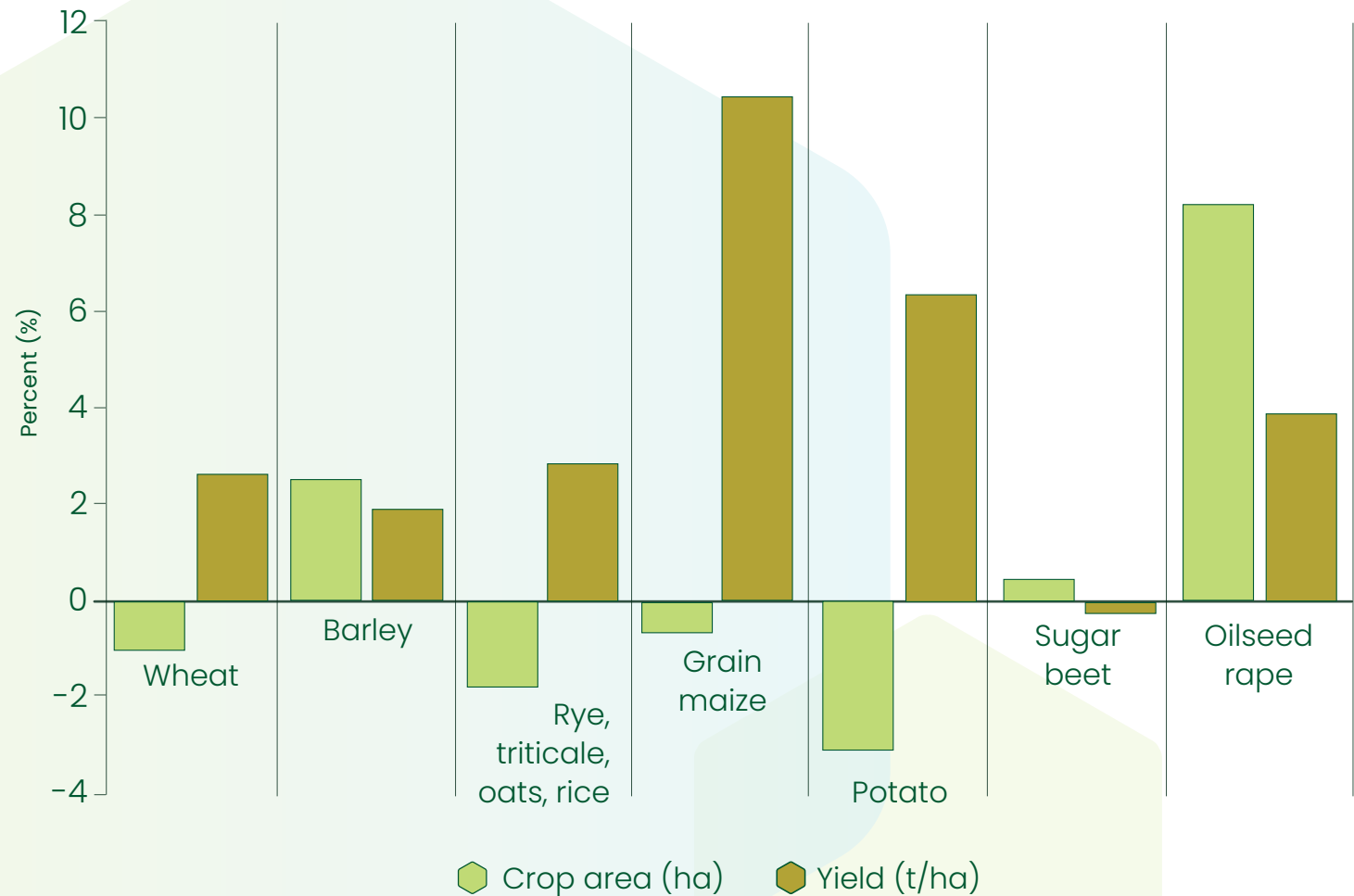
and 19% fertilized grassland. Agriculture in Central and Eastern Europe (EU-13), however, is far more directed towards arable production, which accounts for 70% of the agricultural area (43% cereals, 12% oilseeds, 5% fodder crops), with permanent crops and fertilized grassland only comprising 2% and 7% of the fertilized area respectively.



The grain sector (wheat, coarse grains and oilseeds) accounts for 62% of total nutrient consumption, with wheat accounting for 26%. Fodder crops and grassland account for a further 19%.

Changes in farming food crops 2023–2033

The anticipated cropping pattern in the European Union over the next 10 years, sees a decrease (-0,7%) in the agricultural area devoted to cereals.



This decrease of area is compensated by a significant increase in crop yield (+4,2%). Compared to last year, there is a shift in the primary trends. The oilseed rape area will increase (+8,2%), combined

with a yield increase (+3,9%). There is a reversal in the trend for the sugar beet area, which is expected to show a modest increase (+0,5%) after a previous decline. This increase is compensated by a slight

decrease in crop yields (-0,2%). Yield projections for all other main crops indicate growth, with grain maize recovering to its historical levels. (+10,5%).



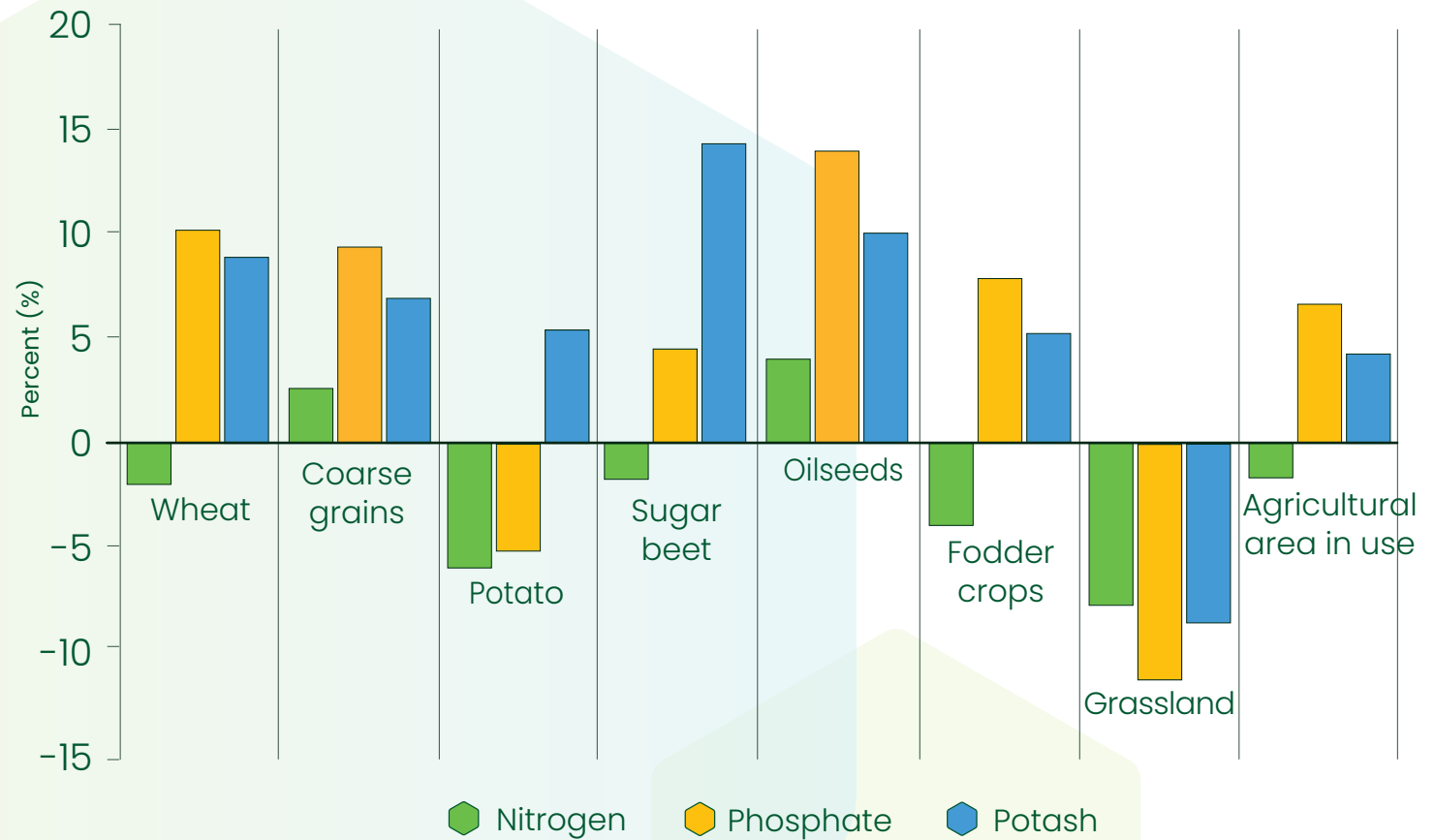
Over the next 10 years, oilseed crops and coarse grains will experience an increase in all three nutrients (N, P, K) consumption.



Conversely, during the same period, we may observe a decrease in the consumption of N, P, and K for grasslands.

Changes in fertilizer use by crop 2023-2033

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 coarse grains and oilseeds where an increase in consumption is foreseen of respectively +2,5% and +3.9%.

Phosphate consumption is expected to increase for most of the major crops (with the biggest increase forecasted for oilseeds +13,9%), except potato and grasslands, where a decrease of respectively -5,3% and -11,4% is forecasted.

Potash consumption is expected to increase for all major crops (i.e. sugar beets +14.3% and oilseeds +10%).

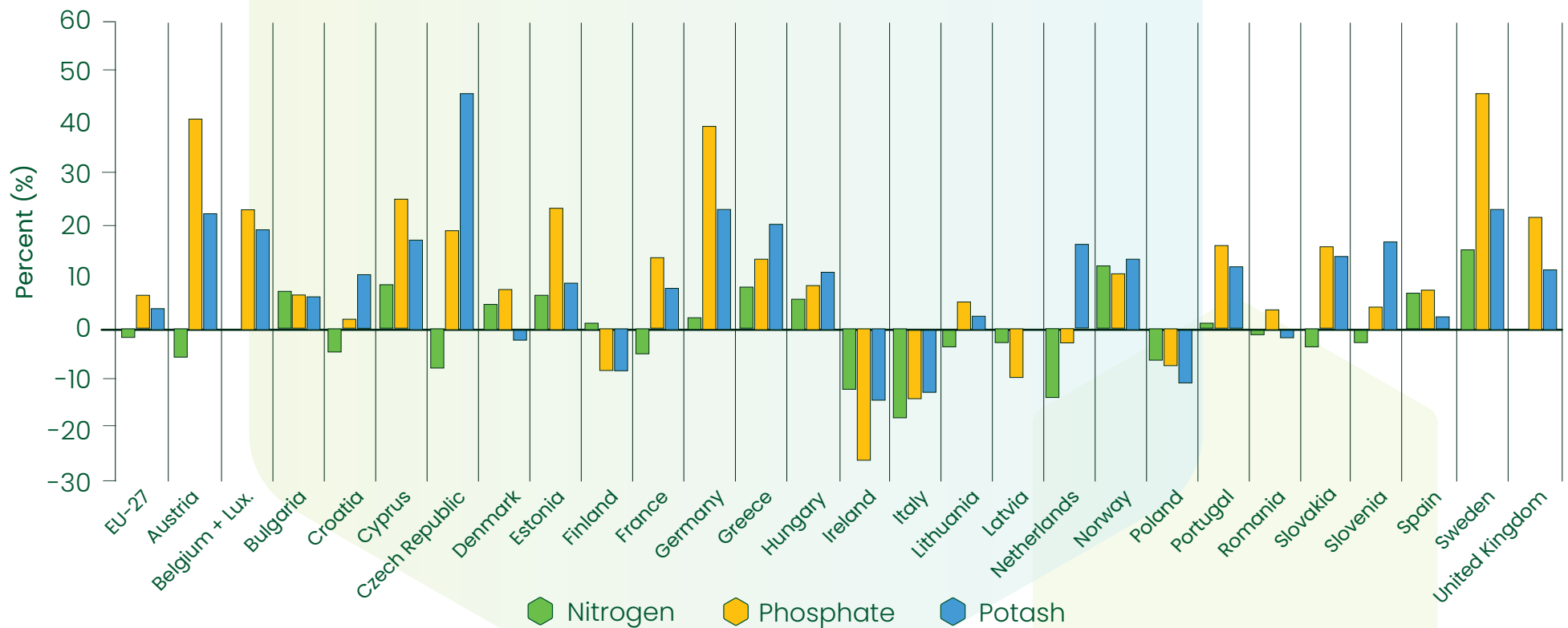


For the period 2023 – 2033, most Central and Eastern European Member States (EU-13) are expected to record higher nutrient consumption.

The forecast predicts that Ireland, followed by Italy, will face a substantial decrease in nutrient consumption followed by Italy, partially linked to improved efficiency and the use of new technologies.

Changes in regional fertilizer use 2023–2033

Increased or stable consumption of Nitrogen is foreseen in half of the Member States in Central and Eastern European Europe (EU-13), while substantial decreases are foreseen in the Western European Union Countries (EU-14), with the highest decreases in Ireland, Italy, and the Netherlands.



For Nitrogen, a -2% decrease in consumption is expected both in Central and Eastern and Western European Countries.

For Phosphate, there is a +7% increase foreseen in the next ten years. Growth is expected in most European Countries, except Finland, Ireland, Italy, Latvia and Poland.

For Potash, growth is expected in most European Countries, except Denmark, Finland, Ireland, Italy, Romania and Poland.

How it is done

The database was developed using the following procedure:



To substantiate the discussion around organic nutrients and the role they can play in ensuring 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.

Data are 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.

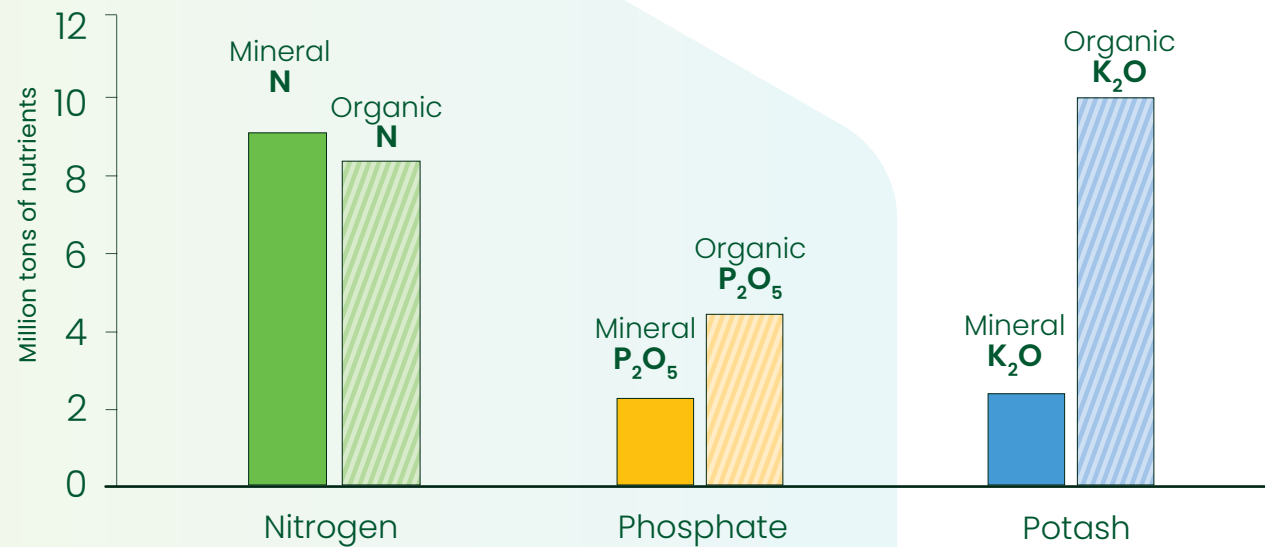
* Eurostat database for agricultural products

Mineral and organic nutrients availability in Europe

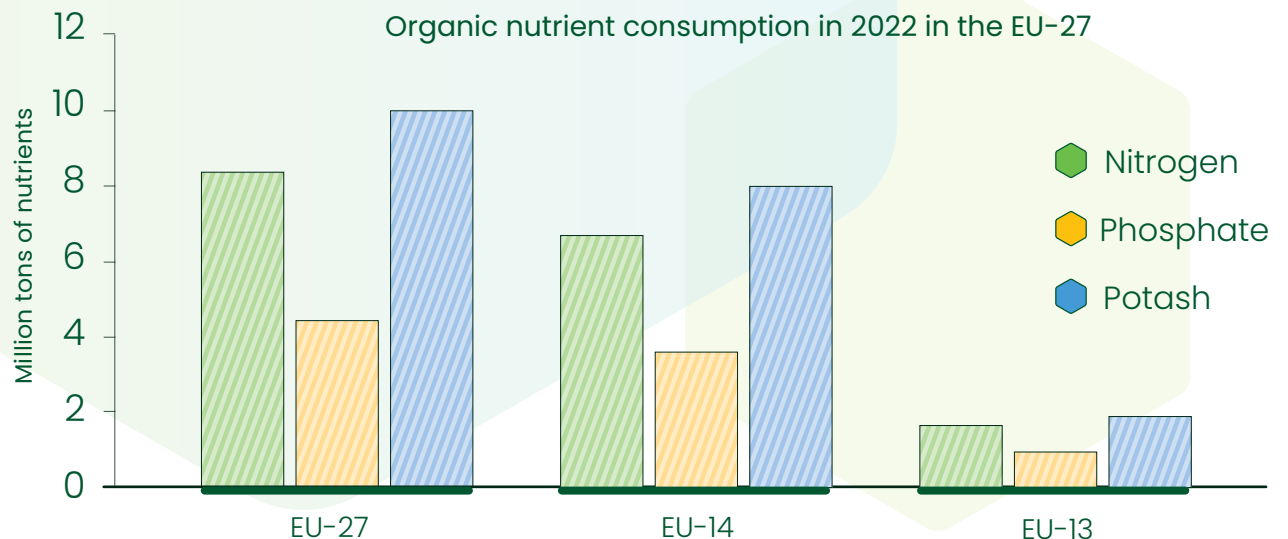
Over the last 10 years, organic nutrient consumption in Europe has remained stable.

In 2022, 8.4 million tons of organic livestock-derived Nitrogen was applied to European crops, compared to the 9 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 2022, complementing the 2.2 million tons of phosphate from mineral fertilizers applied over the season. Organic-derived Potash accounted for 9.9 million tons in 2022, in addition to the 2.4 million tons from mineral fertilizers.

Mineral vs organic nutrient consumption in 2022 in the EU-27

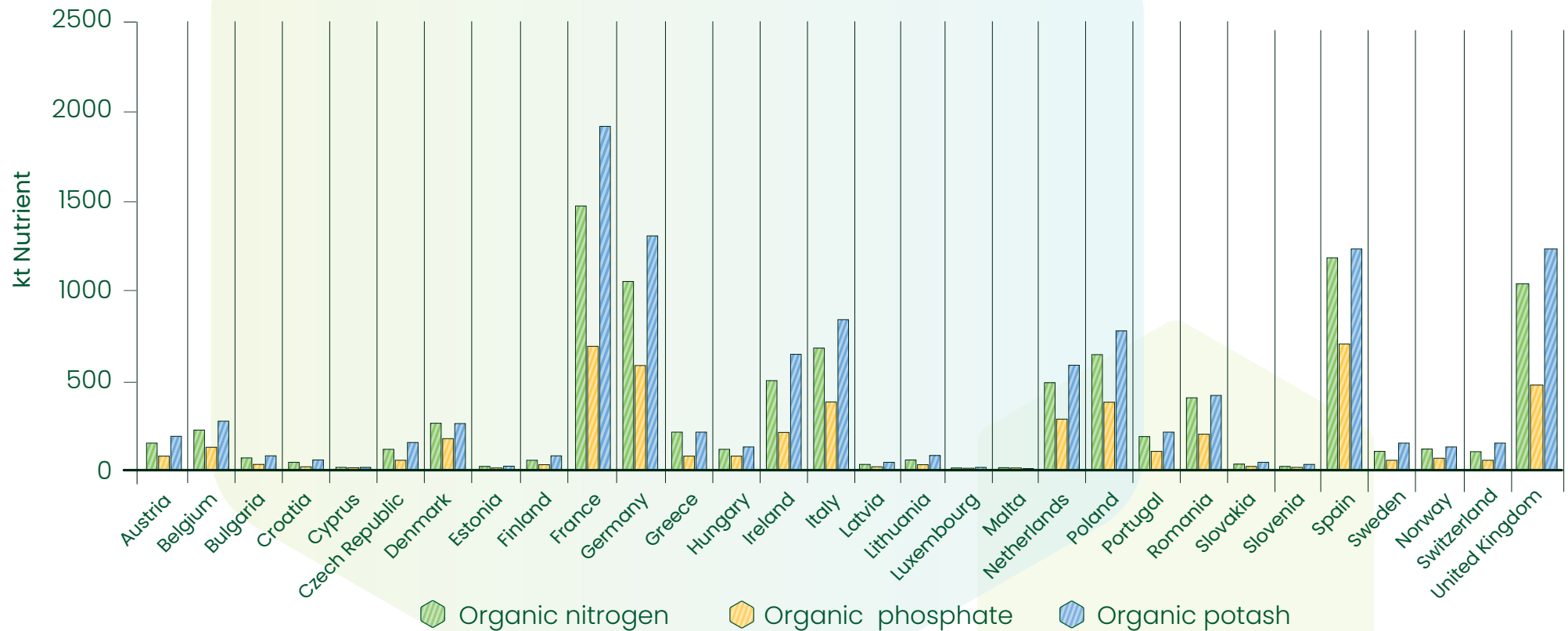


Organic nutrient consumption in 2022 in the EU-27



Differences in regional organic nutrients availability in Europe

Organic nutrients' availability varies significantly across European Countries, 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 confirming a higher level of consumption. Limited availability is registered in

Eastern and Central European Countries (EU-13), where in 2022 1.7 million tons of Nitrogen, 918 thousand tons of phosphate, and 1.9 million tons of potash from organic sources were consumed,

compared to 6.7 million tons of nitrogen, 3.5 million tons of phosphate and 8 million tons of potash from organic sources applied in Western European Countries (EU-14).

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: 2020/2021, 2021/2022 and 2022/2023). This mitigates the extent to which exceptional years (positive or negative) may impact the calculated evolution of demand.

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

EU 14 - AT, BELUX, DE, DK, ES, FI, FR, GR, IE, IT, NL, PT, SE

EU 13 - BG, CY, CZ, EE, HR, HU, LT, LV, PL, RO, SI, SK (MT is currently not covered)

The European Fertilizer Industry has announced its Decarbonisation Roadmap

Developed in collaboration with Guidehouse consultancy, the study represents a clear indication of the industry's decarbonisation ambitions and sets the path to achieve the Green Deal's goal of a climate-neutral Europe by 2050.

EUROPEAN FERTILIZER INDUSTRY'S AMBITIONS

2026



**Decarbonisation
masterplan
by 2026**

2040

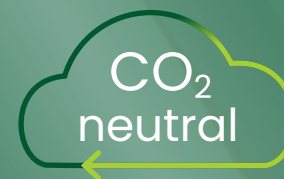


**70% GHG
Emissions reduction
by 2040**

2050



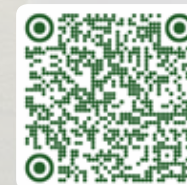
**Climate-neutral
by 2050**



THE INDUSTRY'S DRIVE TO CLIMATE-NEUTRALITY REPRESENTS A SIGNIFICANT STEP TOWARDS ADDRESSING THE CLIMATE CRISIS WHILE SUSTAINING THE VITAL ROLE OF AGRICULTURE IN THE CONTINENT'S FUTURE.

From 2005 to 2020, the industry already reduced its scope 1 and 2 emissions by 49%, demonstrating a commitment to lowering the carbon intensity of fertilizer production. By doing this, EU fertilizer production is the global frontrunner in cutting emissions. However, to further reduce emissions, huge investments and a complete change in the production process is needed. The European fertilizer industry's journey towards a climate-neutral future is both ambitious and necessary. With the right strategies, investments, and collaborative efforts, this vision can become a reality, ensuring Europe's food security and strategic autonomy for generations to come.

For more information on the European Fertilizer Industry Decarbonisation Roadmap visit: <https://www.fertilizerseurope.com/decarbonising-fertilizers-by-2050/>



Disclaimer: This publication contains forward-looking statements, which involve risks and uncertainties because they relate to events, and depend on circumstances, that will or may occur in the future. Actual outcomes may differ depending on a variety of factors.

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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.

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