Agri-environmental indicator - mineral fertiliser consumption

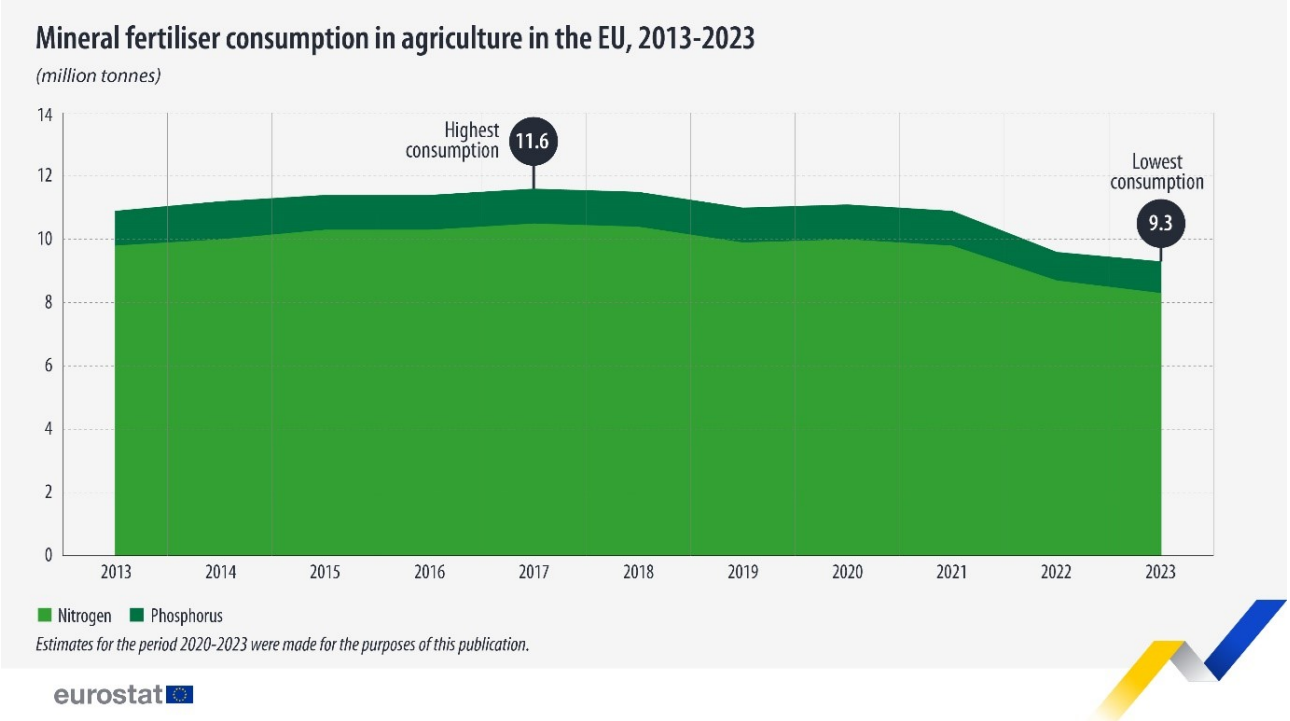
Statistics Explained

Data extracted in June 2025
Planned update: June 2026

Highlights

In 2023, farmers across the EU used 8.3 million tonnes of nitrogen fertiliser. This was 3.8% less than in 2022.

Agricultural use of phosphorus fertilisers amounted to 0.9 million tonnes in 2023, 2.2% less than in the previous year.



Source: Eurostat (aei_fm_usefert)

This article provides a fact sheet of the European Union (EU) agri-environmental indicator **mineral fertiliser consumption** . It consists of an overview of data, complemented by information needed to interpret these data. This article on mineral fertiliser consumption in the EU is part of a set of similar fact sheets , providing a comprehensive picture of the integration of environmental concerns into the Common Agricultural Policy (CAP) .

Analysis at EU level

Mineral fertiliser consumption in agriculture continued to decrease in 2023

In 2023, farmers across the EU used 9.3 million tonnes of mineral fertilisers - nitrogen (N) and phosphorus (P) – for agricultural production (see Figure 1). This represented a 3.7% year-on-year reduction and a cumulative decline of 20.5% from the relative peak in 2017. Please note that throughout the rest of this article, the term 'consumption' refers to the use of mineral fertilisers in agriculture.

Nitrogenous fertilisers (ammonia, urea, ammonium nitrate) are produced using energy from natural gas, which is closely tied to oil prices. The EU's nitrogen-based fertiliser industry has long relied on natural gas imports from Russia. Phosphates are mainly mined outside of the EU and, therefore, incur high transportation costs. Russia and Belarus are key global producers of rock-based fertilisers (phosphates and particularly potassium).

Russia's military aggression against Ukraine and the resulting sanctions on Russian exports led to sharply higher fertiliser prices throughout 2022. This likely contributed to the decrease in fertiliser consumption in the EU that year (Communication on ensuring availability and affordability of fertilisers, European Commission, 2022). Although prices fell back sharply in 2023, they remained considerably higher than pre-2022 levels. Mineral fertiliser consumption in agriculture did not bounce back in 2023: indeed, there were further cuts in consumption levels.

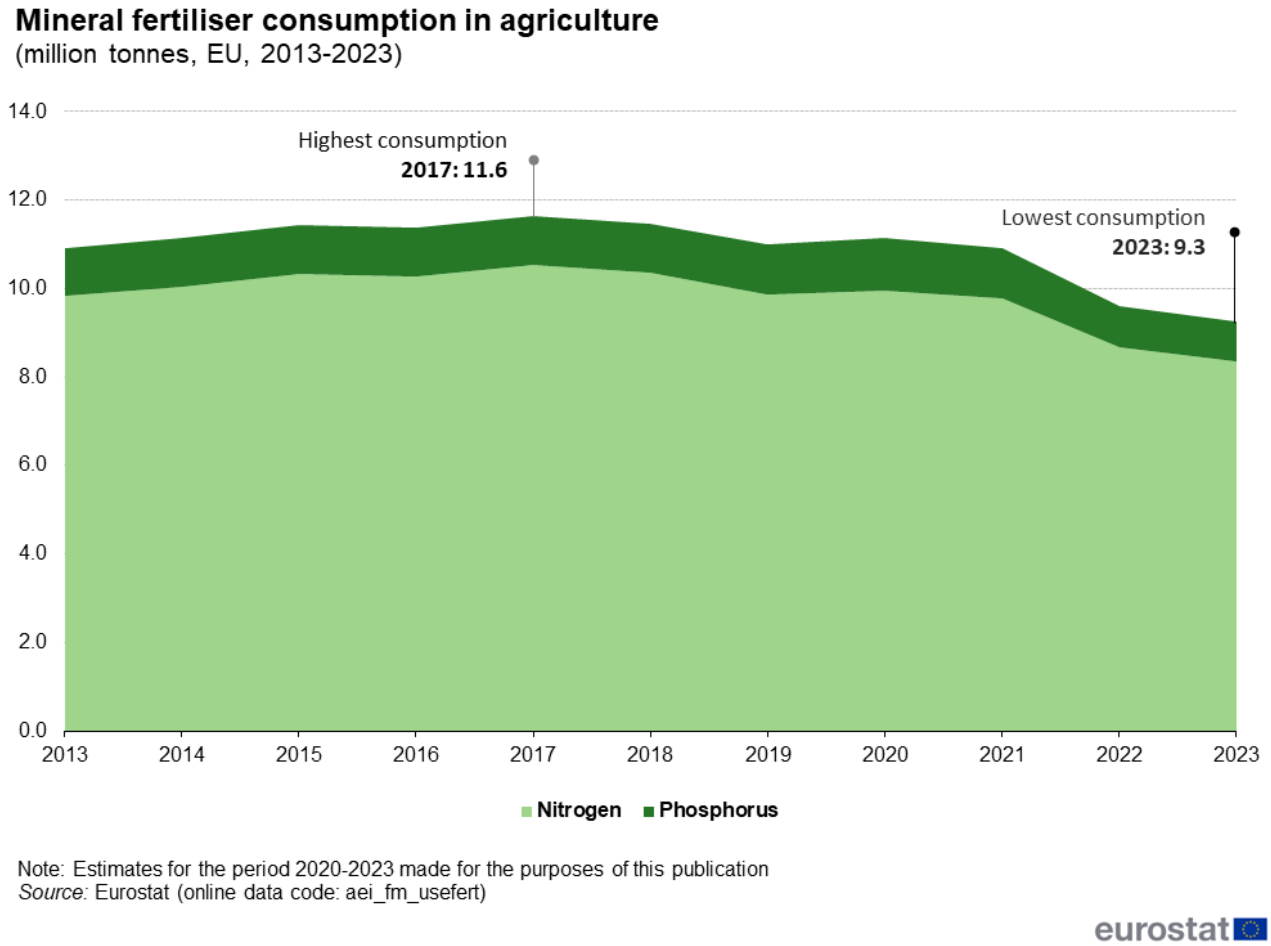


Figure 1: Mineral fertiliser consumption in agriculture (million tonnes, EU, 2013-2023) Source: Eurostat (aei_fm_usefert)

At EU level, nitrogen fertiliser consumption in agriculture was an estimated 8.3 million tonnes in 2023, a 3.8% decrease compared to 2022. This decline followed the short-term downward trend noted since 2017, before which there had been some small rises (see Figure 2).

Earlier declines in nitrogenous fertiliser consumption during the 1990s and into the 2000s were driven by key policy changes. These included the introduction of the Nitrates Directive (ND) in 1991, the implementation of national action programmes for designated nitrate vulnerable zones (NVZs), and reforms to the

CAP that decoupled payments from production levels (Fertilisers in the EU - Prices, trade and use, DG AGRI, 2019).

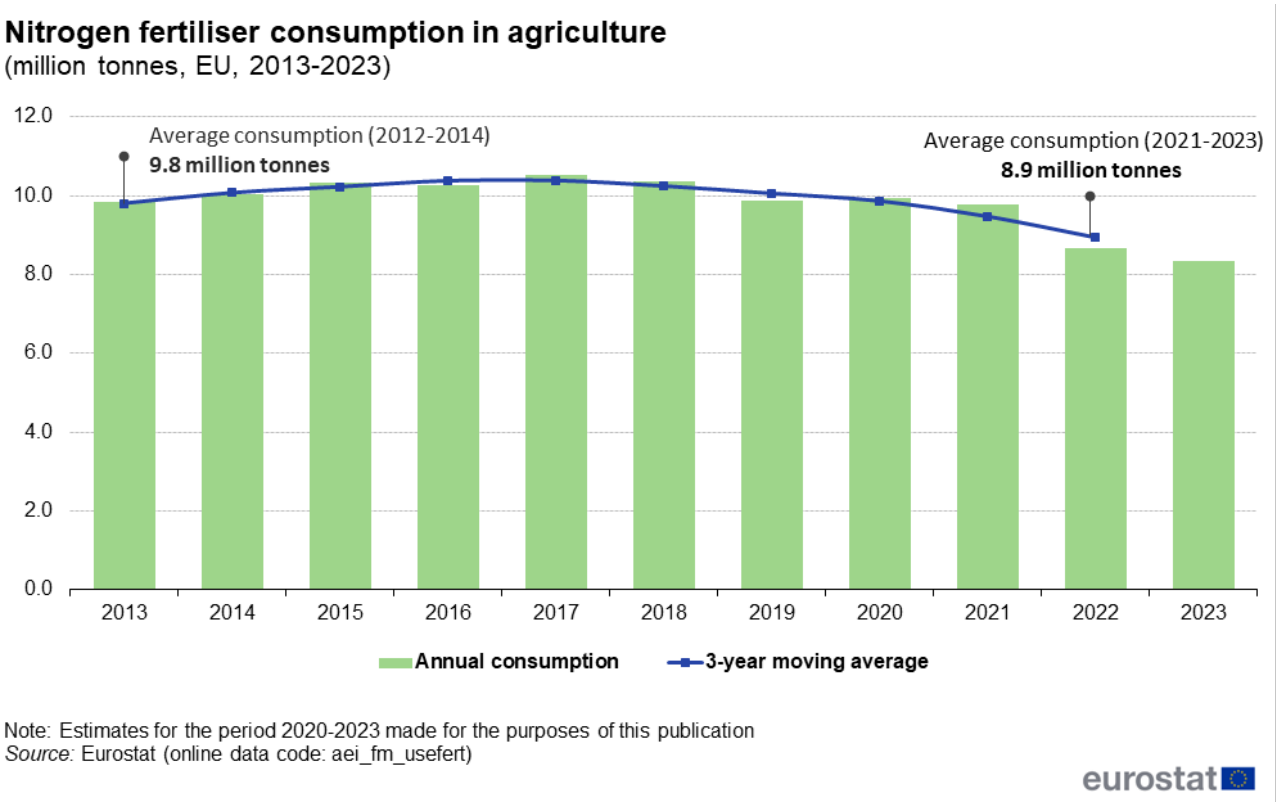


Figure 2: Nitrogen fertiliser consumption in agriculture (million tonnes, EU, 2013-2023) Source: Eurostat (aei_fm_usefert)

At EU level, phosphorus fertiliser consumption in agriculture
was 0.9 million tonnes in 2023, which corresponded to a decline of 2.2% compared to the level in 2022 (see Figure 3).

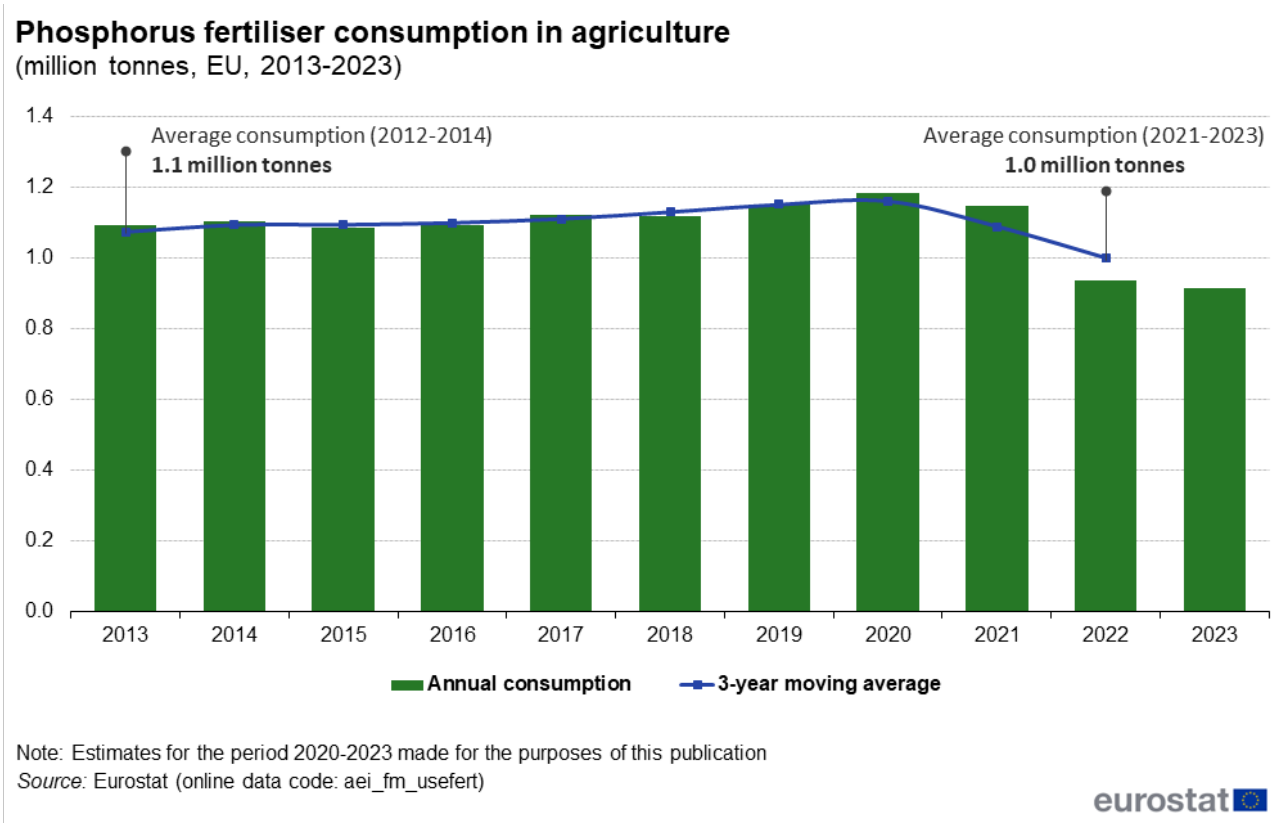


Figure 3: Phosphorus fertiliser consumption in agriculture (million tonnes, EU, 2013-2023) Source: Eurostat (aei_fm_usefert)

Analysis at country level

Note: Mineral fertiliser consumption in agriculture is also influenced by weather and climate conditions. For example, during prolonged and severe droughts – like those in 2012 and 2019 – farmers may have reduced their application of fertilisers in anticipation of lower crop yields. To smooth out these short-term fluctuations and better identify longer-term trends, this article uses three-year moving averages. When these averages are shown, the year is presented in quotation marks (e.g. "2013" refers to the average over the period 2012-2014).

Countries with the highest agricultural production and largest utilised agricultural areas in the EU typically use the most nitrogen fertiliser (see Table
1): In 2023, these included France (1.7 million tonnes), Poland (1.0 million tonnes) and Germany (1.0 million tonnes).

Nitrogen fertiliser consumption in agriculture
(1000 tonnes, 2013-2023)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EU	9 828.7	10 049.2	10 338.2	10 278.5	10 522.1	10 351.8	9 858.2	*9 953.3*	*9 766.5*	*8 676.7*	*8 342.7*
Belgium	137.8	141.2	138.5	146.0	142.7	133.5	141.0	139.0	130.8	110.0	*106.7*
Bulgaria	258.9	322.0	341.6	365.9	351.1	339.3	352.5	364.3	342.9	343.3	340.8
Czechia	331.6	325.7	397.1	407.2	397.6	351.8	332.0	285.4	309.6	324.9	237.6
Denmark	193.6	186.8	205.3	240.7	236.5	224.4	225.2	233.5	202.2	196.1	195.4
Germany	1 648.8	1 675.3	1 822.8	1 710.6	1 658.8	1 496.6	1 342.3	1 372.1	1 265.5	1 096.8	978.0
Estonia	33.7	35.8	36.3	36.4	37.3	38.9	41.4	41.5	46.8	42.1	38.4
Ireland	353.0	331.8	331.0	339.1	369.1	408.5	367.4	379.5	399.2	343.2	280.6
Greece	182.5	165.9	164.3	185.0	192.2	179.4	189.7	202.9	208.8	167.4	174.4
Spain	961.5	1 101.9	1 068.1	982.2	1 072.1	1 033.5	1 011.3	1 059.3	1 029.9	*744.1*	*773.0*
France	2 084.4	2 167.4	2 199.6	2 214.7	2 234.2	2 250.8	2 125.1	2 016.8	1 958.5	1 812.8	*1 733.0*
Croatia	77.9	73.7	87.4	72.3	98.4	99.4	97.1	99.0	102.2	88.4	86.8
Italy	582.4	581.1	579.7	578.4	577.2	575.9	574.5	573.5	572.1	*570.5*	*569.4*
Cyprus	7.1	6.7	7.5	8.1	7.8	7.8	7.8	:	:	:	:
Latvia	69.7	72.9	75.8	78.3	77.4	74.5	80.7	84.3	84.6	82.3	80.3
Lithuania	155.0	162.0	166.6	160.2	167.1	159.4	178.6	185.8	187.5	130.7	127.4
Luxembourg	13.4	12.7	13.0	13.7	13.6	13.0	13.8	13.1	13.9	8.4	10.0
Hungary	335.5	341.2	378.3	404.0	424.5	424.3	415.9	445.2	456.3	325.5	265.5
Malta	0.6	0.6	0.6	0.6	0.6	0.6	0.6	:	:	:	:
Netherlands	216.0	213.2	244.9	229.8	230.2	212.3	214.8	217.4	211.8	184.2	189.3
Austria	110.6	121.6	124.1	132.0	111.9	100.1	102.8	117.3	94.3	*97.6*	*97.6*
Poland	1 179.1	1 098.5	1 003.6	1 043.0	1 150.6	1 178.8	994.1	1 033.0	1 038.1	:	*1 039.8*
Portugal	111.1	131.6	117.9	108.4	102.6	101.4	107.4	103.2	94.9	68.0	*89.2*
Romania	344.5	303.6	357.4	344.3	381.3	468.6	456.0	468.9	510.8	459.0	463.7
Slovenia	27.3	28.6	28.3	27.1	27.1	27.3	28.0	27.7	29.1	27.8	24.9
Slovakia	113.6	119.0	114.8	126.2	122.5	129.0	128.5	127.7	127.5	115.3	107.7
Finland	138.1	147.4	143.5	138.1	138.9	138.4	146.8	139.3	145.8	*106.8*	*140.8*
Sweden	161.1	181.1	190.2	186.0	198.5	184.2	182.7	215.2	195.0	184.9	184.0
Iceland	11.6	14.3	11.6	10.8	13.1	11.7	10.4	11.4	12.2	11.2	8.7
Norway	95.5	101.3	102.6	100.9	99.3	102.4	106.8	105.9	107.3	99.0	87.0
Switzerland	45.7	51.6	45.8	48.5	51.6	47.9	42.0	43.0	47.4	40.2	35.3
Albania	17.3	17.4	17.6	17.8	18.1	*24.8*	*38.3*	*32.6*	*36.1*	*16.5*	29.0
Türkiye	1 584.2	1 492.8	1 486.6	1 896.5	1 764.6	1 527.6	1 682.5	2 052.7	1 787.3	1 579.4	1 948.2

Italics: estimated and provisional data.
Note: 2020 to 2023 EU estimates include 2019 data for Cyprus and Malta. 2022 EU estimate include 2021 data for for Poland
Source: Eurostat (online data code: aei_fm_usefert)

Bookmark to data source in Eurobase:
https://ec.europa.eu/eurostat/databrowser/bookmark/65ba5e1d-11cb-4efe-9d7d-868d71d8378d?lang=en

Data extracted on 19/05/2025

eurostat

Table 1: Nitrogen fertiliser consumption in agriculture (in 1 000 tonnes, 2013-2023) Source: Eurostat (aei_fm_usefert)

Between "2013" and "2022" there was growth in nitrogen fertiliser consumption in agriculture in thirteen EU countries (see Figure 4). The sharpest rate of increase was in Romania, though this largely reflects starting from a relatively low absolute level compared with the EU average (Fertilisers in the EU - Prices, trade and use, DG AGRI, 2019).

These increases were offset by the reductions in the other fourteen EU countries, including some of the largest agricultural producers. In particular, Germany recorded the sharpest rate of decline in the nitrogen fertiliser consumption (-32.7%). The rates of decline in France and Spain were also sharper than the EU average.

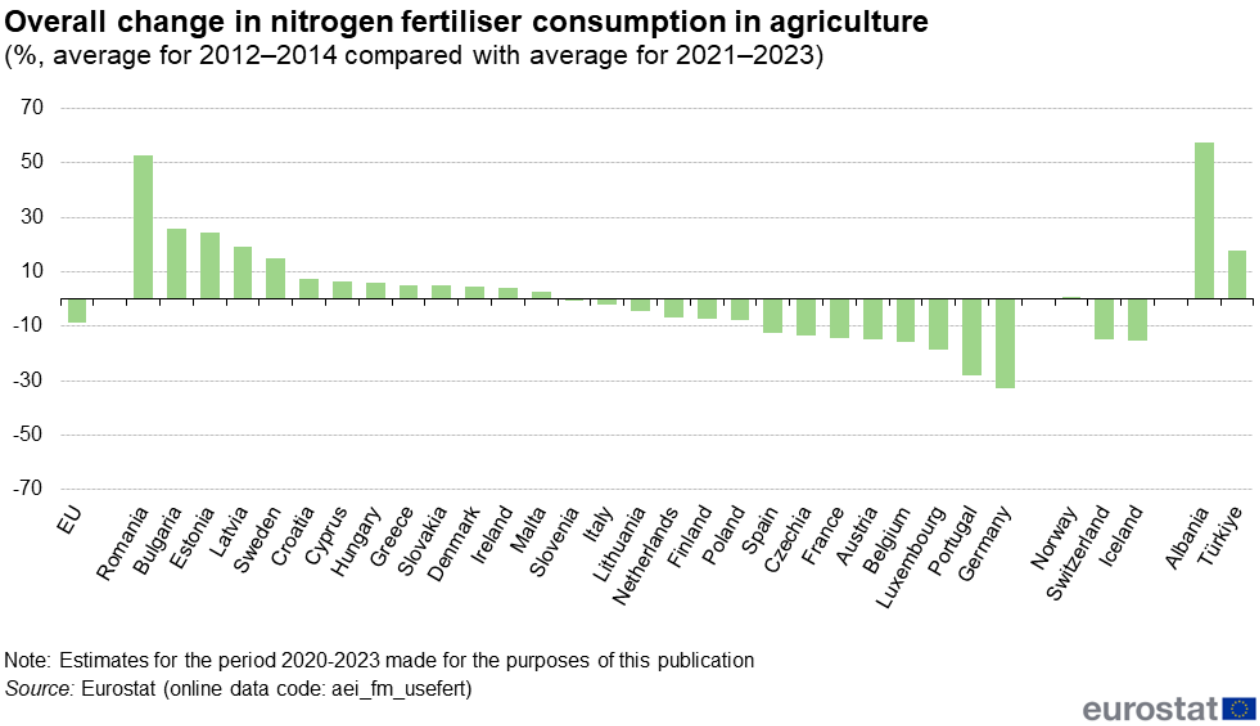


Figure 4: Overall change in nitrogen fertiliser consumption in agriculture (% change, 2013-2023) Source: Eurostat (aei_fm_usefert)

In 2023, the highest levels of phosphorus consumption in agriculture were also for the EU's largest agricultural producers (see Table 2): France (130 000 tonnes), Poland (124 200 tonnes), Germany (119 400 tonnes), Spain (106 300 tonnes), Italy (100 000 tonnes) and Romania (91 600 tonnes).

Phosphorus fertiliser consumption in agriculture
(1000 tonnes, 2013-2023)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EU	1 091.7	1 105.6	1 085.2	1 093.8	1 121.6	1 119.6	1 151.8	1 185.4	*1 148.3*	*935.7*	*915.3*
Belgium	6.1	6.3	5.8	5.4	5.3	5.4	5.7	5.5	5.2	*4.1*	*4.0*
Bulgaria	11.7	28.1	27.6	36.1	29.6	33.3	33.5	34.4	31.8	32.0	34.8
Czechia	18.2	20.1	21.2	20.7	24.2	22.5	25.3	20.7	15.8	16.3	12.8
Denmark	12.3	14.0	13.8	13.8	20.8	14.8	14.8	16.3	15.1	11.0	10.3
Germany	124.1	124.0	131.5	125.6	100.9	91.0	87.8	108.2	83.9	50.0	119.4
Estonia	3.1	3.8	3.5	3.4	4.1	4.1	4.1	4.8	5.0	3.9	2.9
Ireland	37.0	35.6	36.6	37.1	41.9	46.4	42.7	44.3	46.1	34.2	30.8
Greece	25.9	24.0	22.0	22.5	28.2	25.9	26.0	28.3	30.1	24.9	21.4
Spain	189.0	174.0	179.8	181.2	190.4	186.0	209.4	212.5	173.0	105.6	*106.3*
France	202.3	214.4	198.6	189.6	182.9	181.4	190.3	189.0	194.2	180.4	*130.0*
Croatia	12.5	16.9	12.9	5.8	14.9	15.6	15.0	15.4	15.0	14.2	11.9
Italy	98.1	99.7	99.0	99.6	100.3	99.4	98.2	100.0	100.3	97.6	*100.0*
Cyprus	*1.9*	*1.7*	*2.1*	*2.3*	*2.2*	*2.3*	*2.3*	*2.3*	2.3	2.3	2.3
Latvia	10.7	10.2	10.6	11.1	11.3	11.5	11.7	13.6	14.3	11.4	10.0
Lithuania	*18.2*	*19.4*	*19.8*	*22.2*	23.5	22.4	23.0	23.8	24.1	16.6	16.4
Luxembourg	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3
Hungary	35.7	35.8	36.0	41.3	51.6	51.2	50.0	49.0	50.5	28.6	23.8
Malta	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*	0.0	0.0	0.0
Netherlands	4.0	5.9	3.7	6.0	5.4	5.3	5.0	5.7	5.8	4.9	4.1
Austria	14.2	14.1	12.5	15.5	11.8	13.1	13.2	12.2	9.8	6.8	8.6
Poland	163.3	148.9	132.5	142.3	150.0	147.9	150.0	156.6	156.4	*156.4*	124.2
Portugal	17.3	18.5	20.2	19.0	17.9	17.0	16.6	16.8	18.7	11.7	*16.0*
Romania	49.7	51.8	57.9	55.1	63.3	82.3	87.9	81.9	103.7	86.7	91.6
Slovenia	3.9	4.0	4.1	4.0	4.0	4.1	3.5	3.7	3.2	2.4	3.4
Slovakia	9.0	9.9	9.4	10.6	10.1	11.2	11.4	12.0	13.0	10.4	8.0
Finland	11.2	11.8	11.0	9.8	12.3	11.0	11.4	11.5	12.8	8.7	*10.2*
Sweden	11.8	12.1	12.5	13.1	14.4	14.3	12.8	16.6	17.8	14.1	11.7
Iceland	1.6	1.8	1.7	1.5	2.0	2.0	1.5	1.7	1.8	1.6	1.1
Norway	8.5	8.4	9.3	9.1	8.7	8.9	8.9	9.0	9.5	8.3	6.8
Switzerland	4.3	4.2	4.2	4.3	4.3	4.1	4.4	4.1	4.0	*3.5*	*2.4*
Albania	15.2	14.4	14.3	14.1	14.2	5.8	*6.6*	*10.0*	*11.1*	*2.1*	*3.5*
Türkiye	271.9	249.0	255.2	346.0	329.5	227.5	291.4	333.4	276.6	263.5	321.3

Italics: estimated and provisional data.
Note: 2020 to 2023 EU estimates include 2019 data for Cyprus and Malta. 2022 EU estimate include 2021 data for for Poland
Source: Eurostat (online data code: aei_fm_usefert)

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Data extracted on 19/05/2025

eurostat

Table 2: Phosphorus fertiliser consumption in agriculture (1000 tonnes, 2013-2023) Source: Eurostat (aei_fm_usefert)

Between "2013" and "2022", phosphorus fertiliser consumption in agriculture declined in thirteen EU countries. The sharpest rates of decline were in Luxembourg and Austria. By contrast, there was particularly sharp growth in Romania and Bulgaria.

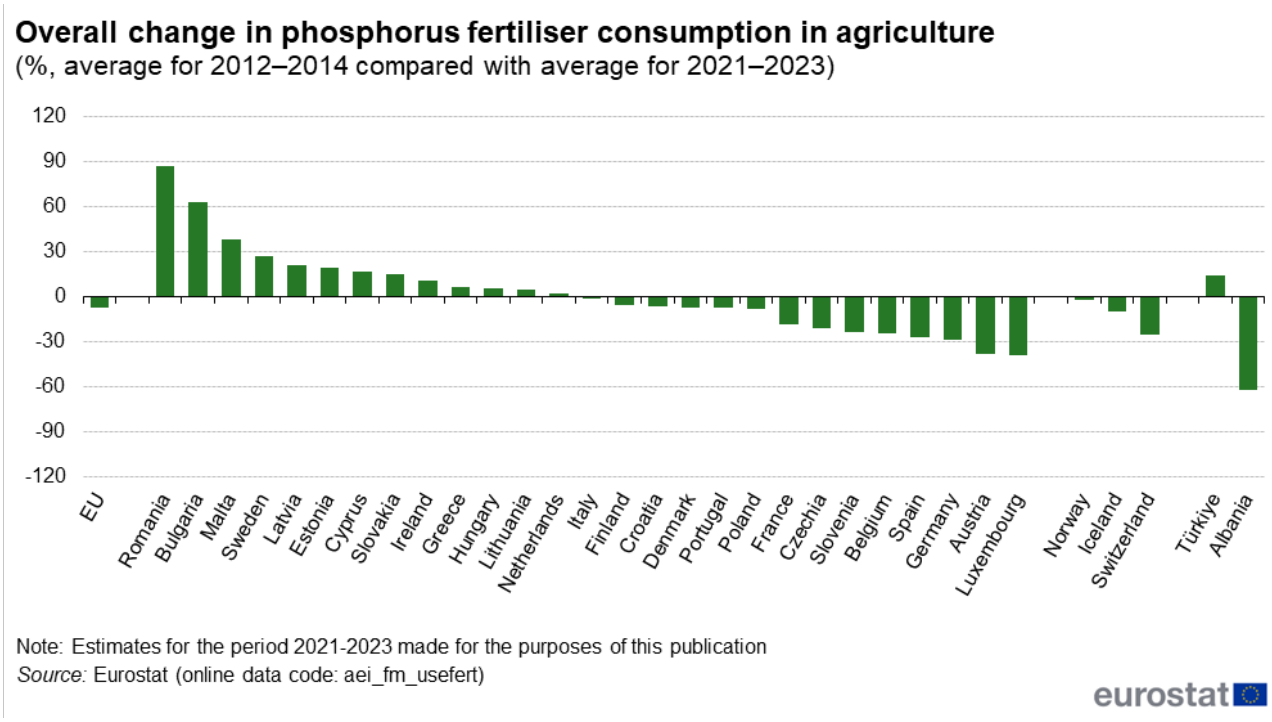

Figure 5: Overall change in phosphorus fertiliser consumption in agriculture (%, average for 2012-2014 compared with average for 2021-2023) Source: Eurostat (aei_fm_usefert)

Source data for tables and graphs

- Download Excel file

Data sources

Indicator definition

Mineral fertiliser consumption refers to the quantity of nutrients - nitrogen (N) and phosphorus (P) - in mineral fertilisers used in agriculture over a calendar year. **Main indicator:**

- Absolute volumes (tonnes) of N and P

Links with other indicators

The consumptions of nitrogen and phosphorus fertilisers are linked to the gross nutrient balances , as nutrient inputs to the soil, as well as other agri-environmental indicators . **Data used**

Eurostat publishes data on consumption of inorganic fertilisers in agriculture (aei_fm_usefert) . **Methodology**

The data source used in the assessment of this indicator is national data. Tonnes of N and P inorganic fertiliser consumption for year t are transmitted annually each t + 1, at NUTS 0 level and (for 11 countries) at NUTS 2 level.

It has to be noted that data sources on fertiliser consumption are not harmonised in the Member States (i.e. countries use different sources such as farm surveys, production/trade statistics, sales statistics or administrative records). Therefore, in some countries, official statistics on mineral fertiliser use as such are estimated based on different types of available data.

The reference period is the calendar year, however, in some cases countries report data based on the crop year. In such cases, no corrections are currently made. **Limitations of data**

The comparability of the data is weakened by the lack of harmonization of data sources and (in some cases) of the

reference year. Data from production/sales statistics may also overestimate the use of mineral fertilisers due to the inclusion of intermediary goods and of non-agricultural use of fertilisers.

Eurostat is working together with Member States to improve the data collection on mineral fertiliser used in agriculture.

Context

Nutrients, such as nitrogen (N) and phosphorus (P), are absorbed from the soil by plants, for their growth. They mainly come in the form of mineral – inorganic – fertilisers, which are widely used in agriculture to optimise production, and organic fertilisers such as manure.

Nitrogen and phosphorus fertilisers greatly enhance crop production, but excessive use may lead to losses of these nutrients to the environment, contributing to environmental pollution. N and P behave differently in terms of their availability for loss from the agricultural system. N is highly soluble with limited build-up in the soils, and research shows a positive relationship between application rate and nitrate loss from the soil root zone. P losses from land occur due to soil erosion and agricultural run-off. Historic over-fertilisation of P can build up soil P saturation, in which case even negligible new fertiliser inputs may increase pollution.

The intensity of fertiliser use has implications for agricultural production and the potential environmental impacts of nutrient run-off from farmland. Agricultural research shows that nutrient requirements (and hence consumption) vary for different crop types and yield expectations and are influenced by previous land management, soil type and climatic factors.

Food production has become highly dependent on mineral P fertilisers. For example, some 80% of phosphorus use is in agriculture. The main source of P in the world is phosphate rock - a non-renewable resource. The majority of phosphate rock reserves in the world are concentrated in a few countries, none of them EU Member States, making the EU highly dependent on imports. Phosphate rock is on the list of critical raw materials for the EU. It means that phosphate rock is a high supply-risk and of a high economic importance.

Increasing the effectiveness of organic fertiliser use will contribute to decreased use of mineral fertiliser since organic farmers do not apply synthetic mineral fertilisers. Organic fertilisers may consist of manure, composts and sewage sludge . These organic fertilisers are important sources of N and P, especially on livestock farms and farms near urban areas.

This indicator is strongly linked to the agri-environmental indicators : Gross nitrogen balance, risk of phosphorus pollution, ammonia emissions, GHG emissions and water quality - nitrate pollution.

Policy relevance and context

Application of fertilisers is a major factor contributing to losses of nutrients such as nitrate and phosphate from agricultural soils into ground and surface water bodies. This loss can occur via run-off along the soil surface or as sub-surface loss via leaching and drainflow.

Consequently, legislative initiatives through the Nitrates Directive and the Water Framework Directive have sought to limit nutrient losses to water bodies through more careful management of agricultural land.

The Nitrates Directive included the designation of nitrate vulnerable zones (NVZs), establishment of Code(s) of Good Agricultural Practice to be implemented by farmers on a voluntary basis, establishment of Action Programs to be implemented by farmers within NVZs on a compulsory basis, and national monitoring and reporting. In the Water Framework Directive, an indicative list of pollutants includes organophosphorus compounds and substances that contribute to eutrophication (in particular nitrates and phosphates). Measures suggested in this context aim at reducing the influx of nutrients, such as nitrogen and phosphorus to the groundwater and surface waters and include the reduction of nutrient application, the modification of cultivation techniques, proper handling of fertilisers, and the prevention of soil erosion through erosion minimising soil cultivation.

Other agri-environmental policies and initiatives that affect the consumption of nitrogen and phosphorus fertilisers:

- In its Farm to Fork strategy , the Commission pledged to act to reduce nutrient losses by 50% and to reduce the use of fertilisers by at least 20% by 2030. This is to be achieved, among other actions, through implementing in full the environmental and climate legislation and through developing with the Member States an integrated nutrient management action plan.
- United Nations Framework Convention on Climate Change (UNFCCC). Countries report on their progress in limiting greenhouse-gas emissions by submitting annual emission inventories and national reports. The application of mineral nitrogen fertilisers by agriculture is one of the items to be reported.
- National Emissions Ceiling Directive (NEC Directive). This Directive sets national reduction commitments for the five pollutants (sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and fine particulate matter) responsible for acidification, eutrophication and ground-level ozone pollution which leads to significant negative impacts on human health and the environment. Targets are set for the years 2020 and 2030. Each EU Member State is required to produce a National Air Pollution Control Programme by 31 March 2019 setting out the measures it will take to ensure compliance with the 2020 and 2030 reduction commitments. The inventory data can be viewed in the EEA National Emission Ceilings Directive emissions data viewer .
- UNECE Convention on Long-range Transboundary Air Pollution Gothenburg protocol . For the EU Member States, the emission ceilings in the protocol are transposed into the NEC Directive (see above).
- Common Agricultural Policy (CAP). The EUs agriculture policy encourages environmentally friendly farming practices through greening, rural development payments, and cross-compliance.
- Natura 2000, the Birds Directive and the Habitats Directive . The main purpose of the Habitats Directive is to ensure biological diversity through the conservation of natural habitats and of wild flora and fauna within the European territory, while taking into account economic, social, cultural and regional requirements. Depending on the specific conditions of a certain area, these include measures to reduce the use of pesticides and fertilisers, measures to mitigate the effects of soil compaction, e.g. limitations on the use of machinery or the setting of stocking limits, or measures aiming to regulate the irrigation of agricultural land. Farmers who have agricultural land in Natura 2000 sites and face restrictions due to the requirements of the Habitat-Directive are eligible to receive payments for the management of these sites by the Rural Development Regulation, which helps promote environmental-friendly farming.

Explore further

Other articles

- Agri-environmental indicators - Factsheets
- Agri-environmental indicators - overview of articles in Statistics Explained

Database

- Agriculture (agr) , see:

Agriculture and environment (aei)

Consumption of inorganic fertilisers (aei_fm_usefert)

Farm structure (ef)

Main farm indicators by NUTS 2 regions (ef_mainfarm)

Farm indicators by agricultural area, type of farm, standard output, legal form and NUTS 2 regions (ef_m_farmleg)

Farm structure (ef)

Farm land use by NUTS 2 regions (ef_landuse)

Farms and hectares by type of crops, utilised agricultural area, economic size and NUTS 2 region (ef_lus_allcrops)

Farm structure (ef)

Farm land use by NUTS 2 regions (ef_landuse)

Permanent grassland by NUTS 2 regions (ef_lus_pegrass)

Organic farming (org)

Organic crop area by agricultural production methods and crops (from 2012 onwards) (org_cropar)

Thematic section

- Agri-Environmental Indicators
- Agriculture - Overview

Publications

- Agriculture, forestry and fishery statistics - 2020 edition

Methodology

- Consumption of inorganic fertilisers (aei_fm_usefert_esms)
- Farm structure (ef_sims)
- Crop production (org_cropar_esms)

Legislation

- Commission Communication COM(2006)508 final - Development of agri-environmental indicators for monitoring the integration of environmental concerns into the common agricultural policy
- Commission Staff working document accompanying COM(2006)508 final

External links

- European Commission - Common Agricultural Policy (CAP)
- European Commission - Reduction of national emissions of atmospheric pollutants
- European Environment Agency (EEA) - Agricultural land: Nitrogen balance
- United Nations Framework Convention on Climate Change (UNFCCC)
- EU Nitrogen Expert Panel