Forecast of food, farming and fertilizer use in the European Union... 2011-2021
Nitrogen, Phosphorus and Potassium are the three main plant nutrients.

Mineral fertilizers are made from naturally occurring raw materials which have been transformed into a more plant-available form by industrial processing.

- Nitrogen (N), taken from the air, is essential as an important component of proteins.
- Phosphorus (P), extracted from mined ores, is a component of nucleic acids and lipids, and is key to energy transfer.
- Potassium (K), extracted from mined ores, has an important role in plant metabolism, for photosynthesis, activation of enzymes, osmoregulation, etc.
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In the next ten years, use of nitrogen in the EU-27 is expected to increase by around 1.6%
Overview for 2021

Fertilizer consumption in the EU-27

On average over the last three seasons in the EU-27 countries, fertilizers containing 10.2 million tonnes of nitrogen (N), 2.2 million tonnes of phosphate (P₂O₅) and 2.4 million tonnes of potash (K₂O) have been applied to 134.4 million hectares of farmland each season (some 47.8 million farmland hectares are not fertilized, which include 36.3 million hectares of unfertilized grasslands).

By 2020/21, Fertilizers Europe forecasters expect fertilizer consumption figures to reach 10.8, 2.6 and 3.2 million tonnes respectively, applied to 133.7 million hectares. Considering the economic situation covered on page 13 and the foreseen evolution of the crop areas presented on page 11, the expected changes relative to the reference period (from 2008/2009 to 2010/2011) at first glance appear, as last year, to be surprising:

- The relative increase in N consumption is foreseen at 5.5% for the EU-27, against 4% last year.
- The foreseen changes for P₂O₅ and K₂O are remarkable, continuing last year’s foreseen increase:
  - An increase of 19.8% is foreseen for P₂O₅ in the EU-27 over the next 10 years, as opposed to the 14.1% foreseen last year.
  - K₂O, which was already foreseen last year to increase significantly by 18.6%, now reaches a record value of 30.2% in 10 years time.

These changes, however, are in relation to the base year which, due to major disruptions in supply and demand for both agricultural outputs and fertilizers, is significantly different from earlier base years. The apparent changes in consumption do not stand out in the same way if a base year which is affected in a less extreme way is used, as can be seen below. The factors which caused spikes in prices and demand are not expected to persist but their effect has influenced these current uncharacteristic changes. It is important therefore to note the actual anticipated changes in volume rather than the percentage changes.

Consideration of the reference years

For the past nine campaigns, the reference used in the forecast to calculate the percentage change in demand is based on the average value of the last three campaigns (2008/09 to 2010/11 for the current exercise). This avoids the extent to which any exceptional years (positive or negative) impact the calculated evolution.

However this three-year buffer was not sufficient for the current reference period which only includes exceptional campaigns (2007, 2008 and 2009) when compared to the previous period. While the reference volume for N has decreased by 3.7%, compared to the 2007 reference, the reference volumes for P and K have dropped by 29.2% and 31% respectively, inducing the surprising relative increases in demand calculated this year. When using 2007 as the base year, the expected changes become +1.6% for N, -15.1% for P₂O₅ and -10.2% for K₂O.

If the quick recovery in demand is confirmed, expected consumption will still be far below the normal levels of the period from 2005-2007.
Significant decreases in nitrogen consumption are foreseen in Denmark, France, Ireland and the Netherlands.
How the forecast is made

The forecast is an annual exercise that respects the following procedure:

- In spring, a European scenario is established, based on quantitative information (from the USDA, FAPRI, and the European Commission) and qualitative analysis made by Fertilizers Europe experts.
- Between May and July the general scenario is adapted to the specificities of each country. National forecasts are then made by the forecasters.
- The national forecasts are then analysed and discussed by all the experts in July.

When the market and economic situation require it, forecasters carry out a last update of the current situation during August, before integration and publication.

In all the EU-27 countries, the forecast is an upward crop-based procedure, where fertilizer consumption is evaluated by assessing cropping area and nutrient application rates for each crop. However, two different methodologies are used to achieve this crop-based procedure:

- In 24 countries (EU-15, Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia), which represent 99.6% of the EU-27 agricultural area and of its total fertilizer consumption, the Forecast is an expert-based approach constructed from the national forecasts generated by Fertilizers Europe’s experts.
- In two countries (Cyprus and Slovenia) evaluation of the production and crop area is based on the economic model used by the European Commission. Application rates for N, P and K nutrients used on each crop are based on an agronomic model developed by a small group of forecasters. One country (Malta) is not covered.

Fertilizer nutrients are expressed as follows in the report: nitrogen (N) as pure element, phosphorus (P) as phosphate equivalent (P₂O₅, or phosphorus pentoxide), and potassium (K) as potash equivalent (K₂O, or potassium oxide).

Forecast changes in regional fertilizer use

The evolutions in nitrogen consumption by country are similar to last year, with few exceptions. After positive trends observed during the last few years, significant decreases are now foreseen in Denmark, France, Ireland and the Netherlands. On the other hand, a slight “recovery” is expected in Austria, Finland, Greece and Sweden, with an even steeper “recovery” in Portugal, Spain and most EU-12 countries, especially Romania, Bulgaria and Hungary where the increase in consumption is following the new pace of development of their agriculture.

Significant growth is reported for P₂O₅ and K₂O in Austria, Belgium-Luxemburg, Spain, Portugal, Sweden and, from the EU-12, in Romania, Bulgaria and Hungary, contributing to the remarkable recovery foreseen for the EU-27 in the coming 10 years.
The EU-27 grain sector (including oilseeds) accounts for 60% of total nutrient consumption, of which 25% is for wheat.
The cropping pattern

The EU-27 agricultural area is characterised by large diversity. The present situation is illustrated in the charts opposite.

In the EU-15, the fertilized area accounts for 73% of the total agricultural area. The non-fertilized area consists of idle land, set-aside and non-fertilized grassland. The fertilized area encompasses 61% arable crops (of which 37% are cereals, 7% oilseeds and 11% fodders), 11% permanent crops (vineyards, orchards and forests) and 28% grassland.

In the EU-12, the fertilized area accounts for 76% of the total agricultural area. The non-fertilized area consists of idle land and non-fertilized grassland (some non-fertilized grassland is not taken into account in the statistics). The fertilized area encompasses 86% arable crops (of which 57% are cereals, 12% oilseeds and 9% fodders), 3% permanent crops (vineyards, orchards and forest) and 11% grassland.

AGGREGATED FIGURES FOR THE EU-27
The fertilized area equals 134.4 million hectares, of which arable crops account for 69%, (cereals 43%, oilseeds 8%, fodders 10%), permanent crops 9% and grassland 23%.

The cropping area combined with fertilizer application rates give the following results in terms of nutrient consumption: the grain sector (including oilseeds) accounts for 60% of total consumption, of which 25% is for wheat. Grasslands and fodders account for 23%.
Over the next ten years, we anticipate that nutrient consumption (N+P+K) will increase by 12% for cereals.
Over the next 10 years, the new Common Agricultural Policy (CAP) is expected to become more market orientated. Associated with the global scenario, where increasing tensions in the food supply are foreseen, this is expected to maintain a sustained demand for biomass production, despite increased pressure on environmental protection.

The expected cropping pattern over the next 10 years sees a stabilization of the cereals area with a decrease of 1.8% (a 0.8% decrease was expected last year), of which a 5% decrease is foreseen for the EU-12 but with no change for the EU-15. The increase in oilseed rape is now forecast at 5.9% compared to 10.4% foreseen last year.

Sugar beet acreage is forecasted to increase by 3% in the EU-27 over the next 10 year period. This induces a remarkable 10% increase in fertilizer consumption for this crop. Stabilization of the grain area, however, is compensated by a sustained increase in yield (10% compared to 8% last year). This will lead to an increase in nutrient consumption (N+P+K) of approximately 12% for cereals and a similar evolution for oilseeds with an expected increase of 17% (a slower pace compared to the 19% increase foreseen last year).

Nutrient consumption will increase by 8% for fodder crops, as the impact of the expected abolition of milk quotas induces a trend towards greater productivity. At the same time, the decrease in nutrient consumption in grasslands is now stabilizing at around 1%.
“CAP towards 2020” and the development of bioenergy are significant drivers for fertilizer consumption over the next 10 years.
Overview

**FOOD TENSIONS AND ECONOMIC CRISIS**
The revised “CAP towards 2020” and the anticipated impact of the 2008 Climate and Energy Package are still the main internal drivers of fertilizer consumption within the EU over the next 10 years. However, recent tensions in the energy and food sectors, and their related impact on food and fertilizer prices, have been key factors in inducing the significant drop in fertilizer consumption between 2008 and 2010. This is now recovering but still has an important impact on EU agriculture.

As far as the “CAP towards 2020” proposals are concerned, despite the announced balance between increased environmental protection and a clear orientation towards more productive and competitive EU agriculture, greater negative impact on fertilizer consumption can now be expected. A detailed analysis of the relative impact of the new CAP will be made in the next forecasting exercise.

**BIOENERGY AND BIOFUELS**
Biofuels continued to eat away at petrol and diesel consumption in the European Union. However the pace of change backs the assertion that growth in EU biofuel consumption has slackened. The final total biofuel consumption figure should hover around 13.9 Mtoe.

The growth of biofuels in EU is hindered by internal and external factors. Indirect Land Use Change (ILUC) and the emissions which derive from this phenomenon have made the European Commission reconsider its position on the sustainability criteria for biofuels (most likely by introducing a “correction factor”) and thus causing turmoil in EU biofuel production. The European Commission will release an impact assessment on ILUC this autumn.

The growth in biofuel consumption in the European Union will also depend on external factors such as increases in the oil price and the worldwide availability of biofuel. The issue of availability could arise much earlier than expected and will dictate the pace at which 2nd generation biofuels will grow. However, this situation is not expected to arise for the time being. It is expected that first generation biofuels will continue to dominate until 2017.

Cereal grains for the production of bio-ethanol will increase three-fold between 2008 and 2015, with a reduction in exports providing a significant proportion of this grain and with sugar beet being the other main feedstock. A detailed analysis on the future of first generation biofuels will be made during the next forecast exercise.

**SUSTAINABLE CONSUMPTION AND PRODUCTION OF FOOD**
2011 confirmed that this aspect will develop very quickly in two directions during the first half of the forecast period:

- Development and communication to consumers of sustainability criteria similar to the ones developed for biofuels, especially for GHG and energy consumption. This may have a negative impact on the consumption of certain types of meat.
- Linked to the above, an incentive for changing human diet within the EU is foreseen, with the objective of better use of natural resources.
“CAP towards 2020”: more competitiveness and environmental protection
The position of Fertilizers Europe

**BACKGROUND**
Through successive reforms, the CAP has increased agriculture’s market orientation while providing income support to farmers, improved the integration of environmental requirements, and reinforced support for rural development as an integrated policy for the development of rural areas across the EU. The same reform process has raised demands for a better distribution of support among and within Member States, as well as calls for a better targeting of measures aiming at addressing environmental challenges and increased market volatility.

**“CAP TOWARDS 2020”, FORESEEN CHANGES**
It is expected that the CAP will maintain its two-pillar structure with the budget for each pillar maintained in nominal terms at its 2013 level and with a clear focus on delivering results on the key EU priorities. Under the first pillar, future direct payments will consist of a “basic payment scheme”, representing up to 60% of the previous Single Payment.

A big share (announced around 30%) of the remaining direct farm support will come from the “Green Premium” which aims to ensure better environmental protection in rural areas. Additional payments, such as support for areas with natural constraints <5% (optional), young farmers <2% (mandatory), small farmers <10% (mandatory) and coupled support <5% (voluntary), are expected to complete the direct support to farm income.

**OUR POSITION**
Fertilizers Europe recognizes the relevance of better integrating environmental protection within the CAP, but we are still concerned about seeing clear support for increasing agricultural productivity towards EU self-reliance in its food supply and, furthermore, its contribution to global food security.

Climate change and biodiversity are two areas which will also benefit from the greater productivity of European land already under cultivation by avoiding “land grabbing” elsewhere. In addition, an increase of agricultural productivity in the EU will also serve to meet the increasing demand for renewable energy resources, such as bioenergy and biomass, and so decrease EU dependency on imported energy.

But we are more concerned by the reintroduction of obligatory set-aside in the farm, dressed up as “ecological focus areas”. Arable land is scarce and the demand for food increases by the day as the world’s population grows, thus we don’t believe that this is the right way forward to address EU food self-reliance.

Fertilizers Europe supports the reinvigoration of the Farm Advisory System (FAS), so that tools helping to implement the “greening” element aimed at improving protection of the environment at field level (climate change mitigation/adaptation, biodiversity and water protection) can be correctly communicated to farmers. The enforcement of crop diversification is another element in the right direction which will ameliorate the soil structure and fertility of European soils.

It is also worth mentioning that Fertilizers Europe believes in the holistic concept of Integrated Farming as a guideline for the sustainable development of European agriculture that reconciles productivity with environmental protection.
Nitrogen use efficiency, a key indicator for monitoring emissions from agriculture.
Nitrogen use efficiency

Fertilizers are applied to balance the gap between the permanent export of nutrients from the field when crops are harvested and the nutrients supplied by the soil. However, not all of the applied nutrients end up in the crop. Some are lost to the wider environment where they can contribute to environmental problems such as loss of biodiversity or GHG emissions.

In order to assess the efficiency of agricultural production in converting applied fertilizer nitrogen into nutrients in the harvested product, the "nitrogen use efficiency" indicator should be broadly used. Nitrogen Use Efficiency (NUE) can be calculated as the ratio between the amount of N fertilizer removed with the crop and the amount of N fertilizer applied.

Nitrogen use efficiency by major crops

Historical data generated by the Fertilizers Europe Forecast enable the development, for the EU-15 (with its sufficiently long data history), of an estimate of the apparent efficiency with which applied nitrogen fertilizer is being utilized by major crops.

Natural annual variations are inevitable, mainly due to climatic effects when the anticipated yields for which the fertilizer N rates were calculated are not achieved due, for example, to drought. The general picture, however, is one of continuing improvement. It is believed that the recent significant improvement for the sugar beet crop is in part due to the reduction in the EU-15 area cropping, with the probability that the more marginal producing areas or growers ceased production.

Index of ‘N use efficiencies’ as output per unit of N input
The mission of the European fertilizer industry is to respond to the needs of agriculture and society by providing, in accordance with the principles of Responsible Care, a reliable and competitive supply of high-quality mineral fertilizers.

The industry encourages, moreover, the adoption of Good Agricultural Practices in the use of plant nutrients, thus stimulating farmers and growers to produce high quality crops in an economically and environmentally sound manner.

The mission of Fertilizers Europe is to identify, promote and manage the common interests of its members by:

- promoting the role of mineral fertilizers in European agriculture and horticulture;
- anticipating and preparing for upcoming issues that may affect the industry;
- being the industry’s spokesperson and sounding board;
- providing its members with a wide range of statistical information and studies.