FORECAST OF FOOD, FARMING AND FERTILIZER USE IN THE EUROPEAN UNION 2006-2016

european fertilizer manufacturers association

How the EFMA Forecast is Produced

The EFMA Forecast is produced annually using the following method:

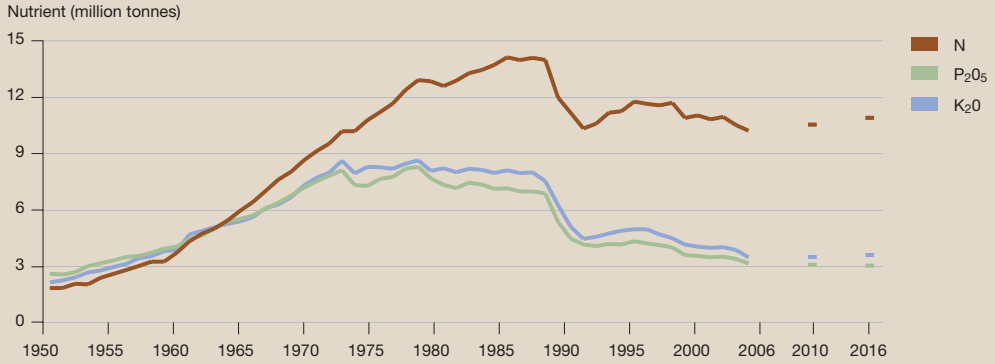
- In spring, a European scenario is developed using quantitative information (e.g. from USDA, FAPRI and the European Commission) and qualitative analyses made by the EFMA Forecasters.
- Between May and July, each national Forecaster adapts this general scenario to the specific situation in his country.
- These resulting national forecasts are then analysed and discussed by all experts in July and are integrated into this overall EFMA Forecast.

The EFMA Forecast is based on a crop-approach for all the EU-25 countries, where fertilizer consumption is evaluated by assessing area and nutrient application rates for each crop. However, two different approaches are used:

- In **16 countries** (EU-15 and Poland), representing 90% of the EU-25 agricultural area, the Forecast is an expert-based approach using the national forecasts produced by our members.
- In the **9 other EU countries**, the evaluation of the production and crop area is based on the agro-economic model used by the European Commission. The application rates for N, P and K on each crop are based on an agronomic model developed by EFMA Forecasters, as there is less past specific knowledge available.

In this report, fertilizer nutrients are expressed as follows: nitrogen (N) as pure element, phosphorus (P) as phosphate equivalent (P_2O_5, or phosphorus pentoxide), and potassium (K) as potash equivalent (K_2O, or potassium oxide).

Fertilizer Nutrient Consumption in the EU-25



FORECAST OF FERTILIZER USE IN THE EU-25

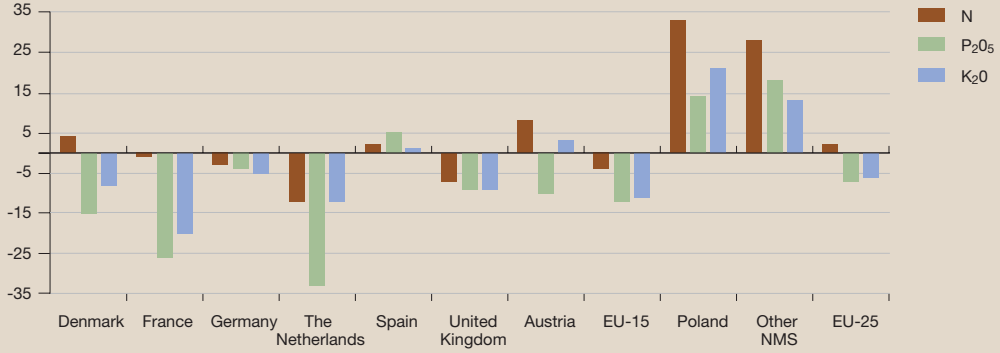
Overview for 2016

Taking the average consumption of three campaigns (2004, 2005, 2006), mineral fertilizers carrying 10.5 million tonnes (Mt) nitrogen, 3.2 Mt phosphorus and 3.7 Mt potassium were applied each year by farmers in the EU-25.

In the next ten years, use of nitrogen in the EU-25 is expected to increase by 2.5%, while phosphorus and potassium are expected to decline by 7.4% and 5.9% respectively. By 2016, EFMA Forecasters expect fertilizers to supply European farmers with 10.7 Mt nitrogen, 3.0 Mt phosphorus and 3.5 Mt potassium.

This is a substantial negative trend from the consumption peak of the Seventies and the Eighties: By 2016, nitrogen will have decreased by 24% in the EU-25, compared to 1986 when the nitrogen consumption peaked. There will also be a decrease of 63% phosphorus and 60% potassium, compared to 1979 when the consumption of phosphorus and potassium peaked.

Changes in Regional Fertilizer Use by 2016



In the long-term Forecast (2015/2016), we still foresee a general decrease of all nutrients in the EU-15. The only exceptions are the slight increases in N consumption in Denmark, Austria and Sweden, as well as an increase in P consumption in Spain – all due to particularly bad current situations in these countries.

In the EU-10, on the other hand, consumption of all nutrients will increase, and the variation among countries is particularly important for P and K: Poland for instance, the biggest agricultural country (accounting for approximately 55% of the nutrient consumption) foresees a rather moderate development of these elements, despite a significant increase in grain production.

However, for the first time in a decade, the positive development of nitrogen consumption in the EU-10 will result in an increase (2.5%) of this nutrient in the whole EU-25 balance.

The development of energy crops (biomass and biofuels) throughout the EU-25 will moderate the negative impact of the CAP reform on P and K consumption and will also contribute to the 2.5% increase in N consumption, as mentioned above.

However, farmers will manage non-food crops according to a "minimum input" scheme, thus keeping use of P and K moderate. The use of P and K will therefore not increase as one could have expected when taking into account that extra acreages taken from the set-aside area will be farmed with energy crops.

The Cropping Pattern

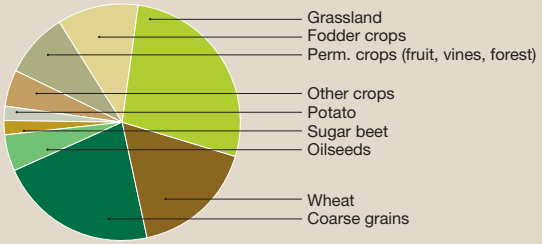
The cropping pattern throughout the EU-25 is very diverse. The current situation is illustrated in the pie charts on this page.

In the EU-15, fertilized area represents 101 Mio ha, of which arable crops account for 59% (cereals represent 37%, of which wheat represents nearly one half, while fodders account for 10%) of the fertilized agricultural area. Grassland accounts for 30% and permanent crops (fruits, vines) for 11%.

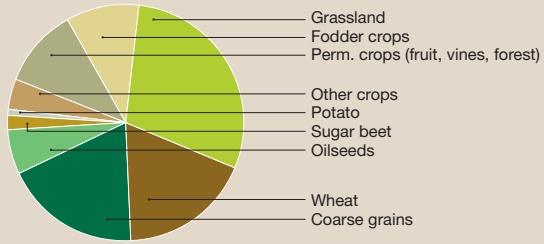
In the EU-10, fertilized agricultural area represents 32 Mio ha, of which arable crops account for 74%, (cereals represent 48%, with one-third wheat and two-thirds coarse grains, while fodders account for 14%). Grassland accounts for 25% and permanent crops (fruits, vines) account for only 1%.

The aggregated figures for the EU-25 show that the fertilized area represents 133 Mio ha, of which arable crops account for nearly 63%, (cereals 39% and fodders 11%) and grassland 28%. Permanent crops (fruits, vines) account for 9%.

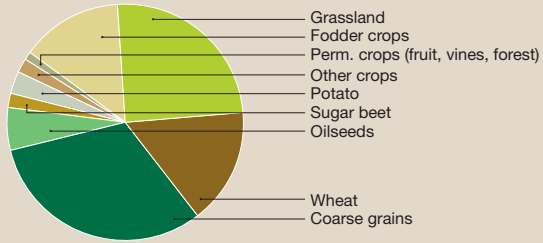
Agricultural Area in the EU-25 (Current Situation)



Agricultural Area in EU-15 (Current Situation)

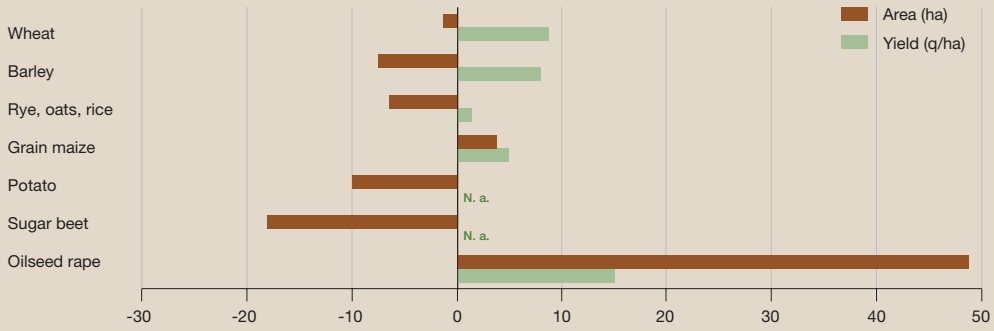


Agricultural Area in the EU-10 (Current Situation)

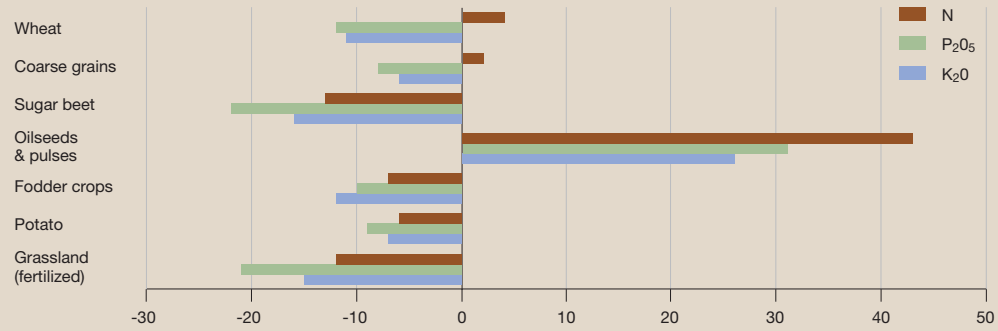


FARMING AND FERTILIZING OUTLOOK IN THE EU-25

Changes in Farming Food Crops by 2016



Changes in Fertilizer Use by Crop by 2016



The Future

Over the next ten years, the new Common Agricultural Policy (CAP) will significantly change the cropping patterns and subsequently change the acreage used for different arable crops in the EU-25.

Wheat, barley and rye acreage will decrease by 2, 8 and 6% respectively, whereas grain maize acreage will increase by 3%. However, since there are significant increases in yield, the overall production of these crops will increase. Rye is an exception where there is no significant increase in yield and the production will decrease by 5%.

The 71% increase in oilseed rape production is mainly a result of the 49% increase of area. However, the yield also increases by 15%.

The total grassland area will remain fairly stable. Nevertheless, fertilized grassland will decrease by 4% and non-fertilized grassland will increase by 4%.

The developments in the crop-area combined with the application rates give us the following results: today, cereals account for 48% of the total nutrient consumption, of which 22% is wheat. Grassland and fodders account for 27%. Over the next ten years, we foresee that fertilizer consumption (N+P+K) will decrease by 1% for coarse grains (barley and rye), and by 16% for sugar beet. With regards to fodder crops and grassland, fertilizer consumption will decrease by 9% and 14% respectively. This is because of the probable extensification in the beef sector related to the Single Farm Payment policy, but also because of the increased use of organic fertilizers and manure as nutrient sources.

On the positive side, fertilizer consumption for oilseed will increase by 37%, and even by 49% for oilseed rape. This is obviously due to the increase in biodiesel production.

Greater Uncertainties

The new CAP: With the CAP now implemented in the EU-25, our first assumptions have now been confirmed: by 2016, there will be a sharp decrease of 3.4% of the cereal area in the EU-25, despite the 19% increase of cereal area in the EU-10. This development will obviously have a significant impact on fertilizer consumption.

Although it is now possible to better evaluate the impact of most of the market measures of the new CAP, including the new Sugar Reform, there are two new developments which bring new uncertainties:

- The accession of Bulgaria and Romania to the EU
- The CAP "simplification project"

In particular, the possible consequences of the CAP "simplification project" on certain CAP measures (Cross Compliance, set-aside) may have an additional impact on the crop patterns.

These new uncertainties must be added to the uncertainties already mentioned last year:

The production of biofuels: It is now four years that the EU strategy and the legal framework have been established. This development is definitely entering its implementation phase. The most ambitious Action Plans are still those of France and Germany. However, the UK, Sweden, Italy and Greece now also have big objectives for biofuels production, closely followed by Austria and Denmark, the original "pioneer" countries in this domain.

These developments are already affecting the food area as we see that energy crops are being grown in this area, even without using the energy crop premium. According to our ten-year Forecast, the production of biofuels will contribute to the 2.5% increase of nitrogen consumption in the EU-25 – the first increase in a decade. These prospects are mostly based on what we see in future biofuels production. They do not take into account possible new generations of bioenergy which might present an additional potential.

The WTO Doha discussions: Although the EU had a much better negotiation position on agriculture because of the changes in the CAP, they were not able to convince their partners to make corresponding moves. This led to the failure of the Doha round. However, the new American Farm Bill might bring new opportunity to reactivate the talks.

In any case, intensifying pressures to decrease, or even abolish, export refunds and import tariffs in the future may require additional concessions from the EU which go even further than the new CAP – a development which will have immediate and significant impact on the EU agriculture market.

Nitrogen, phosphorus and potassium are the three main nutrients of plants

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

Photo: Statoil

Biomass - The Most Important Renewable Energy Source

The European Union considers biomass to be a major future renewable energy source (RES). Biomass is the only renewable form of energy able to deliver all three types of energy that are consumed by society: heat, electricity and liquid fuels for mobility purposes.

According to the EU's target for 2010, 12% of the total energy consumption should be renewable energy. In this context, biomass represents 135 Mt oil equivalent (74% of all RES), an increase of 200% compared to 1995.

Liquid Biofuels

Liquid biofuels can be stored and transported. They are therefore in high demand since an additional EU target, this time regarding the total fuel-market, specifies an increase of the share of liquid biofuels to a total of 5.75% in 2010.

Harvesting Energy with Fertilizers

Fertilizers play a key role in the production of bioenergy. Their use enables the farmers to produce high biomass yields. These high yields are necessary because of the limited amount of available land for growing energy crops and the ambitious bioenergy targets set by the EU.

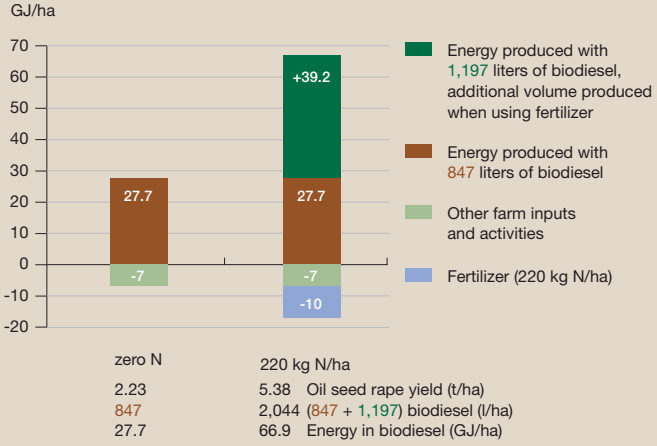
The Positive Energy Balance of Biomass Production in Europe

The energy output in the form of the harvested additional biomass grown when using fertilizers, is higher than the energy required to produce the biomass.

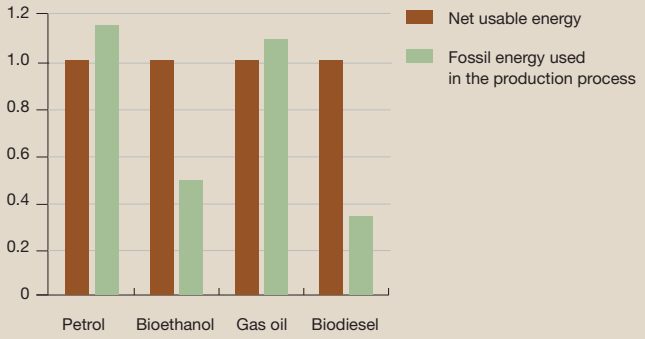
For example, when rape seed is grown with an optimum N supply (around 220 kg N/ha), an extra energy input of 10GJ/ha for N fertilizer results in an additional biodiesel energy output of 39.2 GJ/ha. In other words, fertilizers help produce 4 times more energy in the form of biodiesel, than the energy required to produce, transport and apply the fertilizers.

The industrial process to produce bioenergy still requires fossil energy. However in a total life cycle perspective, biofuels, compared to fuels purely based on fossil energy, use only one-third to half of fossil energy.

The Use of N Fertilizers Enables the Rape Seed Crop to Grow More Biomass, thus Fixing Additional Energy (Germany)



Total Fossil Energy Required to Produce Fuels



PRODUCING BIOENERGY AND MAKING THE BEST OF EUROPEAN LAND

Avenue E. van Nieuwenhuyse 4 - B-1160 Brussels - Belgium - Tel: +32 2 675 35 50 - Fax: +32 2 675 39 61 - E-mail: main@efma.be - Website: www.efma.org

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