Balancing crop nutrition for healthy crop and fertile soils

A good crop feeding strategy at farm level can be achieved with a balanced supply of the main nutrients needed. Balanced nutrition is essential to help crops reaching high yields and quality, moving towards a crop's maximum genetic potential.

Balanced plant nutrition is a vital element of sustainable crop and soil management.

Nitrogen is the most important and commonly lacking nutrient, though N requirements vary by crop. A deficiency of nitrogen will limit crop growth. An excess of nitrogen beyond the plant's needs will result in poor nitrogen use efficiency and possible losses to the environment, especially in relation to to the availability of other plant nutrients.

A fertile soil has the capacity to retain a reserve of essential nutrients for the crops, including nitrogen. This nutrient retention capacity of the soil depends from the presence of clay particles and from the soil organic content of the soil. About 98% of the nitrogen in the soil is tied up in the organic matter and unavailable to plants. Only 2/3% is in the form of nitrate and ammonium form that are available to plants. This makes the use of mineral nitrogen simply a necessity.

Fertilizers Europe
Avenue des Nerviens 9-31
1040 Etterbeek, Brussels - Belgium
T +32 2 675 35 50

www.fertilizerseurope.com
agriculture@fertilizerseurope.com

twitter.com/FertilizersEuro

Group Fertilizers Europe

Nitrogen in food production

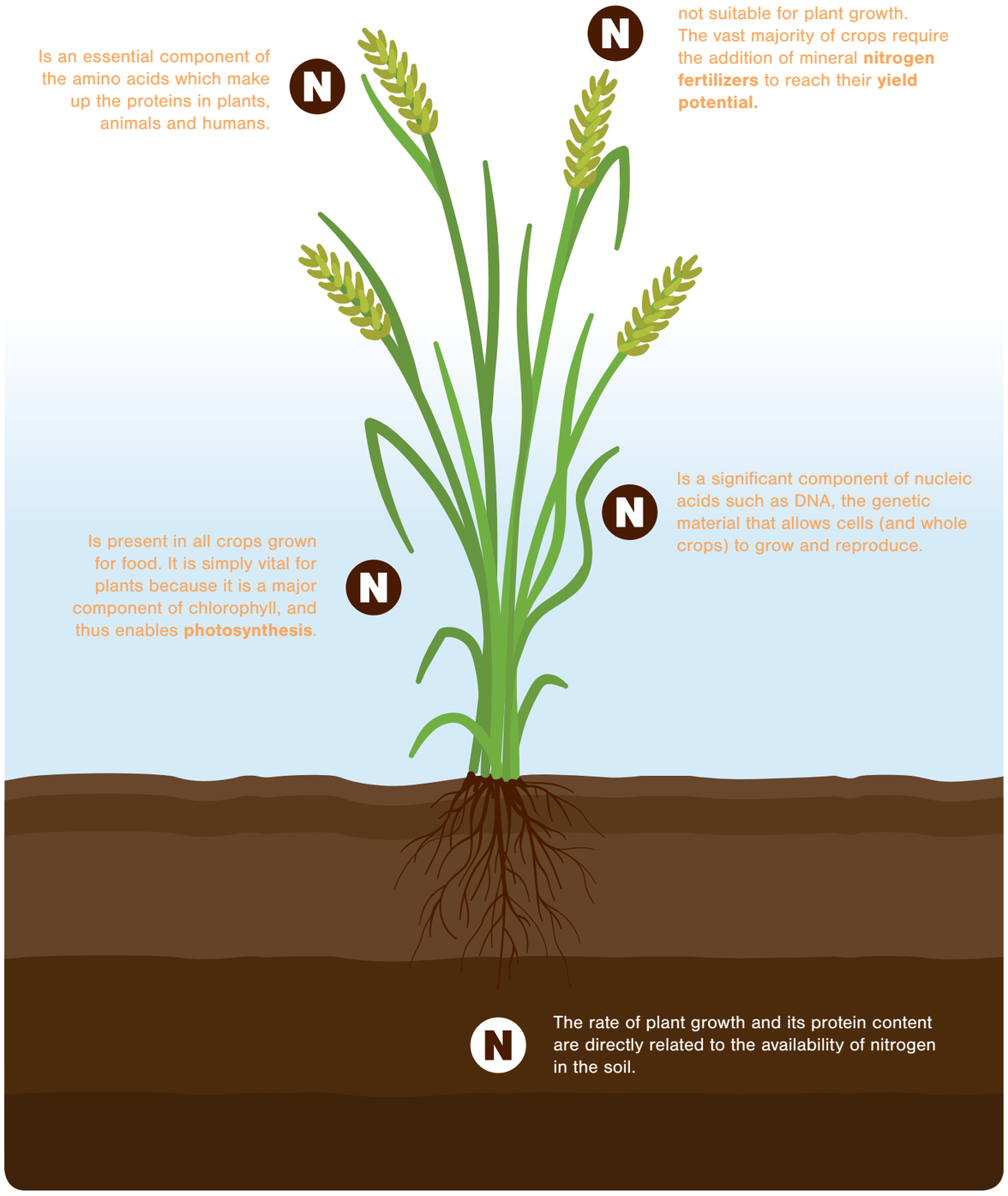
A vital nutrient for life

Did you know?

Nitrogen **N**

Makes up to 80% of the air we breath, but is present in the form not suitable for plant growth. The vast majority of crops require the addition of mineral **nitrogen fertilizers** to reach their **yield potential.**

Is an essential component of the amino acids which make up the proteins in plants, animals and humans.



Is present in all crops grown for food. It is simply vital for plants because it is a major component of chlorophyll, and thus enables **photosynthesis**.

Is a significant component of nucleic acids such as DNA, the genetic material that allows cells (and whole crops) to grow and reproduce.

N The rate of plant growth and its protein content are directly related to the availability of nitrogen in the soil.

Nitrogen sources available to farmers

Farmers cannot profitably grow food without nitrogen.

Depending from the crops, up to 200 kg nitrogen per hectare is removed from field during harvesting. Livestock manures represent valuable sources of nitrogen, which are generally spread on the field before other nutrient sources are considered. Their nutrient content varies regionally and depends on the type of livestock and the farm management system. This is why it is very important to conduct analysis of farm-yard sources before spreading on farmland at the correct rate.

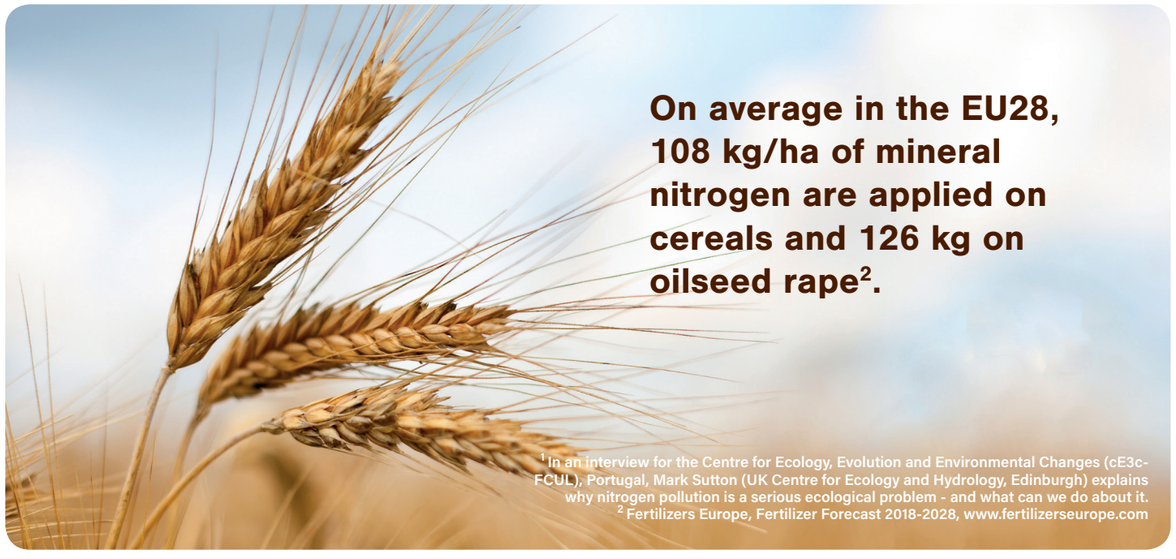
The available nitrogen content of manure and slurry is mostly in organic form. This is one of the reasons why nitrogen from organic fertilizers is not as efficient as nitrogen from mineral fertilizer. In other words, the organic nitrogen needs to be transformed in the soil over time whereas mineral nitrogen is directly available. In addition, the nitrogen contained in manure can be susceptible to significant volatilization to ammonia, meaning a loss of nitrogen to the air.

When the organic materials do not satisfy the nutrient needs of the crops, farmers use mineral fertilizers to make up the deficiency and to feed crops along their needs. The majority of nitrogen fertilizers applied in Europe is nitrate-based fertilizers such as ammonium nitrate (AN) and calcium ammonium nitrate (CAN), which are well suited to most European soils and climatic conditions.

Mineral fertilizers containing nitrogen have several advantages:

- **Guaranteed content and direct availability for crops**
- **Predictable supply of nitrogen to match crop demand**
- **High nutrient concentration and low logistical cost**
- **Suited for application with precision farming technologies**
- **Ease of handling and of spreading for a greater precision intake**

“We need nitrogen to live. One of the ways we feed the world population is with nitrogen fertilizers, and we estimate that, according to current diets, nitrogen is allowing half of the world population to be alive.” Prof. Mark Sutton, 2017[1]



On average in the EU28, 108 kg/ha of mineral nitrogen are applied on cereals and 126 kg on oilseed rape[2].

[1] in an interview for the Centre for Ecology, Evolution and Environmental Changes (cE3c-FCUL), Portugal, Mark Sutton (UK Centre for Ecology and Hydrology, Edinburgh) explains why nitrogen pollution is a serious ecological problem - and what can we do about it.
[2] Fertilizers Europe, Fertilizer Forecast 2018-2028, www.fertilizerseurope.com