

## Nitrogen

**Nitrogen, Water, Carbon, Oxygen, and Hydrogen are fundamental nutrients for life in general and every living being in nature. In the case of plants, Nitrogen is more involved than any other nutrient in the formation of the plant body and the vital functions of development and production. As a component of chlorophyll, it is involved in the process of photosynthesis and the production of carbohydrates, which form the base of the food chain and the only reason why humans developed agriculture. As a structural element of amino acids, proteins and nucleic acids, Nitrogen has a pivotal role in energy conversions, plant reproduction throughout time, and in the growth and yield of crops. Lack of Nitrogen leads to a less fertile soil, stunted growth, premature decay of the plants, reduced production, and poorer quality. Its overabundance favors the production of plants which are vulnerable to diseases and environmental conditions, delays florescence, reduces fruit setting, delays ripening, and harms production. Sufficient supply and the rational management of Nitrogen are the most important factors for the health and productivity of crops in contemporary agriculture.**

### Sources of Nitrogen for plants

Nitrogen is the most abundant atmospheric gas and it occupies 78% of the total volume of the atmosphere. It ranges from 0,05 to 0,4% on the surface layer of the ground and it is found nearly in its entirety in organic form. Despite the fact that crops develop in an environment with an abundance of Nitrogen, plants - with the exception of legumes - cannot absorb and utilize atmospheric Nitrogen. They cannot utilize the organic Nitrogen in the soil unless it has already been broken down and converted to absorbable forms. This is why lack of Nitrogen is the most common nutritional deficiency in crops and the main factor preventing high yields. The rational management of Nitrogen and sufficient supply of it to the crops has been a basic pursuit of agricultural practice throughout time, has been a catalyst in the development of cropping systems, and is directly linked to the development of agriculture from ancient times to this day.

### Advantages of Ammoniac Nitrogen

- More easily absorbed at low temperatures and in saturated soils
- Selectively absorbed by the plants at the initial stages of growth
- Boosts the growth of the root system
- Stimulates the production of plant hormones that increase production
- Energy advantages in terms of being metabolized inside the plant
- Increases the intake of Phosphorus and Trace Elements
- Retained in the ground for a longer period of time without leaching

### Advantages of Nitrate Nitrogen

- More readily absorbed at high temperatures
- Exhibits high mobility in the soil and faster intake by plants
- It is readily available to plants without any conversion in the soil necessary
- Energy advantages in terms of being absorbed by the soil
- Increases the intake of basic cations (K, Ca, Mg)
- Has a practically negligible effect on soil acidity
- Under normal conditions, presents no losses due to vaporization

# Nutrammon®

Contemporary agricultural research has clearly shown that different sources of Nitrogen affect the growth and yield of crops in different ways. The standard for the evaluation of Nitrogenous fertilizers is their capacity to supply plants with absorbable forms of Nitrogen and to advance the quantitative and qualitative features of the production. Nutrammon are high-quality Nitrogenous fertilizers, which have been developed so as to ensure this requirement as much as possible. The two forms of Nitrogen which are absorbable by plants, Ammoniac NH<sub>4</sub> and Nitric NO<sub>3</sub> Nitrogen, are combined in their grain in absolute purity and in a balanced ratio (50: 50). The fast absorption of Nitrates covers the immediate needs of the crop, while the Ammoniac fraction works as a "reserve", ensuring their medium-term supply. Nitrogen is absorbed in an easy and immediate way, without the interpolation of any external factors between plant and fertilizer, as is the case with Urea and Ammonia Sulfate.

### Properties

Nutrammon fertilizers supply the plants with fully water-soluble and absorbable Nitrogen, and immediately provide the crops with the necessary energy for a fast growth of both the roots and the above-ground part of the plant. Their chemical composition improves the intake of other elements as well (K, Ca, Mg), boosts flowering and fructification, and is instrumental to increases production. They are the most reliable source of immediate nutrition with Nitrogen in both low and high soil temperatures, allowing for a flexible fertilizing schedule. Nutrammon fertilizers have a negligible effect on the acidity of the soil and they preserve its physical and chemical properties, as compared to other Nitrogenous fertilizers. Crops fertilized with Nutrammon exhibit robust growth and high yields, have lower requirements in water, and allow for products rich in proteins and carbohydrates, improving the quality characteristics of the production.

### Advantages

- Nitrogen is contained in its entirety in a form that is immediately absorbable by the plants.
- Balanced ratio (50:50) of Ammoniac NH<sub>4</sub> and Nitric NO<sub>3</sub> Nitrogen.
- Congruent nutrition, which covers the immediate and medium-term needs of the plants.
- Year-round reliable supply to crops Flexible fertilizing schedule.
- Fewer losses due to the vaporization of Nitrogen during the summer than with any other Nitrogenous fertilizer.
- They increase the intake of cations (K, Ca, Mg) by the crops and limit the toxic effects of chlorine (Cl).
- They affect the acidity of the soil less than other fertilizers.
- They perfectly cover the increased needs in Nitrogen both during growing season and during the development of the fruits.
- They increase yield by acre, and the carbohydrate and protein content of the products.
- They ensure a uniform dispersion of Nitrogen in the field and do not require earthing up.

# Nitrocan®

Targeted nutrition and a high yield in agriculture require a sufficient supply of both forms of Nitrogen to crops. During the early stages of development, the plants show a preference for Ammoniac Nitrogen and they absorb more of it, synthesizing amino acids and proteins, which are necessary for sprouting and a smooth entrance into the reproductive phase. During the later stages, Nitric Nitrogen becomes more important, as it is metabolized on the above-ground part of the plant and provides the nutrition necessary for the fast growth of the leafy surface and the fruits. Nitrocan fertilizers have been developed so as to gradually supply the plants with immediately available and fully absorbable forms of Nitrogen over time. They combine the fast action of Nitric Nitrogen and the extended availability of Ammoniac Nitrogen in a balanced ratio (50 : 50), and they excellently cover both the immediate and the medium-term needs of the crops. Their specialized composition guarantees maximum utilization of nutrients by the plants, reduces losses due to vaporization, and allows for a year-round flexible fertilizing schedule. Rich in Calcium, they protect the soil from the acidity induced by longtime use of Nitrogenous fertilizers, boost its fertility, and ensure the healthy growth of plants. The immediate and extended action of Nitrocan, as well as their particular technical characteristics, increase the efficiency of fertilizing and make them fit for covering the needs of all crops in all types of soil.

### Properties

Nitrocan® are high-quality fertilizers which combine the two forms of Nitrogen and Calcium in an ideal ratio. The available Nitric Nitrogen is immediately absorbed by the roots, covering the current needs of the crops, while the Ammoniac Nitrogen is absorbed gradually, offering sufficient nutrition to the crops during the subsequent stages of development. The Calcium they contain allows the soil to "breathe", enhances the permeability of water, and ensures the robust and healthy growth of the crops. An additional supply of Boron and Magnesium to crops, especially in arboriculture and horticulture, prevents any deficiencies of these elements, and boosts the production and circulation of carbohydrates, significantly contributing to the development of sprouting and fructification. The excellent granulometry and minimal moisture of the soil required to break down the nutrients make the use of Nitrocan® possible in xerothermic areas with low rainfall and in soils with low water retention. The Nitrocan® 26-0-0 type is intended for field crops, while the Nitrocan® special 27-0-0+5MgO+0,2B has been developed to cover ideally the specific demands of arboriculture and horticulture.

### Advantages

- Balanced ratio (50:50) of Ammoniac NH<sub>4</sub> and Nitric NO<sub>3</sub> Nitrogen.
- Immediate and medium-term nutrition, adjusted to the needs of the plants.
- Year-round reliable supply to crops. Flexible fertilizing schedule.
- Protection of Nitrogen from leaching and vaporization. Minimization of losses.
- Capacity to utilize the moisture in the soil, which allows for their use in xerothermic areas.
- Calcium supply to the soil. Improved fertility.
- Neutral reaction in the soil. Fit for all types of soil.
- Additional supply of Magnesium and Boron to crops (Nitrocan® special).
- Excellent granulometry, which guarantees a wide application and a uniform dispersion of Nitrogen to the soil.

### Plants absorb Ammoniac (NH<sub>4</sub>-N) and Nitric (NO<sub>3</sub>-N) Nitrogen

Plants absorb the Nitrogen in the soil in Nitric (NO<sub>3</sub>-N) form and in Ammoniac (NH<sub>4</sub>-N) form. Ammoniac Nitrogen forms strong bonds with the soil and is absorbed by the roots of plants as they grow and come in contact with soil particles. Nitric Nitrogen moves freely in the soil, approaches the roots, and is absorbed by plants through the water in the soil. It is crucial that both forms of Nitrogen are present in the soil for crops to have a healthy development, for increased yield, and for a better production quality.



Products	Total Nitrogen (N)	Ammoniac Nitrogen (NH <sub>4</sub> )	Nitrate Nitrogen (NO <sub>3</sub> )	
Nutrammon® 33,5-0-0	33,5%	16,5%	17%	with a fertilizer distributor
Nutrammon® 34,5-0-0	34,5%	17%	17,5%	with a fertilizer distributor
Nutrammon® solub 34,5-0-0	34,5%	17%	17,5%	with fertigation

Products	Total Nitrogen (N)	Ammoniac Nitrogen (NH <sub>4</sub> )	Nitrate Nitrogen (NO <sub>3</sub> )	Magnesium Oxide (MgO)	Boron (B)	
Nitrocan® 26 26-0-0	26%	13%	13%	-	-	field crops
Nitrocan® special 27-0-0+5MgO+0,2B	27%	13,5%	13,5%	5%	0,2%	arboriculture horticulture



# Fertammon®

Sulphur is a necessary nutrient for an integral nutrition of the crops.

It is an important element of plants, is involved in most metabolic processes, and significantly affects sprouting and production.

Its activity inside the plant is closely linked to Nitrogen.

This is why lack of either one of these two elements reduces the utilization of Nitrogen by the plants, inhibits the synthesis of proteins, and halts growth. Crops are mainly supplied with Sulphur via the quantities of it that return from the atmosphere through rainfall.

The importance of Sulphur was not acknowledged in the past which, along with its continuously diminishing concentration in the atmosphere, has led to its reserves being nearly exhausted, which has negatively affected soil fertility and the productivity of crops.

Contemporary agricultural research and practice has highlighted its significant contribution to the integral nutrition of crops, and the importance of targeted fertilizing of crops with Sulphur in order to achieve high yields and quality products.

## Properties

Fertammon® are high-quality fertilizers which have been developed in order to supply the crops efficiently with Nitrogen and Sulphur.

They combine the forms of Nitrogen which are absorbable by plants and Sulphur in an ideal ratio in their grain.

Nitric Nitrogen is immediately absorbed by the roots, while Ammoniac Nitrogen is retained in the soil and ensures supply for the crops at later stages of their development.

The Sulphur contained is absorbed by plants and it contributes to the development of the root system, as well as increases the efficiency of Nitrogen when it enters the metabolism.

In alkaline greek soils which exhibit problems of low availability of Phosphorus and Trace Elements, the presence of Sulphur lowers the acidity in the micro-environment of the grains, which leads to these elements being broken down and becoming more available to crops.

Excellent granulometry guarantees the uniform dispersion of nutrients in the field, while its specialized formula ensures sufficient supply of Nitrogen and Sulphur to all crops and in all types of soil.

Fertammon® 26-0-0(+12S) covers ideally the needs of field crops, while Fertammon® special 25-0-0(+12S)+ 0,5Zn+0,5FeSO<sub>4</sub> has been specifically adapted to the demands of arboriculture, viticulture and horticulture.

## Advantages

- Excellent Nitrogen and Sulphur supply to crops, for increased yields and better quality.
- Better utilization of Nitrogen due to its combined action with Sulphur.
- Specialized ratio of Nitric and Ammoniac Nitrogen for maximum absorption by the crops.
- The development of a rich root system and the strong establishment of the plants during their early stages of development.
- Increased absorption of Phosphorus and Trace Elements in alkaline soils.
- Additional supply of Iron and Zinc to crops.



Products	Total Nitrogen (N)	Ammoniac Nitrogen (NH <sub>4</sub> )	Nitrate Nitrogen (NO <sub>3</sub> )	Sulphur (S)	Zinc (Zn)	Iron Sulfate (FeSO <sub>4</sub> )	
Fertammon® 25-0-0(+12S)	25%	19%	6%	16%	-	-	field crops
Fertammon® special 25-0-0(+12S)+0,5Zn+0,5FeSO <sub>4</sub>	26%	18,5%	7,5%	11,5%	0,3%	0,5%	arboriculture horticulture



Unique Quality  
High Solubility  
Excellent Granulometry

- Guaranteed supply of nutrients
- uniform dispersion, without gaps in the field
- absence of dust



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Superiority in Nitrogen