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**LIFE FORCE**

**UREA HUMATE PLUS**

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46-0-0 HUMATE PLUS



**Life Force**

 [www.lifeforce.pro](http://www.lifeforce.pro)

Stabilized nitrogen in an  
innovative fertilizer complex

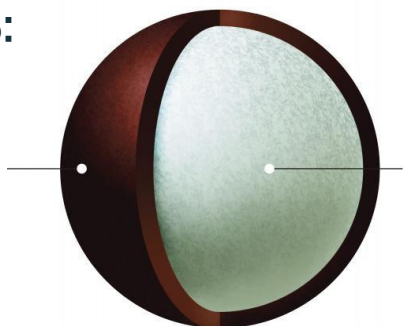
## AGRONOMIC AND ECONOMIC EFFICIENCY

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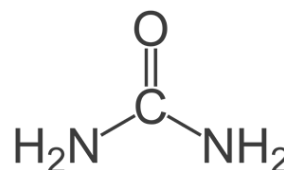
Efficiency of Life Force Urea Humate PLUS lies in the unique three-component (3-component) coating of urea granules:

**Life Force Humate PLUS:**

Humic acids\*  
+  
Potassium humate\*  
+  
Zeolite



**Urea**



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\* Humic and fulvic acids in the composition of the coating at least 40%.

Nitrogen release from the stabilized form of urea is 2 to 5 times slower than from urea, which is produced using conventional technology. Life Force Humate PLUS is effective in controlling ammonia losses and retaining nitrogen in the ammonium form. More nitrogen becomes available for plants in the soil, thus increasing the efficiency of urea.

Life Force Urea Humate PLUS is the most suitable tool for farmers to ensure the maintenance of stabilized nitrogen in the plant root zone for a longer period of time and thus increase the agronomic efficiency of fertilizers, especially in extreme conditions of growing agricultural crops (exceptionally cold and hot climates, droughts or high humidity, high temperatures on the soil surface).

## BENEFITS: PROBLEMS SOLUTION

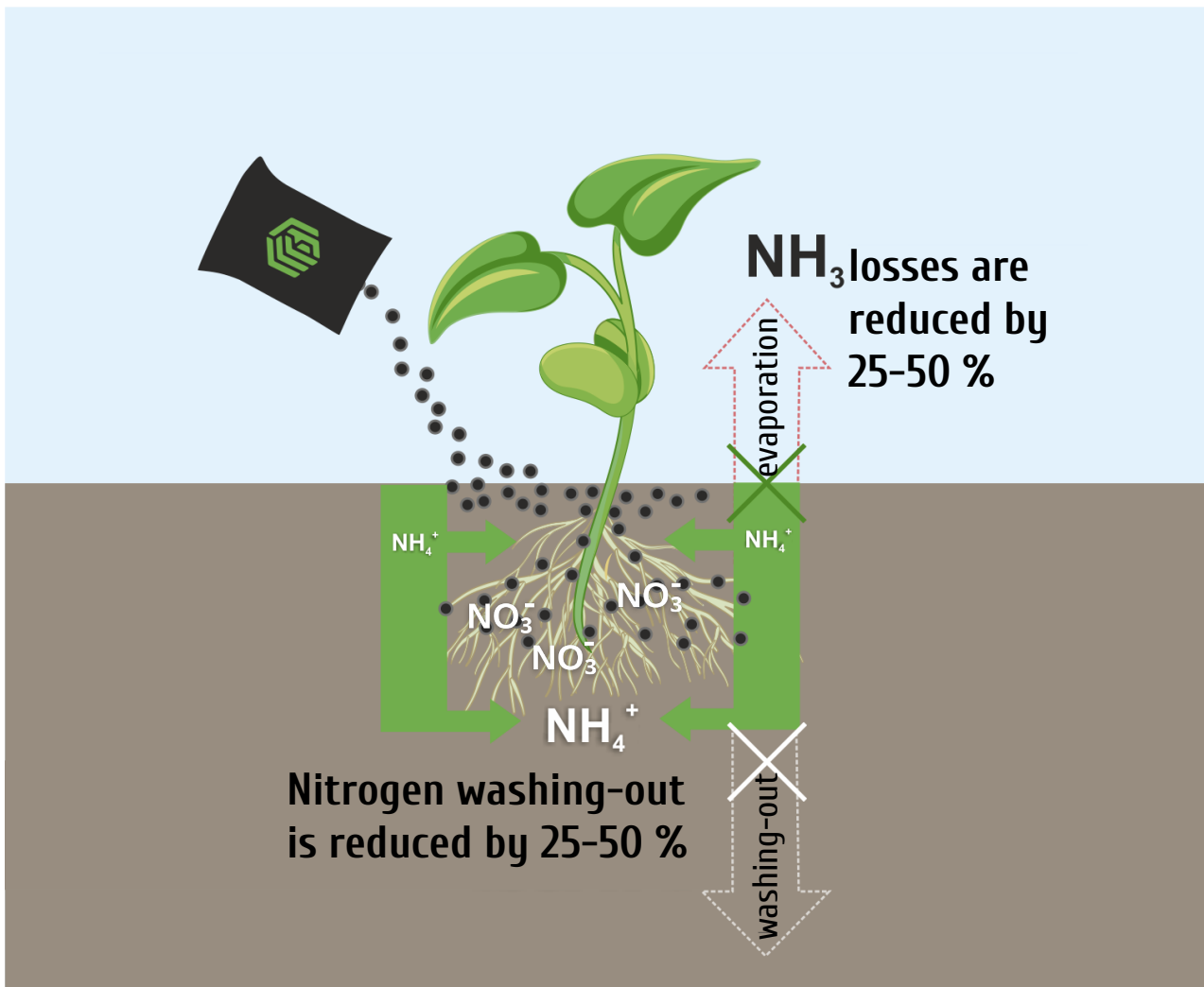
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Urea coated with a three-component Life Force Humate PLUS solves the nitrogen transformation problems associated with the storage and use of conventional (unstabilized) urea and allows:

- Incorporate urea into the soil, ensuring controlled nitrogen release.
- When urea is spread on the soil surface, nitrogen losses due to ammonium volatilization are reduced. (Loss of conventional urea nitrogen due to ammonium volatilization can be as high as 30%).
- To reduce the loss of nitrogen from urea during storage in consumer containers (bags, big bags) in hot climates with high air temperatures.

These advantages of using humic acid coated urea are especially relevant for countries with hot and arid climates.

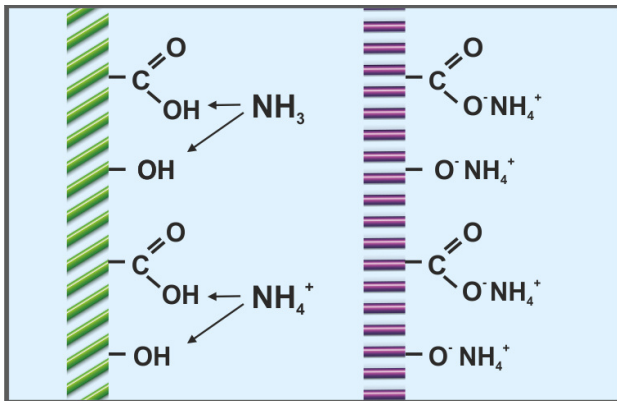
## TECHNOLOGY: HOW IT WORKS



Due to the correct nitrogen transformation and reduced nitrogen solubility, nitrogen leaching is reduced, nitrogen evaporation and nitrification processes are weakened, which allows to reduce nitrogen losses by up to 25-50 %.

The complex of humic acids with potassium humate and zeolite not only maintains the nitrogen forms and nutrients available to plants in the root zone, reducing their losses, but at the same time promotes more active development and intensive growth of the plant root system.

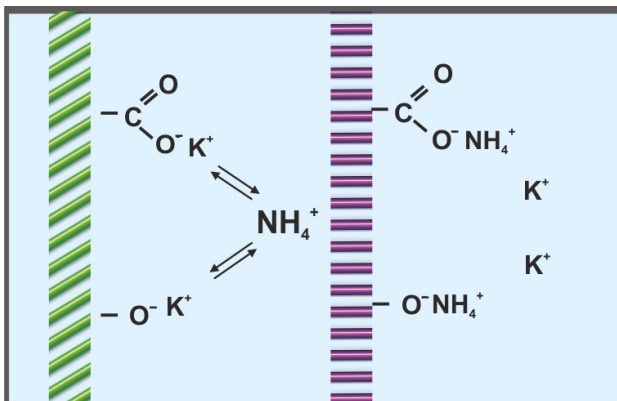
## Humic acids function



The reduction in ammonium loss is closely related to the maximal retention of ammonium ions by the functional humic acid (carboxyl and phenol) groups, which effectively replaces the  $H^+$  ion displaced by exchange during urea hydrolysis. This increases the buffering of the soil and reduces the volatility of ammonium.

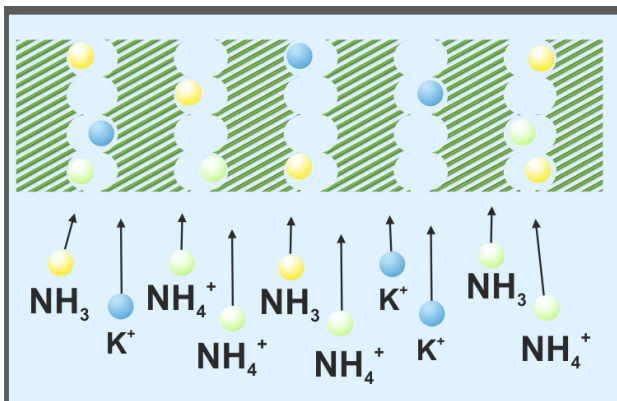
Humic acids have a high cation exchange capacity, which increases the nutrient saturation of the soil after fertilization. They chelate nutrients and help stimulate the activity of soil microorganisms. Promotes the development of an active root system. They also increase the water retention capacity of the soil, along with the zeolite accumulating an aqueous solution of nutrients around the root zone.

## Potassium humate function



The natural synergy of humates and urea stabilizes nitrogen at the level of ionic bonds: fixation of ammonium ions at ion exchange sites protects against the effects of nitrifying bacteria. Humate promotes the efficiency of plant metabolic processes and acts as a natural stimulator of plant growth and root formation.

## Zeolite function



The crystalline structure of zeolite has pores of exact ammonium ion size. This greatly slows down the conversion of ammonium nitrogen to nitrate, which ensures the long-term action of urea. The pore structure of the zeolite acts as a natural reservoir for the accumulation and storage of water and fertilizer components in the root zone.

# DIFFERENCES BETWEEN UREASE INHIBITORS AND HUMATE PLUS

*The use of urease and nitrification inhibitors has drawbacks that will not occur if urea with a humate-zeolite complex is used.*

## INHIBITORS

The advantage of using urease and nitrification inhibitors is that they inhibit the activity of soil microorganisms in order to stabilize the urea nitrogen transformation.

The action time of a proper inhibitor with high effectiveness is from 4 to 10 weeks maximum.

If inhibitors are used for a long time, the effects on the soil and the environment may have negative consequences, in particular, inhibition of the activity of soil microorganisms and the development of plants.

They can have adverse effects on non-target populations of soil bacteria (they can inhibit the vital diversity of soil microorganisms).

Improper use of inhibitors can inhibit plant growth, and root development in the presence of increased concentrations of inhibitors.

## HUMATE PLUS

The advantage of this complex is based on the retention of nitrogen in the soil through ion exchange bonds and the physical retention and stabilization of nitrogen in the soil.

The operating time can be from 1 to 2 months, depending on the amount of organic matter in the soil.

Long-term use of humic acids in the soil promotes humus accumulation processes, improves soil structure, aeration, moisture permeability and water retention in the soil.

Creates favorable conditions for the multiplication of soil microorganisms. By stimulating the activity of soil microorganisms, more nutrients are released to plant roots.

Promotes the development of an active and strong plant root system, accelerates the growth of stronger and healthier plants, the development of plants resistant to diseases and abiotic stressors.

Provides many additional benefits to soil and plant health and nutrition.

Once introduced into the soil, the humate-zeolite complex spreads around the urea granule.

Humic particles and zeolite crystals create unique areas of micropores that contain medium for plant root system, nutrient, and water storage.

Coating urea with Humate PLUS guarantees a longer nitrogen retention in the soil after the application of urea.

The amount of nitrogen in the soil after fertilizer application:

<b>At low humidity conditions</b>		
Weeks	Humate PLUS	Uncoated urea
2	95%	55%
4	84%	30%
6	75%	15%
8	70%	3%
10	62%	1%

<b>At high humidity conditions</b>		
Weeks	Humate PLUS	Uncoated urea
2	90%	68%
4	76%	40%
6	65%	15%
8	50%	4%
10	45%	3%



## SAFE AND EFFECTIVE LIFE FORCE HUMATE PLUS COATING TECHNOLOGY

Urea coated with the three-component Life Force Humate Plus increases the uptake and efficiency of nitrogen fertilizers, prolongs nitrogen retention in the soil, reduces environmental pollution with nitrogen compounds.

Most soil scientists and agronomists recognize humic substances as the most important component of healthy, fertile soil.

The natural synergy of humic acids and zeolite with urea can significantly reduce or completely prevent the reactivity, leaching and denitrification of nitrogen fertilizers, thus increasing the efficiency of such fertilizers and the nitrogen utilization rate of the fertilizer.

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