

«*Food is your medicine*»  
**HIPPOCRATES**

With this saying we are moving forward,  
visualizing a safer and healthier Agriculture,  
with environmental respect.

**NIKOS KARVELAS**



Karvelas S.A. with a successful and constant presence at the Livestock sector for over 30 years, made the next step and dynamically entered the agricultural sector. The situation in the agricultural sector made the Board move strategically and acquire our factory facilities at Ypato of Voiotia (former BayerHellas factory) where the production of new and innovative nutrition products takes place, with a head for a better future in the Greek production. The aim of every farmer is the maximum productivity with the minimum possible cost. However, most of the times the use of pesticides and fertilizers is not adequate to cover all the plant needs and achieve the best possible balance between development and performance. After examining, all the requirements of the plants in nutrition, we initially created 4 innovative foliar products, that can contribute and lead to the achievement of the initial goal.



Aiming at quality and productivity,  
we secure the environment and  
we pioneer with safety for the future.



## FYTOAMINO® - N (N-P-K) 25-0-0 + 7% Betaine + 3% Proline

The product is formulated in Water Solution (WS) and contains:  
**Nitrogen 25% w/w** in three forms:  
**ammonium (NH<sub>4</sub><sup>+</sup>) 6% w/w,**  
**urea (CO(NH<sub>2</sub>)<sub>2</sub>) 13% w/w,**  
**nitrate (NO<sub>3</sub><sup>-</sup>) 6% w/w,**  
**Betaine 7% w/w,** and  
**Proline 3% w/w**

Nitrogen is a key component in every aspect of plant metabolism, thus exerting major positive effect on plant growth, development, reproduction, and yield. Inorganic nitrogen (in nitrate and ammonium form) is adsorbed by the leaf and converted into organic nitrogen, which participates as structural component in chlorophyll, amino acids and many other nitrogen molecules. Amino acids are major components of proteins and enzymes, but also precursors for phytohormone production, molecules that act as regulators through the various growth stages of its life. Organic nitrogen is involved as a stimulation factor in the development and operation of the root system, flowers, fruits, and seeds, whilst it contributes to the utilization of other plant nutrients.

**Betaine** is a nitrogen containing organic molecule, a methylated derivative of the amino acid glycine, that gains beneficial biological role in crops. Foliar application of betaine increases chlorophyll content, and contributes to proper function of stomata, as well as the efficiency of light-absorbing system. Moreover, betaine contributes to retainment of water, even in drought or other oxidative stress conditions, it enforces the activity of antioxidant enzymes thus supporting the crop to perform better in extreme/ stressful conditions, whilst at the same time to handle the supplied nitrogen more efficiently, thus contributing to higher efficiency of fertilizer and crop productivity.

## FYTOAMINO® - PN 5-20-0 (N-P) + 5% L-Methionine

The product is formulated in Water Solution (S) and contains:  
**Nitrogen 5% w/w** in two forms:  
 ammonium 2,4% w/w and  
 urea 2,6% w/w,  
**Phosphorus (P<sub>2</sub>O<sub>5</sub>) 20% w/w** and  
**L- Methionine 5% w/w.**

**Phosphorus** plays an important role in a wide range of processes within the plant, including energy production, nucleic acid synthesis, carbon cycle management, synthesis and stability of membranes, enzyme activation and deactivation, metabolic signal management, metabolism of carbohydrates and nitrogen uptake.

Nitrogen is a key component in every aspect of plant metabolism, thus exerting major positive effect on plant growth, development, reproduction, and yield. Inorganic nitrogen (in nitrate and ammonium form) is adsorbed by the plant and converted into organic nitrogen, which participates as structural component in chlorophyll, amino acids, and many other nitrogen molecules. Amino acids are major components of proteins and enzymes, but also precursors for phytohormone production, molecules that act as regulators through the various growth stages of its life. Organic nitrogen is involved as a stimulation factor in the development and operation of the root system, flowers, fruits, and seeds, while it contributes to the utilization of other plant nutrients.

**Proline** is an amino acid that, when supplied exogenously through this product, supports crop to cope with adverse conditions. Proline application delays water loss through transpiration when the availability of water in the soil is limited, controls the opening of stomata, protects enzyme activity, whilst it modifies the permeability of the membranes.

**Application**  
 Foliar or drip irrigation.

**Caution:** Recommended dosage should not be exceeded.

**Dosage**  
**For foliar applications:**  
 Vegetables, arable crops: 400-500 ml / 100L of water or 200 ml / acre.  
 Tree crops 200-300 ml / 100 L of water

**Drip irrigation:** 2-3 L / acre.



**Methionine** is a sulfur amino acid and in addition to its participation as a structural component of proteins, it serves as the precursor of sulfur-adenosyl-methionine, known as SAM, a key metabolite. SAM feeds various metabolic pathways, one of which is the production of ethylene. SAM is a methyl donor in many metabolic pathways and therefore contributes to dealing with adverse crop conditions in various levels, thus supporting the crop to cope effectively with the adverse conditions.

**Application**  
 Foliar or drip irrigation.

**Caution:** Recommended dosage should not be exceeded.

**Dosage**  
**For foliar applications:**  
 Vegetables, arable crops: 400-500mL / 100L of water or 200mL / acre.  
 Tree crops: 200-300mL / 100L of water  
**Drip irrigation:** 3-4L / acre.



## FYTOAMINO® - Bo with boron, zinc, molybdenum and L-Arginine

The product contains:  
**Boron (B) 5% w/w** in the form of **Ethaneolamine borate,**  
**Zinc (Zn) 2% w/w,**  
**Molybdenum Mo 1% w/w** and  
**L-arginine 5% w/w.**

The product supports the crop during the reproductive stage, for optimal flowering and fruiting. Reproductive phase is particularly sensitive to boron deficiency that causes significant losses in production, even though no visible deficiency symptoms are observed in the vegetative phase. Boron deficiency is often responsible for reduced fruit setting. Foliar application with boron prior to flowering results in increased yields even when elemental analysis of soil and plant tissues shows sufficient existence of transient however critical deficiency during the reproductive phase.

**Zinc** is needed in small quantities and contributes to the normal performance of many functions within the plant. These functions play important role in the growth regulation, enzyme activation, phytohormone activity, photosynthesis, protein synthesis, carbohydrate metabolism, reproductive phase, seed production and protection against illnesses. In addition, resistance to adverse environmental conditions on crops, is associated with a high demand for zinc.

**Molybdenum** participates in various plant functions and the most important contribution is in nitrogen metabolism. Moderate or latent molybdenum deficiency limits production because of combined nutrition disorder with nitrogen and sulfur, especially if they occur in the reproductive phase.

This micronutrient package is supported by the amino acid **arginine**, which is an organic source of nitrogen. Arginine metabolism not only plays a key role in the distribution and recycling of nitrogen in cultivated plants, but also arginine is a precursor towards producing reactive nitrogen and polyamines, which in turn support the crop to encounter with adverse situations by activating defense mechanisms, especially during flowering.

The product also enhances the crop performance with **ethanolamine** along with boron. Plants synthesize ethanolamine

## FYTOAMINO® - PK 0-20-7 (N-P-K) with Choline

The product is formulated in Water Solution (WS) and contains:  
**Phosphorus (P<sub>2</sub>O<sub>5</sub>) 20% w/w,**  
**Potassium (K<sub>2</sub>O) 7% w/w** and  
**L-choline 1% w/w.**

**Phosphorus** plays an important role in a wide range of processes within the plant, including energy production, nucleic acid synthesis, management of the carbon cycle, the composition and stability of membranes, activation and deactivation of enzymes, the management of metabolic signals, metabolism of carbohydrates and nitrogen uptake .

**Potassium** is needed in large quantities in the plant and is particularly involved in growth, development, reproduction and crop yield. A large number of enzymes need potassium to function effectively, many of which are involved in carbon metabolism. Potassium is needed in the composition of proteins, contributes significantly to the preservation and management of water in the crop, but also in the transportation of anions to the juices moving among the organs.

**Choline** is a special molecule; it is a key nutrient for human, but also a methyl donor. It is a precursor molecule of glycine-betaine, an osmosis-protective molecule. Choline is needed for the synthesis of phosphatidylcholine associated with

by decarboxylation of serine and they produce choline, a molecule of special importance. It is a methyl donor but also a precursor of glycine-betaine, an osmosis-protective molecule. Choline is needed for the synthesis of phosphatidylcholine associated with the stability and more efficient function of membranes. Enhancing the plant with choline can therefore contribute substantially to its resistance to adverse conditions such as drought and salinity. Choline is usually produced in small quantities and the plant needs to be strengthened; higher choline levels contribute to production of a higher quality.

**Foliar application**

- before flowering,
  - during full bloom,
  - when the petals fall.
- Two applications cover the needs of flowering and fruit setting.

**Caution:** Recommended dosage should not be exceeded.

**Dosage**  
**For foliar applications:**  
 Vegetables, arable crops:  
 250-300mL/ 100L.  
 Tree crops: 250-300mL/  
 100L or 400-500 mL  
 / acre.

stability and more efficient function of membranes. Strengthening of plant with choline can contribute substantially to its resistance to adverse conditions such as drought and salinity. Choline is usually produced in small quantities and the plant needs to be strengthened because higher choline levels contribute to production a higher quality. Moreover, many of the beneficial soil microbes have the ability to convert choline to glycine-betaine.

**Application**  
 Foliar or drip irrigation.

**Caution:** Recommended dosage should not be exceeded.

**Dosage**  
**For foliar applications:**  
 Vegetables 150-200mL / 100L of water,  
 Arable crops: 400-500mL / 100L of water,  
 Tree crops: 250-300ml / 100L of water  
**Drip irrigation:** 1 – 2L / acre

