Organochemical fertilizers

Eco PLANT Food

The ideal food
that all crops
worship

What do plants need in order to grow?

The presence of mineral nutrients and organic matter in the substrate of the crop is an essential condition for the growth of any plant. Nitrogen, phosphorus and potassium are the three essential nutrients for the plant nutrition. The presence of organic matter allows the conversion of these main nutrients into forms available and readily assimilable. The granular organochemical fertilizers **ECO plant FOOD** provide this blend of nutrients with organic matter that is necessary for the plant growth.

When do plants achieve maximum yields?

When the combination of mineral nutrients and organic matter covers totally the needs of the crop. Each crop has different needs in relation to nutrients and in relation to organic matter and this fact should be taken into account during the fertilizer application. All the types of organochemical fertilizers **ECO plant FOOD** contain nitrogen, phosphorus and potassium in high concentrations along with organic matter in a percentage higher than 30% that assists plants to achieve very high yields.

How can a farmer give to his plants the combination of mineral nutrients and organic matter that they need?

By applying organochemical fertilizers in his crop. Organochemical fertilizers **ECO plant FOOD** are available in many types where each one contains different proportions of nutrients and organic matter. The farmer is free to choose the most suitable type based on the specific needs of its crop and provide the ideal combination of nutrients and organic matter to its plants.

Why are organochemical granular fertilizers ECO plant FOOD the best solution for plant nutrition for all crops?

ECO plant FOOD fertilizers are produced from chemical raw materials of high purity in combination with organic matter of excellent qualitative characteristics which contains humic and fulvic acids, amino acids and proteins. Therefore the organochemical fertilizers **ECO plant FOOD** provide nutrients in an available and easi-ly assimilable form to the plants and in parallel they improve the aeration of the soil, enhance the water retention capacity and activate its organic microflora.

Why should I prefer organochemical fertilizers ECO plant FOOD over a combination of a chemical fertilizer with a soil amendment?

There are many reasons.

1. The yields achieved by **ECO plant FOOD** are higher due to the fact that the mineral nutrients are in a prepared chelated form which is assimilated quickly and easily by the roots. On the contrary when applying separately a chemical fertilizer with a soil amendment, it takes longer in order to achieve the same chelation and good incorporation is needed as well.
2. The application of **ECO plant FOOD** fertilizers demands less effort and cost since with one application we apply both a chemical fertilizer and a soil amendment since **ECO plant FOOD** are 2 in 1.
3. **ECO plant FOOD** fertilizers contain an ideal proportion of mineral nutrients and organic matter in each grain. Therefore, nutrients are dispersed more evenly and with a greater homogenity on the entire application surface, increasing the fertility of the cultivated land.

4. A large part of the nutrients contained in the **ECO plant FOOD** fertilizers are of organic origin (e.g. organic nitrogen from amino acids and proteins), which increases their assimilation by the plants.

Organochemical granular fertilizers ECO plant FOOD
Clear excellence

Organochemical fertlizers **ECO plant FOOD** have a clear advantage on many points:

1. Most organochemical fertlizers contain organic matter which derives from animal feces (manures) or from leonardite (lignite). These two sources of organic matter contain only humic acids in contrast to the organic matter of **ECO plant FOOD** fertilizers which is very rich in amino acids, proteins, humic acids and fulvic acids.
2. **ECO plant FOOD** fertilizers contain more than 30% organic matter while a big part of their nutrients are of organic origin. Consequently the contained nutrients are more easily assimilated by the plants when they are needed.
3. The mineral nutrients derive from raw materials of high purity without impurities and heavy metals.
4. The organic matter contained in the organochemical fertlizers **ECO plant FOOD** derives exclusively from the hydrolysis of proteins that exist in the meat of fish, rabbits and poultry. The result of the hydrolysis of the above organic source is the coexistence of amino acids and proteins inside the **ECO plant FOOD** fertilizers and as a result **ECO plant FOOD** behave as slow release fertilizers since they provide organic nitrogen by both immediate and slow release.
5. Organochemical fertlizers **ECO plant FOOD** contain a vast variety of amino acids which are essential for the integrated growth of plants. In particular they contain the following amino acids:

Arginine	Phenylaline	Hydroxyproline
Aspartic acid	Threonine	Alanine
Lysine	Isoleucine	Proline
Leucine	Cysteine	Methionine
Serine	Glycine	Histidine
Valine	Glutamic acid	Tryptophan

6. **ECO plant FOOD** fertilizers are characterized by the uniform size of the grains, their easy dispersion in the soil and their high solubility in the water.

Organochemical fertilizers vs Manures

Organochemical fertilizers

- Weed growth is not favoured since raw materials are sterilized.
- The salinity of the soil is not increased.
- Contain organic matter along with mineral nutrients.

Manures

- Weed growth is favoured since the animals from which the manure derives may have eaten seeds of weeds and the seeds may not have lost their germination capacity as they go through the digestive system of the animals.
- The salinity of the soil is increased, which may cause toxicity to the crops and reduction of the good function of the root sytem.
- Contain only organic matter.

Chemical vs Organochemical fertilizers

- The fertility of the soils is diminished.
- The underground waters are polluted with nitrate ions.
- The ecosystem is disrupted.
- The yield of crops is gradually reduced.

- The fertility of the soils is enhanced.
- The underground waters are not polluted.
- The ecosystem benefits.
- The yield of crops is gradually increased.
- The population of the beneficial microorganisms that exist in the soil is increased.

Organic

Organochemical fertilizers

The Eco Plant Food series has 3 types of organochemical fertilizers which can be used in organic crops since they are certified in organic farming according to the E.U. regulation 834/07. All the raw materials which are used for the production of organic organochemical fertilizers ECO plant FOOD are certified. Also their production follows procedures which are environmentally friendly.

8 - 3 - 3

bio Suitable for organic crops

SYNTHESIS	
Nitrogen (N)	8.0 %
Organic Nitrogen	8.0 %
Phosphorus (P_2O_5)	3.0 %
Potassium (K_2O)	3.0 %
Magnesium (MgO)	0.3 %
Calcium (CaO)	7.0 %
Sulfuric anhydride (SO_3)	5.5 %
Organic matter	64.0 %
Amino acids - Proteins	35.0 %
Humic-fulvic acids	4.0 %

8-3-3 provides a high rate of nitrogen while at the same time it provides phosphorus and potassium. Amino acids and proteins of animal origin ensure that the contained nutrients will be readily available throughout the growing season. The proteins of **8-3-3** are converted into amino acids and are assimilated by the roots of the plants in a period of 4-6 months.

RAW MATERIALS

- Hydrolyzed skin meal and meat meal
- Apatite
- Potassium sulphate

bio Suitable for organic crops

4-6-10+2%MgO

SYNTHESIS	
Nitrogen (N)	4.0 %
Organic Nitrogen	4.0 %
Phosphorus (P_2O_5)	6.0 %
Potassium (K_2O)	10.0 %
Magnesium (MgO)	2.0 %
Calcium (CaO)	12.0 %
Sulfuric anhydride (SO_3)	12.5 %
Organic matter	41.0 %
Amino acids - Proteins	20.0 %
Humic-fulvic acids	4.0 %

The application of **4-6-10+2%MgO** improves significantly the organoleptic properties of the crops due to the high content of potassium that it contains. Fruits obtain a more vivid color, become more tasteful and have a longer shelf life after their harvest. In ornamentals we observe more vivid coloring in the flowers and an increase of the longevity of the buds after their cutting.

RAW MATERIALS

- Hydrolyzed skin meal and meat meal
- Apatite
- Potassium sulphate
- Dolomite

4 - 11 - 5

bio Suitable for organic crops

SYNTHESIS	
Nitrogen (N)	4.0 %
Organic Nitrogen	4.0 %
Phosphorus (P_2O_5)	11.0 %
Potassium (K_2O)	5.0 %
Magnesium (MgO)	0.3 %
Calcium (CaO)	18.0 %
Sulfuric anhydride (SO_3)	7.0 %
Organic matter	35.0 %
Amino acids - Proteins	18.0 %
Humic-fulvic acids	3.0 %

4-11-5 contains all 3 main nutrients while having a high percentage of phosphorus. Phosphorus fortifies rooting of the plants and in parallel it enhances blooming. The organic matter of **4-11-5** contains humic and fulvic acids which play a major part in the plant nutrition since they improve the assimilation of the nutrients by the plants while at the same time they reduce their leaching in the soil.

RAW MATERIALS

- Hydrolyzed skin meal and meat meal
- Apatite
- Potassium sulphate

Conventional Organochemical fertilizers

12 - 5 - 6

SYNTHESIS	
Nitrogen (N)	12.0 %
Organic Nitrogen	1.9 %
Ammoniacal Nitrogen	7.6 %
Urea Nitrogen	2.5 %
Phosphorus (P_2O_5)	5.0 %
Potassium (K_2O)	6.0 %
Magnesium (MgO)	0.2 %
Calcium (CaO)	6.0 %
Sulfuric anhydride (SO_3)	23.0 %
Organic matter	35.0 %
Amino acids - Proteins	13.0 %
Humic-fulvic acids	7.0 %

12-5-6 is a N-P-K organochemical fertilizer with a very high rate of nitrogen which is gradually released due to the simultaneous presence of the organic, ammoniacal and urea nitrogen. The presence of phosphorus enhances the germination of seedlings and promotes the development of flowers in all crops. Potassium fortifies all the structures of plant cells which results in the fortification of the resistance of plants against various stressful factors.

RAW MATERIALS

- Hydrolyzed meat meal and bone meal
- Ammonium sulphate
- Urea
- Phosphate salts
- Potassium salts

7-12-6+2%MgO

SYNTHESIS	
Nitrogen (N)	7.0 %
Organic Nitrogen	2.2 %
Ammoniacal Nitrogen	4.8 %
Phosphorus (P_2O_5)	12.0 %
Potassium (K_2O)	6.0 %
Magnesium (MgO)	2.0 %
Calcium (CaO)	10.0 %
Sulfuric anhydride (SO_3)	9.0 %
Organic matter	41.0 %
Amino acids - Proteins	15.0 %
Humic-fulvic acids	8.0 %

7-12-6+2%MgO is a N-P-K organochemical fertilizer rich in phosphorus. Proteins and amino acids contained in **7-12-6+2%MgO** enhance the growth of the root system of all crops. Phosphorus and calcium are readily available due to their chemical union with the particles of humic and fulvic acids during the production of the fertilizer.

RAW MATERIALS

- Hydrolyzed meat meal and bone meal
- Ammonium sulphate
- Phosphate salts
- Potassium salts
- Dolomite

7-5-12+4%MgO

SYNTHESIS	
Nitrogen (N)	7.0 %
Organic Nitrogen	1.8 %
Ammoniacal Nitrogen	5.2 %
Phosphorus (P_2O_5)	5.0 %
Potassium (K_2O)	12.0 %
Magnesium (MgO)	4.0 %
Calcium (CaO)	6.0 %
Sulfuric anhydride (SO_3)	16.0 %
Organic matter	34.0 %
Amino acids - Proteins	12.0 %
Humic-fulvic acids	7.0 %

7-5-12+4%MgO is an organochemical fertilizer that derives from the chemical reaction between organic and mineral raw materials. **7-5-12+4%MgO** contains magnesium which promotes photosynthesis since it belongs in the particle of chlorophyll and therefore ensures the proper growth of plants. Furthermore the high content in sulphur reduces the levels of sodium which improves the conductivity of the soil.

RAW MATERIALS

- Hydrolyzed meat meal and bone meal
- Ammonium sulphate
- Phosphate salts
- Potassium salts
- Magnesium salts

Organic matter

The organic matter of the soil derives from the living plant and animal organisms living in the soil and is the result of the degradation of their residues. Organic matter consists of high molecular weight particles such as humic acids and proteins and of lower molecular weight particles such as fulvic acids and amino acids.
The organic matter is essential in all cultivated soils for the following reasons.

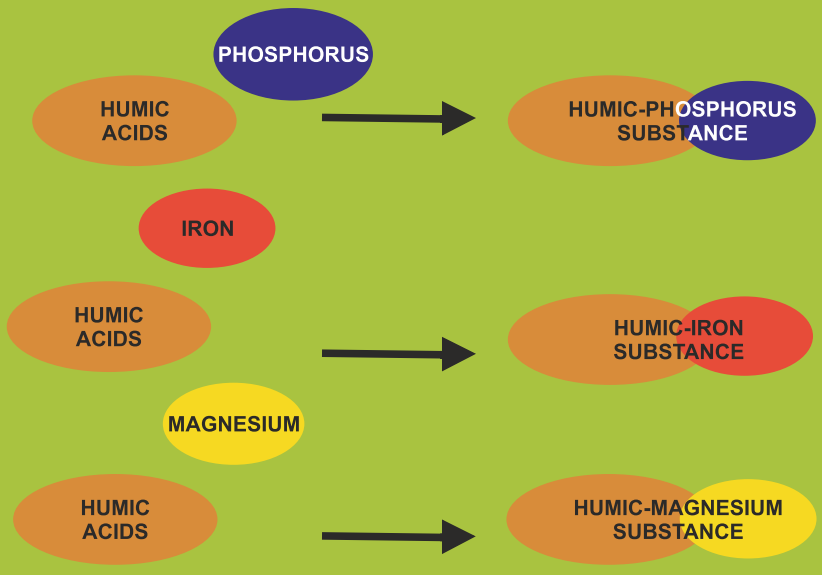
- **The presence of organic matter in the soil makes it darker and therefore warmer. This results in the better seed germination and the quicker root growth.**
- **Organic matter increases the retention capacity of water and nutrients especially in sandy soils.**
- **Organic matter converts mineral nutrients in readily available forms to the plant roots.**
- **Enhances the cation exchange capacity and as a result the uptake rate of nutrients by the plant roots is increased.**
- **Reduces nutrient leaching by improving the capacity of the soil to retain and store the essential nutrients.**
- **Reduces the soil compression and therefore allows a better aeration of the root system and consequently a lower chance of root rots appearance.**
- **Facilitates the root penetration in greater depth and width which reduces unearthing.**

The importance of Humic acids

As humic acids are defined the complex dark brown colored organic substances which are formed through metabolic processes of the plant residues of the soil. Humic acids offer multiple benefits both in crops and soil.

- Supplement the organic matter of the soils.
- Convert the existing nutrients in the soil into readily assimilable forms since they increase the cation exchange capacity.
- Stimulate the activity of the soil beneficial microorganisms.
- Improve the structure of the soils.
- Increase the retention of the water soluble fertilizers by the roots of the plants.
- Enhance the assimilation of nutrients by the root system even in calcareous soils with a high pH.

As it appears in the chart on the right, organochemical fertilizers **Eco plant Food** derive from raw materials very rich in humic acids, combined with mineral nutrients, such as phospho-rus, iron and magnesium which would be insoluble in the soil. In **Eco plant Food** mineral nutrients are converted in totally assimilable by the plants forms.



The importance of Fulvic acids

Fulvic acids occur from the degradation of humic acids. In contrast to humic acids, fulvic acids are smaller in size and have a lighter colour (yellow-brown). Fulvic acids are widely known for their great properties such as:

- Provide a valuable carbon source to the beneficial soil microorganisms.
- Are water soluble in a wide range of soil pH.
- Chelate nutrients and improve their assimilation by the plants.
- Promote seed germination and the rapid growth of roots and shoots.
- Increase the permeability of the cellular membrane and as a result they improve the assimilation of nutrients by the plants.
- Fortify the cellular division and the elongation of the cells.
- Improve the retention of humidity by offering protection to the crops during conditions of drought.

Organochemical fertilizers ECO plant FOOD are the excellent source of fulvic acids that creates optimum growing conditions for all crops.

The importance of L-Amino acids

All amino acids except glycine are capable of forming 2 different stereoisomers around the central atom of carbon. In particural they are called L-amino acids in case they are levorotatory and D-amino acids in case they are dextrorotatory. Only L-amino acids are assimilated by the plants and are involved in metabolic procedures. Organochemical fertlizers ECO plant FOOD contain a high concentration of L-amino acids derived from the degradation of proteins.

The main plant stimulating action of amino acids when they are in contact with the root system is that they encourage the cellular reproduction and emergence of secondary roots.

Furtermore L-amino acids

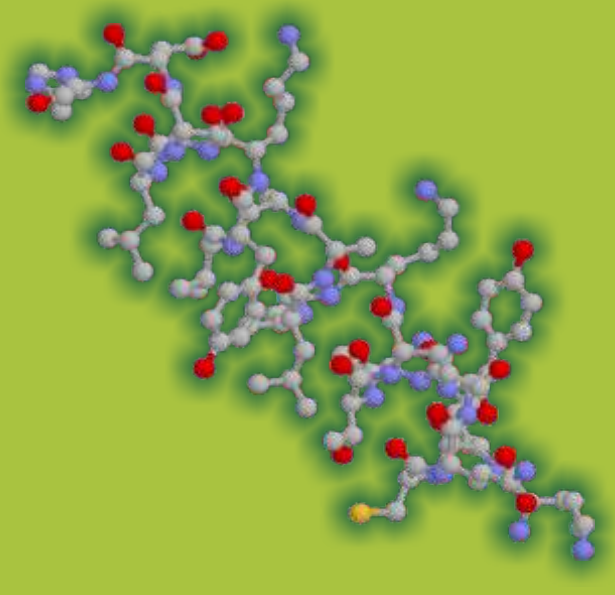
- Enhance the photosynthetic capacity of the plants.
- Reinforce the resistance of crops against biotic and abiotic factors that cause stress.
- Participate in the synthesis of plant hormones (auxins, gibberellins, cytokinins).
- Increase the percentage of pollination of crops.



The importance of Proteins

The main structural components of all living organisms are proteins. Proteins consist of amino acid sequences.

Organochemical fertlizers ECO plant FOOD are very rich in proteins since their organic matter derives from the thermal hydrolysis of the meat of rabbits, fish and poultry. Throughout the thermal hydrolysis a reaction is caused during which the molecule of the protein is divided into 2 or more particles (dipeptides or tripeptides). The division of proteins causes the release of amino acids and carboxylic groups. Carboxylic groups act as chelating agents and therefore improve the assimilation of mineral nutrients from the plants.



Application Rates - Periods

CROPS	8-3-3 +1.5%MgO bio	4-6-10+2%MgO bio	4-11-5 bio	7-5-12 +4%MgO	7-12-6	12-5-6
Fruit trees	600-1,000 kg/ha From the end of Summer until the end of Spring	600-800 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter	600-800 kg/ha From the end of Summer until the end of Spring	500-800 kg/ha From the end of Summer until the end of Spring	500-700 kg/ha From the end of Summer until the end of Spring
Citrus trees	800-1,200 kg/ha Autumn-Winter	600-800 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter	1,400-1,600 kg/ha Winter	1,400-1,600 kg/ha Winter	1,400-1,600 kg/ha Winter
Stone fruits	600-1,000 kg/ha From the end of Summer until the end of Spring	600-800 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter	600-800 kg/ha From the end of Summer until the end of Spring	500-800 kg/ha From the end of Summer until the end of Spring	500-700 kg/ha From the end of Summer until the end of Spring
Pome trees	600-1,000 kg/ha From the end of Summer until the end of Spring	600-800 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter	600-800 kg/ha From the end of Summer until the end of Spring	500-800 kg/ha From the end of Summer until the end of Spring	500-700 kg/ha From the end of Summer until the end of Spring
Vineyards	600-1,000 kg/ha From the end of Summer until the end of Spring	600-800 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter	600-800 kg/ha From the end of Summer until the end of Spring	500-800 kg/ha From the end of Summer until the end of Spring	500-700 kg/ha From the end of Summer until the end of Spring
Olive trees	600-800 kg/ha Autumn-Winter	600-800 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter	500-800 kg/ha Autumn-Winter	500-700 kg/ha From the end of Summer until the end of Spring	500-700 kg/ha Autumn-Winter
Open field Vegetables	600-1,000 kg/ha During the preparation of the soil	800-1,000 kg/ha From the end of Summer until mid-Spring	400-500 kg/ha Prior to sowing or transplanting	600-1,000 kg/ha From the end of Summer until the end of Spring	600-800 kg/ha Prior to sowing or transplanting	600-1,000 kg/ha Prior to sowing or transplanting
Greenhouse Vegetables	800-1,000 kg/ha During the preparation of the soil	800-1,000 kg/ha From the end of Summer until mid-Spring	400-500 kg/ha Prior to sowing or transplanting	600-1,000 kg/ha From the end of Summer until the end of Spring	600-1,000 kg/ha Prior to sowing or transplanting	600-1,000 kg/ha Prior to sowing or transplanting
Vegetables	600-1,000 kg/ha During the preparation of the soil	800-1,000 kg/ha From the end of Summer until mid-Spring	400-500 kg/ha Prior to sowing or transplanting	600-1,000 kg/ha From the end of Summer until the end of Spring	600-1,000 kg/ha Prior to sowing or transplanting	600-1,000 kg/ha Prior to sowing or transplanting
Corn, Tobacco, Sunflower	500-1,000 kg/ha Prior to sowing	500-800 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter		500-600 kg/ha Prior to sowing	400-500 kg/ha Prior to sowing
Cereals, Soya, Rice, Beets and industrial crops	500-1,000 kg/ha Prior to sowing	500-600 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter	500-1,000 kg/ha Prior to sowing	400-500 kg/ha Prior to sowing	600-1,000 kg/ha Prior to sowing
Cotton	500-1,000 kg/ha Prior to sowing	500-600 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Autumn-Winter	500-1,000 kg/ha Prior to sowing	400-500 kg/ha Prior to sowing	600-1,000 kg/ha Prior to sowing
Lawn	1,000-1,200 kg/ha Winter-Spring	800-1,200 kg/ha From the end of Summer until mid-Spring				800-1,000 kg/ha Winter-Spring
Ornamentals	500-1,000 kg/ha Autumn-Spring	800-1,000 kg/ha From the end of Summer until mid-Spring	500-600 kg/ha Prior to sowing or transplanting	600-800 kg/ha From the end of Summer until mid-Spring	400-500 kg/ha Prior to sowing or transplanting	500-800 kg/ha Autumn-Spring

Produced by

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