

## Microbial plant stimulant Microbial soil stimulant

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*Biostimulants under  
the trademark  
ekoFertile™  
for use on leaves and  
soil*

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Microbial soil and plant stimulants – Rehabilitation of the microbiome – Improved nutrient and soil conditions – Strengthening of the plants immune system – Higher yields through improved nutrient availability



### Summary

*ekoFertile™ plant* is a natural biostimulant (Organic mineral NK fertilizer) for the biological strengthening of ornamental and crop plants – *ekoFertile™ soil* (Soil conditioner) primarily serves to promote or restore the microbiome in the soil – and thus in turn to strengthen the health, resistance, and growth of the plants.

Both biostimulants contain plant growth-promoting bacteria that activate soil life, organic acids produced by the microorganisms and various trace elements. This increases humus production, accelerates growth, improves soil conditions, increases yield, and improves nutrient and soil conditions for better crop quality.

The microorganisms contained directly influence plant growth. They also strengthen the plants' immune system and buffer the effects of biotic and abiotic stress factors. The resistance they create to phytopathogens and insect pests can reduce the need for pesticide use.

## Microbial soil and plant stimulants

Biological crop protection uses living organisms as well as biological active substances and principles. This includes the preservation, promotion, settlement, and application of beneficial organisms as well as the use of natural substances, organic and inorganic substances as plant protection and tonics. They protect plants from harmful organisms or prevent their effects.

Substances that focus on supplying the plants with nutrients and trace substances and stimulating growth fall under fertilizer law as plant additives or soil additives.

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*The main benefit of organic fertilizers is their ability to support soil health*

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Biological plant strengtheners or biostimulants, on the other hand, are substances and mixtures including microorganisms that serve directly or indirectly to keep plants healthy or protect plants from non-parasitic impairments. They have no harmful effects on the health of humans and animals, the groundwater or any other unacceptable effects, especially on the ecosystem – quite the opposite. They have a preventive effect against pests and diseases. In accordance with the EU Fertilizer Regulation, which will apply from June 2022, they stimulate plant nutritional processes regardless of the nutrient content and aim to improve the efficiency of nutrient utilization, tolerance to abiotic stress, and/or the quality characteristics of crop plants.

Biostimulants contain plant growth-promoting bacteria that activate soil life. This in turn accelerates the conversion of organic matter for increased humus production, shortens the growing season, improves soil conditions for more root mass, increases yield through improved nutrient availability, and improves nutrient and soil conditions for better crop quality.

Today, the need for biostimulants is greater than ever – for various reasons, not to mention the skyrocketing prices for artificial fertilizers. On the one hand, new and restrictive fertilizer regulations are increasing the pressure on farmers. Despite stricter regulations, they still want to harvest high yields and good quality. On the other hand, well-known active ingredients also fail due to resistance.

## Soil, plants, and the microbiome

Soil is interspersed with numerous microscopic pores. On average, these make up about 45% of the total soil volume and are filled with water and air. In addition, every soil has a distinctive soil life. Billions of microorganisms live in the soil, on the roots of plants, but also in plants and on their surface. They form complex communities in which individual fungal and/or bacterial species compete and perform specific functions. The totality of all microorganisms in a certain habitat forms the microbiome.

The microbiome or microorganisms interact with plants in a variety of ways. A healthy root microbiome ensures the survival of the plants. The plant's own immune system alone is not sufficient to survive. Microorganisms in the root microbiome expand the plant immune system, even increase growth, and thus play an important role in the plant ecosystem.

Among the countless microorganisms in the soil, there are many that protect plants from diseases and pests or help to cope with stress. They support plant growth

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*Strengthen the plant  
via the microbiome*

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through signal and messenger substances, nutrient transport, root networking and the associated improved water supply. Microorganisms fix nitrogen, make phosphorus available, produce iron-binding compounds and messenger substances that control plant growth and development. In addition, there is increased protection against herbivores and parasites through the activities of various enzymes – for example cellulases, proteases, lipases.

However, soil is not only a complex, but also a sensitive ecological system. The microbiome is disturbed or even killed by conventional cultivation methods and the use of artificial fertilizers and sprays, by overloading the soil ecosystem – especially with excessive use of herbicides. The pores are lost due to compaction, the soil loses its ability to aerate and store water.

The restoration of the natural soil functions can be accelerated by adding suitable biostimulants. Microbial soil and plant stimulants serve to restore the microbiome. They provide important elements for repairing soil structure, while at the same time stimulating growth, health, immunity, and development of the plants grown on them.

The surfaces of plants are also colonized by complex microbial communities. Changing the balance between these microbes in the microbiome can lead to disease.

## After-effects of herbicides

Application of herbicides to plants leads to slow dieback accelerated by reduced resistance to root pathogens. Plant growth-promoting rhizobacteria are negatively affected or killed, while pathogenic bacteria and fungi are enhanced. Glyphosate in particular inhibits the production of aromatic amino acids, which in turn contribute to the production of lignin and antimicrobial phytoalexins that protect plants against pathogens. Plant pathogens are attracted, while at the same time the reduced defenses facilitate the entry of pathogens into the plants. (see <https://doi.org/10.3389/fenvs.2021.763917>)

## *ekofertile™ soil from ekolive*

*ekolive* uses naturally occurring heterotrophic microorganisms as a biological tool. Our biostimulants for soil and plants produced in this way offer a hitherto unique combination of microorganisms, organic acids, and dissolved micronutrients. They ensure increased root growth, thus more fine roots, and thus better phosphate absorption. Amino acids – in combination with trace elements – stimulate plant growth. Fulvic acids, short-chain, water-soluble humic acids, improve the absorption of nutrients and thus lead to corresponding advantages in plant growth.

Our biostimulants work in the soil because they are present in the root area and strengthen or even rehabilitate the microbiome. While conventional liquid biostimulants can only be applied to a limited extent in the root area and the fine roots quickly grow beyond them, *ekofertile™ soil* is mixed into the topsoil and thus becomes part of the root area. The organic acids and humic acids contained are very

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*Make fertilizer and  
pesticides on the  
field superfluous*

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stable and form clay-humus complexes in the soil, which can bind water and nutrients. They act against abiotic stress such as water shortages.

The lactic acid bacteria contained in *ekofertile™* improve the soil, fight plant diseases, strengthen their immune system and defenses against abiotic stresses and promote plant growth.

The use of *ekofertile™ soil* is a step in the right direction to sustainably maintain the functionality and performance of the soil with reduced use of pesticides and fertilizers. By using it, large amounts of fertilizers and pesticides can probably be saved and at the same time biodiversity and the soil can be protected in the long term.

### *ekofertile™ plant from ekolive*

Our liquid biostimulants contain living, plant growth-promoting microorganisms (PGPM), various organic acids produced by the microorganisms, and various trace elements, which are applied to the leaf surfaces of crop plants or to the soil. The PGPM specifically colonize the root area and the inside of the plant and increase the health, resistance, and growth of the plants.

The microorganisms contained in *ekofertile™ plant* directly influence plant growth. They also buffer the effects of biotic (pathogenic fungi, bacteria, viruses, and insects) and abiotic (heavy metal levels, periods of drought, lack of nutrients, high salt levels and extreme temperatures) stress factors. They produce the plant's own hormones, which act as signal molecules or messenger substances and thus control and coordinate both growth and development.

The microorganisms produce metabolites that are said to have an antifungal, antibacterial, antiviral, or phytotoxic effect. In addition, pathogens are pushed back within the rhizosphere simply because of increased competition from the mere presence of the PGPM. Resistances to phytopathogens and insect pests created in this way avoid the need for the use of pesticides.

## Examples of experiments and applications



0%                    10%                    50%                    100%  
Used concentration of *ekofertile™ plant* on basil (BDC – England, 8 weeks)



Basil (left with *ekofertile™ plant*, right without); tested by Victory Organics, Croatia, 6 weeks



Bio-potatoes (below with *ekofertile™ plant*, above without); tested in Hungary, 14 weeks  
– size and amount of potatoes increased significantly –



Chilli (left with *ekofertile™ plant*, right without); tested by Victory Organics, Croatia, 4 weeks  
– new flowers and leaves growing –



Tea herbs (*Thymus serpyllum*) (left with *ekofertile™ plant*, right without);  
tested by *ekolive*, Slovakia, 4 weeks



Tea herbs (*Melissa officinalis*) (left with *ekofertile™ plant*, right without);  
tested by *ekolive*, Slovakia, 4 weeks  
– new leaves starting to grow –



Spinach (left with *ekofertile™ plant*, right without); tested by Victory Organics, Croatia  
– faster development –



Strawberries (left with *ekofertile™ plant*, right without); tested by Victory Organics, Croatia  
– faster development of fruit –

## Composition of liquid additive **ekofertile™ plant**

Microbial biomass<sup>1</sup>: 57 % probiotic lactic acid bacteria that strongly promote plant growth and development and improve their health.

Organic acids naturally produced by bacteria (lactic acid, butyric acid, acetic acid, methanol, ethanol) with dissolved minerals from the bioleaching process.

Total Nitrogen (N)	%	0.0400
<i>VDLUFA II.1, 3.5.2.7; 1995</i>		
Ammonium Nitrogen (NH <sub>4</sub> -N)	%	0.01
<i>DIN EN ISO 11732-E 23; 2005-05</i>		
Nitrate-Nitrogen (NO <sub>3</sub> -N)	%	< 0.01
<i>DIN EN ISO 13395-D 28; 1996-12; #6</i>		
available nitrogen (NH <sub>4</sub> -N + NO <sub>3</sub> -N)	%	0.01
<i>Calculated; #6</i>		
Carbamid Nitrogen (N)	%	< 0.05
<i>VDLUFA II.1, 3.9.2; 1995</i>		
Phosphorus (P <sub>2</sub> O <sub>5</sub> ), mineral acid soluble	%	< 0.0100
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Potassium (K <sub>2</sub> O), mineral acid soluble	%	0.0840
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Magnesium, total (calculated as MgO)	%	0.0275
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Calcium, total (calculated as CaO)	%	0.0855
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Total Sulphur (S)	%	0.0250
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Sodium (Na)	%	0.0895
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Silicon (Si)	%	< 0.0100
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #6, #A2</i>		
Alkaline active components (calculated as CaO)	%	0.440
<i>VDLUFA II.1, 6.3; 1995</i>		
Boron (B)	mg/kg	< 2.00
<i>DIN EN ISO 11885 (E 22); 2009-09, #A2</i>		
Cobalt (Co)	mg/kg	0.117
<i>DIN EN ISO 17294-2 (E 29); 2005-02 (mod.), #A1</i>		
Iron (Fe)	mg/kg	142
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Copper (Cu)	mg/kg	< 2.00
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Manganese (Mn)	mg/kg	6.58
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
Molybdenum (Mo)	mg/kg	< 0.100
<i>DIN EN ISO 17294-2 (E 29); 2005-02 (mod.), #A1</i>		
Zinc (Zn)	mg/kg	< 2.00
<i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>		
pH value		4.5
<i>DIN 38404-C 5; 2009-07; #6</i>		
Salt content	% KCl	0.782
<i>VDLUFA I, A 10.1.1; 1991</i>		

<sup>1</sup> natural probiotic bacteria consortia *microlive®*: Lactobacillus, Leuconostoc, Lactococcus, Bifidobacterium, Acetobacter, Bacillus.

## Composition of solid additive *ekofertile™ soil*

Minerals as a source of plant nutrients and carrier material for microbial biomass<sup>2</sup> with their metabolic products: probiotic lactic acid bacteria that strongly promote plant growth and development and improve their health.

Total Nitrogen (N) <i>VDLUFA II.1, 3.5.2.7; 1995</i>	%	0.105
Ammonium Nitrogen (NH <sub>4</sub> -N) <i>DIN EN ISO 11732-E 23; 2005-05</i>	%	< 0.01
Nitrate-Nitrogen (NO <sub>3</sub> -N) <i>DIN EN ISO 13395-D 28; 1996-12; #6</i>	%	< 0.01
available nitrogen (NH <sub>4</sub> -N + NO <sub>3</sub> -N) <i>Calculated; #6</i>	%	< 0.01
Carbamid Nitrogen (N) <i>VDLUFA II.1, 3.9.2; 1995</i>	%	< 0.05
Phosphorus (P <sub>2</sub> O <sub>5</sub> ), mineral acid soluble <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	%	0.114
Potassium (K <sub>2</sub> O), mineral acid soluble <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	%	0.322
Magnesium, total (calculated as MgO) <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	%	1.14
Calcium, total (calculated as CaO) <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	%	1.33
Total Sulphur (S) <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	%	0.121
Sodium (Na) <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	%	0.133
Alkaline active components (calculated as CaO)	%	2.59
<i>VDLUFA II.1, 6.3; 1995</i>		
Boron (B) <i>DIN EN ISO 11885 (E 22); 2009-09, #A2</i>	mg/kg	3.32
Cobalt (Co) <i>DIN EN ISO 17294-2 (E 29); 2005-02 (mod.), #A1</i>	mg/kg	5.15
Iron (Fe) <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	mg/kg	16300
Copper (Cu) <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	mg/kg	6.42
Manganese (Mn) <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	mg/kg	206
Molybdenum (Mo) <i>DIN EN ISO 17294-2 (E 29); 2005-02 (mod.), #A1</i>	mg/kg	0.228
Zinc (Zn) <i>DIN EN ISO 11885 (E 22); 2009-09 (mod.), #A1</i>	mg/kg	33.7

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<sup>2</sup> natural probiotic bacteria consortia *microlive®*: Lactobacillus, Leuconostoc, Lactococcus, Bifidobacterium, Acetobacter, Bacillus.

## Guidance

### Method of application:

Liquid additive *ekofertile™ plant* is applied by spraying/irrigation.

Solid mineral additive *ekofertile™ soil* is applied directly into the soil.

### Dosage:

Spaying: 1 l *ekofertile™ plant* per hectare mixed with at least 100 litres of water.

Irrigation: 1 l *ekofertile™ plant* mixed with at least 100 litres of water

Apply three times – 1<sup>st</sup> application at the 2–4 leaf stage, 2<sup>nd</sup>, and 3<sup>rd</sup> application at 14-day intervals.

Soil: 100 kg mineral *ekofertile™ soil* per hectare

Apply once during sowing.

### Storage:

Store *ekofertile™ plant* and *ekofertile™ soil* in the originally closed containers/bags at a dark place at a temperature of approx. 10-25 ° C. Protect from frost, fire, and direct sunlight.

### Shelf life:

If stored in the undamaged original packaging and if the storage conditions are observed, 6 months from the date of manufacture.

### Packing Size:

Canisters of 1, 2, 5, 10, 25, 50, 1000 litres; Bags – 1, 2, 5, 10, 25, 1000 kilograms.

### Manufacturer:



## Imprint and Contact

### ekolive Germany GmbH

Humperdinckweg 12  
33102 Paderborn / Deutschland  
mail: [ekolive@ekolive.eu](mailto:ekolive@ekolive.eu)  
web: <https://ekolive.eu>

### Victory Organics d.o.o.

Kandlerova 8  
52 100 Pula / Kroatien  
mail: [info@victory-organics.com](mailto:info@victory-organics.com)  
web: <https://victory-organics.com>

### Our offer

*ekolive* is the first and leading provider of a new ecological *bioleaching* method for the ecological release of elements and the breakdown of organic contaminants with consecutive production of biostimulants.

## Kennzeichnungsvorschlag gemäß Düngemittelverordnung

Labor-Nr.: 21DD002374

### ekofertile™ soil

#### Bodenhilfsstoff

unter Verwendung von Sand, tierischen Nebenprodukten, pflanzlichen Stoffen aus der Lebensmittelherstellung, lebende Mikroorganismen

Zur Verbesserung der biologischen Aktivität des Bodens,

#### Nährstoffgehalte:

0,11 % Gesamtstickstoff (N)  
0,12 % Gesamtphosphat (P<sub>2</sub>O<sub>5</sub>)  
0,33 % Gesamtkaliumoxid (K<sub>2</sub>O)

Nettomasse: ..... kg

#### Hersteller / Inverkehrbringer:

ekolive s.r.o  
Americka trieda 3  
04013 Košice Slowakei

#### Ausgangsstoffe:

Sand natürlicher Herkunft  
Tierisches Nebenprodukt (Rindergülle) Kategorie 2 gem. VO (EG) Nr.1069/2009  
pflanzliche Stoffe aus der Lebensmittelherstellung (Melasse)  
Lebende Mikroorganismen (heterotrophe Mikroorganismen (Lactobacillaceae))

#### Nebenbestandteile:

3,15 % Organische Substanz  
1,16 % MgO  
0,12 % Schwefel (S)  
98,44 % Trockenmasse (TM)

#### Aufbereitungsmittel:

#### Hinweise zur sachgerechten Lagerung:

Die Lagerung hat in den dafür zugelassenen und geschlossenen Originalbehältern, trocken und bei Temperaturen zwischen 10-25 °C für maximal 1 Monat zu erfolgen. Direktes Sonnenlicht sowie Frost ist zu vermeiden. Abtragungen in Oberflächen- oder Grundwasser ist sowohl während der Lagerung als auch bei der Ausbringung zu vermeiden.

#### Hinweise zur sachgerechten Anwendung:

Auf die Bestimmungen des Gentechnikrechtes, sowie weitere abfallrechtliche, wasserrechtliche und düngerechtliche Vorschriften wird verwiesen.  
Die Anwendungsempfehlungen des Herstellers sind zu beachten, eine Beratung durch den Hersteller wird empfohlen. Abhängig von der lokalen Situation sind die grundsätzlichen Empfehlungen ggf. anzupassen.

- Bei der einmaligen Anwendung im Ackerbau, bei Rasenkulturen und im Landschaftsbau wird ein direktes Einarbeiten/Grubbern kurz oder unmittelbar von der Aussaat mit mindestens 100 kg ekofertile™ soil pro Hektar – je nach Anwendung bis ca. 10 % empfohlen
- Im Gemüsebau, Obstbau bzw. der Anzucht sind je nach Anwendung ca. 10 bis maximal 30 % ekofertile™ soil durch Grubbern oder anderweitigem Untermischen einzuarbeiten.

## Kennzeichnungsvorschlag gemäß Düngemittelverordnung

Labor-Nr.: 21DD002373

### ekofertile™ plant

#### Organisch-Mineralischer NK-Dünger – Suspension – 0,04 – 0,08 mit Eisen (Fe) und Mangan (Mn)

unter Verwendung von Sand, tierischen Nebenprodukten, pflanzlichen Stoffen aus der Lebensmittelherstellung, lebende Mikroorganismen

**Nährstoffgehalte:**

0,04 % Gesamtstickstoff (N)  
0,08 % Gesamtkaliumoxid (K<sub>2</sub>O)  
0,0142 % Eisen (Fe)  
0,0007 % Mangan (Mn)

**Nettovolumen:** ..... l

**Hersteller / Inverkehrbringer:**

ekolive s.r.o.  
Americka trieda 3  
04013 Košice Slowakei

**Ausgangsstoffe:**

57 % Lebende Mikroorganismen (heterotrophe Mikroorganismen (Lactobacillaceae)), Sand natürlicher Herkunft, Tierisches Nebenprodukt (Rindergülle) Kategorie 2 gem. VO (EG) Nr.1069/2009 und pflanzliche Stoffe aus der Lebensmittelherstellung (Melasse)

**Nebenbestandteile:**

29,67 % Organische Substanz  
0,44 % Basisch wirksame Bestandteile als CaO (Neutralisationswert)  
0,03 % Schwefel (S)  
0,03 % MgO  
0,09 % Natrium (Na)  
0,91 % Trockenmasse (TM)

**Aufbereitungsmittel:****Hinweise zur sachgerechten Lagerung:**

Die Lagerung hat in den dafür zugelassenen und geschlossenen Originalbehältern, trocken und bei Temperaturen zwischen 10-25 °C für maximal 1 Monat zu erfolgen. Direktes Sonnenlicht sowie Frost ist zu vermeiden. Abtragungen in Oberflächen- oder Grundwasser ist sowohl während der Lagerung als auch bei der Ausbringung zu vermeiden.

**Hinweise zur sachgerechten Anwendung:**

Auf die Bestimmungen des Gentechnikrechtes, sowie weitere abfallrechtliche, wasserrechtliche und düngerechtliche Vorschriften wird verwiesen.

Die Anwendungsempfehlungen des Herstellers sind zu beachten, eine Beratung durch den Hersteller wird empfohlen. Abhängig von der lokalen Situation sind die grundsätzlichen Empfehlungen ggf. anzupassen.

ekofertile™ plant wird durch Sprühen auch bei Bewässerung ausgebracht.

Dosierung: Zur Aussaat und im Rahmen der Bewässerung: 1 l ekofertile™ plant pro Hektar gemischt mit mindestens 100 Litern Wasser. Es wird eine dreifache Anwendung empfohlen und zwar - 1. Anwendung im 2-4-Blatt-Stadium, 2. und 3. Anwendung im Abstand von jeweils 14 Tagen.