

What is Humentos®

Humentos® is a liquid soil conditioner that is based on lignite from the eastern part of Germany. Humentos® therefore builds on fossil minerals and natural humic acids that were created out of natural flora about 20 million years ago. To produce Humentos, humic acids with a molecular weight of 2.000 to 50.000 are chemically extracted as K-humates from the brown coal (lignite).

Humentos® supports the soil formation process due to its capacity to promote the development of clay-humus-complexes. These are in fact the true supporter of increased sorption capacity in the soil. Thus, Humentos® augments the retention capacity and consequently the availability of water and nutrients in soil. Moreover, Humentos® does not only positively affect the chemical and physical properties of soil but also takes direct effect on plant physiology and soil microbiology.

The sorption capacity of Humentos® allows the addition of macro nutrients exclusively for plant use without the risk of nutrient fixation in soil or leaching into groundwater. The nutrient complementation can be adapted to the cultivation and to local conditions to meet the particular demands of your application in e.g. agriculture, specialized crops, horticulture landscaping and green space maintenance.

Humentos® improves the physical soil structure, ion exchange processes as well as the buffering and water sorption capacity of the soil. Results of scientific investigations and experience in the field showed a substantial curative effect on cultivations and increased resistance of plants against stress such as drought, heat, cold, salinity, contaminants, and pathogens.

The advantage of Humentos® over other humus and humic acid soil products lies in its long-lasting impact and its multivalent effects due to a high number of poly-functional groups. Furthermore, it has a plant- and soil-pleasant pH.

The application of Humentos® results in the following advantages:

- Cost reduction:
 - Mineral fertilizers 40-80%
 - Watering up to 50%
 - Pesticides/Fungicides up to 30%
- Increased harvest of biomass and fruit mass up to 30%
- Increased crop quality (e.g. starch in potato, flavour of fruits)
- Improved seed and root development
- Reduced risk of plants loss by up to 30% (due to increased stress resistance against heat, drought, cold, pests, etc.)

Humentos® has been tested and is supported by:

- Prof. Dr. Huettl, Chair Soil Protection and Recultivation, Brandenburg Univ. of Technology)
- Dr. sc. Dr. h.c. Michael Boehme (Prof. for Agriculture at Humboldt University of Berlin)
- Dr. sc. nat. J. Freiberg (Lead Scientist Inst. for Env. Research in Schlieben, Germany)

Ingredients of Humentos®

Humentos® is an organic-mineral soil conditioner and plant growth stimulant with humic acids, durable humus and specifically selected macro nutrients and numerous trace elements.

All **Humentos®** products contain 12% humic acids (4% water soluble, 8% as long term available humus).

Currently, Humentos is available in four variants ⁽¹⁾:

Humentos® pure 3-2-3⁽²⁾ + 4 Hu⁽³⁾ + 8 Dhu⁽⁴⁾

Humentos® for Lawns 15-4-5 + 4 Hu + 8 Dhu

Humentos® for Flowers/Fruit/Vegetables/Field 12-6-9 + 4 Hu + 8 Dhu

Humentos® for Groves/Trees/Bushes 5-2-3 + 4 Hu + 8 Dhu

Ingredients of **Humentos®** variants (in g/ kg)

| Ingredients | Lawn/ Grass Humentos® | Flower/ Fruit/ Vege table/ Agriculture Humentos® | Groves/ Trees/ Bush Humentos® | Humentos® pure |
|--|-----------------------|--|-------------------------------|----------------|
| Water-dissolvable Humic Acids (K-humates) | 40 – 45 | 40 – 45 | 40 – 45 | 40 – 45 |
| Durable Humus | 80 – 85 | 80 – 85 | 80 – 85 | 80 – 85 |
| Nitrogen (N) | 150 – 160 | 120 – 125 | 55 – 60 | 30 |
| Phosphate (P ₂ O ₅) | 40 – 45 | 60 – 65 | 20 – 25 | 15 – 20 |
| Potassium (K ₂ O) | 50 – 55 | 90 – 95 | 30 – 35 | 25 – 30 |
| Iron, Manganese, Calcium, Sulphur and trace elements | 2 - 5 | 2 - 5 | 2 - 5 | 2 - 5 |

(1) Other variants can be prepared on demand.

(2) N-P-K (nitrogen - phosphor - potassium)

(3) Hu: water-soluble humic acids

(4) DHu: durable humus

Application of Humentos® (temperate climate)

Humentos® can be applied before or after the installation of the cultivation. If possible it should be incorporated into the upper soil layer (approx. 10 cm). It can be applied with the watering (ewer, sprayer) and via common watering systems.

Humentos® should always be diluted at least at a rate of 1:50 (100 kg Humentos in approx. 5,000 litres of water or 1kg Humentos in 50 litres of water). 1 kg Humentos equals approx. 0.9 litres. For application after planting we recommend higher dilutions.

Depending on climate, plant and soil conditions, a second, lower application after 6 weeks can improve the results. Elsewise, a subsequent application after one year is recommended.

Avoid application during extreme drought or heat.

Always stir well before use!

Humentos – pure

Application: for long-term improvement of the soil structure, can be used for all kinds of vegetation.

Application quantities: Depending on the local conditions 60-200 kg/ha (0.6-2 kg per 100m²).

Application quantities for trees: 100 kg Humentos in 5,000 litre water for approx. 400-500 trees.

Humentos – for Lawn

Application: for lawns, green space (golf fields, sports fields, parks etc.), greenbelt setting

Application quantities: 100 kg/ha (equals 1 kg per 100 m²).

Following applications: 50 kg/ha (equals 0.5 kg per 100 m²).

Under extreme edaphic and climatic conditions the application can be raised up to 200 - 300 kg/ha.

Humentos – for Flower/Fruit/Vegetable

Application: for ornamental plants, garden flowers, horticulture, fruit-growing, agriculture

Application quantities: 60-150 kg/ha (equals 1 kg per 100 m²).

Following applications: 50 kg/ha (equals 0.5 kg per 100 m²).

Grove/Bush/Tree-Humentos

Application: for all kind of groves, trees and bushes during period of growth

Application quantities: 100 kg Humentos in 5,000 litre water for approx. 800 - 1,000 trees.

Following applications: 50 kg/ha (equals 0.5 kg per 100 m²).