MICROALGAE BASED BIOFERTILISERS FROM WASTEWATER BY HETEROTROPHIC MICROALGAE PROCESS

Microalgae powder obtained from the treatment of effluents with high organic and nutrient load

Keywords: organic • biofertiliser • microalgae• powder

Key facts:

- **Product Category**: Organic fertilisers
- **Input material:** Fruit and vegetables processing industry waste water
- **General appearance:** Green microalgae powder
- **Nutrient Content (N-P-K %):** N/A
- **Product status:** advanced development stages
- **Limitation of application:** The valorization of wastewater-grown microalgae for food or feed purposes is legally restricted, but not for use as fertiliser.
- **Permit availability**: N/A
- **Geographical area:** EU28
- **Price range:** N/A

Summary: Max 1400 character

An average composition for microalgae is 40-60% proteins, 10-30% lipids and 20-40% carbohydrates. This composition makes this product totally adequate as raw material for the production of feed products (where high proteins content is the target) and fertilizer (where high contents in organic matter, nutrients and oligoelements is required). Moreover, they allow for the efficient recovery of the nitrogen (N) and phosphorus (P) present in wastewaters by concentrating these nutrients in algal biomass.
With the use of microbial fertilizers obtained from microalgae, the amount of soil organic matter and the water holding capacity are improved and have positive effects on soil, plants and therefore environment.
As an organic fertilizer, microalgae have the potential to prevent nutrient losses through a gradual release of N, P and potassium (K), which is attuned to the plant requirements.

How to use:

- **Type of farming**: organic
- **Cultivation methos:** open field, greenhouse, etc.
- **Recommended crops**: Wheat and spelt, Grain maize and corncob, cereals for the production of grain, fresh vegetables, etc.
- **Application doses :** N/A

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Key product features:

- → Wastewater-grown algal materials effectively provide plant nutrients to crops and can be used successfully as fertilizers.
- → As a biologically based (bio based) alternative, algae fertilizers could supplant some of the dependency on conventional fertilizers, reducing the need for their costly production.
- → Microbiological fertilizers are significant to approach of eco-friendly agricultural practices.
- → Bio-fertilizers include principally the nitrogen fixing, phosphate solubilizing and plant growth- promoting microorganisms.

Key product benefits:

- → Algal biomass as a new bio-fertiliser contain macronutrients as well as micronutrients, some growth regulators, polyamines, natural enzymes carbohydrates , proteins and vitamins implemented for improving vegetative growth and yield.
- → Algae biomass to the soil improve soil characteristics that have favourable effect on nutritional status of plants.
- → It can use for good agriculture practice or organic agriculture.
- → Microalgal fertilisers improved the fruit quality through an increase in sugar and carotenoid content.
- → Some studies had demonstrated that the performance of algal materials was similar to that of a conventional synthetic fertiliser and exceeded that of the commercial organic fertiliser.
- → Wastewater-grown algae fertilisers can reduce environmental impacts associated with fertiliser use in crop production.

Competitive position and advantages:

The coupling of wastewater treatment and microalgae production was initially proposed as alternative for reducing the microalgae production cost, but today it is considered as an alternative to the utilization of conventional wastewater treatment systems. The main reason for this is that the utilization of microalgae allows recovering nutrients carried by the wastewater, while minimizing the emissions of greenhouse gases and saving energy.

Nutrients recovered by microalgae-based processes can partially replace the production of synthetic N and P based fertilizers. Therefore, soluble forms of N and P are produced at large scale worldwide because they are the pillars underpinning food production by agriculture.

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