

CELLOZYME 1200 – TECHNICAL DATA SHEET

Microbial Ecosystem for Soil and Water Denitrification

General Description Cellozyme 1200 is a natural microbial ecosystem designed for the biological removal of nitrates from soil and water through reductive enzymatic pathways.

The accumulation of nitrates in both soil and water as a result of present agricultural and industrial practices is creating serious contamination problems to various water supplies used by humans and animals. The toxic effects of excess nitrates in drinking water have been well documented in the literature.

Biological Denitrification

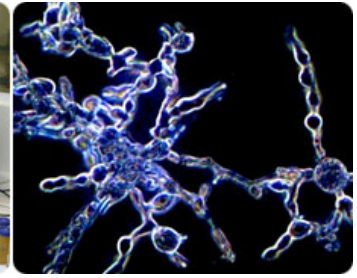
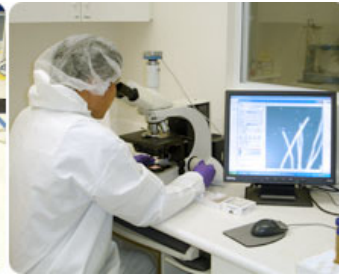
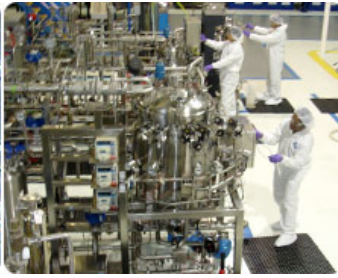
Biological denitrification is essentially a microbial respiratory mechanism in which nitrate replaces molecular (O_2) as a source of respiratory oxygen.

The rate and velocity of denitrification is primarily dependent on soil pH, temperature, moisture, concentration of nitrate and available organic matter.

The microbial denitrifiers in Cellozyme 1200 are facultative anaerobes, using nitrate as an electron acceptor only in the absence of oxygen. These microbial denitrifiers are capable of converting nitrates to molecular nitrogen (N_2) using nitrate (NO_3), nitrite (NO_2), nitric oxide (NO), or nitrous oxide (N_2O) as electron acceptors.

Decreasing the partial pressure of O_2 enhances the denitrification of nitrates. In well-drained soils microbial denitrification is appreciable when the saturation of the water holding capacity of the soil is above 60%. No loss of nitrate occurs below 55 – 60% regardless of the carbohydrate supply, pH, temperature or nitrate concentration.

The microbial denitrifiers in Cellozyme 1200 are sensitive to high hydrogen ion concentrations. Acidity controls not only the rate but also the proportions of nitric oxide, nitrous oxide and nitrogen formed. Below pH 6.0, nitric oxide and nitrous oxide make up more than 50% of the nitrogenous gases evolved. At pH 6.2 to 8.5 nitrogen tends to be the predominant gas produced.



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Directions for Use

Cellozyme 1200, for long-term stability, is supplied as a dehydrated powder and must be rehydrated with water to activate the microorganisms prior to use. To rehydrate, add one pound of Cellozyme 1200 to one gallon of warm water (20°C to 30°C) and allow to stand for one hour, with occasional stirring before use.

One pound of hydrated Cellozyme 1200 is mixed with one pound of non-ionic surfactant, 10 gallons of molasses and 25 gallons of water to treat each cubic yard of soil. Do not aerate the soil.

Allowable Usage Range

Parameter	Minimum	Optimum	Maximum
pH	6	6.5-7.2	8.5
Dissolved Oxygen (ppm)	2	3	No max
C:N Ratio		20:01	
Temperature °C	10	30	40