



Organic Waste - Greenhouse and Noxious Gas Production

Carbon Dioxide

Along with fossil fuel combustion and deforestation, microbial decomposers such as algae, soil bacteria and fungi contribute to the release of carbon dioxide - a greenhouse gas - back into the atmosphere when they break down organic material. As the planet warms under climate change, bacterial growth is not only encouraged but soil respiration and carbon dioxide release accelerates - doubling with every -10°C increase in temperature. It's called a positive feedback loop - or vicious cycle.

Methane

Methane is a potent greenhouse gas 20 times more effective in trapping heat in the atmosphere than carbon dioxide (CO_2) over a 100-year period. Remaining in the atmosphere between 9-15 years, human activity is increasing the amount of methane released by microbes by an estimated 150 million tons annually. Sources include landfill sites, rice paddies, wastewater treatment, oil and gas systems and agricultural activities.

Methanogenic bacteria is anaerobic in nature and generally can only survive in areas where oxygen is extremely scarce. The metabolic result is CH_4 (methane). As BIODEX reaches the depths of the mass, it reduces this population, thereby halting and reversing waste solidification and reducing methane gas emissions.

If the waste water is totally starved of oxygen, both in O_2 and SO_4 forms, and the bacteria will not be able to digest carbohydrates properly causing the release of semi digested carbohydrates as $\text{CH}_4\text{-O}$ (a methane string), a very noxious gas. BIODEX reduces this type of gas production by killing the excess bacteria population leaving oxygen resources at par to the B.O.D. of the mass.

Ammonia

In 1990, an ammonia presence study was performed in concert with the Resource Management Branch of the B.C. Ministry of Agriculture Food and Fisheries and the biochemistry department of University of British Columbia. Twelve hog farms in British Columbia used BIODEX resulting in a 60% ammonia concentration reduction. Similar results were achieved in 2001 test at Richie Smith Farms of Abbotsford, British Columbia. Using BIODEX over a 12 week period, ammonia level concentrations were reduced between 50 and 60%. Related tests involving use of BIODEX in manure storage lagoons showed odors are virtually eliminated when BIODEX is added.



Hydrogen Sulphide

When mainly anaerobic digesting bacteria use SO_4 (sulphate) instead of O_2 , for digestion, they produce H_2S (hydrogen sulphide) rather than CO_2 as a by-product. By applying BIODEx to liquid waste, the active copper (Cu^{2+}) reacts with H_2S , changing it to a new sulphurous precipitate, CuS (copper sulphide) that drops out of solution. By killing sulphur-reducing bacteria and converting H_2S with BIODEx, H_2S emissions can be eliminated.