



Addressing Waste Management Problems with Micro-Aid®

Micro-Aid®

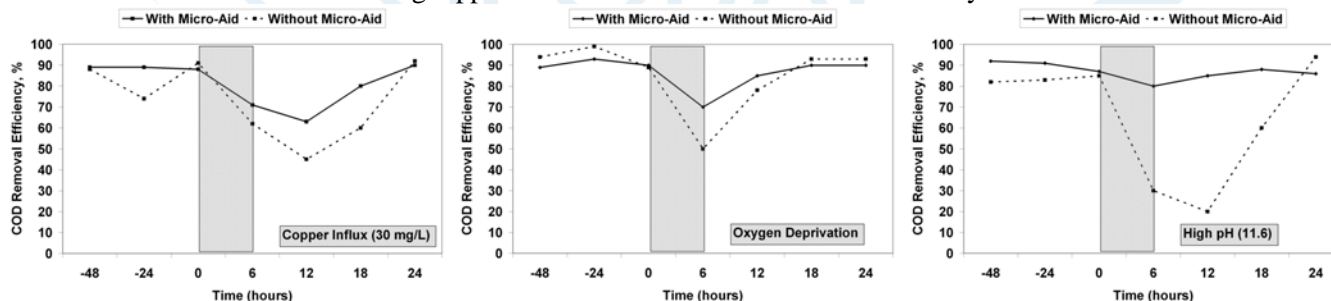
Micro-Aid® is an all-natural, environmentally-safe additive whose biological activities are due to the naturally occurring saponins in the plant extract. Micro-Aid® Feed Grade concentrate is a dry, granular product that is produced by drying the phytogetic extract in combination with a unique blend of ingredients; whereas, Micro-Aid® Liquid is made from high-quality, liquid, plant extract. Micro-Aid® has been university researched and commercially proven as being effective in controlling noxious gases (e.g., ammonia, hydrogen sulfide, etc.) and accelerating waste breakdown in storage systems, along with improving cleanup of building pens and equipment.

Industrial and Municipal Wastewater Management

Wastewater includes not only sewage, but all the water used in a home that goes into the sewage collection system. As well, water from storm drains is added in some municipal systems. Therefore, there is wide variation in both the composition and volume of the waste treated. Such variation tends to create stress conditions for the microorganisms feeding on organic materials in the waste. This will result in inefficient digestion of the organic waste and the occurrence of objectionable odor levels, excessive sludge accumulation, and a reduction in chemical oxygen demand (COD) removal efficiency. No biological waste treatment facility is immune to these conditions.

Most wastewater treatment plants have primary (physical removal of floatable solids) and secondary treatment (biological removal of dissolved solids) processes. An example of a secondary treatment process is a lagoon, which relies on the interaction of microorganisms, algae, oxygen, and sunlight to dissolve solids. After the primary and secondary treatment of wastewater, it is typically disinfected using chlorine or other disinfecting compounds.

A study was conducted to evaluate the effects of Micro-Aid® on digestion efficiency during three adverse chemical conditions (i.e., stresses) that were administered for a 6-hour duration to bio-oxidation units. These conditions were: 1) excessive copper influx (influent contained 30 mg/L of copper sulfate); 2) oxygen starvation achieved by bubbling nitrogen through the units rather than air; and 3) high-pH influent (pH = 11.6). As shown in the figures below, during and after each of the three stresses, the COD (i.e., measurement of the amount of oxygen that will be consumed by microorganisms during the biological reaction of oxygen with organic material) removal efficiency of the bio-oxidation units containing 5 ppm Micro-Aid® was increased substantially over that of the Control unit.



Micro-Aid® can be used to reduce the length of time required for a biological treatment process to recover from a stressful environment. Additionally, the use of Micro-Aid® in biological waste treatment facilities can reduce organic sludge accumulation and odors to acceptable levels and enhance COD removal efficiency.



Micro-Aid® in all feed, all the time





TECHNICAL BULLETIN

Animal Waste Management

Lagoons, pits, and slurry stores are common waste storage systems used in the livestock industry. These waste storage systems treat manure biologically with numerous types of bacteria that form a fermentation biomass and work together to decompose organic material. Protozoa are also present in most fermentation biomasses. Protozoa engulf bacteria in the fermentation biomass and breakdown their cellular proteins into ammonia. Reducing the number of protozoa in a fermentation biomass will reduce the amount of ammonia produced and increase the number of bacteria present, which subsequently increases the conversion of released ammonia into bacterial protein and the rate of solids breakdown. Adding an effective amount of Micro-Aid[®] to a fermentation biomass, both directly in the form of Micro-Aid[®] Liquid or by feeding Micro-Aid[®] Feed Grade Concentrate to the animal, will decrease ammonia production and increase solids digestion.

Loading rate is defined as the amount of manure that will be added to a waste system on a daily basis. The long-term rate of manure addition should not exceed the rate at which stabilization can occur. Because the rate of organic matter breakdown is regulated by lagoon or pit temperature, biological activity in an anaerobic lagoon is dramatically reduced and organic matter is incompletely digested during winter months. As the lagoon warms in spring, bacteria are presented with excess organic matter to digest. At this time, very vigorous activity is observed on the lagoon surface and large amounts of biogas are produced. This is referred to as lagoon “turnover” and can produce highly offensive gases. The use of lower loading rates, especially during winter and early spring, will help to reduce the potential for odor production. As well, lagoons or pits should not be pumped below the minimum design volume to ensure that the necessary bacteria population for biological activity is retained.

A large portion of the nitrogen entering a waste system is converted to ammonia. The nitrogen in urine will convert to ammonia rapidly whereas the transformation of nitrogen to ammonia in organic matter will occur over an extended time period. The greater part of ammonia will then volatilize from the lagoon or pit surface over time. Volatilization will increase as lagoon or pit temperature, pH, and surface air movement increase.

Micro-Aid[®] Liquid in Action

Micro-Aid[®] Feed Grade Concentrate is recommended in conjunction with the use of Micro-Aid[®] Liquid. Once the desired level of solids breakdown has been achieved, the use of Micro-Aid[®] Liquid can be discontinued. Mix Micro-Aid[®] Liquid with water at a rate of 1 part Micro-Aid[®] Liquid to 5 parts water.

For pits, simply add four ounces of Micro-Aid[®] Liquid per 100 cubic feet of sludge per week. The application rate will decrease as sludge breakdown occurs.

Example: $2 \text{ ft. sludge} \times 10 \text{ ft. wide} \times 50 \text{ ft. long} = 1,000 \text{ cu. ft.}$
 $(1,000 \text{ cu. ft.} / 100 \text{ cu. ft.}) \times 4 \text{ oz.} = 40 \text{ oz. Micro-Aid}^{\text{®}} \text{ Liquid}$

For treatment of waste ponds or lagoons, initially apply 10 gallons of Micro-Aid[®] Liquid per 1 million gallons of waste. Then, apply 4 gallons of Micro-Aid[®] Liquid per 1 million gallons of waste every week to maintain proper solids digestion. Mix Micro-Aid[®] Liquid with water and spray along the windward side. Excessive solids buildup may require maintaining initial application rates for an extended period.

Initial Micro-Aid[®] application



After 3 months of Micro-Aid[®]



After 9 months of Micro-Aid[®]



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