

Global-Life Bio-Stimulant Technical Manual

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Frequently Asked Questions about Global-Life Bio-Stimulant

What is it?

Global-Life is a bio-stimulant designed to speed bio-remediation of organic waste, animal waste, and waste water. It also works to eliminate odor, and is used for ammonia control. It has been introduced to several animal production operations throughout the United States, and all demonstrate similar results: bio-remediation time reduced by 20% - 75%, and significant elimination of odor, because it contains high amounts of free and dissolved oxygen.

How does it work?

Global-Life stimulates existing microbial growth already present in the organic matter. These microbes then consume and digest the waste, converting it to non-toxic byproducts such as water, carbon dioxide, and a minimal amount of sediment.

Where can it be used?

Global-Life can be used with great success in a wide variety of poultry and livestock applications. It is used in slurry lagoons, slurry tanks, compost piles, directly on broiler litter, and in fields to rejuvenate depleted soil.

Is it safe?

Global-Life is non-toxic, non-hazardous, completely biodegradable, water soluble, and safe to use directly on plants and animals as a natural biological deodorant. It is USDA authorized for use in sewage and/or drain lines of official establishments operating under the Federal meat, poultry, shell egg grading, and egg products inspection programs. It also meets the regulations of several US agencies: the Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Department of Transportation (DOT), and California's Clean Air and Water Regulations.

Does Global-Life contain any bacteria?

Not at all. Unlike other products of its kind, Global-Life is not a live microbial additive. It is not a bacteria. It is a self-generating bio-system, which increases growth of existing microbial life. Global-Life has no live components.

Is it cost effective?

When you consider the costs of transportation, odor abatement, ammonia reduction, machinery and storage facilities in your current system, you will find that using Global-Life will save you money in the short term and increase your profits over the long term.

Product Review

Global-Life is a biochemical product containing several vitamin precursors of plant and animal origin in a highly concentrated mass of different autotrophic, aerobic, and facultative enzymes, coenzymes, exoenzymes, humic nutrients, and various multifactorial inducer molecules. These components are able to withstand a wide range of environmental conditions as they decompose and deodorize plant, animal and commercial residues. This is accomplished by dispensing oxygen and deriving energy from the oxidation of simple mineral compounds and organic gases such as ammonia, hydrogen sulfide, carbon monoxide, sulfur dioxide and others.

Global-Life produces a biologically balanced stimulant for the ecosystem in water, air, soil, and plant and animal niches by increasing available nutrients through the increase of oxygen. The different enzymes found in this product are able to exist and thrive in waters with wide variations in salt content.

Global-Life's enzymes and organic nutrients synergistically stimulate a broad spectrum of natural microbes composed of aerobic and facultative (capable of adapting to varying environments) anaerobic microbial strains selected for maximum efficiency in industrial, animal, municipal, and hazardous waste treatment systems. Global-Life's unique ecosystem can break down various toxicants within waste treatment systems more efficiently than imported microbes. This system offers the advantage of immediate activity of the microbes found within the waste stream.

Global-Life has made it possible for agriculture, industry, and commerce to obtain a faster biologically balanced recovery of wastewaters, solid wastes, and plant and animal residues. It is safe to use on plants and animals as a natural biological deodorant, and is USDA authorized for use in sewage and/or drain lines of official establishments operating under the Federal meat, poultry, shell egg grading, and egg products inspection programs.

Global-Life is classified non-hazardous and is produced according to Federal Regulation 11910.1200. Because it is an aqueous solution, there are no fire or explosive hazards. Global-Life poses no health hazard whether internally or externally. After being emptied, the product container can be rinsed with water and reused.

The Role of Microorganisms

Degradation makes various elements available to other living organisms in nature's constant cycle of decomposition and regeneration. The microorganisms that help "earth recycle earth" are being used more today as natural biological remedies to humankind's pollution. Up to 90% of the chemical substances considered hazardous can be degraded. Nature requires a relatively small proportion of native microorganisms found in a contaminated system that will have the intrinsic (genetic) ability to degrade the contaminant. The chemical and hazardous waste environment, for example, plays an important role in determining not only the percentage of microorganisms that have the ability to act upon a contaminant, but also whether the ability will be expressed under site-specific conditions. Long-term exposure to a contaminant will generally result in an increased number of "adapted" contaminant-degrading strains.

What to expect from Global-Life

Global-Life contains a carefully developed system which keeps its water medium in a constant state of oxygen saturation. It includes an ecologically-balanced combination of stimulants that serve as activators or “triggers” and remain active over a wide range of temperatures and other environmental influences. Continuous treatment of water or waste material with Global-Life will completely clear the effluent under treatment of any objectionable odors, and will at the same time, regenerate the natural eutrophic in these liquids. Over a period of time (relative to Biological Oxygen Demands (BOD) and Chemical Oxygen Demand (COD) ratios and contact periods), effluent being treated may be totally returned to life-supporting oxygenated water.

Regular use of Global-Life can also result in:

- Greatly improved digestion rates and terminal flocculation, thereby, increasing the overall efficiency of the aerobic waste treatment system
- Higher concentrations of waste can be accommodated because of the more rapid degradation
- Markedly reduced solidified fats, oils, and grease, thereby eliminating “cake” or matting in anaerobic digesters.
- “Enzymatic” alteration of the physical structure of the suspended solids, causing those substances to separate more efficiently.
- Significantly accelerated degradation of synthetic detergents, thus decreasing the time required to achieve the overall BOD reduction.
- Rapidly hydrolyzes and degrades the various forms of cellulose usually present in waste treatment plants, thus increasing the overall digestive efficiency.
- Degrades up to 200 ppm of inorganic and organic cyanide compounds, thereby reducing the toxic shock loading effects on industrial waste treatment systems.
- Highly phenol-cyanide tolerant; therefore able to reduce concentrations to near zero levels, thus eliminating excessive capital expenditures for costly equipment.
- The reduced sludge volume that follows is a result of more complete liquefaction and gasification of organic waste, as well as the destruction of waste-binding molecules.

Application Instructions

Apply Global-Life by simply diluting one part product with nine parts of clean water. To initiate the treatment, the diluted (1:9) Global-Life should be sprayed over the surface of the area to be treated at a rate of 10 gallons (37.85 liters) of the diluted solution to each foot/acre of animal waste. This application may need to be doubled as a shock treatment for the initial treatment. Repeated application should then be made once every two weeks until the pond or lagoon is liquefied. Observe the directions for application on the label.

Continuous application of Global-Life is most effective when applied as a spray, either over the surface of an aeration pond or directly at the top of a pipe mouth. It is best to cover as much area as possible. Over time, the eutrophic process will penetrate deeper; however, initially, most of the odor control will be through the surface layers.

Normal dilution of the odor remedy product ranges from nine parts water to one part Global-Life (9:1) to 200:1. A good practice means of application is to create a 10:1 dilution and introduce through a conventional hose-siphon, which will further dilute to 20:1. In the event particularly strong odors persist, the user need only to re-spray after a short time or strengthen the mix of Global-Life by reducing the dilution.

Application parameters for bio-stimulant

1. pH: Optimum of 7, minimum of 4.5, maximum of 9.0
2. DO (dissolved oxygen): Optimum 3 PPM+, minimum of 2 PPM
3. C/N (carbon/nitrogen ratio): Optimum 10:1, maximum 20:1
4. Temperature: Optimum 86° F (30° C), minimum 66° F (19° C), maximum 120° F(49° C)
5. Free of toxic metals, such as hexavalents and chromium, and reasonable dilution of organic and inorganic cyanide wastes and normally toxic compounds.
6. Increased surface area or solubility allows for more rapid oxidation and stimulated metabolism of the biota of the animal waste being treated.

Specific treatment systems

1. Activated sludge systems
2. Trickling filters
3. Oxidation lagoons
4. Wastewater treatment tanks

Subject: Odor Control & Dissipation

Odor Remedy Description

Global-Life contains extremely high amounts of oxygen in the forms of dissolved oxygen (DO) and free oxygen (O₂). It neutralizes odor-causing anaerobic molecules by saturating them with oxygen. Applied to animal cages or living quarters, it will overcome odor-causing anaerobes by using the sulfur and mercaptan odor sources as nutrition for the newly-stimulated microbial life. This process continues the generation of additional oxygen. In addition to eliminating odors, it actually provides environmental benefits to animals by inhibiting the growth and spread of fungi and helps to provide an aerobic layer that is aversive to ticks, fleas, lice and other pests.

Animal Odor Remedy for Homes, Kennels, Barnyards, Commercial Feed Lots, etc.

Global-Life Bio-Stimulant almost instantly neutralizes animal odors in homes, zoos, kennels, or wherever animals are kept. It is an easy to apply, non-toxic product and is completely safe for use around humans and animals. It is not a bacteriological culture or a masking agent. It is a self-generating living bio-system that immediately produces multiplied amounts of dissolved and free oxygen which neutralize odor-causing anaerobic molecules.

This process includes nature's own balancing: an odor-neutralizing process recreated and captured in a balanced micro-ecosystem. Other derivations of this system are currently used by industry and by sewage treatment plants to eliminate odors. Many of these additional uses are included throughout this book.

Application

Global-Life is easily applied to odorous areas as either a rinse or a post-wash spray. In an enclosed area or building, it is recommended that the entire area be fogged or sprayed with Global-Life once, prior to the start of a routine cleaning schedule. It should also be applied to all cage walls, floors, ceilings, within animal caves (zoos), and other areas where odors originate and emanate and may be missed in normal cleaning. However, it is not necessary to remove animals or their food while applying Global-Life.

Some disinfectants will reduce the effectiveness of a portion of the odor neutralizing microorganism enzymes and coenzymes found in the product, but disinfectants cannot reduce the oxygen content. If a disinfectant has been applied, a heavier application of Global-Life should be used.

Keep in mind, free oxygen in Global-Life will help kill many odors almost immediately. However, conversion of odor-causing mercaptans and sulfur compounds may take as long as an hour.

Subject: Animal Waste Transformation

Animal waste, and even up to 90% of the chemical substances considered hazardous, can be degraded. To accomplish this, nature requires a relatively small proportion of native (indigenous) microorganisms found in a contaminated system that have the genetic ability to break down the contaminant. Generally speaking, the process involved in degradation develops through a complex series of enzymatically-related reactions, which may or may not be dealt with by a specific bacterial species or group of bacteria.

For example, the animal waste environment plays an important role in determining not only the percentage of microorganisms that can act upon a contaminant, but also whether it can act under site-specific conditions. Long-term exposure to a contaminant generally results in an increased number of "adapted" contaminant-degrading strains.

We have yet to encounter the need for exogenous foreign or recombinant (the formation in offspring of genetic combinations not present in parents) bacterial species to perform the necessary degradative task. With very few exceptions, bio-remediation specialists rely upon the tremendous diversity and capability found in naturally occurring microbial populations.

Microbial life is pervasive in any ecosystem. It exists, for example, in all geological soils and animal waste, and under all climatic conditions. This microbial life is extremely aggressive under the appropriate circumstances and with adequate stimulation. They were created to be very competitive in performing nature's assigned tasks. This process is how ecological balance is maintained for a specific location. As excessive foreign-organic materials, such as large amounts of animal waste matter, are introduced into a specific ecosystem, a natural process begins to occur to eliminate the overload problem. As the overload of this foreign material occurs, the surplus begins to burden the natural processes resulting in serious contamination. This problem can be corrected by a balancing addition of Global-Life.

When the overload or foreign matter is eliminated, the revived natural system resumes its normal process. After the task is complete, the additional microbiota that were induced are phased out and allowed to become dormant again. In other words, when the remediation is complete, the treated site returns to its original natural state.

The enzyme recruitment system made available by Global-Life offers the potential for the acquisition and evolution of new degradative pathways. The ability to create new pathways suggests a great flexibility in the capability of microbes to degrade complex materials. This includes animal waste substances that are unfamiliar to those microbes.

Animal Waste Treatment: Cellulose

Animal waste containing high levels of cellulose are one of the compounds that are difficult to liquefy and decompose. Cellulose is degraded by certain bacterial and fungal strains capable of secreting cellulose enzymes. These enzymes convert the tough, fibrous structure of cellulose into a soluble fluid state. This material is able to benefit from the rapid hydrolyzing capabilities of Global-Life. Global-Life contains selected inducer molecules for microbial ecosystems that are capable of degrading native cellulose by secreting a variety of select cellulose digestive enzymes within the microbiota. A limited quantity of cellulose digesting enzymes are produced by the normal flora of the average animal waste disposal system, but some of those have been forced into dormancy. To meet the demands of many of our overload systems, more microbial life needs to develop and dormant microbiota must be activated. The inoculation of animal waste with Global-Life reactivates many trillions of cellulose enzyme-secreting, inducer-molecule triggering microorganisms that are able to hydrolyze and degrade efficiently the various forms of waste and cellulose found in waste treatment systems.

In these situations, the bio-stimulant applications may be 1) added to an incoming line of a biological treatment section of a waste treatment system, 2) added into a lagoon on a water-slurry pond, 3) added through a primary clarifier or process pump, or 4) sprayed over the surface of a lagoon or

Animal Waste Transformation ctd.

holding pond. When Global-Life is applied to fields or stockyards, a spray application is best; however, when applied in this situation, adequate moisture must be maintained because microbial life is moisture sensitive.

In situ microbial treatment may be the ideal animal waste treatment technique. The areas where the waste products are found serve as a reactor structure. Commercial waste treatment sites have activated naturally occurring hormonal enzymes and coenzymes, thus accentuating or promoting microbial growth through the addition of nutrients or oxygen. The additional nutrients or oxygen, in turn, accelerates natural degradation properties, without a formal reactor. Using this approach, the natural (in situ) environment itself becomes a giant reactor, accentuated by the use of Global-Life.

Nitrification Process in Animal Waste Treatment

Ammonia concentration in wastewater is reduced by treating the wastewater with a suspended growth microbial system (such as an activated sludge), containing organisms stimulated by Global-Life. This process subjects the ammonia-containing wastewater to a bio-stimulated microbial system. As a result, this retrograde step of ammonium nitrate/nitrite conversion in the overall denitrification process is reduced or eliminated, with consequent energy and cost savings.

The Global-Life treatment method is one directed toward the natural microbial population. This method conditions the microbial population to enhanced conversion or degradation of a given substrate. Subsequently, greater conversion of the substrate is possible even when the microbial population is exposed to fluctuations of conditions including particular shock loads of that substrate. The microbial population is able to adjust to such fluctuations because of biota exposure to a non-toxic or non-inhibitory amount of (bio-stimulant activated) enzymes and coenzymes, and is biochemically or structurally activated and thus beneficial to the treated substrate. This method of bio-stimulation is applicable for systems where the production of useful metabolites is the objective. The method also applies to waste treatment where degradation of waste into a more acceptable form needs to be achieved.

It is during aerobic respiration that organic carbon is converted to carbon dioxide, nitrogen to nitrates, sulfur to sulfates, and phosphorus to phosphates. The presence of excessive amounts of organic matter causes a great demand for oxygen because of the intense activity of the microorganisms. If this demand for oxygen exceeds its supply, the metabolic processes become anoxic rather than occurring with a normal amount of oxygen. Microflora and microorganisms exist in different metabolic types. When there is a change of chemistry in the substrate and its environment, different types of organisms take over the degradation process. When the oxygen supply becomes depleted, anaerobes become active. At this juncture, nitrates, phosphates, and sulfates, become the basic oxidants and terminal acceptors of the electrons generated in the degradation of organic matter.

Animal Waste Transformation

The capacity of a bacterium to degrade animal waste materials is controlled by enzyme stimulation that catalyzes a specific oxidation. Even though a bacterium contains the information to synthesize enzymes in its genetic material, the cell may not spend the energy to produce the enzymes necessary for rapid reproduction and thus accelerate the degrading of a specific waste matter. The application of Global-Life enzyme treatment with various additions, serves as an "on switch" of the genetic material of a bacterium and thus serves as an inducer molecule. The multifactorial inducers may then serve as a degradation product of the substrate molecule. Relative to metabolic pathways, enzymes experiencing complex multifactorial inducer activity. The final products of the enzyme-stimulated, bacterial-degradation of this animal waste matter are reduced cells of H₂O and CO₂.

Subject: Municipal and Industrial Wastewater Bio-Restoration

Bio-restoration of contaminated sites, such as sewage treatment plants, has been used for several decades. Over the years, the technology has been modified, adapted, and improved.

The selection of a specific bio-restoration strategy is determined by a number of important considerations:

1. Factors that can impede the degradation process.
2. Problems related to the transport of any contaminants within that environment.
3. The biological/chemical reactivity of a specific contaminant.
4. Time required for degradation.
5. Client's future liability.
6. What the client can afford.

Special effort is required to determine which choices are correct. This special effort involves the integration of the principles of geochemistry, hydrogeology, microbiology, engineering, and job costing.

Bio-restoration usually provides the best answers, particularly as it relates to budget and future liability considerations. At the same time, it may be necessary to employ other technologies in concert with bio-restoration to satisfy the unique demands of a given project.

Degradation of Animal Fats and Oils

Annually, millions of gallons of greases, fats, cooking and industrial wastes, and oils from personal care products are introduced to waste treatment plants. These materials create an overload on the plant, and the normal microbial flora are unable to degrade these substances. In many situations, these insoluble greases, fats, and oils contribute as much as 25% to 50% of the actual organic matter in the domestic sewage plant. These insoluble fatty acids accumulate in the activated sludge treatment plants because of the inability of the resident microbial biota to degrade these materials properly within the allotted processing time. Solid grease is usually skimmed from the clarifiers and pumped directly to the anaerobic digesters. This cycle bypasses the aerobic liquefaction and degradation process. Anaerobic digesters, then exposed to this overload of compacted grease, generate floating mats or layers, often two to five feet thick. This situation results in digester malfunction and costly repairs.

Global-Life includes a natural addition to and stimulation of a microbial ecosystem capable of secreting higher concentrations of lipase enzymes, exoenzymes, and coenzymes that break down fats, oils, and greases through rapid enzymatic and exoenzymatic hydrolysis. The addition of Global-Life to activated sludge systems significantly reduces the emulsified grease solids, thereby assisting in the elimination of digester "cakes" or matting within the sewage plant anaerobic digesters.

Degradation of Cellulose

Municipal treatment plants accommodate industrial wastes that contain high levels of cellulose. Among the cellulose waste are such materials as cotton, cigarettes and various forms of paper. These materials are among the most difficult compounds to Global-Life will generate great gas pressure when reacting with anaerobic life forms and should not be used in enclosed vessels. In sewage plants, it should be added to the system after the initial digesting, in an oxidation pond or trickling filter where it is outside in sunlight and where it may exist on the surface of the material being treated.

Initial shock treatment usually will be required. To initiate treatment, the odor remedy should be sprayed over the surface of the area to be treated at a rate of 10 gallons of the diluted product (1 part Global-Life and 9 parts water) per foot/acre of sewage. The odor should liquefy and decompose.

Municipal and Industrial Wastewater Bio-Restoration ctd.

Fortunately, cellulose is degradable by certain bacterial and fungal strains that are capable of secreting cellulose enzymes that convert the tough, fibrous structures of cellulose to a soluble fluid state. Municipal waste treatment plants that receive overloads of paper, cotton, fruit and vegetable pulps, cereal fibers, and various other forms of cellulose substances can benefit from the rapid hydrolyzing capabilities of Global-Life.

Global-Life contains selected components which trigger the microbes capable of degrading native cellulose by further secretion of cellulose enzymes, exoenzymes, and inducer molecules. Limited quantities of cellulose digesting enzymes are produced by the normal flora of the average waste disposal system. However, treatment of sewage materials with Global-Life generates many trillions of additional, active cellulose-secreting microorganisms. This new microbial life is able to hydrolyze and degrade the various forms of cellulose materials found in waste treatment plants.

Degradation of Detergents

Municipal wastewater treatment includes many synthetic detergents, including nonylphenol ethoxylates, N-alcohol ethoxylates, and sodium N-dodecyl benzene sulfonate. These materials, because of the ability to reduce both surface and interfacial tension, alter the efficiency of sewage treatment systems by reducing the oxygen transfer rate of these systems. Such a reduction of oxygen transfer reduces the operating capacity of an activated sludge plant by as much as 30% to 40%, thus increasing the amount of the required to process the sewage and to obtain overall BOD reduction and final flocculation.

The goal is to reduce the injurious effect of these detergents and other closely related syndets. This can be accomplished with the aid of Global-Life, which serves as a tonic and a “trigger” to the natural microbial ecosystems which have been isolated or have become dormant. It helps the existing microbes break down a wide variety of detergents effectively and to cause the degradation of higher concentrations of these detergents in less time.

Odor Remedy for Industrial Use and Municipal Sewage Treatment

Heavy-duty industrial application of Global-Life is designed to neutralize odors from municipal sewage treatment plants and in industrial processes in which large quantities of odor-producing water must be remediated. It is also useful in replenishing oxygen and thus eliminating odors in stagnant ponds or other standing or polluted water.

Application

Often the most effective usage for odor remedy of sewage or a specific industrial odor abatement need may require a tailor-made system to meet that individual requirement. In general, however, the following guide may be followed:

Apply Global-Life by simply diluting one part product with nine parts of clean water, or as much as 200:1. Spray or sprinkle evenly over the entire odor area. Repeat application if necessary or whenever more odorous material is added.

Global-Life will generate great gas pressure when reacting with anaerobic life forms and should not be used in enclosed vessels. In sewage plants, it should be added to the system after the initial digesting, in an oxidation pond or trickling filter where it is outside in sunlight and where it may exist on the surface of the material being treated.

Initial shock treatment usually will be required. To initiate treatment, the odor remedy should be sprayed over the surface of the area to be treated at a rate of 10 gallons of the diluted product (1 part Global-Life and 9 parts water) per foot/acre of sewage. The odor should begin to diminish within a few minutes. This treatment should be repeated at one to two week intervals.

Repeated application of Global-Life is most functional when applied as a spray, either over the surface of an aeration pond or directly at the top of a pipe mouth. It is best to cover as much water area as possible and to allow the odor remedy to be applied at the surface of the sewage as long as possible. Over time, the eutrophic process will penetrate deeper; initially, however, most of the odor control will be through the surface layers. Global-Life is applied continuously to a 200:1 dilution at

a rate of 360 gallons diluted product to 1 million gallons of effluent. There are several acceptable ways to accomplish this treatment. For treatment with a volume near 1 million gallons per day, the easiest and least costly means is with the use of a 200-gallon tank of 10:1 dilution that is re-diluted with water 20:1 upon application. Thus, treating 1 million gallons/day would require replenishing the tank with 20 gallons Global-Life concentrate every ten days. Other application rates for different effluent volumes may be linearly calculated by this example.

Subject: Petroleum Hydrocarbon Bio-Remediation

Consider the present energy system and the energy storage on our planet. Included are power from the sun, life in the oceans, the living action within the soil, and the accumulated reserve of power in carbon. Microorganisms can be considered one of the most successful representatives of life on our planet, and when and where allowed, microbial life continues to abound. It has been estimated that the combined weight of microbial cells on Earth is about 25 times that of the Earth's other animal life. While their individual size is incredibly small, one cubic inch of pure typical bacteria would contain over nine trillion microorganisms. Even today, microorganisms continue to cleanse this planet effectively.

Environmental Biotechnology and Bio-remediation

The concept of bio-remediation is used to describe operationally the process of using living organisms, microorganisms, to decontaminate a polluted system effectively. Some of the microorganisms used are bacteria, fungi, algae, actinomycetes, and various other plants. Several techniques use microorganisms to degrade a number of pollutants. One method uses the microorganisms that can already be found in the soil. These microbes may be stimulated to grow by introducing nutrients, bio-stimulants, and humic materials into the soil, thereby enhancing the degradation process. This process is referred to as bio-stimulation. Another method involves culturing the microorganisms independently and adding the culture to the polluted site. This process is known as bio-augmentation.

An advantage of bio-remediation is that the process may be implemented on site, involving a minimum amount of space and equipment. When the treatment takes place on the original location, the overhead costs and the liability factors are greatly reduced when compared to off-site treatments that require transporting large volumes of polluted material. On-site and off-site treatments have advantages and disadvantages, and the decision to use one method of treatment versus the other is usually dictated by the economic and efficiency factors of each unique scenario.

No book would include all of the possible solutions for each pollution problem. However, an attempt has been made in this manual to give a few general categories of problems that have been successfully addressed with biotechnology involving microbial action. These situations serve as limited examples, and if you have a pollution problem, you are encouraged to know your local, state, and federal regulations and to work with a competent consultant in that field to assist you with his or her experience, advice, and up-to-date laboratory analysis of your specific pollution problem. Most hazardous waste problems require individualized engineering, advice, and in many cases bonding and special permits.

The following are a few examples of the bio-cultural answers presently available:

1. Global-Life activates the indigenous microorganisms found in sewage treatment plants and collection lines, including municipal wastewater treatment facilities. This technology can handle a variety of waste problems including heavy grease loadings, cosmetics, salad oils, petroleum products and byproducts, and many industrial waste products. Foul odors and hydrogen sulfide emission are controllable. Overall treatment plant efficiency can be improved while sludge volume is reduced.
2. Bio-remediation through the use of Global-Life, treats high concentrations of carbohydrates, starch wastes, and aliphatic chemical wastes such as acrylics, vinyl acetates, and a variety of solvents using the indigenous microbial life, present on site. This approach also is beneficial for canning companies, soft-drink bottlers, and manufacturers of corn products, starches, glue products, and chemicals. This treatment category effectively enhances settleability.

3. Another category of degradation treats wastewaters with very high lipid content, such as animal, fish, and vegetable oils. Here again, Global-Life is effective in activating the indigenous microorganisms. It improves the performance of wastewater treatment systems including lagoons, activated sludge systems, trickling filters, and oxidation ditches. The microorganisms degrade gasoline, light weight mineral oils, and most petrochemical products.

4. Some indigenous microbes combat heavy tar-like oils, coal tars, and organic sludge in waste streams, tanks, and land spills which react to the triggering effect of Global-Life. Indigenous microbes are particularly effective in degrading diesel fuel, bunker oil, and crude oil. Also included in this category is treatment of waste containing phenolic and other aromatic chemical structures. These microbes are capable of breaking down diverse organic materials, including coke wastes, as well as wood preservative wastes such as creosote and pentachlorophenol that are associated with railroad ties and telephone pole facilities, refinery bottoms, and asphalt.

5. Some microbes function as a biotreatment, successfully treating industrial wastes with exceptionally high protein contents such as blood and fat. High protein wastes generated by dairy processing, and meat packing and processing companies can be heated effectively. Treatment of nitrogenous compounds generated by petrochemical firms is reported to form excellent flocs. Here again, no foreign microbial life is imported.

6. Bio-remediation with Global-Life improves the performance of anaerobic systems. The already present microbes, highly stimulated and multiplied, aid the breakdown of problematic organic material in septic systems, Imhoff tanks, digesters, and anaerobic lagoons. Percolation in leach fields and seepage pits is restored, while sludge volumes are reduced and odors controlled. This category of microorganism stimulation is specifically effective with anaerobic treatment of domestic wastes containing heavy amounts of salad oils, detergents, and grease.

7. The final indigenous microorganism category in this list consumes many of the components found in industrial waste streams. They treat wastes containing detergents, various petroleum and petrochemical byproducts, and protein and lipid structures. These Global-Life stimulated microbes treat pulp, paper, and forest products in wastewaters.

These functional descriptions are only examples of some of the tasks bio-remediation can accomplish. Global-Life, functioning as a triggering microorganism activator, reactivates or revitalizes microbes present in soil, water, and out-of-balance toxic wastes. Once activated, the microbes stimulate naturally existing microbes as well as perhaps the bio-augmented microbe family. Microorganisms may be further stimulated by nutrients such as humic matter to promote healthy organic activity. Environmental biotechnology complements bio-remediation and contributes to the healing of our lands.

Compost Treatment Instructions

Global-Life Bio-Stimulant is a product designed to speed bio-remediation of animal waste and other organic waste (such as poultry litter, dead birds, spent hens, etc.). It has shown excellent results in US poultry and livestock production markets. It has been introduced to several animal production operations throughout the United States, and all demonstrate the same results: bio-remediation time reduced by 20% - 75%, and almost-complete elimination of odor.

Because of its effectiveness in bio-remediation, Global-Life is ideal for compost heaps. However, it can also be used in lagoon treatments (next page), and spraying of litter. Global-Life will stimulate the increase in number, activity, and output of the microbes already present in the compost piles.

The job of the microbe is to digest the solid organic waste, converting it to humus and water. A microbe's castings (humus) are extremely rich in nutrients and vitamins which are valuable in promoting plant growth. The application of Global-Life leads to a rapid increase in the number of microbes, which leads to faster remediation of the organic matter, as well as an increase in the nutrients and vitamins available for plant use.

According to the inventor of Global-Life, Dr. William Jackson, a treatment of Global-Life in a compost pile would have the following results:

It would have more microorganisms and macroorganisms (worms), which actually create top soil. The humus from compost does not create topsoil. Rather, it's the castings from the micros and macros that do that.

Earthworm castings are so perfect in their chemical balance, which is why they're very expensive. Microbial castings are the same way, but they're just smaller. However, since there are billions upon billions of microbes, it is possible to get the same balance. Earthworm castings (this is also true for microbes) contain a nitrate increase of 300%, phosphorous increase of 600%, potassium increase of 1000% (one-thousand percent), calcium increase of 40%, and a magnesium increase of 200%.

To use Global-Life in a compost pile, do the following:

1. Determine the number of cubic yards of compost that you have. One ounce of Global-Life will treat 4 cubic yards (2.3 cubic meters).
2. Dilute the Global-Life with 64 parts unchlorinated water.
3. Spray the entire pile with a backpack sprayer, or some kind of misting equipment. Be sure to use the entire amount of Global-Life required. If necessary, reduce the amount of water used before you start.

To compost a large number of spent hens, do the following:

1. In a compost bin, put down a layer of litter, then a layer of dead birds.
2. Lightly spray (but don't soak) the birds, following the instructions above.
3. Put down another layer of litter, then another layer of dead birds.
4. Spray that layer with the Global-Life dilution.
5. Repeat the process until the bin is full. When you have filled the bin, spray the remaining Global-Life dilution on the surface and sides of the pile.

Global-Life is non-toxic, non-hazardous, completely biodegradable, water soluble, environmentally friendly, and safe to use directly on plants and animals as a natural biological deodorant. It is USDA authorized for use in sewage and/or drain lines of official establishments operating under the Federal meat, poultry, shell egg grading, and egg products inspection programs. It also meets the regulations of several US governmental agencies: the EPA, OSHA, the Department of Transportation, and California's Clean Air and Water Regulations (Proposition 65).

Lagoon Treatment Instructions

In lagoon and slurry pit applications, most problems usually arise from a lack of microbial activity in the pit. That is, the microbes that usually digest the material have gone dormant. This is because of the overuse of disinfectants and detergents in the washdown procedure. If sufficient quantities of disinfectant are applied to remove disease-causing pathogens in the house, the carry-over to the pit or lagoon will have the same "killing" effect on the positive microbes, thus stopping all digestive activity in the pit. (Note: Microbes cannot be killed, they only go dormant in hostile conditions, such as extreme cold or heat, or when treated with disinfectants).

This idea led to the practice of the litter treatment with Global-Life Bio-Stimulant and post-washdown rinse with Global-Life and Global-Clean multi-purpose cleaner.

Past experience has shown that a hot water high pressure wash of the facilities, followed by a rinse combining Global-Clean and Global-Life in a water solution will serve the same function as a disinfectant without stopping the microbial activity in the lagoon. A protocol for spraying animal houses with Global-Life is available from WE International, Inc.

1. For any manure treatment (except for hog manure), one gallon of Global-Life will treat 325,000 gallons of lagoon material. Determine the number of gallons in the lagoon, and figure the number of gallons you will need for treatment.

Another way to figure this is that 1 gallon of Global-Life will treat one acre foot of lagoon size. For example, a 2 acre lagoon with a 5 foot depth will require approximately 10 gallons of Global-Life.

2. Determine that the lagoon is free of disinfectants, and is within acceptable pH ranges (ideally between 6.0 - 8.0).

3. The first application is the "shock treatment." For this application only, double the number of gallons you figured in Step 1.

4. Dilute the product at least 20 parts of unchlorinated water to 1 part Global-Life. If the lagoon has a large surface area, increase the amount of water. This will allow you to take more time to cover the entire surface. Use a high pressure washer or sprayer to apply the product, and spray the surface. There is no need to inject the product, or spray below the surface.

Note: Global-Life can be diluted 200:1, if necessary. However, it is important to apply the entire amount to your application.

5. Ongoing treatments should take place every 2 - 3 weeks at the original amount you determined in Step 1. It normally takes three to six weeks to observe significant changes in the lagoon.

As an alternative, it is possible to also inject Global-Life on a daily basis with a dosing machine, based on the quantity of incoming new material.

For animal production houses with lagoons: the most efficient application method is to pour diluted Global-Life into the effluent as it leaves the house. The Global-Life will quickly infuse through the entire lagoon waste volume and will steadily work from the bottom up within the lagoon biosystem. Determine the amount needed using the same 1 gallon of Global-Life to 325,000 gallons of effluent ratio (typically 6 - 8 ppm).

Sunny and warmer weather will also assist the topical remediation process (since the processing is a form of photosynthesis), but is not a requirement. Lack of sunlight will not slow down or stop the process. However, water temperatures below 40°F will slow down the microbial process.

Finally, if an aerating system is in place, regular application of Global-Life will reduce the number of pumps required.

Notes