

# PURE GREEN II-B

Bio-Stimulant for Golf Course Applications

## Technical Manual FOR THE BLACK LAYER, HARD PACK, FUNGUS & BARE SPOT SOLUTION



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**PURE ONE ENVIRONMENTAL, INC.**  
**Presents for**  
**GOLF COURSE TEES, GREENS AND FAIRWAYS**

THE PROBLEMS  
**BLACK LAYER**  
**HARD PACK**  
**BAER SPOTS**  
**FUNGUS**

THE SOLUTION  
**PURE GREEN II-B**

The high concentration of anaerobic bacteria is majorly responsible for the formation of the back layer in the soil. The fact that a golf course requires a constant watering regimen to maintain a pleasing and healthy appearance which is important to please the customers creates an environment below the surface that is ideal for the growth of anaerobic bacteria which is the major contributor for the formation of black layer. An anaerobic bacterium grows in an oxygen starved environment and its food source is also supplied by the fertilizers and nutrients that are used to keep the surface grass green, attractive and pleasing to the golfers. This is a never ending cycle that is required by the grounds superintendent to maintain the desired appearance. The watering requirement can make the condition worse and eventually can affect the surface condition and appearance. For this reason, aeration devices are employed to punch holes into the soil to introduce air in the region of the soil to effectively combat the high concentration of anaerobic bacteria. Also, aerobic bacteria are introduced to aid in the process of controlling the high concentration of anaerobic bacteria. This is expensive, time consuming and affects the surface of the course, especially the greens, which can be undesirable for the players. Also this can only be done occasionally, which is not necessarily as often as it is needed. Everyone admits that the biggest problem in solving this condition is getting oxygen to the affected area, the **BLACK LAYER**. The biology changes with the presence of oxygen which is the root requirement to solving the problem.

Anaerobic bacteria in large concentrations in the soil, aids in the development of fungus by the production of carbohydrates and carbonic acids in a cellulose form. This complex form of sugar is a source of food for the development of the growth of fungus. This acts as a substrate for the food source to aid the fungus to grow. The ability to reduce the presence of anaerobic bacteria in high concentrations creating an environment that feeds and supports the growth and development of aerobic bacteria will decrease the concentration of anaerobic bacteria. The food source for the growth of fungus is then diminished. This directly affects the decrease of the growth of fungus. We affect the food source to be decomposed so rapidly, that instead of serving as a food source for fungus, it serves as a food source for other biological life forms like bacteria in the aerobic range. We are, in effect, changing the biological pathway. Where you have a water, saturated soil that is affected with black layer, commonly called "root rot," which

contain the biology's that result from the lack of air movement and oxygen, supports fermentation. With this fermentation you have conditions conducive to fungi, mold etc. The different species or type of anaerobic bacteria produces different compounds that act as food source. Different fungus species have different requirements such as light conditions, temperature, and food sources etc. The conditions of the soil then dictate the development of different fungi development which is the reason that you can have more than one type growing on the same course. The least common denominator for this condition of fungal growth is the high concentration of anaerobic bacteria that is present in the soil.

So far we have identified two elements of the problem that must be addressed effectively and economically. Next is the condition of **HARD PACK SOIL**. We are exceedingly well qualified to address hard pack since we developed and are one of the world renowned manufacturers and suppliers of a soil stabilizer that creates hard packed soil by creating a method of bonding soil particles together to a degree capable of making a serviceable road base from native soil alone without the necessity of aggregate. These roads are being built all over the world. Having the technology of making hard pack, bonded soil compacted layers, capable of supporting up to 100 ton trucks, allows us the advantage of being able to reverse the condition of breaking the bond of soil particles. Hard pack is an undesirable condition for golf courses and is responsible for several undesirable conditions such as bare spots, dead grass areas, black layer and disease.

To address the mechanics of a binder of soil particles is very important and a good place to start. Polysaccharides are a primary and important binder of soil particles. In order to solve the hard pack problem, the polysaccharides must be broken down so that the bond between the particles is released. These complex sugars are decomposed by bio-oxidation where oxygen is required for this through break down of these complex sugars. With the polysaccharides broken down the soil particles bond is weakened and broken resulting in the hard pack consistency to open up and allow the soil to breathe, absorb water and move air efficiently and allow our product, along with other fertilizers and nutrients to be absorbed into the soil. This allows gases such as CO<sub>2</sub> to escape from the soil. Oxygen present in the soil alters the soil atmosphere. This changes the output of the soil and the decomposition of organic matter and the resulting gases that are released from the soil. For extreme hard pack conditions the amount of product can be increased to increase the effectiveness of decreasing the hard pack. The key to the process is the presence of oxygen in the soil which is no secret to the well informed. **PURE GREEN II-B** solves the problems by performing the functions that are lacking in these three conditions. The absolute root cause of these specific problems is the lack of oxygen. This is the primary function of **PURE GREEN II-B**. A derivative of this product has proven beyond any possible doubt that this product creates oxygen from water. This biocatalyst formula stimulates aerobic biological activity by enzymatically releasing oxygen through a unique system contained in the product. This enzyme known as H<sub>2</sub>O Dehydrogenase, (HDH) reduces the bonds between the oxygen and hydrogen atoms that comprise the water molecule. This subsequent release of elemental oxygen provides energy for the respiration of aerobic microorganisms and improves the bio-oxidation rate of carbon containing matters. The hydrogen remaining from the reaction acts to buffer the hydroxyl or alkaline components that are formed or released during the metabolic activities of these microbes. In a nutshell, the oxygen in the water that is mixed with **PURE GREEN II-B** and the water that is trapped in the ground is the source of the oxygen that propagates the growth of aerobic bacteria and releases hydrogen.

So the cycle goes, application of **PURE GREEN II-B** creates the oxygen needed to stimulate the growth of aerobic bacteria which consumes and reduces the population of anaerobic bacteria. The reduction of the population of anaerobic bacteria reduces the food supply required by fungi to grow which reduces the instances of the formation of fungi. The other element in **PURE GREEN II-B** dissolves the polysaccharides in the soil and chelation action of the soil reduces the hard pack condition on the soil which allows the soil to breathe more effectively and release gases such as CO<sub>2</sub>.

This treatment does not change the normal care and maintenance protocol of the grounds superintendent. The application of **PURE GREEN II-B** is very specific in its value and that is to create oxygen and chelate and reduce the hard pack condition of the soil. Continued fertilizing and application of nutrients should not be interrupted. You will quickly determine the value of **PURE GREEN II-B** in as little as 3 to 6 weeks, depending on the application amount and temperature. This application can be performed through the sprinkler system during routine watering. Testing on an affected area can be performed by spraying it with a green sprayer.

## **PRODUCT CHARACTERISTICS**

### **ANALYSIS:**

Total Nitrogen (N)	6.0%
Urea Nitrogen	4.0%
Water soluble organic Nitrogen	2.0%

Derived from Urea, Protein Hydrolysate, Iron EDTA, Manganese EDTA and Zinc EDTA.

### **Contains:**

All Natural Humic and Fulvic Acids, Surfactants, Protein Hydrolysate, Enzymes, Vitamins, Biostimulants and Buffers.

Physical Characteristics:

8.9 Lb/gal. pH 7.4 (0.48 lbs/gal.)

### **Storage:**

Keep product in original container. Do not transfer into food or drink containers.

**SHAKE OR STIR AFTER EXTENDED STORAGE.**

# MATERIAL SAFETY DATA SHEET

## PURE GREEN II-B

ALL NATURAL SOLUTION  
PURE ONE ENVIRONMENTAL, INC.

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<b>SECTION I: PRODUCT INFORMATION</b>	
<ul style="list-style-type: none"><li>• Trade Name:</li><li>• Chemical Name:</li><li>• Formula:</li><li>• D.O.T. Proper Shipping Name:</li><li>• D.O.T. Hazardous Class:</li><li>• D.O.T. Identification Number:</li></ul>	PURE GREEN II-B Natural Enzymes Proprietary blend of Enzymes Pure Green II-B - Non-Hazardous Liquid Non-Hazardous Liquid Class 70 Sch. B Harmonizing Code 1212.20.0000
<b>SECTION II: PHYSICAL DATA</b>	
<ul style="list-style-type: none"><li>• Specific Gravity:</li><li>• Boiling Point:</li><li>• Melting Point:</li><li>• Vapor Pressure:</li><li>• Viscosity:</li><li>• Solubility in Water:</li><li>• Appearance &amp; Odor &amp; Form:</li><li>• pH:</li></ul>	(H <sub>2</sub> O) 1.0 g/cm <sup>3</sup> 105° C -7 degrees C 9 m-bar 60 m Pa-s (Brookfield) Yes, 900 g/l Brown, Ammoniated Humus odor, liquid 7.7
<b>SECTION III: HAZARDOUS INGREDIENTS</b>	
NONE	
<b>SECTION IV: FIRE &amp; EXPLOSION</b>	
Treat the same as water	
<b>SECTION V: REACTIVITY DATA</b>	
<ul style="list-style-type: none"><li>• Stability:</li><li>• Incompatibility:</li><li>• Hazardous Polymerization:</li></ul>	Stable. Avoid high temperatures as this will neutralize the enzymes. Avoid low or high pH substances (i.e. acids, caustics). None. Product is compatible, will not polymerize nor create hazardous by-products. There are no specific conditions to avoid. Will not occur.
<b>SECTION VI: HEALTH HAZARD DATA</b>	
<ul style="list-style-type: none"><li>• Eye Contact:</li><li>• Inhalation:</li><li>• Skin Contact:</li><li>• Ingestion:</li><li>• Non-Carcinogenic:</li></ul>	Avoid eye contact. If product gets in eyes, flush with water. None None Will cause slight laxative condition. No known conditions to avoid.
<b>SECTION VII: PRECAUTIONS FOR SAFE HANDLING AND USE</b>	
No special gloves No ventilation No exhaust No protective clothing No special equipment No respiratory protection	

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