

BRANDT

Greens Grade Black Layer Control Granules

Brandt Eclipse



Eclipse Greens Grade Black Layer Control

Immediate action is necessary to oxygenate the soil, remove or tie up toxic gases and stimulate healthy root growth, else the turfgrass may die quickly.



Black Layer before treatment with ECLIPSE.



7 days after treatment with ECLIPSE, plus aeration.



21 days after treatment with ECLIPSE, plus aeration.

The Problem

Black Layer is an anaerobic (without oxygen) condition that develops on golf course greens due to a number of environmental and cultural factors. While more common in USGA (sand based) greens, the condition is not limited to them.

Black Layer forms when slow draining soils that are high in organic matter stay wet for extended periods. These wet soils eventually become anaerobic (without oxygen). After a period of time in these conditions, anaerobic microbes thrive, and feed on the organic matter in the soil. Anaerobic microbes are able to obtain oxygen by chemically removing the oxygen from sulfate compounds in the soil, causing the formation of Hydrogen Sulfide gas which is toxic to turf root systems and has the characteristic smell of rotten eggs. Hydrogen Sulfide is highly unstable and can combine with metal ions such as Fe, Mn and Mg creating more insoluble precipitates, making the anaerobic problem worse. Oxygenated soils typically have an orange, tan, and yellow color while soils without oxygen become darker, and eventually turn black. Since oxygen is necessary for root respiration, roots cannot survive in soil afflicted with Black Layer. Live roots will only be found in soil above the Black Layer.

Immediate action is necessary to oxygenate the soil, remove or tie up the toxic gases and to stimulate healthy root growth, else the turfgrass may die quickly.



Causes

The cause of Black Layer may have several different origins:

- Excess water leading to anaerobic conditions
- Layering from topdressing with different materials and/or burying thatch
- Presence of Sulfur or use of Iron Sulfate
- Soil pH greater than 5.5

Symptoms

- Areas of chlorotic, bronzed and thinning turf develop in low, wet and/or highly compacted areas on golf greens.
- Turf slowly dying and turning brown.
- Plugs from affected areas show black pockets or a solid black layer somewhere between the soil surface and the bottom of the root zone.
- A characteristic rotten egg smell accompanies this layer caused by the release of Hydrogen Sulfide (H_2S).

The Solution

Eclipse is formulated to attack Black Layer from 4 different Angles

Calcium Silicate

Calcium: Clay particles in soil attract and hold cations (positively charged atoms). When those cations are Sodium or Iron, the balance of soil chemistry is thrown off, and this imbalance causes the clay particles in the soil to disperse into very fine particles of clay and silt. These extra fine particles fill in the porous spaces between the normal soil particles creating a seal to water penetration and the salts will not leach. Calcium is a double charged cation (divalent), whereas Sodium has a single charge (monovalent). Exposing the clay particles to Calcium will cause the Sodium, Iron and Sulfur to be exchanged by the Calcium because of the stronger attraction, allowing the Sodium to be easily leached below the root zone where it is flushed away. Calcium plays a key role in displacing Iron in the Iron Sulfide complex.

Silicon: When applied to the soil by incorporation or over the top application, Silicon is readily absorbed by the grass and accumulates within the soil tissue. Amassing throughout the plant, the plant becomes more rigid and upright, hardens off more completely, increases the plant's ability to withstand stress, and develops an increased resistance to pests and disease.

Activated Carbon (52 Pickup Granules)

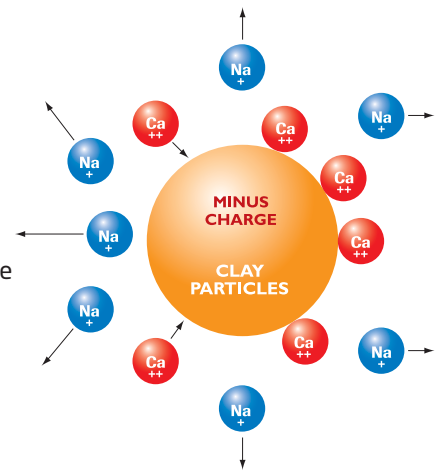
The Activated Carbon in this greens grade blend is designed to adsorb the Hydrogen Sulfide created in the Black Layer process. Activated Carbon with its huge surface area and affinity to organic chemicals, will not only tie up the Hydrogen Sulfide mitigating its toxicity to the plant root system, but also will minimize the rotten egg smell.

Beneficial Soil Microorganisms (Noculate BL)

Containing 100,000,000 CFUs per gram of bacteria, actinomyces and fungi, the addition of these specific Beneficial Soil Microorganisms will reduce the presence of Thiobacillus in the soil profile through competitive exclusion. These organisms will create micro-aggregates in the soil profile through the production of polysaccharides. The end result is improved soil structure, improved percolation, nutrient cycling and disease suppression. Increased oxygen levels in the soil profile will further reduce the presence of the anaerobic/facultative Thiobacillus. The use of these microbes will also inhibit the production of sulfide reductase, the enzyme that catalyzes the reduction of sulfur to sulfide.

Wetting Agent (Generation CG)

The common practice of topdressing golf course greens often results in a soil profile that consists of several layers or interfaces due to the inconsistency of the top dressing materials. These layers can lead to water retention and/or inconsistent water movement through the entire soil profile, and contribute to the anaerobic conditions that lead to Black Layer. The use of Brandt's Generation will improve water movement throughout the soil profile, and will help to reduce the anaerobic conditions, and improve root growth. The Generation applied in this formulation is impregnated on a greens grade soil amendment.



The wetting agent component of ECLIPSE will improve water movement throughout the soil profile, help reduce the anaerobic conditions, and improve root growth.



ECLIPSE may be applied at any time of the year as a preventative or curative treatment for Black Layer and to improve seed establishment when overseeding.

Application Rates

Apply ECLIPSE using conventional rotary or drop spreaders.

Read product label before use.

How To Use Eclipse

To achieve best results, and to expose the ECLIPSE to the Black Layer, mechanical aeration (hollow tine, solid tine, slitting, etc.) is crucial.

1. Aerate or spike to a depth greater than the Black Layer.
2. Apply ECLIPSE at the recommended rate.
3. Use drag brushes or other appropriate methods to pull as much of the product into the aeration holes as possible.
4. Leave aeration holes open or if necessary, topdress using appropriate sized material.
5. Until recovered from Black Layer, do not over irrigate, and refrain from using Iron, Sulfur or organic based products.
6. Use nitrate based fertilizers and micronutrients like Manni-Plex products.
7. Two weeks following application of ECLIPSE, apply Brandt's Noculate WS at the rate of one half ounce per 1000 square feet to reinforce microbial populations.

Black Layer

Curative Treatment

Broadcast at the rate of 6 lbs. per 1000 square feet, or approximately 6 containers per acre, following recommended pre-application procedures as shown above. Irrigate lightly after application. Up to 4 annual treatments may be made.

Preventative Treatment

Broadcast at the rate of 3 lbs. per 1000 square feet, or approximately 3.25 containers per acre following recommended pre-application procedures as shown above. Irrigate lightly after application. Up to 8 annual treatments may be made.

Seed Establishment

Scarify the area to be overseeded. Apply ECLIPSE at the rate of 4 lbs. per 1000 square feet, and complete normal overseeding practices.

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