

Black Layer only occurs in anaerobic soil conditions. Anaerobic conditions are caused by a physical condition in the soil, which restricts the movement of water through the root zone. If the soil does not drain quickly enough, or impenetrable layers are present which restrict downwards water movement, it is likely that Black Layer will occur.

- When a root zone has excess water present, the water will push air out of the soil pore spaces. A root zone in this condition can be described as anaerobic.
- In an anaerobic soil, anaerobic bacteria replace aerobic bacteria.
- Anaerobic bacteria produce Hydrogen sulphide gas, which has a characteristic 'rotten egg' smell. It is poisonous to grass plant roots.
- Hydrogen sulphide reacts chemically with metal elements such as Iron (Fe), creating black deposits, which form layers within the soil.

### Possible Causes of Black Layer

- Poor root zone mixture.
- Layering in the soil profile
- Buried thatch layers.
- Compaction.
- Soil panning.
- Incompatible top dressing.

### Conclusions

- Black Layer only occurs in soils with excess water present.
- Improving drainage or increasing aeration can cure Black Layer.
- Sulphur does not cause Black Layer.
- Sulphur is an essential grass nutrient.
- Potassium nitrate does not prevent Black Layer.
- Continued use of Potassium nitrate may cause soil de-flocculation, which could increase the risk of Black Layer (J.B. Beard).

