

EDITORIAL



This will be the last issue of the *Sports Turf Manager* for which I will be your Editor.

Fifty years ago this week I was completing my first semester at the University of Saskatchewan. Thus began a career which has been dedicated to trying to grow two blades of grass where one grew before. It does not matter whether that grass species was wheat or corn, or in latter years, turf species.

It has been an interesting half century, sometimes frustrating, most often rewarding, particularly when some new technology was implemented, in part as a result of my efforts. Even more rewarding was when a student, a farmer, or a turf manager received recognition for his or her achievements as a result of some assistance I may have been able to give them.

The last six years have been among the most rewarding as many hours, yes, days and weeks, have been spent assisting the Sports Turf Association in becoming a recognized part of the turf industry.

Why go fishing when I am not a fisherman.

The basic reason is that my well of ideas which has enabled me to fill the pages of the *Sports Turf Manager* has run dry. While I enjoy writing, the pressure of deadlines and reminders that an issue is overdue reduces that enjoyment to the negative side.

Someone will be taking on the role of Editor. The success he/she will have will depend on the assistance each and every member of the STA is willing to provide. The *Sports Turf Manager* is well accepted as an informative turf publication. It is now up to each of you whether it continues to be a success.

Black Layer Formation in Turf Characteristics, Causes and Cures

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The occurrence of black layer in turf for sports facilities has been a continuing problem over the past two decades. Generally the condition has been associated with construction of the fields using U.S.G.A. Green Section specifications or variations thereof. The condition is recognized by chlorosis and die back of the turf which can not be identified as a nutritional or pathogenic problem but which appears associated with it certain characteristics of the root zone.

What are these characteristics?

As the name suggests the condition is black discolorations on the soil particles and slime materials in the root zone which occur as continuous horizontal plates of varying thickness or vertical columns of black, often slimy, root zone material. Associated with the black layer are unpleasant swampy or sewer like odours; even that of rotten eggs which is the aroma of hydrogen sulphide.

The black layers may be from 0 - 10 cm below the surface. The layers may range from 2 to 7.5 cm thick where they occur at or near the surface to 1 to 3 cm thick where they are deeper in the profile. The affected areas may be associated, but not necessarily, with minor depression in the playing surface. The affected areas have a reduced infiltration rate, combined with a reduced hydraulic conductivity. Due to the black slime of bacteria - metal complexes the condition is often referred to as a "black plug layer".

While generally a condition that occurs on sand based root zones, it is also

found in natural soils where a program of sand topdressing has been employed to control thatch or modify poor physical conditions. In the latter case the black layer generally occurs at or near the surface

The turf growing on the affected areas dies in a relatively nondescript pattern. The grass may die rapidly by turning a straw to reddish-straw or bronze colour; or occasionally, the affected turf may become chlorotic before dying.

A parallel phenomenon is known to occur in water wells and in drain lines. In water wells slime producing microorganisms proliferate on the screens of sand points and out into the surrounding aquifer. This brown to black slimy growth gradually becomes sufficiently dense enough to plug the screen and reduce the water flow. When tile lines are placed in high iron content soils and backfilled with high organic content top soils a reddish brown slime deposit occurs within the tile which eventually plugs the tiles. In the first case the colour is associated with reduced manganese whereas with the tile lines the material is precipitates of reduced iron compounds.

What are the causes?

Many theories have been promoted for the formation of the black layer but they all accept the basic cause is an anaerobic condition; that is, a lack of oxygen in the soil atmosphere. Work at Michigan State has provided rather definitive data that the anaerobic condition results in the reduction of sulphate sulphur by sulphur reducing bacteria to sulphides. The reducing conditions