

7th & 10th Greens Report

For the consideration of the committee:

- **Problem**

The 7th and 10th greens are suffering from high organic matter (OM) concentrations within the upper profile which is causing foot printing and a host of other agronomic problems. On examination (photo's attached) the OM appears to be 50mm thick and accompanied by a heavy black layer. The OM is home to pathogens like Fusarium and Anthracnose, if the situation is not addressed in the short term I would expect to start to see a thinning of the sward due to the toxic effect of the black layer or sulphides.

- **Historic evidence**

These two greens have long been a problem and a plan of recovery should have been devised long ago, speaking to one of the staff he recalled that tonnes of lawn sand had been applied per annum to the greens on a regular basis.

- **Causes**

Basically over watering, over feeding with lawn sand and general lack of maintenance (aeration) are the culprits.

Lawn sand consists of Ammonium Sulphate, Sulphate of Iron and sand, Ammonium Sulphate causes rapid growth which produces lots of leaf and root matter which is far more than the soil bacteria can break down into nutrient, and the Sulphur in Sulphate of Iron and Ammonium Sulphate are turned into Sulphide by sulphur reducing bacteria. As the process continues metal sulphides are created, metal sulphide gas stinks like rotten eggs and is highly toxic to plant roots (see picture)

I believe that a significant contributor to the problem are the sprinklers around these greens, worn gears and nozzles means irregular irrigation patterns and poor deliver patterns resulting in the green being grossly overwatered.

- **The last 18 months**

Since my arrival in March 2013 I have identified problems with the irrigation and nutrient regimes. To date 2014 has only seen 95KG of Nitrogen (target 100KG) applied to the greens with forms of N varying with seasonality, no lawn sand or sulphate of iron applied anywhere. The irrigation system is a mixture of brands all giving different outputs, therefore I would fit new sprinklers to 7 and 10 for next season.

- **Recommendations**

Ultimately the aim is to reduce OM levels to an acceptable level as quickly as possible, to do this we need to increase coring and topdressing particularly on these two greens, the use of the Graden Sand Injector will also be of benefit. Generally speaking the greens need top dressing regularly throughout the golfing season, unfortunately this is very time consuming with the equipment that we have at our disposal. There is relatively little that we can do

during the winter months, however look at the photos and you will see what happened to the black layer over a 6 hour period after being exposed to air.

- **Immediate action**

It is essential that the black layer (sulphide H₂S) is oxidized to minimise any loss in turf, this is achieved by aerating the greens (solid spikes) and encouraging the anaerobic bacteria to become aerobic.

Unfortunately this will possibly make the green wetter in the short term but increase oxygen levels therefore I would recommend we use the temporary green until the green stabilises or ground conditions become drier, this could be several days or weeks as it is totally weather dependant.

- **Medium term**

Obtain OM % levels at different depths but it's the top 50mm that will be the most important, this will give me a datum from which I can measure the % reduction and adjust the program as required. Apply a penetrant wetting agent; this will encourage water through the profile and pull in oxygen. In the spring when we core I would like to double up on these two greens and follow up this a further treatment after recovery, also intensify verti-cutting and sarrel rolling.

I have spoken to Rotherham Golf Club and they are willing to loan us their Graden sand injector for £100 per day, this is a very generous offer since we only need it one day.

I will apply a biological thatch eater to both greens at a cost of £200, this will give me a double pronged attack on the thatch.

- **Long term**

It is a fact that the most successful Golf Clubs aerate and top dress more than less successful clubs, therefore ideally I would like to increase spiking and topdressing to at least a monthly program through the summer but there are many constraints with both machinery and staffing levels, I am however hoping to claw back some hours with the new Toro Groundmaster mower that is coming in the spring.

- **Photos**

Below is a sequence of photos taken of a core sample from the 10th Green it was taken at 14:00hrs on Friday 12th December 14, it graphically shows the benefit of aeration and the oxidation of black layer resulting into the volatilisation of the Sulphide gases.



Note the break at 50mm



Also 50mm break (indicating thatch depth) note blackness



Black layer down to 50mm



After 1 hour all external black layer has oxidised and gone, it's smooth because it had been rolled in paper



Cutting into the sample you can see the black layer internally but oxidization working inwards



3 hours after the sample was taken oxidisation continues



6 hours in total and the black layer has gone



After washing we are left with the organic matter

Based on this evidence you can see why I want to aerate the greens, although you may be on temps for a short while or not at all if the conditions are correct.

Graham Pickin

Head Groundsman Phoenix SSC