

17-132 Report on Air Injection Treatment of Bowls Green

This report follows an earlier report logged with the Clerk detailing maintenance problems on Waterbeach Bowls Green and how they might be remedied. This report specifically relates to the issue of compacted soil and remediation by **de-compaction aeration**.

An excerpt from the earlier report:

“As with any other sports surface, a bowls green can become compacted. Compaction is caused by the action of mowing and other maintenance operations (the mower we use weighs approximately 160kg) and the wear caused by play (people walking on the green)..

In tests, we found the green to be heavily compacted in the areas which suffer with Dry patch disorder, and less so in more healthy areas (although there is still some compaction).

The green to my knowledge has never received any decompacting treatment, certainly this is the case in the time I have worked here¹.

Compaction is the root cause of many turf problems, in our case the compaction has lead to increased thatch (caused by a lack of oxygen in the soil, which is required by the beneficial soil microbes which break down thatch) which in turn increases the population of harmful fungi in the soil (of the type which cause hydrophobic soil, by secreting a waxy substance that prevents water being absorbed by the soil)”.

And from the suggested remedies section in that report:

“The core of the problem on the Bowls Green is compaction caused by machinery and players. To the best of my knowledge, the green has never received any kind of treatment to alleviate compaction, which ideally should be carried out on an annual basis as for other areas such as the Football pitches. There are a variety of machines using different methods to decompact the soil without disrupting play”.

Compaction

Compaction is the term given to the phenomenon of soil particles being pushed together under the weight of machinery and foot traffic. Healthy soil has many spaces between the particles containing air (referred to as pores). Grass roots grow in macropores, the larger air spaces between soil particles. Soil that is compacted has a greatly reduced number of macropores. This causes several problems:

- Reduced oxygen levels in the rootzone, which can lead to anaerobic conditions, this in turn causes harmful microbes such as those responsible for dry patch disorder to increase, and aerobic microbes to die off. This also increases thatch accumulation, as aerobic microbes are responsible for breaking down thatch into good organic matter the grass can absorb.
- The roots of the grass are limited in their growth ability, as they can only grow in spaces of a certain size, so root growth may be weak, shallow or stunted. This in turn causes problems with drought resistance as the roots are unable to grow deeper into the soil to extract water and become heavily reliant on irrigation. The surface is also more easily damaged by players,

¹ Our Spiker does not relieve compaction, as the solid tine displaces the soil around it, it will increase compaction (with the benefit of allowing air in).

as the roots are not very strong.

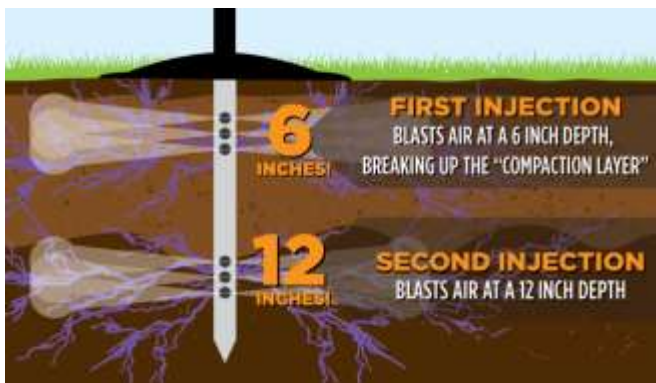
- Drainage is impaired as water passes more slowly through a compacted soil.
- The turf may be subject to more attack by diseases in its weakened state which require expensive chemical treatments to control. In addition more irrigation and wetting agent is required to keep the turf alive in times of drought than would be required for a healthy sward, again costing more money.

There are two innovative methods available to relieve compaction on greens, one injecting water the other air. In the local area an Air Injector is available to hire from A.J. Scambler at Bourne.

Air Injection

This works by forcing high pressure air into the soil via large hollow probes (fig 1). These are driven into the soil to the desired depth and then a valve on the machine releases air at a set pressure. This high-pressure air forces the soil apart, breaking compaction. This causes no marks on the surface except for the holes made by the probes, and the surface can be used immediately after treatment.

The machine is self-propelled and can be taken on the surface in almost any conditions without damage (fig 2).



There are two studies that show a reduction of compaction and improved soil conditions. They are appended to the end of this report.



Figure 2, The Air2G2 Machine in operation.

Recommendations

Given the scientific evidence of reduction of compaction, and the costs created by managing the surface with this problem, we would recommend the Parish Council has an Air Injection treatment carried out on the Bowls Green over the Winter. If it proves to be successful we could look at making this part of our annual maintenance of the Green.

We have received a quote from AJ Scambler of **£295+VAT**.

Appendices:

- Scientific Report on Air2g2 treated green
- Journal Article on Air2g2 Machine study
- Air2g2 Machine UK Brochure
- Quote from AJ Scambler for one days hire of Air2g2.