

GRASS CLIPPINGS 18

On any natural sportsturf playing surfaces the performance of the green will be influenced by the inputs of the greenkeeper (GKP) and his staff – this is as true in the management of a bowling surface. Unfortunately, one occasionally encounters a situation where undue pressure from the players has led to a disaster

After renovation we rejoice when we see the first vertical leaves emerge from the top-dressing. About two weeks later we also rejoice when we see the first “runners” or stolons creeping horizontally over the surface to form a contiguous thin mat which eventually covers the whole green.

We open the green for play and everybody is happy.

As time goes on the mat gets thicker and, even, spongy, the grass is under stress and appears to have lost its vigour – a typically “tired” green – the green is slow.

What has been described above is one of the commonest problems encountered on a bowling green.

Unfortunately, many bowlers still believe that the solution to this is a straightforward one and can be rectified by simply mowing very close and by the repeated use of a heavy roller – the “mow and roll” brigade.

On my visits to bowling clubs I still see too many bowling greens where the grass has been put under undue stress by the mere fact that the GKP has, in most cases, been pressurised into cutting the green much shorter (below 4 mm) and even rolling frequently with a heavy roller to increase green speed.

Whilst a shaving (and rolling) programme will sometimes produce an immediate improvement in the pace of the surface, the longer term side effects of these operations can be, and often are, next to disastrous. Excessively close cutting only serves to weaken even the finer turf grasses and, ultimately, leads to the appearance of moss, bare thin swards and weak grass growth, resulting in a stressed sward with low wear tolerance to diseases and weeds and which lacks colour, vigour and appearance.

If, in addition to close-cutting, the GKP has also used the heavy roller the soil profile would have become compacted and the air spaces reduced leading to poorer root growth, less movement of

water and air and resulting in flooded surfaces.

In the RSA our GKP's come into green keeping without any basic grounding in plant management

Their theoretical knowledge of photosynthesis and mat formation is often rather sketchy and the scenario described above can, usually, be attributed to the fact that the GKP succumbed to the pressure from the members **because he did not know any better**

Photosynthesis is the process whereby water is conveyed from the roots to the leaves of the grass plant where, in the presence of direct sunlight, the water is combined with Carbon Dioxide from the atmosphere and converted into Carbohydrates and Oxygen. **The grass plant produces its own “food”**

Whenever the GKP mows or thins out the green he is, actually also reducing the leaf area and, therefore, the capability of the grass plant to produce enough “food” to sustain the vigorous growth the grass plant needs on a bowling green.

But, this Article is not only about mowing short to produce a fast green but rather about the management practices which lead to the GKP producing a green which is getting slower all the time and has precipitated the demands from the members for a faster green. Therefore, in order to deal effectively with a slow green it is essential to appreciate exactly what is causing the slowness of the surface and not simply turn to the myth that if you cut short and roll, it will sort itself out.

The first requirement for a grass to be used on a bowling green is that it should form a contiguous mat which covers the whole green.

With the exception of Paspalum all the grasses we plant on our bowling greens in the RSA belong to the Genus Cynodon. The Cynodons have the characteristic that most of their leaf growth is horizontal rather than vertical (In the finer varieties eg Bayview the ratio is 80 % horizontal and 20 % vertical) When managing a green we refer to -

- 1) **Horizontal Mowing** to control the vertical growth.
- 2) **Vertical Mowing (Brush, verticut, groomer, scarifier, and teaser comb)** to control the horizontal growth

It is important that the GKP should appreciate the need for both forms of mowing eg If the GKP only uses the horizontal mower and does not thin out the green he is only controlling the vertical growth and allowing the horizontal growth to heap up and the mat to get thicker – this will inevitably lead to a slower green and as the mat gets thicker and the undigested organic fibre accumulates it is referred to as **thatch**

What is Thatch? Thatch can be defined as the accumulation of undigested organic material lying in the mat. If the horizontal growth is not curbed the mat will become so thick that the bottom leaves have no exposure to the sun – although still attached to the grass plant they are of no use to the grass plant. Normally these leaves and stems would be “digested” by the bacteria / fungi in the soil , but, if this does not take place these leaves will accumulate in the mat and form a layer which is termed **“thatch”**

Thatch is a layer of living and dead organic matter that lies between the green vegetation and soil surface. It is composed primarily of turfgrass stem and root tissue materials. This living material is continually breaking down into layers of thatch material, which over time increases in depth. In some cases over 5mm of thatch can accumulate in any one growing season.

The natural process of breaking down organic matter (living and dead stem/root tissue) by the benevolent bacteria / fungi in the soil is often very slow. By promoting vigorous grass growth, we end up increasing the problem. The plant produces more debris than it can break down, thus we get an accumulation of material which, over time, builds up into a thatch layer.

Therefore, the primary cause of thatch can be traced back to the inability of the bacteria / fungi in the soil to break down all the organic material. This will happen when

- 1) The grass plant is producing more leaves and stem that the existing bacteria / fungi can cope with.
- 2) The number of Bacteria / fungi has been reduced

Thatch is easily detectable when you simply walk across the green as the surface feels soft and spongy, rather like a mattress, and one sinks slightly into it leaving behind a distinct footprint.

When investigating the extent of the thatch the GKP should cut a sample plug from the green and check to see the extent of the thatch layer. The presence of any amount of thatch should serve as a warning to the GKP but real problems start when you have more than 10mm depth of thatch.

Many experienced GKP’s contribute to the proliferation of the thatch by following an intensive fertiliser programme to stimulate maximum growth to guard against a possible problem or damage to the green. **Maximum growth must always be accompanied by an intensive “thinning out” programme.** When thatch exceeds 10 mm the accumulation of thatch can create an environment that affects sward quality in many ways:

- 1) Excessive thatch can create a favourable environment for many pests and diseases – some fungi thrive in thatch.
- 2) Thatch can influence water movement in and around the grass plant.
- 3) Thatch can alter soil surface conditions, often producing a waxy layer that can prevent water movement into soils (dry patch).
- 4) Thatch can influence soil temperatures.
- 5) Thatch interferes with air movement around the grass plant.
- 6) Thatch can affect mowing quality.
- 7) Thatch can prevent the effective absorption and use of chemicals and fertiliser applications.
- 8) Excessive thatch will affect the speed of the green and the consistency of the run of the bowl.
- 9) Thatch will also affect the traction and shear strength of the turf surface.

The rate at which this thatch layer builds up will be determined by many factors:-

- 1) Type of grass species, some grasses are more vigorous and produce more vegetative matter.
- 2) Soil conditions – the number of bacteria / fungi present and the soil pH.
- 3) Badly drained soils – Soils clogged with water in the spore spaces will reduce the oxygen intake to the root zone and

inhibit the growth of bacteria / fungi

- 4) Weather conditions/climate.
- 5) Management Policy of the GKP

As indicated above the thatch layer is the main cause of many problems associated with the performance of the green. It is essential that the GKP should control thatch formation by thinning out the mat regularly – in fact thinning out the accumulated horizontal growth is as much a part of good greens management as mowing and should really be done as often as he uses the horizontal mower to curb the vertical growth.

Preventing thatch formation is the ideal but if it has already formed and is more than 15 mm thick then the GKP is faced by a real problems not only as far as the speed is concerned but the health of the grass could be severely compromised and he will have to resort to rather drastic mechanical devices to remove this thick layer

Two kinds of thatch have been identified

- 1) Sometimes one encounters a layer of material which is brown in colour and often looks like coconut matting. This is often produced by excessive acidity and a soil test can show exactly what the pH figure stands at. Excessive acidity levels reduce bacterial action in the soil and the natural breakdown of the fibre is, therefore, slower than it should be. If you try to change the pH other undesirable side effects will be observed, such as worms, weeds, coarse grasses and disease.

- 2) More commonly the thatch layer has a spongy yellow appearance and, in wet weather, can smell sour and unpleasant. Thatch of this kind is usually caused by poor drainage, of which compaction is likely to be the underlying problem. With yellow thatch aeration and selected topdressing are probably the most important considerations

Carbon is often applied as a food source to assist in the natural breakdown of thatch by way of soil macro and micro organisms. They are the factory by which all soils become productive once more.

Prevention is Better than Cure

Preventing thatch by proper management of the sward and effective cultural practices by including regular “thinning out” procedures in the management programme is easier than having to deal with all the problems that are caused by thatch and its removal but, in spite of this I still believe that irrespective of how efficiently the GKP tries to prevent thatch there will, always, be some build up which will have to be removed one day.

Thinning Out The processes whereby the horizontal growth is controlled by using certain equipment.

Brush The brush will remove any loose material lying on the green and cluttering up the mat. The brush will, also, make a number of the horizontal leaves stand up so that they can be cut by the mower. Some GKP's normally use the brush almost every time they mow in the sunner.

Verticut The verticut will slice the stolons to increase the leaf count and also remove loose material lying in the mat. It will, also, raise some of the horizontal leaves.

Groomer The groomer has many more plates and points of contact than the verticut and will, not only, remove loose material but, also, make the leaves stand up for removal by the mower.

Scarifier The cylinder is normally fitted with pins or nails which virtually tear out the upper part of the mat and dig into the soil. The scarifier is essential when removing last years growth at renovation but it can, also, be used in mid-season if the GKP feels that the mat has become a bit thick and spongy.

As some of the main problems associated with the formation of thatch is the fact that some GKP's do not remove all the grass when they scarify thus putting top-dressing directly on to grass preparing the way for thatch formation; – **a GKP must remove about 150 wheelbarrow loads of grass and**

muck when he scarifies – even if it takes him 7 days.

In general, the level and quality of scarification is dependant on the type of machinery available. In some cities it is possible to “hire” a scarifier which removes the required amount of thatch within a few hours

Following the above “thinning out” regime should keep thatch formation down to a minimum but it might not be enough. More drastic measures might have to be contemplated.

Removal of Thatch Most experienced GKP’s realise that in the same way as a cricket pitch gets slower with lowered bounce so will a bowling green get older and less responsive to his ministrations. I attribute this mainly to the existence of a layer of thatch just below the surface. The only remedy being physical removal by a sod-cutter. The mere fact that you cannot see a layer of thatch does not mean that the processes which cause thatch have not been active. Having observed the impressive improvement of a green after the “top has been removed” has convinced me that this should be a regular part of a greens management – say every 5-7 years

Sod-cutter Removal of the top 15 – 20 mm of grass will usually suffice unless the GKP is dealing with a major thatch layer more than 20 mm in extent. The first requisite is to establish the depth of the root system – one must, obviously, not remove 20 mm of the upper layer if the roots only extend to a depth of 15mm. It is, usually, possible to obtain the services of a nurseryman to remove all the sods- roll them up and take them away. If he does not want the grass the club will have to pay to have the sods removed

Apart from removal of the thatch removal of the upper layer has distinct advantages

- 1) If a green needs levelling it is much easier to level it when the mat has been removed..
- 2) There is no need to raise Ditch boards because the green is brought down to the level of the ditchboards every few years.
- 3) When re-planting a green it is essential that the layer of “old” grass and thatch be removed before planting

When the upper layer has been removed by a sod-cutter the green will be out of commission for 6 – 8 weeks - depending on the time of the year.

Shaver Many years ago some clubs used shavers to remove excessive growth. The shaver could remove 10 – 15 mm of the upper layer of the mat. It is uncertain why these machines have gone into disuse as they are the answer to mat and thatch control. A well known club in Pretoria had three greens and every year they used the shaver on one of their greens . They never had any problem with a thick mat or thatch.

COMMENT – A new inexperienced GKP will soon discover that if he does not mow the green regularly the grass will grow vertically and the green will become slower and, eventually, unplayable. Unfortunately the same cannot be said for the lateral growth and proliferation of the mat.

This is an insidious process and it might take many years before the GKP has found the balance between mowing height plus thinning out the mat and still retaining the required amount of leaf area to sustain growth and a healthy sward

GOOD LUCK