

Noel MacKenzie takes a timely look at mowing practices in a sequel article to "A Close Shave" (GI March 2000)

Second pass

Further thoughts on mowing practices

Of all the maintenance operations carried out at a golf club mowing certainly has the biggest impact. It is the only maintenance operation that, if it is left for more than a day or so, quickly draws the attention of all and sundry who visit the club. Every club official and employee from Club Secretary to trainee Greenkeeper should remember that clubs can stand or fall by the reputation of their greens. Greens that are not up to standard are quickly noticed and, as the word spreads, so the financial implications for the course concerned may be keenly felt.

Of course, there are many reasons why greens may slip out of condition but so often it is the case that mowing practices can be a fundamental and yet insufficiently considered part of the equation.

In my last article on mowing I described some of the background to cutting heights and how these should be considered. In this follow up arti-

cle I want to highlight some important issues of mowing and how these will affect the playing surface. Unfortunately, research into this most fundamental of practices lacks detail but I hope I can get across the essence of the important considerations.

What is it that makes the playing surface what we want it to be?

On greens the main concern is that the surface presents conditions that are fair for players to demonstrate their skills, especially in competition. What is required is a smooth (but not necessarily flat) surface that is free from discrepancies that would result in unpredictable ball behaviour ("bobble"). The surface should also allow the ball to roll at a suitable pace. We are concerned that the green should be consistent in both pace and surface uniformity without either factor becoming dominant.

To create such conditions from grass is asking a lot! We aim to achieve these goals by mowing to present a smooth surface where the ball can roll along the uniformly cut leaves. Without cutting, shoot growth from the sward quickly creates an uneven surface due to differences in growth rates across the green caused by the presence of a variety of species, and variations in soil moisture, nutrients, drainage, wear, etc. However, summer or winter, the grass comes under stress from many sources and since mowing makes up the majority of maintenance carried out, the importance of cutting regimes should not be underestimated. I hope that I can encourage the reader to consider some of the issues he/she should be addressing on a regular basis when looking at mowing practice and greens condition.

How grass grows

Most plants are severely damaged as a result of grazing by animals as the grazing occurs toward the outer edge of the plant where the buds are located. Grass is able to survive, even thrive, under grazing pressure since the bud or growing point (apical meristem) is located just above ground level, away from the herbivores' teeth. Cell division (growth) in grasses occurs from the bottom of the leaf rather than at the extremities as in most plants. Therefore, when the leaf is damaged or removed the plant just keeps growing up from the base.

Mowing by humans mimics the effects of grazing and, provided that mowing also mimics the consistent height and frequency at which grazing occurs, poses few difficulties for wild grass species in a non-playing situation. However, on a golf green the mechanical "grazing" we undertake has been taken to extremes. I find it amazing that plants have adapted to

survive the regimes that are often in place on golf courses, after all, many of the commonly used grasses naturally grow to around 30-50cm yet we expect them to survive (even thrive) at 5mm cutting height (or less!). Furthermore, this closely mown grass may have to take several hundred pairs of feet across it in a weekend, something that even the average domestic lawn would struggle to accommodate!

These close cutting regimes have been made possible by the development of low growing cultivars allowing mowing to be carried out more closely than grazing ever would. *Poa annua* however, has a natural ability to withstand close mowing, indeed close mowing may favour this grass against others in many situations - hence its widespread distribution on many golf courses.

The mechanical cutting of grass leaves triggers a whole chain of biochemical and physiological reactions in the plants. In order to survive, the plant must maintain enough leaf area to manufacture its own food through photosynthesis. Over short periods of time the plant can survive near complete defoliation (e.g. on a cricket pitch) but only if the meristem remains undamaged and the plant has enough resources in reserve (stored in the roots) to rebuild leaf tissue. We have to manage the growing environment to reduce stresses and allow it to thrive despite very low cutting heights. Our difficulty comes in achieving a balance between providing a good enough playing surface to satisfy the players while still maintaining a healthy sward that does not succumb to disease and stress at every opportunity.

What does this mean for the UK golf green?

Mowing is a fundamental tool in





the production of the surface as we have already identified. Most of us have had the textbook values for mowing drummed into us over the years, 5mm (3/16th") in summer and 6-8mm (1/4-5/16") in winter. Perhaps these are fine for what I would describe as the 'stable seasons' of summer and winter when more consistent expectations of weather prevail. However, each season also provides its own problems as we will see below where we will also consider the 'unstable' seasons of spring and autumn.

Stable seasons

Summer

In my experience it is quite rare to find a 5mm cut being employed on a UK golf course in summer these days. Many courses bench set to 4mm and some go as low as 3mm for regular cutting. Come tournament time cutting might be taken closer still with as much as 50% of the leaf area of the plant being removed without consideration of the implications for the plant. Last summer this problem was worse than usual due to the

wetter conditions that prevailed leaving mowers sinking into the greens surfaces and thereby exerting a closer cut.

Not surprisingly the grass frequently objects to such close cutting, though usually these reactions are predictable if only Course Managers or club committees would look further than the immediate requirements demanded by players. In summer time close cutting can quickly see the grass dehydrate and stress when the sun comes out, especially after a poor spring. How much time and money is spent correcting such issues and how much play is lost? It would be possible for a club to measure this in purely financial terms if required.

Winter

In winter the grass is semi-dormant depending on the weather and soil temperatures. At this time of year the plant needs to make greater use of resources stored in its roots. Grass growth is limited so pedestrian cutting is the norm on many courses, something I approve of because it allows the greenkeeper to feel the

green underfoot, an ability which is lost when using a triple mower.

In the winter mower heights are raised but usually only to the minimum winter height of 6mm.

However, because greens are often softer at this time of year the height of cut can be even closer than in the summer when the machine is set at 5 or even 4mm. If the height of cut is too low then the grass comes under greater stress. It is less able to manufacture food, less able to grow and produces less tillering. Rooting depth can also be affected. In addition the proportion of the leaf damaged when cutting in relation to the healthy leaf remaining will be greater. Under such conditions greens will wear more severely and it may be necessary to put play onto temporary/winter greens more frequently.

Unstable seasons

Spring and Autumn

Spring and autumn both bring with them the same types of problems though from slightly different angles.

The problems of autumn were really brought home last year when a course hosting a significant tournament contacted me. The course in question was losing grass density from its creeping bent/Poa annua greens and patches of grass were stressed and dying back. Signs of sub-lethal pathogen activity were identified in the samples submitted to a laboratory. Some inquiries soon identified the cause of the problem, close mowing (3.25mm) in October (in a wet year). Fortunately, frosts did not come early last year but even so with the height of cut raised it still took several weeks to restore reasonable surfaces. The moral is to watch those low heights of cut in late season or disease risk increases dramatically and the greens become wear-susceptible and slow to recover.

Low cutting heights in the spring or autumn cause real stress and dif-

ficulty to the grass. These are times of year when starch and other materials are either being mobilised for growth (spring) or stored (autumn). Damage or stress at these times uses up nutrients from stores held in the roots limiting sward performance for some time to come. Close cutting in the spring may hold swards back by two to three months, or leave them more susceptible to summer stress (drought). Such problems are more significant on inland and upland courses where soil temperatures are slower to rise in the spring.

The impact of mowing is both a simple and a complex matter. Simple because most green staff can quite quickly see a green beginning to deteriorate (provided they are looking for it!) and take appropriate action. Complexity stems from the business side where there are political and commercial pressures to pursue management policies which are less than ideal for the long term health of the green(s).

To conclude briefly I would like to emphasise the following:

- The greenkeeper must attempt to manage the greens in a more scientific manner with greater consideration of plant biology, balancing the demands of the golfer as well as possible with the long term condition of the greens.
- Mowing heights and frequency may have significant implications for sward species composition as well as sward health. Grass in a greens situation can cope very well provided that the height of cut is not altered too quickly or taken too low.
- Excessively low cutting should be avoided as it reduces playing surface quality (threatening course income) while increasing management costs.
- Cutting too high is equally undesirable and may result in poor playing characteristics, untidy appearance and problems such as greater disease susceptibility due to increased humidity within the sward microclimate.
- In a country such as ours we need to consider the weather far more carefully when attempting to mow the greens at a consistent height, especially in the light of warnings of future more extreme weather events from climatologists.
- While we must look to provide winter greens where possible we and, more importantly, players must understand that winter golf in the UK is going to be a compromise of what can realistically be achieved by grass in a cool, maritime climate.
- Competition and tournament organisers should aim for the main summer months to avoid possible long-term repercussions for golf clubs trying to maintain a regular income.
- Demands for speed come mostly from an elite band of members within a club. Correct mowing practice, balanced with other techniques, should make it possible to satisfy the majority without making conditions too fast. The scratch and low handicap players should be satisfied with good green speeds but no course can sustain high speeds for long.



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