

Noel MacKenzie of the STRI discusses the intricacies of cutting your turf to the correct height.

A close shave

Since the first Budding's lawn mower was manufactured in 1832 there has been a steady development of mowing technology by manufacturers which has helped to develop highly accurate machines capable of cutting in excess of 200 cuts per metre travelled. In addition, modern machines are fitted with a variety of "whistles and bells" such as groomers, brushes, etc., all designed to enhance the final finish. Used correctly the modern mower can produce the highest standards of finish that players have ever experienced. Furthermore, these high standards of cut are found from the elite championship courses with the highest aspirations through to the local clubs with less demanding players because the machines capable of achieving such high standards are now basic items of maintenance equipment.

However, whilst greenkeepers now enjoy the latest state-of-the-art equipment it is still common to find mowing equipment and the basic operation of mowing being insufficiently considered.

The intention of this article is to highlight matters relating to the

height of cut since this is probably the area where most misjudgement occurs. For the purposes of this discussion we must assume that the mower is well maintained, has sharp and accurately adjusted blades and an operator fully acquainted with effective and safe use of the machine.

What's your height of cut?

During advisory work I will always ask the height of cut being employed by the greenkeeper. Whilst many greenkeepers can answer my question to a fraction of a millimetre I must confess to being amazed by the number of answers which indicate no knowledge of the height of cut or only a vague indication. Where vagueness is noted the common response is, for example, "About 3/16 of an inch." Inspection of the mower, however, may reveal a height of cut totally different to that perceived by the greenkeeper. In one such instance I was informed that the greens were being cut at 5 mm but checking the mower found the height of cut set at just 3 mm!

Another common response is to refer to "notches" which are encoun-

tered when the operator adjusts the machine. Don't get me wrong, the height of cut may create the optimum finish when the mower is set to the "third notch" but the point to get across is that this is a qualitative statement rather than an exact measure and could therefore be open to interpretation. An accurate measurement gives a quantitative value to the cutting height in operation which is more easily communicated to different staff members. Additionally, most courses are cut with more than one machine or the machine may have three cylinders so there may be differences between the height of cut obtained with the third notch for example on one machine or cylinder unit compared with another. This could have a noticeable effect on the speed and finish on the greens out on the course.

Setting the height of cut and mower gauges

The mower gauge is the tool for this task and is simplicity itself to use, though there are different designs. Mower gauges will normally be supplied with a machine when

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purchased. If you do not have one then order a device from the mower manufacturer.

A good greenkeeper should check the height of cut frequently, ideally every time the greens are cut, along with whether the blades are set correctly, lubricant levels, etc.. Often such checks are not made and this is where many problems may start which can result in poor quality of finish and damage to the greens. These checks are best done in the afternoon before the sheds are locked up for the day. By preparing the machinery the night before use the minimum amount of time is lost in fueling, lubricating and adjusting machinery first thing in the morning when time is pressing to get ahead of play. In addition, if a machine has a problem it is better to find this out before you need it rather than when you need it, remember; "An ounce of prevention is better than a pound of cure!". Furthermore, fiddling with temperamental machinery in the cold of morning is an experience few people enjoy so better to avoid this and do any fiddling in the warmer hours of the previous afternoon.

What should your height of cut be?

This is a real "How long is a piece of string?" question. What may be appropriate on one course might be totally unsuitable for another even under apparently identical conditions and this may have potentially disastrous consequences.

Let's start at the beginning with text book values for greens:

Summer time = 5 mm (3/16 in.).
Winter time = 6-8 mm (1/4 - 5/16 in.).

However, whilst these might be ideal text book values it is common to find heights of cut varying considerably from these. For example, a course with firm greens might cut with machines set at 4 mm in sum-

mer and only 5 mm in winter whereas a softer, clay-based parkland green may struggle to cope with much below 5 mm in summer and less than 8 mm in winter.

There is not scope within this article to discuss in depth what your height of cut should be in every instance. In practice the heights of cut normally employed are dependent on:

- Experience of the Course Manager/Head Greenkeeper.
- Weather/climate conditions (both current and forecast).
- Frequency of mowing.
- Recent mowing and maintenance operations.
- Machine type employed (ride-on or pedestrian), flat or grooved front roller, floating or static head design.
- Usage of the course.
- The agronomic composition of the greens e.g. fescue intolerance of mowing below 4 mm or so.
- Sward Vigour.
- Tolerance of greens to drought stress.
- Sward stress tolerance and disease susceptibility e.g. anthracnose susceptibility in close mown *P. annua* swards.
- Firmness of greens (related to thatch content, drainage and construction).
- Irrigation system efficiency and effectiveness.
- Topography of surface.
- Emphasis placed on other operations to maintain green speed e.g. verti-cutting, grooming, rolling, etc.

If you are an experienced greenkeeper then you may take some of these factors into consideration without even thinking about it, but it still doesn't do any harm to have a look at the list above from time to time with fresh eyes to make sure you've not neglected any item. Like all maintenance operations on the course make sure records are kept of cutting heights.

If you are a trainee or less experi-

enced greenkeeper then don't be afraid to ask your supervisor/manager why he/she has chosen the height of cut employed. He/she may not always be able to answer this accurately but if you can understand the basis of the decision based on experience then that is a good start. As you progress through your career you will gather the knowledge of others and use it to make your own decisions in the future.

Having decided on the height of cut to employ you can go ahead and set up your machine in the workshop.

You've set your height of cut... but what's your height of cut?

Now your mower is set at the desired height of cut you are ready to cut the greens, or are you?

Beware, the cutting height set on your machine does not always equate directly to the grass length produced. For example, its winter on a wet golf green and there is some thatch presence which makes the surface soft. The mower has been set for 6 mm but the weight of the machine makes it sink into the surface by 2-3 mm. The result is that the green is being cut too closely, the actual cutting height being 3-4 mm (which might be lower than summer height!), which will stress the grass considerably and reduce the quality of the playing surface. Under the above conditions it may be necessary for mowing to be postponed until the surface has dried or, if this is not an option, raising the mower cutting height setting by a further 2-3 mm to achieve the desired results.

Knowledge is a powerful tool and unfortunately the greenkeeper has not, until relatively recently, been able to assess the actual cutting height on the green. Nowadays though, mowing prism gauges are available to allow assessment of the cutting height on the ground to be made. For example, at STRI we have

seen examples of a pedestrian mower set at a height of cut of 3 mm but using a prism gauge we find that the sward is left at 2 mm. These differences may seem very small, after all we're only talking about a millimetre or so aren't we?

Well a millimetre might be rather small to you and I but try to imagine you are only 3 mm tall and someone wants to take 1 mm off you, not a pleasant thought is it? In percentage terms this equates to 33%, or about a third of the plant. Even if the height of cut was set at 5 mm but came out at 4 mm this would still equate to 20% removal of the plant's leaf material! These large percentage reductions in leaf area must cause significant stress to the plant by reducing photosynthetic productivity and therefore plant vigour. Conversely, if a sward is under stress we can see what a big difference raising the height of cut by even half or one millimetre can make.

These thoughts become even more relevant when we consider that a green's surface can soften or dry dramatically within 24 hours and this could have a major impact on the real cutting height imposed on the turf. Nowhere is this more relevant than on overly thatchy or poorly drained greens. Turf nursery greens provide an opportunity to check mowing heights with a prism before going out onto the course (provided your turf nursery area is very similar in construction to your greens).

Changing the height of cut

When changing the height of cut the amount of millimetres should not, in my opinion, be the only measure of the change. I would suggest instead that greenkeepers think in terms of percentage change alongside the actual measured change. Realistically, for turf mown at 5 mm and with control of cutting heights almost impossible at less than 0.5 mm increments the best we can man-



age is changing the height of cut by about 10%.

Through the year conditions change and the greenkeeper must be ready to adjust the mowing regime to achieve optimum results. In the springtime great care must be taken not to push the grass too hard too soon by cutting close before growth is properly established. On coastal courses proper growth may establish sooner than on inland sites, especially on those inland courses with wetter greens based on clay which take longer to warm up and allow growth. As a general rule of thumb keep the height of cut up in the spring until growth is properly underway before slowly lowering it for the main summer season.

Summary

Remember, changing the height of cut even by a small measurement has a sudden and dramatic effect on turf being maintained at 5 mm or less. Furthermore, the mowing height set on your mower seldom, if ever, is accurately reflected in the length of

grass after cutting. Mowing constitutes the main management tool used in greens maintenance and its importance in sward health, agronomic composition and wear tolerance are often overlooked.

There is often a great deal of demand for pace but we should remember that the average golfer can find putting on fast greens very difficult indeed. In addition, windy sites really become very difficult to play if greens are too fast i.e. over about 10 feet using a stimpmeter. Consistency of putting surface is more important than pace (within reason). On courses with varied green construction mowing practices may need to be considered very carefully, especially if sward species composition is different also. Such situations may even require one mower to be set up differently for particular greens in order to maintain consistency in the playing surfaces from green to green. Try to avoid stressing grass through overly close mowing and too frequent application of other treatments in pursuit of pace which may cause

uneven growth, additional inflorescence (flower) production from *Poa annua*, pest invasion e.g. moss, pearlwort, etc., disease and even loss of grass cover. It should also be remembered that other maintenance inputs can be adjusted to reduce the stress of mowing practices e.g. irrigation, frequency of verti-cutting and grooming, etc.

Take care when selecting heights of cut, especially during the changing seasons of spring and autumn when the grass growth can be unpredictable. Is a consistent height of cut ever right? In essence, probably not since no two days are identical. However, the weather and wear pressures which the grass is exposed to can be broadly consistent and therefore the height of cut can be set at a certain level for short periods, but I would urge you to review cutting heights regularly.

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