

At the recent Turf Science Live educational event held at St Andrews in Scotland, Ian Mitchell, **Product Trainer** with Cutting Edge Training spoke of the benefits that can be achieved by using alternative roller designs on greens mowers.

It was surprising to note that many greenkeepers attending this event were not aware that such a comprehensive choice of rollers were available to help them prepare fine turf surfaces.



Ian Mitchell speaking on the benefits of using alternative roller designs at Turf Science Live in St Andrews

Therefore, this article is the perfect opportunity for him to discuss the importance of selecting the correct roller from the range of options available to today's fine turf manager.

Turf roller selection

Modern greens units are not supplied with a "standard" front roller. In fact, the front roller is selected from a range of options, designed to give the customer a choice for their particular sports turf surface.

There's more to roller selection than choosing either grooved or smooth!

Rollers vary in weight and in the case of grooved rollers, have a significantly reduced contact area. Therefore, selecting the correct front roller to suit your particular turf conditions throughout the year is extremely important.

They can greatly affect the performance of the unit and the quality of the playing surface, so it is imperative to get it right.

Weight:

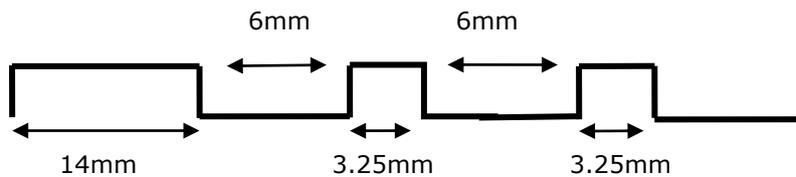
Light rollers are easy on the surface, but can contribute to thatch build-up as they simply run over the top of the turf, without sitting into it. Heavier rollers will sit 'tighter' to the turf and provide a closer cut and they will also give an enhanced rolling affect, which will produce a smoother turf surface.

The impact from **foot traffic and** pitch marks will be more effectively reduced by a heavier roller and the striped effect on the turf will also be more defined by a heavier roller and cutting unit arrangement.

Grooved:

Grooved, or Wiehle rollers, have been around for many years and have several effects on the quality of cut; firstly, the grooved roller has less surface area, so it will sit lower into the turf than a similar weighted smooth roller. Individual grass leaves will not all be flattened, so more are going to be cut, giving a better quality of cut when the grass is actually growing.

Grooved rollers reduce the contact area, so they sit deeper into the turf. The actual reduction in surface area is more than you might think:



The above illustration shows a typical grooved front roller dimensions; there are 57 grooves in a 22" roller, which equates a 60/40 split. The surface area contacting the turf is only 40% of the roller width (including the wider bearing housings at each end), and this is why the roller sits deeper in the turf, giving a closer cut.



The downside to grooved rollers is surface marking and the stress affect on the grass plant when the units turn during perimeter cuts. Most modern greens triples now have steering heads to reduce side loads, but these loads are not completely removed and fitting an aggressive front roller can cause unforeseen problems in soft ground conditions or during the winter months, especially when grass growth does not keep up with the wear and tear caused by grooved rollers.



This can be alleviated somewhat by the use of a sectional roller, allowing the inside section to rotate slower than the other two during the clean up pass.

Seasonal changes:

As mentioned above, the turf performs differently as the growing conditions change through the year.

In *Spring* we have softer ground conditions, early soft growth, which is still prone to disease and damage. Smooth rollers at this time of the year will help reduce marking, stress and turf damage. **Grooved rollers should then be fitted as temperatures rise and the growth rate increases.**

As we get into *Summer* we experience strong growth rates and healthy turf which is more resistant to wear and stress. Grooved rollers will give a tighter cut and the best quality finish.

In *Autumn* the growth rate slows and we experience softer soil conditions; this is the time to change to smooth rollers to reduce stress and the possibility of marking issues.

With the onset of *Winter* we experience colder, wetter weather and soft soil conditions. Smooth rollers would be the preferred choice to reduce marking and give the smoothest playing surface.

Mowing heights:

Most turf professionals are aware that the actual mowing height is different to the bench set height. The grass plant will offer resistance to the weight of the unit and this will affect the actual height of cut that is achieved.

This effect can easily be seen when a smooth and grooved roller (of the same approximate weight) are laid on a piece of foam. The grooved roller sits further into the material due to its reduced surface area, which increases the actual ground pressure.

It should be noted that this effect will change with the growth rate of the turf in question, i.e winter and summer and will also vary according to the amount of thatch build up in the playing surface.

By changing the rollers and measuring to a fixed datum point on the unit, we can see the differences created by changing the front roller.



Taking a fixed datum point helps demonstrate the differences created by changing the front roller

Fitting a heavier smooth roller can give the same actual mowing height as a lighter weight grooved roller, but with greater surface smoothing effect and less marking, which can lead to a faster, truer playing surface.

Types of roller and their uses:

Description	Weight	Application
Smooth roller	3kgs	Greens, Autumn/Winter
Grooved aluminium	3.4kgs	Greens, Spring summer
Smooth heavy roller	7.1kgs	Greens, Autumn/Winter
Grooved steel roller	7.8kgs	Greens, Spring/Summer
Segmented roller	3.8kgs	Greens, Softer surfaces
Sectional grooved roller	4.5kgs	Tees & Surrounds mowing

Accessories:

The fitting of groomers, bi-directional brushes and/or rear roller brushes all add to the overall weight of the cutting unit and will affect the performance of the unit in respect of its ground following characteristics and actual mowing heights.



Cutting unit fitted with bi-directional brush

Pedestrian Mowers:

With particular regard to pedestrian mowers, heavier front rollers can have a significant impact on the mowing height, as most operators do not allow the handles to float correctly.

Operators tend to have their hands placed on *top* of the handle, exerting downward pressure **which restricts the floating action of the mower**, and attempts to lift the front roller, changing the effective height of cut. Fitting a heavier roller can reduce this effect and provide a more consistent cut.



The correct method of controlling a pedestrian mower is to hold the side of the handles and “carry the handles”, keeping the handles in the middle of their mounting slots. This allows the machine to float over all the minor undulations of the green, giving a better, tighter finish to the green.



Keeping the hands to the side of the handle, makes it easier to control the bale arm and reduces the tendency to apply any downward pressure on the handles.



Some modern pedestrian mowers have movable engines or battery packs, which allows the Greenkeeper to change the forward weight bias of the mower to suit both growing conditions and the time of year to get the optimum results. This combined with good roller selection can greatly change the performance of the mower & the green.

The battery on the Jacobsen Eclipse2 can be moved front to back to adjust downward force on the front roller

Conclusion:

There's no 'one choice fits all' when it comes to the selection of front rollers for fine turf mowing. The choice of front roller is an important factor, because depending on the time of the year and the growing condition of the grass plant it can have a significant effect on the actual height of cut. Fortunately, the major manufacturers have a selection of rollers to suit the requirements of today's fine turf managers.

However, all of this advice will be count for nothing, if the mower is not on cut with sharp cylinder and bottom blades, but that's an article for later!