



# Greenkeeping – art or science?

Greg Evans gives an insight into his **greenkeeping philosophy** and how he goes about achieving his much talked about cutting heights

**When I was a young greenkeeper coming in to the profession I was always told that you can't beat experience and that greenkeeping was a simple art.**

Reduce water, don't feed and embrace the finer grasses was all that you need to do and the rest would look after itself. Oh what a dream. If only it was that simple. The problem is that we prepare these beautiful surfaces and then the golfers expect to come and play on them, compacting the hell out of them as they do. Then we have machines running all over them trying to maintain these top quality greens, so that the customers are happy. As for the weather, forget it.

If we relied on that, we would never open up the surfaces to be played on at all.

Over the years I have often thought about whether greenkeeping is scientific or just a simple art form. The traditionalists say that it's not rocket science and tell you to keep it simple, while the scientists tell you that it is anything but simple and you need to be a scientist to understand it all.

As you may have read, I have caused quite a stir over the past few seasons with my aggressive maintenance method based around a low cutting height. Over several years I have seen it work with my own eyes, but many are dissatisfied with this anecdotal evidence. They demand

facts! Hard facts, the sort that a NASA scientist would be proud of.

In my eight years as a Course Manager, I have come to the conclusion that the main reason Poa Annua has got such a bad name in this country is because it has been mismanaged and not fully understood. Colleges, Agronomists and research bodies have always preached that Poa should be eradicated from playing surfaces. Like Creeping Bent, we have been told that you need big resources and budgets to keep Poa happy. What rubbish! Like any grass, the Poa species needs a maintenance regime tailored to its needs. If it does, it will produce top quality putting surfaces.



#### about the author

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An automatic irrigation system



A prism gauge – used to tell the 'true' cutting height.

### Height of cut? Who dictated it, Agronomists or machinery manufactures?

Have you ever wondered how we arrived at our greens cutting heights? Whether you chose two, three or even five mm as your preferred cutting height, where did this number come from? The figure is probably based on the machinery capabilities of the day. If the soil scientists had their way you would be lucky if we got in to single figures! I am able to bring my height of cut down low because modern machinery allows me to do so. The skill is then to make this new cutting height sustainable. Just like they did in days gone by. I use techniques such as summer aeration and liquid foliar feeding to help keep the plant healthy. "Where is your

evidence?" I hear you ask. With this in mind I have started to compile data on my regime, with special emphasis of the cutting heights and plant health.

The thing that was really starting to frustrate me was that I knew my method worked but was unable to prove it scientifically. I had to have a way to turn my 'soft' data into hard, solid, concrete factual evidence. I also wanted to make sure that every maintenance procedure was based on solid information and not just guesswork based on past practices.

The first thing I did was to ask myself some questions. For example, 'When and why should I aerate?' or, 'How deep should I aerate?' My aeration programme, like many across the country, had always been based around tradition. It would inevitably happen during the winter months, with little or no aeration in the summer. This was when I had most time available for staff to do the work and also, more importantly it would be when the golfers would 'put up with it'. But if you look at this from an agronomic point of view, when is the grass plant under the most stress? Summer of course, when there is more traffic, less moisture

and greater disease pressure. The rootzone needs oxygen in greater quantities during this period, but like many turf managers across the country, I didn't want to upset my customers by going out and pumping lots of holes in the greens during the playing season.

Another question concerned my irrigation inputs. 'How much water should you irrigate with nightly to keep the plant healthy?' Do you go to the nearest green and bang your foot on the ground to see how hard the turf is? Or do you apply five minutes per night, because the club up the road does and their greens seem good?

Historically greenkeepers have applied our automatic systems in minutes and not millimetres. This is so wrong and probably one of the main reasons why automatic systems have got a bad name in the past. Five minutes at my course could be one millimetre of water. But at the course up the road, five minutes of watering could be double that amount.

After asking myself these sorts of questions, I started to look at areas that I wanted to know more about. The three areas that I've listed below dictate how a green will perform in terms of ball roll, reaction and reliability.





## 1. Plant health

There has been a lot of negative press aimed at the 2mm cut height. The argument is that the grass plant is put under additional stress because there is less root mass and a reduced chance for the plant to photosynthesise. However, recent research from America has concluded that *Poa Annua's* biotype, Reptans, only really requires a 100mm root depth mass to grow. There's even talk of reducing the rootzone depth in a U.S. specification green from 300mm down to 100mm. This is still a long way off, but the point is that there is no added value in adding a 300mm rootzone at considerable cost, if *Poa Reptans* only requires a 100mm root depth!

There have also been studies that have concluded that *Poa Reptans* takes in 23% more Carbon than *Creeping Bentgrass*. Plus, it also has a greater shoot density. So *Reptans* seems to be photosynthesising and tillering quite rapidly. Where other plants are putting their energy into their root depth, *Reptans* channels its energy into new shoots. It's a dominator!

With these issues in mind I have based my data around the following:

- Suggested picture of data tools
- Current carrying capacity (density)
- Organic matter levels down to 100mm
- Nutrient levels – both soil and tissue analysis
- PH and CEC levels
- Disease frequency and type
- Root depth and mass
- Height of cut – Bench setting versus actual
- Stimp meter readings relating to moisture deficit and height of cut.

The aim is to see how each area is affected by a sustained low height of cut over the next few years. The plant visually looks to be improving year on year, but we would like to know how its health is being affected.

## 2. Infiltration

Water movement through the soil is the most important function of a rootzone. Forget grass species or thatch levels; without a good, well draining soil medium, your greens performance just won't function. Sanding and aeration are the two most vital tools in achieving a well drained soil. One of these in isolation is pointless. If you go out and punch loads of holes in a green without backfilling it with sand, after several weeks the holes will be filled in. The sand is there to prise them apart.

Sanding and aeration are the backbone to my greens performance. However, I need to make sure that what I am doing is achieving my goals. The following actions allow me to monitor these procedures:

- Infiltration tests
- Soil moisture deficits
- Irrigation calculations
- Evapo-transpiration calculations
- Sprinkler auditing
- Water quality tests

## 3. Compaction

Compaction is the sin to any sports surface. If soil is compacted, plant health and infiltration rates will be affected. How many of us know whether our soil is compacted or not? Simple tools such as the Penetrometer give us this information. The readings can be taken 'in house', so that when you decompact next time, you know the right depth and angle that you should be using.

To ensure that decompaction is channelled in the right area two things are measured:

- Compaction levels
- Bulk density levels

I am trying to investigate and record my results in plant health, infiltration and compaction scientifically and will continue to do so over the next few years. I have some thoughts and theories that will hopefully be proved by the collection of this data.

Over the years there have been many advances in technology, especially in machinery. But the tools that the greenkeeper uses to maintain his turf have been slow to change. The addition of measurement tools such as the prism gauge and weather stations don't devalue the turf manager's ability, but allow him to make the right call at the right time, based on facts instead of just guesswork.

I've always regarded greenkeeping as a pure skill or art. However, over the years I've seen how science has come in to our profession and improved our surfaces greatly. We all need to embrace and understand the science of greenkeeping. Each grass species has positive and negative aspects. There is no single grass type that is the answer to all our prayers, so each grass species has to be managed in a different fashion.

Based on my research I hope to provide additional information on the *Poa Annua* biotype, *Reptans*, that will allow us to maintain it more effectively in the future.



ABOVE and BELOW: A hole core in various stages

BELOW: Summer aeration – 8mm tines, followed by a sand dressing



A petrometer



Collating data



*Poa Reptans* putting green surface