



parks will probably only be fully utilised for that one week in October.

“There is a semi permanent feel to the whole thing and we will need every one of the 141 days we have left to get everything into shape,” said Jim, who had the additional problem of dealing with a 20% staff reduction through redundancy last year as the Resort took action to preserve its long term future.

To compound matters further the annual Wales Open is still being held at the beginning of this month.

“We decided that May Day was the cut off for any significant changes we wanted to make to the course because of the Wales Open. If it hadn’t been in the calendar we could have made changes much closer to the date,” explained Jim, who has turned 2010 into an even more special year by getting married on June 20.

One problem, caused by the rapid growth and expansion of Celtic Manor, which has recently been resolved is that of the Maintenance facility which was originally built to

service the Roman Road course and its 12-16 staff.

“Towards the end we had more than 50 working out of it with three fleets of equipment and it was taking half an hour for a triple to drive to the 1st tee of the 2010 course. We went through an extraordinary number of tyres and a lot of fuel while guys were spending perhaps an hour and a half each day just travelling between the Maintenance facility and the course.”

The purchase of a farm in the middle of the 2010 course has cut that travel time to 90 seconds and provided a superb facility for machinery, aggregate, administration as well as home for three of the team.

Although completely different events the Wales Open will be used to hone some of the areas they will need for the Ryder Cup and is particularly useful when it comes to timing certain tasks.

“The Ryder Cup is three weeks later than its traditional slot, because of events which have been added to the US Tour and this adds



ABOVE: 9th green on the Roman Road  
MAIN ABOVE: 14th on Twenty-ten



BELOW: 1st on the Twenty-ten

to the pressure. I don’t envy Scott (Fenwick) at Gleneagles in 2014 and I know this is why Sweden pulled their bid – it gets dark in Sweden at 6pm in October.

“Here daylight will be 7am and the 1st tee time is 7.45am. As it stands the Home Captain doesn’t have to decide if he wants to start with Foursomes or Fourballs for some time yet. If Monty goes for Fourballs a round will take about five hours and I will have a bit more breathing space to ready the course, but if he decides to go for Foursomes they will be round in four hours and at every green much earlier and my guys will have to be really, really quick,” explained Jim, while in the room behind us Europe’s newest superstar, Rory McIlroy, was taking part in a photo shoot.

“We have to assume that it is Foursomes for the sake of planning. The first game will be on the 2nd green by 8.10am so by that time I will have had to have had the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 13th and 14th cut and by the time they get to the 5th I’m going to have



**“With supervision and mechanical support, people reading the magazine will work it out for themselves. We will have a team of around 120 working on the golf course”**

***Jim McKenzie***

to have had the 17th cut. So it looks like we will have one huge team on the practice ground – which for the first time ever will be floodlit – and six or seven separate teams working on the golf course.”

Jim also points out that Celtic Manor is not like Wentworth where you could have 100 people working on the 4th fairway with golf on the 3rd and no-one would know.

“This is a big open site and basically they don’t want to see us and they don’t want to hear us if it can be helped.”

The Celtic Manor team is very strong with many guys having

worked on all 10 Wales Opens and been involved in the building of the golf courses.

“The three Head Greenkeepers, Gary Connell, on the 2010; Paul Davies, on the Roman Road, and Nick Vickery, on the Montgomerie, as well as Neil Shepherd, the Irrigation Technician and Cal Callaby, our Workshop Manager are all excellent. You never hear me talking about my team. They all work with me, not for me.”

The logistics and the sheer numbers involved is quite mind boggling.

“We can’t have someone cutting the 1st green then moving to the 4th because that would be too noisy and too visual by that time, and if he broke down on the 1st we’d have a real problem. We’ll have two guys cutting the 1st then going to the 9th and two guys cutting the 2nd then going to the 10th so that they can get away, and so on. Then there will be between 12 and 14 guys cutting fairways so that the fairways of the first six holes will be cut within 20 minutes, the same number cutting tees. With supervi-

sion and mechanical support people reading the magazine will work it out for themselves. We will have a team of around 120 working on the golf course.”

That additional work force will be made up of volunteers drawn in the main from golf clubs in Wales and the South West and a few trusted friends from further afield.

“The reason for this is two-fold. One, it is only fair that Welsh greenkeepers who have invested their heart and soul into the Welsh Ryder Cup can be a part of it, and two, logistically accommodation is a problem so most of the local guys will travel from home and car share wherever possible. South Wales Section Secretary, Steve Chappell, and Regional Administrator, Jane Jones, have been instrumental in pulling this together.”

Although the match itself lasts for just three days the volunteers have to report to Celtic Manor on the Saturday before – six days before a ball is struck in anger.

“They will be inducted on the Saturday with insurance issues





addressed and risk assessments carried out and we go into lockdown on the Sunday. On Monday evening the teams arrive and they start practice on Tuesday before a ticket paying gallery of 45,000.

“Monday therefore is the only opportunity we have for our volunteers to work out there and learn the ropes. It wouldn’t look professional to be teaching guys in front of the players or the galleries,” said Jim, who has struck deals with the Match’s official suppliers including Pro Quip for uniforms and has also worked closely with his own suppliers, including Toro, Bernhard’s ClubCar and the like.

Weather permitting – and while the course has proven itself to be well draining fog is an issue that can’t be so easily resolved – the work will involve some very intense period of activity followed by long periods of downtime and so arrangements have been made for table tennis, pool tables, dart boards etc.

So what will Jim be doing during the week and what will he be 2feeling?

“I’ve recently been given my schedule for the week and to be honest I’ve put a line through a lot of it. I’ll have a lot of close friends here that week so I’d like to think I’d have time with them. I’ve been fortunate to visit Ryder Cups at Valhalla, the Country Club in Boston and The Belfry and spoken to Superintendents, who have had Ryder Cups. I have also visited Augusta for The Masters, as, like us, they own and operate their own event.”

One of his abiding memories, however, was four years ago when he spent a week at K Club during last European Ryder Cup.

“Jerry (Byrne) did an incredible job at the K Club and dealt amazingly with a hurricane coming through during the week. My main memory of that week was not the match itself but an hour after it had finished. I was in the tented village and some of the players and caddies were up on stage singing Amarillo with a band. I heard a cheer and turned round to see Jerry come into the village on the back of a buggy holding the biggest bottle of champagne you’ve ever



seen. People who didn’t even know him but must have thought he was important were cheering him.”

I’m sure that on the evening of October 3 there will be two such bottles of champagne. One in the hands of Sir Terry Matthews and the other being clutched by the man he convinced to buy into his dream – Jim McKenzie.

# Photography Competition 2010

BIGGA's Photographic Competition, supported by Syngenta, is back...

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The winner will receive a full course profile in Greenkeeper International and a special prize, while the 12 best pictures will be selected for the 2011 BIGGA Calendar.

Photographs will be accepted in three forms. Prints, transparencies, or digitally.

Digital pictures need to be high

resolution, at the largest size capable by the camera, as it may ultimately be scaled up to A3 print size (42cm wide x 29.7cm high).

Please try to avoid reducing the file size to fit on email as this will reduce the quality of the image.

If the file size is too large to send, we recommend using a compression facility such as Stuffit ([www.stuffit.com](http://www.stuffit.com)) or a website such as [mailbigfile.com](http://mailbigfile.com)

Also please note, cropping may occur if photos are to appear in the magazine or calendar. Also ensure digital photos do not show the time/date display!

Anyone wishing to enter should email them to:

[tom@bigga.co.uk](mailto:tom@bigga.co.uk), entering 'BIGGA PHOTO COMP 2010' as the email subject header.

Alternatively post to:

Tom Campbell, BIGGA HOUSE, Aldwark Manor, Alne, York, YO61 1UF.

All entries need to be received by July 31, 2010.

Only BIGGA members are eligible to enter.

Please note Syngenta will have access to the winning pictures and will credit them when and if used.

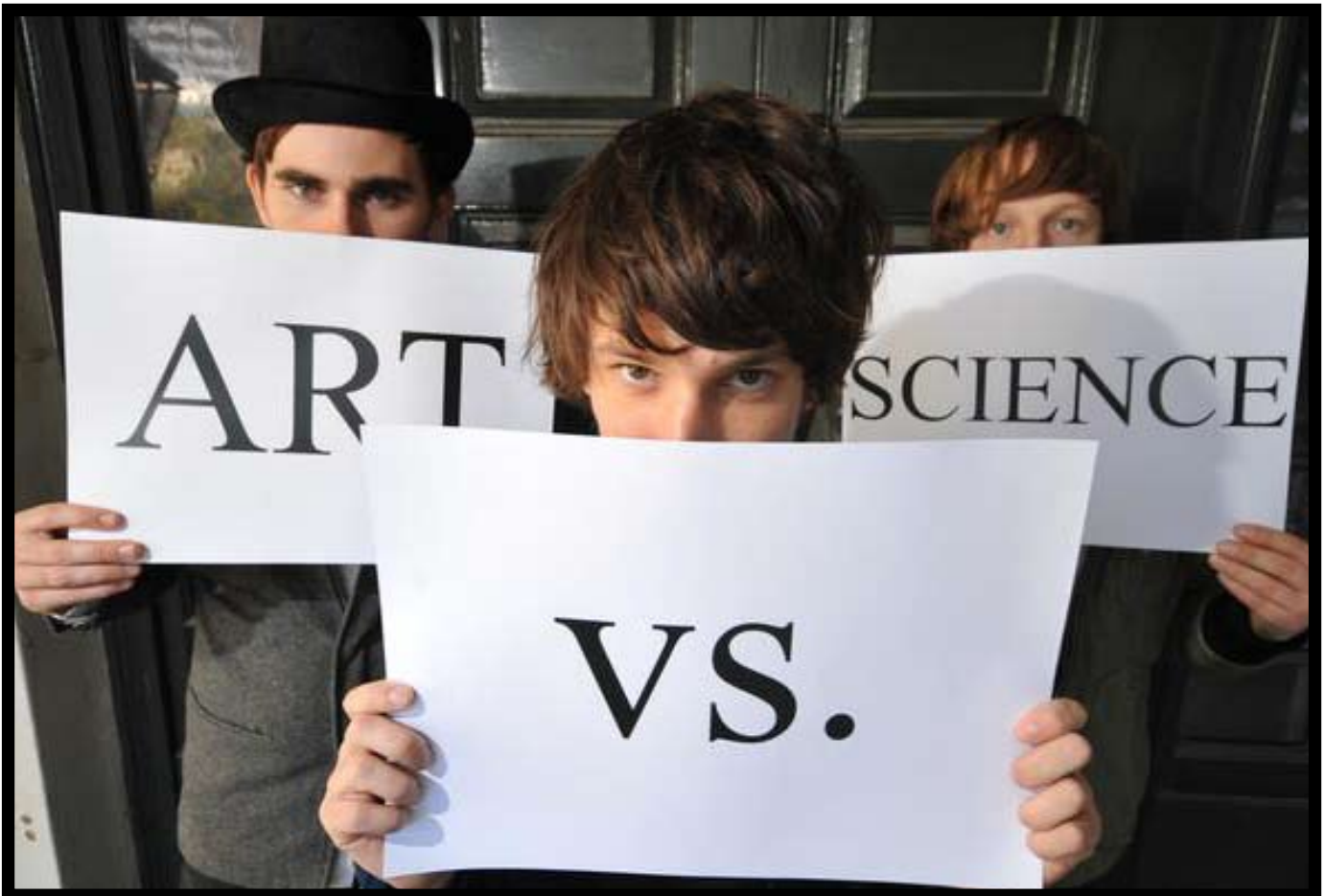


## BIGGA Calendar 2010

Featuring the Top 12 Entries for the 2009 BIGGA Photographic Competition, sponsored by Syngenta

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# 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

Greg Evans is a newly qualified Master Greenkeeper. He also leads the consultancy company, Complete Golf Solutions, which provides practical advice and assistance to clubs and their greenkeepers in the golfing industry. He can be contacted on 07951 157 208 or by email at gregevans1973@hotmail.com



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



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# Leatherjackets continue to undermine turf

Dr Terry Mabbett casts his expert eye over the leatherjacket

**By definition and description professional turf is a well nourished and nurtured sward but the crisply low-cut grass shoots and leaves offer slim pickings for insect pests, because the green above-ground pristine biomass is clearly limited in scope.**

But underground is an extensive dense and highly efficient fibrous root system, established over many years and active virtually year-round, collecting and pumping water and nutrients for stem and leaf growth to replace the clippings sliced off by regular mowing. Chafer grubs and leatherjackets are the two important insect pests of professional turf in the United Kingdom (UK), and both predictably target turf grass roots

Root zones of perennial grass species like fescues and bents, the key component species of UK professional turf, are ideal territory for invertebrate animals. And

logically better host plants than cereals which are essentially annual 'grasses' grown for a single season in the farmer's three to four year crop rotation on the same piece of land.

Lots of invertebrate animals feed on grass roots and thatch while only causing little if any damage to the turf, but a select few can rise to economic pest levels and threaten sports turf as a commercial playable surface. Invertebrate animal pests do not possess backbones but these two insects in particular – chafer grubs and leatherjackets – have the capacity to 'break the back' of fine professional turf with it the spirit of greenkeepers.

The larval stages (grubs) directly damage grass plants through their voracious feeding on the roots and indirectly, and usually more seriously, by attracting wild predator animals to feed on the larvae and causing penetrating collateral damage in the process. These may

be wild mammals like foxes and badgers or wild birds (especially corvids including rooks and crows), all seeking out the larvae (grubs) as food and tearing up the turf in the process.

## Leatherjacket life history

Crane flies (*Tipula* sp) the Dipterous (double-winged) insects popularly known as 'Daddy Long-legs' are among the most short-lived and delicate of insects, but this doesn't stop their robust, long-lived and 'hungry' leatherjacket larval stage from becoming a serious insect pest of turf. Mass appearance of adult crane flies during the perceptibly cooling and shortening days of late August and September marks the beginning of a year-long life cycle with rapid appearance of large, long-lived, robust and damaging larvae and the complete antithesis of adult crane flies.



### about the author

Dr Terry Mabbett has experience in grassland agronomy, and tree protection in forestry, horticulture and amenity. He has worked as consultant and technical writer in these fields for 20 years with a strong focus on pest, disease and weed management



Adult crane flies emerge from pupae in dew-covered turf on early autumn mornings and almost immediately lay eggs in turf. With hard winter conditions just several months away and no time to lose larvae hatch within 14 days and promptly start to feed on the grass roots. They feed at a low level through winter then step up a gear in spring, gorging on new root growth sustained through winter by autumn application of fertiliser. More fierce feeding resumes in the warmer conditions of spring on growth kick-started by spring fertiliser especially the phosphate components.

Leatherjackets continue to increase in size and voracity, cutting through turf grass roots and stem bases with sharp biting mouth parts through spring and into summer. Now approaching maturity and ready for pupation, they are 'greasy' looking, earth-coloured grubs, legless and several cm long with a tough and leathery cuticle (outer covering) and a correspondingly appropriate common name.

Leatherjackets feed on and damage grass roots through autumn and winter, but first tell tale signs of damage do not appear until spring when feeding accelerates and cumulative effects become apparent. In spite of the now warm moist conditions growth by damaged plants is sluggish and yellow patches of stressed and dying turf start to appear. Problems become painfully obvious during hot dry spells when already damaged grass is put under even more stress, dies and turns brown.

Affected turf is easy to lift having lost its firm anchorage due to extensive leatherjacket damage to the root system. Rapid weed growth in spring will take advantage of the weakened and thinner turf, and unusually large numbers of birds including corvids (crows, rooks, magpies and jays) and starlings may start to take an unhealthy interest, pecking down into the turf to secure the grubs.

Early symptoms of leatherjacket feeding and damage can be mistakenly taken for poor water relations, nutritional imbalance or even disease, but when large numbers of particular birds at key times of the year take up residence on turf this is a pretty accurate indicator of turf pests like leatherjackets and the signal for greenkeepers the signal to act quickly.

Lifting segments of the damaged turf reveals the leatherjackets but there are easier ways to locate and identify them. Soak part of the affected area with water and cover overnight with black polythene or old carpet which encourages the leatherjackets to the surface by the next morning.

Detailed examination reveals legless, segmented grubs with black retractile heads; a pair of horny jaws with two dark coloured spiracles (breathing holes), surrounded by six cone-shaped projections, on the last body segment. Leatherjacket damage is most severe on poorly drained soils and made worse by wet autumns. Any management practice that improves drainage is beneficial.

## Population dynamics

Leatherjacket populations vary from year to year, with prevailing conditions at key points of the life cycle affecting numbers and resulting damage levels in turf during the following months and into the next calendar year. Climate and weather clearly impact on adult emergence, movement and egg lay in September, autumn feeding of newly hatched larvae and their ability to survive the winter and resume feeding in spring.

The same leatherjackets are important insect pests of agricultural grassland and cereal crops with the farming community keeping a watchful eye on populations from year to year. This information can prove useful to greenkeepers by giving a strong indication of what they are likely to expect. For instance in spite of the very cold winter of 2009/2010, calculated in many parts of the country as the coldest for around 30 years, SAC (Scottish Agricultural College) is predicting high numbers and significant damage from leatherjackets. And this in the coldest part of the UK.

According to SAC Ecologist Dr. Davy McCracken two-thirds of all the fields sampled harboured populations greater than 0.6 million grubs per hectare (ha), while over half were well above that at 1 mil-

**“The severe winter weather will not have had any impact on reducing grub numbers. Leatherjackets are able to reduce their feeding until the soil warms up again”**  
**Dr. Davy McCracken**

lion/ha. “It means the damage and loss of yield could be serious when hungry grubs start feeding as soils warm up, said McCracken.

“Unfortunately, the severe winter weather this year will not have had any impact on reducing grub numbers,” he says.

“Leatherjackets are very resilient to cold and frost and all they do under such conditions is reduce their feeding until the soil warms up again.”

And this in spite of their shallow position in the soil where they eat the roots of grasses, cereals and other plants. SAC's annual surveys shows leatherjacket densities fluctuate from year to year, but there has been a consistently higher trend over the last 13 years linked, it is believed, to