



# Holes in the Ground

**Ian McClements studies aeration and its role in cultural disease suppression, fusarium patch and anthracnose basal rot.**

Turfgrass diseases are most common on highly maintained close mown turf, particularly golf greens. As maintenance intensity increases, so diseases become more common. Partly as a result of more intensive maintenance practices, we are now seeing disease pressures increasing on greens, tees and fairways that would have been uncommon five to ten years ago. Changes in climate are also having an impact, for example we have detected an increased incidence in fusarium activity over the past three autumns due to milder, wetter weather conditions.

Disease symptoms are the result of a causal agent (pathogen) attacking a susceptible host which, for the purposes of this discussion, is the turfgrass stand. Disease development thus depends upon three factors:

- (a) **The availability of a virulent pathogen, such as a fungus or virus.**
- (b) **A susceptible host possessing a growth rate that favours the parasitic activities of the pathogen.**
- (c) **A favourable microenvironment, particularly regarding temperature and moisture.**

The most common turfgrass diseases in Ireland, fusarium patch disease and anthracnose, are as a consequence of fungal activity. These fungi are incapable of synthesizing their own food and thus live as saprophytes by feeding on dead plant material or as parasites by infecting and deriving nutrients from living plants. Most of the common fungal pathogens live as saprophytes on dead plant material in the turf profile but also have the ability to become parasites when conditions are favourable. This parasitic activity can only arise when the fungus enters the host plant, through wounds and stomata, and undergoes an incubation period, during which time the fungus colonises and disrupts the normal physiological processes within the host plant.

It is important not to underestimate the importance of environmental conditions and their role in disease development. Excessively wet

conditions are particularly favourable for the development of most turfgrass diseases. Films of moisture allow spores to travel freely from infected to uninfected plants and, combined with humid conditions, tend to accelerate fungal growth rates. Fusarium patch disease is extremely prevalent under cool damp, humid conditions.

The maintenance of a healthy, actively growing turfgrass stand under dry conditions will make it much less prone to disease attack and therefore reduce the need to apply plant protection products, itself a costly exercise. There are many management factors that will determine the health and strength of the sward cover on putting greens but the two most important are water management and nutrition.

In my opinion, too much emphasis is placed on nutrition and not enough on water management, drainage and irrigation. Mechanical aeration helps improve the intrinsic drainage characteristics of the soil profiles but unfortunately aeration doesn't sound glamorous nor does it gain favour amongst golfers, who tend to despise holes in their greens, not to mention the superintendent who wants an easy life. Yet the foundations of a solid maintenance programme should be based around a year-round aeration programme that is suited to the nuances of the site, green profiles and levels of traffic on the course. There is no such thing as a "one size fits all" since all courses differ environmentally, architecturally and in terms of construction.

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### OPERATION

Producing firmer, drier surfaces will help promote a healthier turfgrass stand as well as reducing disease incidence. Water must penetrate the surface first before it can move through the profile to depth, highlighting the importance of surface aeration treatments such as solid or hollow tining. Hollow tining has the greatest influence on surface drainage, improving drainage rates for a five to eight week period with 1/2-5/8 inch (13-16 mm) tines on high sand content greens with the holes backfilled with sand (Carrow 2004).

Solid tining with a 1/4 inch (6 mm) tine will also improve surface drainage rates but its effectiveness is reduced within three to four weeks of the operation. The effectiveness of these aeration treatments declines due to hole closure at the surface as well as the plugging of the holes with new root mass.

Since fusarium patch disease tends to be most prevalent through the autumn period, it is crucial that any coring work completed at the end of the season is done so when weather conditions are suitable for sward recovery and, more importantly, to allow for the integration of top dressing. The application of heavy dressings to fill the tine holes is fraught with difficulties if the weather conditions are poor and the surfaces damp. The smearing of sand on a damp turf surface is a sure recipe for fusarium, more so in Ireland given the alkaline sands that are commonly used. Potentially disruptive hollow coring treatments associated with the subsequent risk of disease again suggest that this work is best completed as early as possible in the autumn period.

The predictions of milder wetter autumns due to climate change may extend the growing season but offer little comfort when contemplating the application of top dressings. A few forward-thinking clubs that complete the work in late August or early September enjoy better surfaces through the autumn as well as quicker recovery immediately following the operation. All in all, less disruption to play and better playing surfaces for longer.

Anthraxnose basal rot infection occurs long before symptoms become apparent and control applications of fungicide made once the symptoms are apparent will only protect plants that have yet to be infected. Routine preventative fungicide applications are costly and increase the risk of inducing fungicide resistance. Cultural control strategies represent the first line of defence against this particular disease, a disease that may be increasing due to the greater levels of stress that putting surfaces are being subjected to.

### ANTHRACNOSE BASAL

Anthraxnose basal rot is a stress indicator; healthy turfgrasses just don't succumb to this particular disease. Aggressive brushing in of top dressing, aeration and other cultivation techniques create stress but also have the potential to create wounds that allow the fungus to enter the plant. Verticutting and close mowing have been shown to increase disease incidence even if the treatments are completed prior to infection (Uddin & Soika 2003). It also seems possible that hollow core aeration is likely to be more



damaging to the turfgrass stand than less disruptive forms of aeration such as Hydrojecting or solid tining, the latter clearly being preferred during periods of stress or if anthracnose basal rot is already prevalent.

Lack of sufficient summer aeration combined with routine close mowing will enhance the sward's susceptibility to anthracnose basal rot. Sealing off at the surface prevents gaseous exchange resulting in reduced root function and greater stress. This is particularly common during rapid fluctuations in weather conditions and can exacerbate sward recovery from drought stress or drying. It is not uncommon to see midsummer outbreaks of anthracnose misdiagnosed as a consequence of poor nutrition rather than a lack of summer aeration that maintains an open, receptive surface to both air and water.

### SUMMARY

There are clearly a number of factors to consider when determining the most appropriate aeration programme to adopt to minimise disease activity but considering the plethora of modern aeration equipment, it should be possible to implement a year-round aeration programme with the minimum of disruption to play. The depth and intensity of aeration treatments should be varied to optimize gaseous exchange and drainage yet, on the basis of the standards demanded today, a monthly treatment through 12 months of the year would not be an unrealistic aeration policy to adopt.

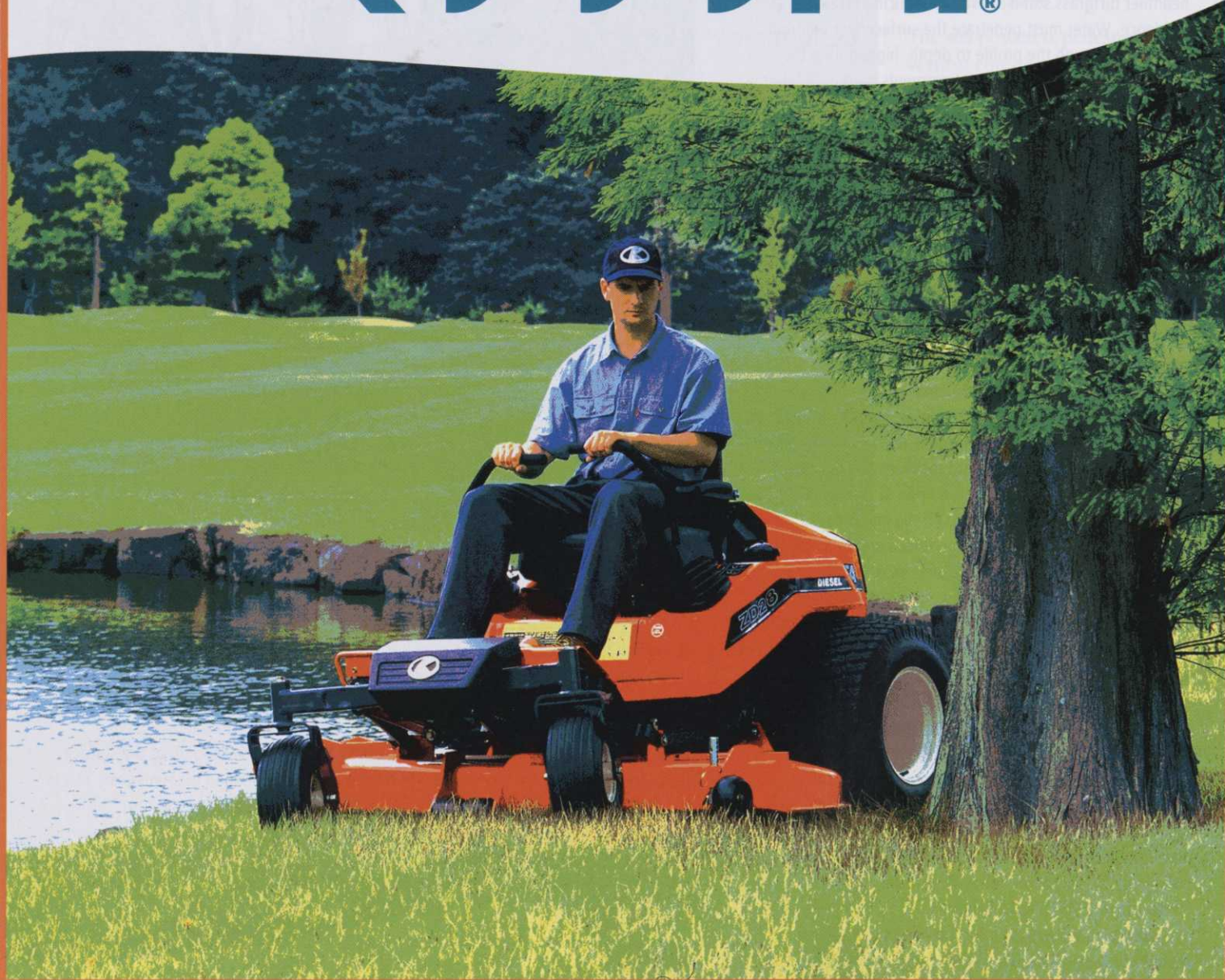
Nonetheless, the nature and intensity of the aeration programme will have a bearing on the strength and health of the sward and should therefore be site specific.

Carrow, R.N. (2004). Surface organic matter in bentgrass greens. USGA Green Section Record 42 (1): 11-15.

Uddin, W. & Soika, M.D. (2003). Effects of turfgrass cultural management practices on severity of anthracnose basal rot in mixed-annual bluegrass and creeping bentgrass greens. American Phytopathological Society Annual Meeting, August 9-13, Charlotte, NC.

Ian McClements is STRI Area Manager for Scotland & Ireland and can be contacted on 01274 565131.

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# Zeros to Heroes

James de Havilland looks at what's available with today's zero turn mowers - more choice, more performance and more productivity

When zero turn mowers first entered the UK market, petrol power and mowing decks that could be compromised in heavy going were the norm. Now Zero turns have matured, with choices that can include diesel power, heavy duty wide decks and collectors.

When zero turn mowers first started to be sold in the UK there were those who predicted this type of machine had the potential to take over from mid-deck tractor mowers and out front rotary models. It has not happened that way of course, zero turn models just adding choice to an increasingly diverse mower market. But there is little doubt that a zero turn mower, in the right application, will literally run rings around a 'conventionally' steered alternative.

The key to getting the most from these manoeuvrable mowers is choosing the right machine. Although it is tempting to lump all zero turn models into a single category, the reality is that there is a tremendous difference between the mowers on offer.

As a starting point are entry level petrol powered models with decks of perhaps 36 inch / 0.90m. Ideal for nipping in between trees and awkward to mow areas, these small zero turns are great at getting into areas that at one time would need clearing with a brushcutter. These entry level models are priced from around £5,500 for a 15 to 20hp unit.

Slightly larger petrol powered machines, with power units of about 25hp and decks of around 60 inch / 1.52m form the next 'group'. Physically larger than entry level models, these units offer good performance and productivity and can be well priced at around £8,000.



It does not take long to master the controls of a mower like the Toro Z590-D, a close cut around trees helping to reduce the amount of work that may previously have been carried out with a brushcutter. When trying a machine, try it with a collector. These can be useful when dealing with leaves in autumn



With a choice of 52 inch / 1.32m or 61 inch / 1.55m deck, the Wright Sentar can tackle reasonably large areas without any compromise on its ability to mow close to trees. As with any zero turn mower, clean turns can be achieved after only a little practice



Lastec offer a wide choice of zero turn models, with diesel power units from 22HP to 36HP. The established Articulator deck design allows close following awkward contours as pictured, the mowers being offered with deck choices that include working widths from 39 inch / 1.0m to 195 inch / 5.0m with three or four deck sections according to model. Options include stripping roller kits and collectors

Going for diesel power makes sense on units that will see a lot of use, a 60 inch / 1.52m machine tending to be priced in the £12,000 to £14,000 bracket. This is a significant hike compared to a petrol machine of similar width, but these prices are just a guide. Wider 72 inch / 1.83m diesel models will typically be priced over £15,000.

It is worth repeating the listed prices are ball park figures; it is really difficult to put a price to equipment these days and listing individual equipment prices can be misleading as a result. With this in mind, check to see exactly what the price includes. In some instances options such as a rear catcher and front weights can be disproportionately expensive. So cost them in from the start and not as an afterthought!

It is also important to check on the warranty offered. A one year warranty is the norm, but some manufactures offer second year cover as standard. Check the conditions of the warranty are made clear too. It does vary between suppliers.



The John Deere JD 717E and JD 997 (pictured) zero-turn mowers are powered by 19hp petrol and 30hp diesel engines respectively, the larger model being designed and built in Europe and featuring a choice of side-or rear-discharge decks. Both models are fitted with folding ROPS frame and lap belt as standard



Powered by a 20hp diesel and fitted with a 60inch / 1.50m deck, the Ransomes ZT220D is claimed to have the capacity to mow up to 3.5 acres / 1.4ha in an hour. Although this will be in ideal area mowing it does serve to illustrate the serious capacity offered by zero turn mowers



Fitted with a saddle as opposed to a seat, the 25hp petrol engine Wright Sentar is also offered as Sport version with a diminutive 36 inch / 0.90m deck. This allows it to work amongst closely spaced trees. The operator can stand up to get a better view, making the mower great in a tight space



Husqvarna offers both petrol and diesel powered zero turn mowers, the 27hp BZ27D sharing the same compact dimensions with other models in the range. Fitted with a 61 inch / 1.55m deck, its larger 34hp brother, the BZ34D will suit those looking for greater output with its 72inch / 1.83m mowing width

Powered by a 31.5hp diesel and offered with a choice of 61 inch / 1.55m or 72inch / 1.83m deck, the Ferris IS 5000Z is, in zero mower terms, a large item of kit. Despite this, it will still mow close to trees and around difficult obstacles, but has the mowing capacity to cope with large areas



JCB initially launched its zero turn mowers as concept models at SALTEX 2005. The diesel ZT20D is fitted with a 48inch / 1.22m rear discharge deck, the collector and side discharge decks of the pictured unit suggesting the company is looking to offer several options. Keep on eye on what JCB has to offer. The company has the determination and resources to develop its groundcare range



Offered with a choice of 60inch / 1.52m side- or rear discharge deck or a side-discharge only 72in / 1.83m unit, the 28hp Kubota ZD28 targets those looking for a rugged medium capacity zero turn that is equally at home in tough going as it is on finer turf



Powered by a 27hp three-cylinder diesel, the Toro Z590-D is offered with a choice of 60 inch / 1.52m or 72 inch 1.82m side-discharge deck. Available also with a mulch deck option or collector system, the ROPS frame can be folded to clear overhead branches



Cut and collect zero turns are often called upon to help with autumn leaf clearance, a point to consider when looking at new models. Kubota offer two collector models, the GZD15 and GZD21 with 15 and 21hp diesel power units with 42inch / 1.06m and 48inch / 1.22m decks respectively

# NEW PRODUCTS

## OUT IN FRONT

Kubota has replaced its established F60 out-front rotary mowers with two new models, the F2880 and F3680. Replacing the F60 range that first emerged back in 1996, they are powered by 28 and 36hp three-cylinder diesel engines respectively and benefit for an enlarged operator area to improve comfort. Up front, two main deck widths of 1.52 and 1.83m are on offer with the choice of side- or rear-discharge.

A dual range hydrostatic transmission is standard to deliver operating speeds from 0 to 20kph. Auto Assist 4WD is also fitted. This engages drive to the rear steering wheels only as needed, with the steering wheels freewheeling during a turn to help reduce the chance of turf damage. To operate, the new mowers are a definite improvement over the outgoing F60 units; there is a great deal more leg room for a start. The front lift system is also faster and has greater lift capacity.

For further information Tel: 01844 214500; Web: [www.kubota.co.uk](http://www.kubota.co.uk).



## QUICK HITCH

To facilitate the easy attachment of Broadwood's state-of-the-art SweepEx modular brush system to Telehandlers and other loaders, Broadwood International has introduced a new hitch that enables the SweepEx Megabroom to be coupled directly to the vehicle's back-plate.

The SweepEx has no moving parts, which means that the maintenance and downtime normally associated with ride-on rotary-style brooms is practically non-existent. The robust construction allows a powerful sweeping action both forwards and backwards enabling rapid, efficient and economical sweeping of large areas.

Available with numerous optional extras, the SweepEx magnetic bar assures the removal of nails and dangerous debris whilst the dust mop is ideal for polished floors. Other options include a debris collector arms and leaf collectors.

For further information Tel: 01794 388881.

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## SHOWCASING

The new Avoncrop Amenity Products catalogue has been launched showcasing the products available to the turf and amenity buyer. This edition provides the user with comprehensive information on the products, the application rates and all in a user friendly way.

Included are the very latest additions from the leading manufactures in the industry such as Primo Maxx from Scotts UK and new selective herbicides, Esteem from Vitax and Nocweed from Bayer.

For further information Tel: 01934 620868.



## SMART THINKING

Smartedge is a heavy-duty, lightweight 2mm thick polypropylene structure that is so durable that once installed a small tractor can run over it without damaging either the edging or the machine. Despite the strength it is still flexible enough to adapt to any curve required.

To keep a grassed area looking even smarter the A-frame system allows the grass on top of the edge to grow through and secure Smartedge to the ground.

The edging stays smart all year round, as the product is very weather and stain resistant. It is also very friendly to the environment due to its ability to be recycled and is non-toxic. Smartedge is available in 5, 10 or 50 metre lengths.

For further information Tel: 01923-255699; Web: [www.smartedge.co.uk](http://www.smartedge.co.uk).



## RAT TRAP

To help combat this year's unprecedented rise in rodent populations, STV, the poison-free pest control specialist, has introduced a Multi-Rat Cage Trap that traps 10 or more rats at a single setting.

The double-decker trap boosts catch rates using a proven multi-catch entry-port system, making it most effective in areas of high infestation. The trap is manufactured from heavy-duty steel mesh with rust-resistant powder coating.

It is easily set up, with self-setting entry ports at either end. A pre-baiting system also enables catch-rates to be boosted by overcoming rats natural neophobia - a problem that ordinarily makes it difficult to tempt rats into cage-type rats.

For further information Tel: 01953 881580.



## BUILDING A PLATFORM

Haygate Engineering, the pioneers of the Henchman range of safe hedge cutting platforms, has launched its tallest cutting platform yet - The Major.

Forming part of the company's Hi-Step range, the Major's platform height varies from 6' to 8', or up to 11' with a Height Extender fitted. This enables the user to cut across the top of hedges up to 16' (when cutting at 5' shoulder height). Like all Henchman, it provides the safe alternative to ladders and stepladders.

The main difference with the Hi-Step Major is that it has an aluminum frame with plated steel legs. After 18 months of research, and with advice from senior materials experts in the industry, the aluminum most suitable for this application was chosen. This has resulted in a really strong and very stable platform, but one that is remarkably light in weight for such a big platform.

For further information Tel: 01635 299847; Web: [www.henchman.co.uk](http://www.henchman.co.uk).

## VERTICUTTER COLLECTOR

Campey Turf Care Systems have further extended the versatility of their Koro Field TopMaker turf renovation machine, in the shape of the Verticutter Collector, which attaches to the 1.2m wide FTM 120 model.

At the heart of the machine is a verti cutting rotor, available with spacings of 20mm, 34mm or 40mm between the cutting blades, which are offered in 1.5mm and 3mm widths. The heavy duty steel hopper collects thatch and other removed material, negating the need for a tractor or trailer running alongside.

When required, the Verticutter assembly lifts and tips hydraulically, so that its contents can be discharged easily into trailers or utility vehicles like Pro Gator, Workman and Truckster units.

Extra cleaning brushes are also fitted to the front of the Verticutter Collector, to ensure the efficient collection of debris in wet conditions.

The Verticutter Collector can be retrofitted to the 1.2m Koro Field TopMaker machines already in use.

For further information Tel: 01260 224568 Website: [www.campeyturfcare.com](http://www.campeyturfcare.com)





## News from the Chief Executive

April rolls by and many of the golfing population in the UK are spurred into action by The Masters on the television and the prospect of longer, warmer days. In my part of the world, Yorkshire, I hope that Spring also means some drier days, there has been no apparent shortage of rainfall in this area over the last few months! Augusta looked immaculate, as you would expect, with the Azaleas adding that splash of colour and a lengthened course testing the competitors to the fullest. Congratulations to Brad Owen, the Superintendent, Jim Evans, his Deputy, and the rest of the greenkeeping staff not to mention a worthy winner in Phil Mickelson, who in my opinion is a good ambassador for the game.

Having been privileged enough to visit Augusta National Golf Club earlier in the year while attending the GCSAA Conference and Exhibition I was able to appreciate how such spectacular results can be achieved, unlike the myriads of golfers who will now expect their own course to be suddenly transformed into Augusta like condition. Although this will inevitably put pressure on many Course Managers and Head Greenkeepers in this country, and around the world, it is never the less important that we should all strive for higher standards. The main issue for greenkeepers comes in trying to satisfy the expectations of the golfer who is often unaware of the conditions and resources available and who sometimes overlooks the increasingly unusual weather patterns. Communication helps, both at club level and nationally and it was good to hear Peter Alliss make reference to the budget and exclusiveness of play at Augusta which sets it apart from your typical club! What is BIGGA doing to help you may ask. The answer is that we continue to provide courses on effective communication, available to members and non-members, and we are working with the other national bodies in golf together with making information available to the media all in an attempt to raise the understanding of the challenges facing today's greenkeeping staff.

The Association together with the AGCS are making steady progress towards their goal of producing a Standard Health and Safety Management System and the joint working group met again in April. The greenkeeping representatives are Andy Campbell, Les Howkins, Gavin Robson and Tony Smith and their commitment and contribution is appreciated. The next step will be to invite current Health and Safety consultants to a meeting in May in order to seek their support for the project and give them an outline of progress to date. I would like to take the opportunity to thank Ransomes Jacobsen Limited who have agreed to support financially the final product that will be available to members over the internet in due course.

Ransomes have also agreed to support the 2006 Environment Competition in conjunction with existing sponsors Syngenta and Scotts and I am also pleased that Course Care are joining the list of sponsors for this event for the first time. The responsible management of the environment is an important part of all our lives and I hope that members and their golf clubs will give maximum support to the competition.

I have received confirmation that John Deere Limited will this year resume the running of their national golf competition, the John Deere Team Championship, which will follow the format of previous years in so far as there will be local dealer sponsored knockouts culminating in a national final at the East Sussex National Golf Club in September. The lucky winners of the final will be invited to play in the John Deere World Championship in Georgia, USA (not at Augusta I hasten to add!) in November, an event not to be missed I am reliably told. John Deere have again pledged £25 to BIGGA for every dealer-sponsored team entered in the UK that will be used to support education for BIGGA members.

I, and my colleagues at HQ, are planning our Section and Region visits for this year and I will publish a list of events that we intend attending on the members' bulletin board and in the June edition of Greenkeeper International. We look forward to meeting faces old and new and I hope that members will take the opportunity to meet us.

**John Pemberton**

40 Greenkeeper International

### SCOTTISH REGION

The 2006 Scottish National Tournament will be held at Leven Links, Leven, Fife on Thursday June 22 2006 by kind permission of the Leven Links Joint Committee. The cost of the event will be £22, which includes coffee/tea, filled roll, evening meal and prizes. Apprentice fee will be £12.

Entry forms are available at all Section Spring Outings and from the Regional Administrator.

All entries with remittance must be sent to the Regional Administrator, Peter J. Boyd, 10 Meadowburn Avenue, Newton Mearns, Glasgow G77 6TA by Tuesday 13 June 2006. Cheques made payable to BIGGA Scottish Region.

Peter J. Boyd

### Ayrshire

New members to the Section this month are Robbie MacDonald, Brodick GC, and Mark Hodgson, Turnberry. This brings us up to about 125 in total which is a good increase from just a few year's ago.

The Spring Outing at Southernness will have been played and results will appear in next month's notes.

Western Gailes plays host in the Autumn on Wednesday 27th September with tee times from 2pm. The outing will also decide this year's winner of the prestigious Harry Diamond Jug as sponsored by Daval Products.

June 22 is the date for the annual Scottish Greenkeepers' Championship and will be contested over Leven Links GC, in Fife, so good luck to the Ayrshire contingent heading over.

The National Conference in Dunfermline was a resounding success once again, not surprising though with the quality of speakers. Our thanks to Peter Boyd for his work in organising the day. Then to cap it off Mr Brown took us for beers. Ya dancier!

Anyone interested in playing football against the West can contact myself or team manager, Marshall Sloss. We are hoping to get the game played in May so be quick or else Iain might have to play again?

In early October we are planning a little golf match against some of the lads from Northern Ireland. Probably a Friday afternoon game in the Irvine area, with possibly a few light refreshments taken afterwards in the quaint town of Ayr. I'll let you all know more of the details as things progress but anyone interested just get in touch with me on 07939104701 or by e mail at denis.t@hotmail.co.uk.

Dennis Tweddell

### East

I am writing this report in early April, with my wife whispering in my ear to remain quiet, as we have our usual visitors in the form of two lesser spotted woodpeckers to our bird feeder. A beautiful bird close up, it is extremely shy.

A man operating a revolving door system this month is Steven Halliday, head man at Melville Golf Centre, with the departure on a free transfer of Shai' Cunningham to Mortonhall Golf Club, Making his debut at Melville is John Shaw who has spent the last two years with the SRU at Murrayfield.

The new Deputy Course Manager at Cardrona is Bruce Watson who has been working at the Archerfield Estate for the past 18 months. A former head man at Selkirk Golf Club, Bruce commenced his greenkeeping career at Moffat Golf Club under the expert tutorship of Robin Macmillan.

The National Conference in early March was held in Dunfermline but the attendance from the East Region was disappointing. Only 10 members attended.

I must apologise (or causing Kevin to have kittens when in the last edition I gave the wrong date for the Spring Outing. sincerely hope it did not cause too much upset.

I promised two editions ago some input from Ian Kinky on his trip to Atlanta. The following with the odd adjustment is a report sent to me via email by Ian:

'I am in the middle of stripping the putting green ready for constructing a new one once the scaffolding comes down from around the new clubhouse, perfect timing eh, so this will be quick, short and sweet! We need to crack on if we are not careful it will stop raining and we'll be working whilst not soaked to the skin, and that will never do.

Atlanta 10 BIGGA delegates from around the UK, only person representing Scotland was me, an Englishman living here, although there was a Scottish fellow working in