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Official publication of the British & International Golf Greenkeepers Association  
**MARCH 1993**



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# GREENKEEPER International

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Launched by Viscount Whitelaw at BTME 1992, the Fund provides the key to the future for greenkeeper, golf club and game. Individuals and companies can join the Golden Key Circle and Silver Key Circle. For details, contact BIGGA on 03473 581.

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Course Manager  
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# Faces and places



Continuing its policy of regionalisation, the STRI has announced the hiring of Peter Winter as regional advisory agronomist in the south west of England. Peter is well known in the region, having worked for Fisons plc Horticulture Division for some 20 years, responsible for both sales and technical advice in the turf, amenity and commercial grower markets. Peter previously worked with the STRI back in the early 1970s.

Jeremy Howarth has also rejoined the STRI as an advisory agronomist, this after a 12 year break in industry where he gained considerable experience in marketing, promotion and PR. In addition to marketing and promoting the Institute, he will also be visiting subscribers, offering advice on the correct management of golf courses, sports grounds and amenity facilities.

Supreme Mowing Ltd have appointed Paul Wakefield as sales engineer, an eminently suitable post as Paul has been with the company since leaving school. He has worked in just about every department and his speciality has developed on the grinding machine business. Paul's first task began in early February when he visited customers within the Pacific Rim – Japan, Thailand and Malaysia – countries offering considerable scope for Supreme Mowing's expanding activities.



It's just as well that Roy Kates, chairman of BIGGA, arrived at BTME by car as he left with a surprise gift of a 25kg bag of Barenbrug grass seed. The grass seed mixture, including Barenbrug's high quality Barcrow, Bargreen and Bardot, was presented to Roy by Anthony Compson, managing director and Michel Mulder, marketing director of Barenbrug.

If Roy decides against turning his home lawn into a luxurious practice green, Wexham Park Golf Club is bound to stake a claim.

Horseman Harvey Smith is to appear in court in March, charged with assault, following an alleged incident at Baildon Golf Club in which two greenkeepers were taken to Bradford Royal Infirmary, one nursing a black eye and a colleague needing five stitches in a head wound. Smith, whose house borders the course, has been involved in a long running dispute over horses damaging the course and churning up fairways.

Greenkeeper International understands that staff were laying paths to keep horses off the greens when the alleged incident took place.



Winner of the Farmura 'See Your Spray' Blazon competition, Norman Fenwick, course manager of Sandford Springs Golf Course, is pictured here presented with his ticket to the GCSAA Show in Los Angeles by Jonathan Harmer, managing director of Farmura Environmental Products.

Falling under the editorial label of 'it was bound to happen, sooner or later', the Lancashire College of Agriculture and Horticulture has officially changed its name and title to Myerscough College, for donkey's years the monicker by which it had been affectionately known by greenkeepers. Though the name has changed, the college wish it to be known that Myerscough College remains a GTC approved centre for greenkeeper training.

On the evening of 4 February shortly after staff finished for the day, the four year old purpose built facility which housed most of Sunningdale's maintenance equipment was discovered burning fiercely, resulting in a near wipe-out of the club's machinery and equipment. Sunningdale's course manager, Lawson Bingham, told Greenkeeper International that major losses thus far include four tractors, a JCB, eight triplexes, five Cushman/derivatives, a GA 30, a Vertidrain, a Toro outfield spiker and every rotary mower and strimmer in the place! Came the reckoning, losses were so great that Lawson declared he was hard pushed to find a shovel for each staff member to help with the clear-up. The cause is still under investigation, though a forensic expert believes that an electrical short on a tractor will likely prove the culprit.



The SISIS Tankard, awarded annually to the Sparsholt College student achieving the highest grades whilst attending, on block release, Level II Greenkeeping and Sportsturf Management, has this year been won by Adrian Johnson. Thirty year old Adrian, attending Sparsholt on a continuation course in Greenkeeping Phase III, Supervisory Studies, is head greenkeeper at Broadstone Park GC., a public nine hole facility situated south of Guildford. The course was built on a land infill site and opened in March 1989.

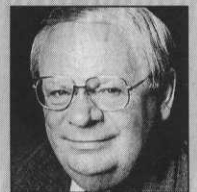
• Pictured, from left, Adrian Johnson, Russell Jordan (Sisis) and Bob Young (Sparsholt College).



Mike Taylor, who until recently was head of the Horticultural Division, has been appointed to the post of deputy principal at Elmwood College. The college has a roll of 350 full time and around 2000 part time students, following courses in Horticulture and Greenkeeping, Engineering, Agriculture, Food Studies and Business & General Studies. Elmwood College Horticultural Division remains at the forefront of developments in greenkeeping education and training.

Greenkeeping staff from the three neighbouring golf courses Newmarket, Bury St Edmunds and Haverhill have taken part in the 'Toro West Suffolk Greenkeepers Challenge Trophy' sponsored by Atterton and Ellis. Newmarket take first honours with A&E's sales manager, Roger Denson, presenting the trophy to Arnold Mynott. This was a Stapleford competition over a period of six months with the final scores reading: Newmarket 369 points, Bury 332 points, Haverhill 327 points.

This is the first of what is intended to be an annual Toro Golf Challenge, played between local greenkeepers or BIGGA members on a home and away basis, with perhaps one match played each month during the summer. Toro are keen for other local greenkeepers to join this 'challenge' and are seeking to recruit an additional three club teams.



John Kerridge, current deputy chairman of Ransomes PLC, is to succeed Astley Whitall as non-executive chairman of the company in April. Mr Kerridge joined Ransomes PLC board in 1984 and became deputy chairman in 1990.



Guy Longbottom, latterly operations director with Rolawn Ltd, has formed his own fine turf supply company, Turf International, operating from Wressle, North Yorkshire. He can be contacted on 0757 638964.



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# Yee har: Rounding up Ma Rion and the Westurf gang



I was on special assignment. I'd had the whisper from my 'grass' and come up with a place and a date – Long Ashton Golf Club, Wednesday 28th April.

Something big was going down but I was not sure how big. The word was that Ma Rion and her boys had organised something special. All the local 'dealers' were in on the act and some of the big 'gangs' from up country were in for their share of the 'cut'.

I didn't know what to expect so I went prepared for anything. It was my big chance to catch all these 'operators' in one go so I packed my shooter, jumped in my jalopy and headed out for Westurf.

They were sure of their security and as I swung in off the road a guy in uniform smiled and waved me through. I parked up and went to take a look around.

I was amazed, everyone was there and thousands of punters were checking out the merchandise. Some of the hardware on show was unbelievable. I kept my ear to the ground and one gang boasting about how it had cut down some 'bent grass' and another said he had a 'bandit' that did the best 'topping' job around. One dealer was openly offering 'ransom' deals while the main talk among the punters was about two hit men, Jim and Arthur, who had clashed with the authorities many times but no-one had managed to put them down.

There was one spot in particular that was crawling with uniforms. I was sure this was HQ and decided to take a closer look. When I got near, the uniforms closed in. A big guy asked me if I had seen the latest magazine. I couldn't

even see his machine gun but I took his drift and told him I was looking for the John. He directed me to this crazy guy who said he was a big 'supplier' and had some of the 'purist organics' around and did I want to sniff some. The man next to me said he'd tried some and it was the best 'grass' he'd ever had.

I glanced through the window of HQ and my blood froze. There was no mistaking that profile and that curl of smoke, it was Ma Rion herself and something big was happening. I could see the infamous Red Coats from up north, I knew it was my one chance to bag them all at once.

One of the Red Coats came out of HQ and the uniforms huddled round to protect him. Without a second thought, I made my move. I burst through the door my gun at the ready. Ma Rion didn't flinch, she looked me straight in the eye and said did I know anything about the 'Silver Key'. This threw me completely off guard and at that moment I felt an almighty thump on the back of my head and I passed out.

When I regained consciousness my head was spinning and I had a lump on my skull the size of a golf ball. This wasn't surprising as it was a golf ball that had hit me. Men in weird hats and funny shoes were bending over me and asking if I was alright and didn't I hear them shout 'Fore'?

As my head cleared I asked them what the date was? – March 25th – Thank God! For one minute I thought I had missed Westurf.

Catch the Action. Westurf – Long Ashton Golf Club – April 28th – be there!



Ma Rion – organising 'something special'

'SUPERGRASS'

## Campaigner for every greenkeeper in the land

The life of Norman Exley is best understood not by what he achieved for himself, considerable though this was, but by what he achieved for his fellow man. Listening to him at the BTME just days before his death, it was clear that the widespread euphoria celebrated that week was something he identified with as being in part of his making, albeit in the most modest of ways, for no man strove harder or worked more diligently than he to improve the greenkeeper's image, awareness or need for professionalism.

In a quiet moment he said, "I always knew we would get there in the end, and this week has proved my point beyond doubt – our profession has arrived!" His pride positively radiated.

Norman came to greenkeeping



Norman Exley: always optimistic

as a mature student after studying at Askham Bryan College, settling comfortably into work that he found totally rewarding, for the past ten years a cornerstone member of the staff at his beloved Northwood Golf Club. From his home base at Northwood he masterminded the Association's affairs

for his fellow greenkeepers, at first managing the old EIGGA London section, along with Martin Peters, and eventually taking on the major administrative role for the BIGGA South East Region, cajoling, coaxing, organising and rebelling as only he knew how.

Always optimistic, often against the odds prevalent in the hierarchy of golf club management, Norman could best be described as having the zeal of an evangelist when fighting his corner, for his corner was also that of his fellow man, his resolve never wavering for a moment – he was a campaigner for every greenkeeper in the land, and he was winning the battle.

An avid golfer, Norman demonstrated his love for the game not only by playing, but by again

being an organiser of such wonderful events in the greenkeeping calendar as the Walton Heath Gentlemen's Golf Tournament and Dinner and, his lasting memorial amongst so many, the 1992 BIGGA National Tournament at Littlestone.

Norman Exley's influence and contribution within the British and International Golf Greenkeepers Association will not be forgotten, his example an encouragement for others to stride forward with real purpose and genuine pride.

The sincere condolences of all BIGGA's members are extended to Linda at this sad time.

■ Norman Exley, greenkeeper, golfer, BIGGA regional administrator, born Manchester 11 June 1936, died London 6 February 1993.

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# Break in very lives

**B**eware the burglar, the damage he causes is not always just to property!

Intruders broke into our equipment store overnight recently, smashing the radiator on a tractor, spraying tins of marker paint on the walls and discharging a fire extinguisher. Upon entering the shed I discovered that the chemical cabinet had also been ripped open and without delay summoned the police. They arrived and did what they had to do before asking us to assess any loss.

The shed was in such a mess that we had to start at one side and work our way around. Only after 45 minutes did we reach the cabinet, discovering that a number of Phostoxin tablets were missing.

I informed the police immediately, having left instruction that the shed was OOB, as we had discovered two tablets on the floor, exuding toxic fumes as they reacted with the radiator leakage.

An hour later three of my staff were taken ill and an ambulance was summoned. The Fire Service was also contacted and three appliances attended. Some 45 minutes later I also was overcome by sickness.

For a while we were all on the critical list, needing oxygen overnight and some put on heart monitors – a spell in hospital was deemed necessary for us all.

The Local Authority Health & Safety officer has given us (the club) a clean bill as far as storage, security, assessments and handling was concerned, declaring us to be blameless.

The moral of this tale? Should my sheds be broken into in the future, I will be wearing protective clothing when I enter to check damage or loss. According to the doctors, my staff and I are lucky to have survived.

The police have charged three men with the offence of breaking and entering and causing damage... but there is no charge that

we can bring against them for what happened to us.

**GORDON MITCHELL**

Head Greenkeeper, Westwood Golf Club, Leek, Staffordshire

**O**n behalf of the Northern region may I thank those members who gave freely of their time at BTME, acting as stewards and working on our regional stand. Everyone did an excellent job, behaved most courteously and appeared smartly turned-out – indeed, they were a credit to our Association.

To those not familiar with the BTME, the first people encountered by visitors as they enter the exhibition are the BIGGA stewards, our front-line ambassadors. I see it as vitally important that they present themselves well for the good of the Association. The whole event was a great success and I hope everyone enjoyed it. Well done lads! May I have your names for next year please?

**BOB LUPTON**

Northern Regional Administrator, Shipley, W Yorkshire

**M**ay I use the columns of Greenkeeper International to thank the many kind people, too numerous to mention or respond to individually, who contacted me following my husband Norman's untimely death on 6 February?

The huge numbers of letters, cards and floral tributes that were sent gave true indication of Norman's popularity, especially within BIGGA, and I was deeply moved that so many people were thinking of him – and me – at this time. I am sincerely grateful.

**Linda Exley**

Northwood Golf Club, Northwood, Middlesex

**I** read with interest the letter from the president of Boldmere Golf Club concerning the condition of public golf courses in the Birmingham area and the sorry tale he told. I must point out that



## put greenkeepers' on the line

whether or not the courses are maintained by a private contractor, the standards of grounds maintenance are determined by the Council through its specification and the subsequent management of the contract by the client. The limiting factor is generally financial, and I am left wondering how much a round of golf on Birmingham municipal courses costs and whether a reasonable price increase to pay for an increase in the standard of maintenance is called for.

At Bradley Park Golf Course in Huddersfield the specification for grounds maintenance (contract won by the in-house direct works organisation) is designed to produce high standards of maintenance and has achieved this through the endeavour of the contractor and the co-operative but watchful eye of the Council's client officers. This specification is achieved on a green fee of approximately £8 a round.

However, it will also interest your readers to note that the course has been closed to date (11 December) for some six weeks. The relatively new course, built on a clay sub-soil, has experienced saturated top soil conditions because of the record rainfall in October and November and even those areas of the course with extensive drainage systems have been unplayable. What is remarkable is that two miles down the road a 100 year old course has been open throughout with most areas in good condition: firm underfoot with few areas which could be considered unplayable. The main reason for this amazing contrast is the effect of thatch on the fairways, in this case preventing the downward movement of water to the soil to such an extent that, despite the record rainfall, test holes reveal a bone dry soil underneath the 3" thatch layer. This all bodes ill for the summer when drought conditions will soon be prevalent because of the lack of moisture in

the soil – but what a boon for winter golf!

When extended course closure results in a loss in revenue of many thousands of pounds, I find myself wondering whether the thatch we see as a villain and spend so much time eradicating is in fact a friend of the fairway and not a foe as widely believed. Perhaps a case for thatch management rather than control?

**JOHN S FLETCHER**

Operations Manager,  
Kirklees Metropolitan Council,  
Huddersfield

**M**ay I respond to John Turner's letter in the December issue, by saying that many municipal greenkeeping staff strive under very difficult circumstances to achieve the same high standards of presentation and quality as those found on many private courses. The tone of Mr Turner's letter tars all concerned with the same brush, yet there are good and bad courses, both public and private.

CCT, however, seems to be the latest spanner in the public golf works. For many years municipal golf received a bad press due in the main to the lack of interest paid by some local authorities in the game of golf itself. With the realisation that there was valuable income to be gained and a demand to be met, many have attempted to put their house in order.

Situations that have arisen, as appears in Mr Turner's case, are a direct result of the process that many authorities have taken under CCT. The area that Mr Turner is concerned with is the grounds maintenance/course maintenance operation, whether put out to tender as an individual service or undertaken as an entire golf course management operation by a private company. The key to successful operation under this system lies in the course maintenance specification.

In my experience, because the

specification is written without skilled input from experienced greenkeepers and course managers, it is often outdated and inappropriate. Poorly written, it can provide an unscrupulous contractor with many loop-holes by which vital areas of maintenance may be overlooked.

At the other extreme, specifications have been written in such fine and rigid detail that work is often carried out completely unnecessarily, eg. spraying for fusarium patch on a set date, even when none is present! Both extremes threaten the success of the tenderer and the quality of the course by:

- a) The contractor being kicked off the site as the course deteriorates into such a bad state, as he is deliberately allowed to miss jobs out – the 'if I don't say it, he won't do it' syndrome – along with employing unskilled staff, using poor quality materials etc.
- b) Placing a burden of financial pressure on the contractor – even the better, conscientious one – and often placing him in real financial difficulty when he is forced to carry out unnecessary tasks.

As a final point here, the Local Authority invariably make the mistake of opting for the cheapest bid when buying course maintenance as a direct service, or awarding the contract to the highest bidder when the entire management package of a golf site is put out to tender. In this case may I suggest that Mr Turner digs a bit deeper, for there are courses of action he can take. He should be hounding the Local Authority concerned and going through the course maintenance specification with a fine tooth comb. If the contractor is not meeting required standards, the Local Authority should be issuing him with default notices. If a number of these do not suffice, then they should be relieving him of his contract. Perhaps the final twist in this bureaucratic nightmare is that

some Authorities are unwilling to do this, as the cost of re-writing the tender specifications – the documentation and the pure laborious process of it all – is one they are reluctant to undertake a second time, especially so soon after a contract is awarded. In these cases we only hope that come the next round of CCT they get it right!

What is required is rational and expert management communication and understanding of the whole process – from town clerk's pen to assistant greenkeeper's mower – in order that delivery of the high class facilities and courses all golfers deserve may be achieved.

**PAUL COPSEY**

Head Greenkeeper, Barnehurst  
Golf Club, Kent

**B**ringing the dangers of Fluorolaster and Veton to the attention of your readers (October, Flying Divots) is to be applauded.

Our company contracts maintenance work all over the UK and on many occasions, especially in the early morning, we have come across stolen burnt-out vehicles that have been abandoned, both on inner city and rural courses.

The temptation to ferret around in such vehicles is considerable, yet without a knowledge of the dangers that lurk therein, anyone without a COSHH assessment is literally playing with fire.

Sanity alone suggests that before approaching such dangerous substances, which when melted turn into highly corrosive Hydrofluoric acid, the handler should at very least wear industrial gloves, for should the product come into contact with bare flesh, amputation is the only solution – too horrible to contemplate.

Congratulations on a very well presented magazine. Continue to keep education to the fore.

**DAVID STEPHENSON**

Company Secretary,  
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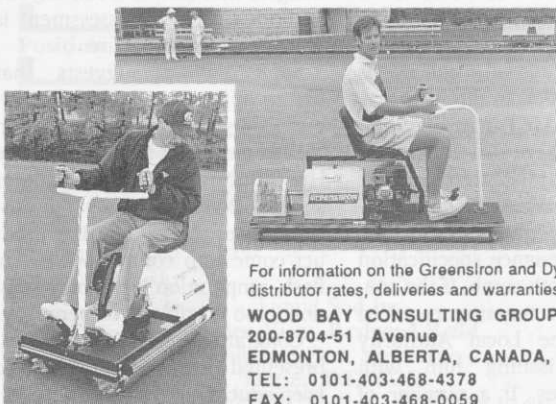
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Over the last three years, **KATE YORK**, research officer at the **STRI**, has been researching the biology and control of dry patch as it affects golf greens in the UK, supported by funding from the **Royal and Ancient Golf Club of St Andrews**. Dry patch is a term used to describe a turf condition which is characterised by the presence of underlying water-repellent soil. This article is the first of two showing how our knowledge of dry patch in the UK has increased, with reference to results obtained from an extensive questionnaire survey and provides a practical guide for the greenkeeper on how best to manage dry patch on the greens.

# DO OR DRY

**S**ymptoms of dry patch first become apparent during the spring, but usually develop to a maximum through the summer months when it is generally most severe.

The localised circular to irregular shaped areas of the golf green affected by dry patch range in size from small, isolated patches to a general effect, as can be seen in the photograph. The turf present in affected areas generally shows signs similar to those of drought stress, i.e. the turf wilts and is unable to return to an upright position following compression by, for example, foot traffic. The botanical composition of the sward and its appearance is one way of determining areas of the golf green affected by dry patch. Due to the low moisture content of soil in affected areas, the relatively shallow rooting annual meadow grass (*Poa annua*) tends to die out, leaving the deeper-rooting, darker green *Agrostis* spp. and *Festuca* spp. to dominate affected areas. Under extreme conditions of high summer temperatures and low water availability, the grass in affected areas will eventually die out resulting in unsightly bare patches.

The photographs overleaf show the condition of the soil in both unaffected areas and those affected by dry patch on the same green. In the first photograph, the soil appears dark due to its high moisture content, which 'holds' the soil together following the removal of the soil core. In areas affected by dry patch the soil moisture content is severely reduced and the soil takes on an almost dust-dry appearance, which causes the soil profile to crumble when a soil core is removed (second picture).

An extensive questionnaire survey has enabled us to determine the extent and severity of dry patch on UK golf courses. The questionnaire was divided into several subject areas including presence/severity of dry patch, greens maintenance and the use of wetting agents. Eighty-five percent of courses included in the survey indicated a problem with dry patch. Due to the total number of parkland courses within the UK, it is not surprising that over 60% of affected courses included in this survey were parkland. However, although a fewer number of heathland and links courses were surveyed, the percentage of these courses with dry patch was 82% and 100% respectively. The results obtained from the survey indicated dry patch had only been a problem on the majority of courses for 2-5 years (up to 1991), although we know that dry patch has been recognised on certain courses for over 20 years. It is possible that the symptoms have only recently become apparent due to changes in maintenance practices, eg. reduced irrigation, even though in fact the soil may have been water-repellent for many years.

Eighty-seven percent of completed surveys confirm the common belief that dry patch generally affects older, more mature greens. However, the results showed that just over 10% of courses surveyed indicated the presence of dry patch on greens which were less than ten years old. Severity of dry patch on individual greens was recorded as the percentage area exhibiting symptoms. On the majority of courses included in the survey, between 5-25% of the green's surface was affected by dry patch, but in extreme cases up to 75% of the surface showed dry patch symptoms. The results of the survey indicated that in the majority of cases, once dry patch had been identified, there appeared to be no annual increase in the extent of the symptoms, i.e. dry patch does not appear to 'spread' like fungal diseases are known to do.

Applications of high sand content top dressings have frequently been suggested as a likely cause of dry patch development. Many courses do use these top dressings, but if they were causing this condition it might be expected to occur as a blanket effect across the entire greens' surface, rather than as the patchy distribution which is actually observed. However, it is true that if by some means a water-repellent material is being deposited in the soil, sand grains will be 'covered' more readily than smaller soil particles, due to their lower surface area:volume ratio and express the symptoms of water-repellence more rapidly.

Both thatch and root breaks have also been suggested as causing dry patch, however, neither appears to be a significant problem on affected greens included in the survey. Thatch if allowed to dry out is known to be highly water-repellent and is capable of forming a barrier to water penetration. It is possible therefore, that thatch may enhance the severity of the symptoms but it is not a primary causal factor in dry patch development. Root breaks can appear on any green, irrespective of its construction type or its age and occur as a result of a change in the physical state of the soil. Most commonly, this is a result of a change in top dressing material, which eventually leads to shallow rooting, poor turf composition and frequently an increase in its tendency to dry out.

From the results of the survey, we have found no evidence that dry patch is caused by compacted soils – another common misconception. Over 60% of the affected courses surveyed indicated no association between areas of dry patch and the normal traffic routes/pin position. Compaction may itself cause reduced water infiltration and subsequent deterioration of the sward, but it is not directly associated

## How to manage dry patch on the golf course



Core holes taken from adjacent unaffected (left) and dry patch (right) areas

# DO OR DRY

11 → with dry patch development.

Finally, as expected, non-ionic wetting agents are used on 93% of courses affected by dry patch, in an attempt to control the symptoms. Currently, a wide range of wetting agents are in frequent use as a tool to combat the problem. However, it appears that although wetting agents solve the short-term problem of getting water into the soil profile and sustaining plant growth, the symptoms of dry patch recur shortly after treatment stops. Various methods of aerating the soil such as spiking are frequently used, particularly on severely affected areas prior to wetting agent application. If certain areas on particular greens are known to have a severe problem with dry patch, it is perhaps advisable to complete the first application of the wetting agent in the early spring before the symptoms begin to show.

It is well known that whilst wetting agents have a role to play in turf management, they will never be able to solve the problem of dry patch completely, but currently they are an effective means available to greenkeepers to reduce the symptoms.

Laboratory analysis of soil has identified a significant

reduction in the moisture content of soil from areas affected by dry patch when compared with adjacent, unaffected areas. However, soil analysis has also shown that there are no significant differences between soil from dry patch and unaffected areas with regard to levels of pH, phosphate, potassium or nitrogen, nor are there any significant differences with depth with regard to soil particle distribution or soil organic matter content. These results tend to imply that dry patch is more likely to be a biological problem rather than a purely chemical or physical one.

In conclusion, we are now aware of the distribution and severity of dry patch on UK golf courses, its associated maintenance factors and how the problem is currently being alleviated with wetting agents. In addition, the physical and chemical characteristics of soils from areas affected by dry patch have now been well defined. This information is crucial for the development of techniques to remove the deleterious effects of dry patch on UK golf greens.

■ In April's Greenkeeper International, the results of research at the STRI on the influence of turf irrigation practices on dry patch formation and the possible biological causes.

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## Demand for golf in Germany to 'explode'

Under the Communist regime in East Germany, golf was rarely played, as the sport was viewed as typically capitalist, and its introduction was discouraged.

For a long time even in the former West Germany there was a suspicion that only the wealthy could afford to play. For this reason the number of players has been, and continues to be, small. Of a total population of about 80 million, there are only 170,000 golfers, belonging to about 370 clubs.

In comparison to the United States or Great Britain, Germany is, in golfing terms, an under-developed nation. Still, there is an unmistakable upwards trend: the number of players has doubled every ten years. Recent surveys indicate that more people would play golf if more courses were available. Many existing clubs will accept no new members and public courses are almost non-existent. The only public course in the whole of Germany is in Düsseldorf, at Lausward.

Many golf course projects in the western part of Germany do not proceed because of the concerns of the politically appointed committees that are responsible for issuing permits, or because they cannot overcome conflicts with environmental protection measures. In addition to their significant successes in national politics in recent years, members of the Green political movement have gained considerable influence in elected bodies at the city and town level. They regularly oppose the construction of new golf courses. Considerations of preservation of the countryside and protection of the environment lead many of them to try to put a stop to a sport they have chosen to mistrust. For these and other reasons the construction of golf courses in the densely populated parts of western Germany has become almost impossible.

So it is not surprising that shortly after the reunification of Germany in 1990 planning commenced for new golf courses in the eastern part of Germany. The eastern part offers many good conditions. It is not as densely populated as the western part, so there is more space available and environmental concerns can be more easily accommodated. Most importantly, there is a more open-minded view of golf in many cities and towns. Golf is associated with expansion, prosperity, and the growth of industry. There is keen interest in any form of investment, which (for example) is a factor weighing heavily in favour of a proposed development when the effect on the countryside is being assessed.

The real boom will only come when the federal Government Ministries have been completely transferred from Bonn and Berlin is fully established as the capital of Germany. The demand for golf courses and golf clubs is then expected to explode. The golf courses that profit most from this boom will be those that were planned properly at the outset. Good sites for popular golf courses won't be available for ever.

■ Reproduced courtesy of Denton International, from their January 1993 Leisure Newsletter.

# On your

**T**he difference in golf course greenkeeping between Germany and Scotland is quite striking. To a large extent this may be attributed to Germans slavishly following the American example, rather than attempting to develop the traditions of 'real' golf, such as may be found in Scotland and elsewhere in the British Isles. The point must be made: Britain is a much closer neighbour than Florida and one might sensibly assume therefore that it offers a more appropriate example to follow.

Wall to wall manicuring and course 'prettifying' has become the essential criteria, not only in Germany but in many other European countries, and the true turf quality we greenkeepers know to be critical to the game has in general been sacrificed, or at least not fully recognised as being of high priority, in the European quest for a 'beautifully green' golf course.

As with most developing industries, initial influences can have a lasting and sometimes irreversible effect. This may be seen to the extent that fescue greens are unheard of in Germany. To some extent this is understandable, for in very many instances greens have been improperly constructed using poor materials and employing doubtful specifications. They are then built only to about 350 - 500m<sup>2</sup> in size, with crazy contours which severely restrict pin positions.

In my experience, tees also are generally too small in area, offering little scope for movement following natural wear, whilst often being set at incorrect angles and in many cases being uneven to boot. Bunker design and positioning also leaves a lot to be desired on many courses. Yes, many clubs in Germany have suffered through bad construction, despite having paid a great deal of money,

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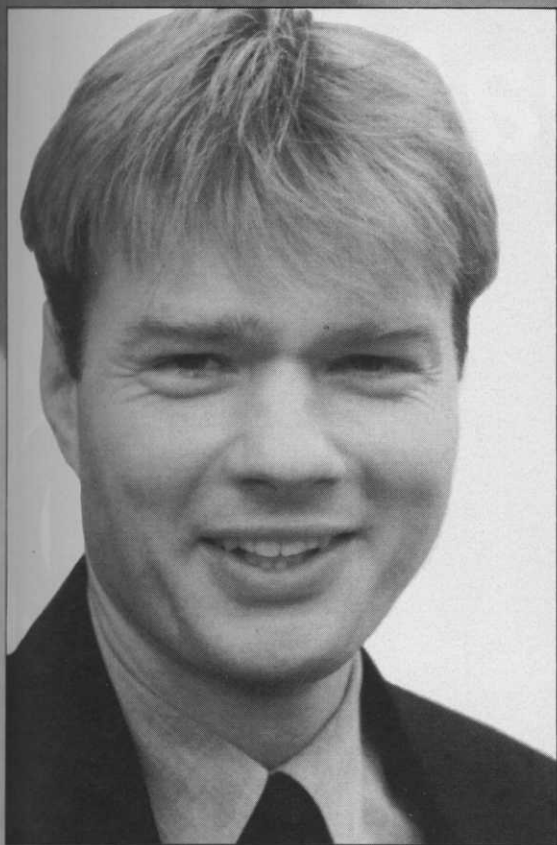
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# Deutschmarks



**ARNE VAN AMERONGEN** discovers how the developing German greenkeeping industry is taking its lead from the United States, in preference to following the traditions of 'real' golf

designed and of greater variety, whilst fairways are generally somewhat narrower. The resulting effect presents a natural appearance, emphasising the architecture of the course: skill is rewarded and wayward shots are punished. There is much greater emphasis on developing the fine, perennial grass species for golf and their needs in all areas of the golf course. Cultural practices are designed to work hand in hand with nature – not against it, as is so often the case in Germany.

Particular attention is paid to physical, rather than chemical, requirements, with aeration in its various forms a top priority in maintaining and improving soil structure. Compost top-dressing materials are of a high quality and contain 70-80% sand. Root-zone mixtures for construction purposes, for instance at Carnoustie, are processed from silt and clay free fen soil and local beach sand in a ratio of 25%-75%.

Scottish greenkeepers show a 'greater awareness of soil life and daily turf conditions with a view to assessed needs. For example, I have witnessed much greater concern regarding efficient plant water usage, rather than just straightforward 'turn on the taps' application. All playing surfaces are maintained as dry as possible anyway and firmness allied to correct resilience in greens is always a paramount aim. Fertiliser inputs are low and of nitrogen only and herbicide use is limited. Control of the weed grass *Poa annua* is a high priority and every aspect of maintenance is geared toward giving the competitive edge to more desirable species. Turf resilience is sought by way of cultivating fine grasses, not ball receptiveness, and colour is irrelevant.

In Scotland then, the art of greenkeeping is very much to the fore, based on good old-fashioned common sense and long standing traditions, both of which have been adapted and intensified to meet modern demands. This natural approach to course maintenance is in direct contrast to the artificial German approach. I think it is the only way to produce fine fescue dominated turf, the ultimate in quality for the game of golf.

I would thoroughly recommend a stay in Scotland to all aspiring young European greenkeepers, working under an experienced course manager such as Carnoustie's John Philp. The experience to be gained regarding the practical aspects of fine turf maintenance and production in the vast turf nursery areas, not to mention the reconstruction work on greens, tees and bunkers, is invaluable. Be prepared to learn and work hard because, like most things in life, you only get out what you put in.

■ The author, Dutchman Arne Van Amerongen, spent several years working as a course manager in Europe, specifically in Germany. He trained at a BIGGA approved college in Great Britain and was nominated for the Toro/PGA European Tour Young Greenkeeper of the Year in 1990. He is currently employed at Carnoustie Golf Links whilst studying for an HNC in Golf Course Management.

though this money thing is something which I am led to believe is not uncommon in Scotland as well!

Regular spring and summer applications of NPK fertilisers, allied to overwatering (to stop the ball on greens, never mind the putting quality), autumn fertilisers often high in phosphates, lack of regular and appropriate aeration and the use of poor quality compost top-dressings are not uncommon practices on German golf courses, regardless of soil types and with inevitable results (not to mention costs!).

*Poa annua* is by far the most dominant grass species, particularly on greens, even on very young greens originally sown out to *Agrostis Palustris*. Here again the American influence is strongly evident in both northern and southern parts of the country, although some courses have started out with *festuca rubra/agrostis tenuis* seed mixtures on greens only to succumb to *Poa annua* infestation. Ryegrass fairways are commonplace and various unsuitable seed mixtures have been used on teeing grounds.

Greenkeeper education in Germany is in its infancy and is consequently well behind the training available at colleges in Scotland. With no established golfing heritage and with little recognition of the original concepts of the game, many ill-conceived developments have resulted.

I have seen it happen – the president or owner of a golf club will suddenly decide that the course needs some water hazards (which he saw whilst on holiday in the USA), perhaps a windmill or two, or flower beds around the tees! This public park concept has little in common with golf in the real sense. In light of this and other circumstances I consider golfer education in Germany to be even more critical than greenkeeper education if real progress is to be made in the future development of quality golf courses.

The golf courses of Scotland exhibit much greater character. Rough areas are not mown, bunkers are deeper, better

# *Worm casts can be a real handicap*

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# CHEMICALS and the GREENKEEPER

**Certain chemicals are now OFF the shopping list, leaving greenkeepers weighing up the alternatives. Greenkeeper International asked experts Graham Paul, Geoffrey Ellis and David Stansfield to take a look at the options, the fungicides and the pesticides which keep YOU in control**

# CLAMPDOWN

*The passing of 1992 saw the withdrawal of approval for the use of the wormkiller chlordane. Later this year a similar fate will befall some of the triazine herbicides – namely atrazine and simazine. Is this 'weeding out' of chemicals going to become a trend for the years to come? GRAHAM PAUL looks at the future for the chemicals we have come to take for granted and suggests measures we might take to preserve their usefulness.*

**T**he loss of atrazine and simazine will mean that almost one hundred products will no longer be available to the greenkeeper. This will be quite a devastating blow for users and suppliers alike, for the triazine herbicides provide useful long-term control of weeds and grasses in non-crop areas. They persist in the soil, preventing seeds from germinating, and it is this persistent behaviour which has resulted in the detection of minute amounts of triazines in ground water. One could argue that the popularity of this large group of products has contributed to their demise. Alternative methods of controlling weeds in non-cropped areas are not easy to find. There are chemical alternatives – such as diuron and imazap – which are available, but the process of developing and registering new products based on them is very costly and can involve long delays: three or four years to develop a formulation and carry out laboratory studies and field trials, plus up to two years waiting for the necessary approval from the Ministry of Agriculture.

The wormkiller chlordane has been off the shopping list for some time now, although the approval for its use remained until December 31, 1992 to enable stocks to be used up. In a similar way to the triazine herbicides, the persistence of chlordane in the soil made it an excellent product for achieving long term control. Now that we have to use less persistent products we might need as many as ten applications to do the same job – a fact that will be welcomed by the manufacturers and, I imagine, by the worms!

When mercury based fungicides were withdrawn in 1981 their place was filled by alternative, less persistent fungicides such as iprodione, chlorothalonil, quinterozone and the systemic fungicides; thiophanate methyl, carbendazim and thiabendazole. These chemicals were available as substitutes because they had been developed for uses in the much larger agricultural market. However, that happened in the 1980s. Registering new products was easier then and there were more new active ingredients being discovered and developed for uses in agriculture.

Today there is no endless supply of alternatives to replace

those being withdrawn and we have to take great care in the use of the remaining armoury of pesticides, or they too maybe withdrawn. It is not just the recession that has reduced the rate of registration of new products, but more durable causes such as the effect on the farmer's purse of policies to reduce surplus food production. Farmers have been forced to spend less on chemical sprays and so the manufacturers are looking harder at what money they can invest in the search for new active ingredients. Currently it costs about £30 million to bring a totally new active ingredient to the market-place. A large proportion of this is the cost of providing data on the toxicology and environmental impact to support the approval of products containing it.

Clearly, if we wish to continue to benefit from using chemicals to control weeds, pests and diseases, then we must learn to safeguard those we already have. This might be achieved by ensuring that all pesticides are only used when necessary, with the utmost of forethought and care to prevent contamination of ground water supplies. We should take particular care in using the few residual herbicides new to this market, such as those based on diuron, lest these too find their way into ground water and are banned – like the simazine and atrazine products.

Users should avoid under-dosing as well as over-dosing because the former can result in the need to re-apply a product which fails to perform, thereby using in total nearly twice the correct dose. Consideration must also be given to the possibility of pesticides losing effectiveness through resistance developed by the target species. Although this has not been common in the past, cases have occurred in most areas of pesticide use; such as warfarin resistance developed by rodents and fungicide resistance in grey mould and powdery mildew.

In many cases such resistance can be attributed to popularity and sheer over-use of the product. Where there are several alternative products to choose from, as with turf pesticides, sensible rotation will go a long way to help preserve our armoury.

We are all in favour of cleaning up our environment to improve the quality of life on earth, but pesticides can provide a useful benefit to our society without posing a threat to its future. The continued availability of these valuable tools will only be assured by sensible and responsible use.

**■ The author, Graham Paul, has over 20 years experience in the chemical industry, having been closely involved in the development of the Rhône-Poulenc range of environmental products for much of that time. Graham is now territory sales manager for Sta-Brite Supplies Limited.**



by GRAHAM PAUL

# How to make the

**E**arthworms have both beneficial and harmful effects on fine sports turf. If you like, this makes them both baddies and goodies. The good news is that by going about their daily business, worms tunnel through the soil and give much needed aeration. The bad news is that some species, actually only two or three of the twenty or so found in Britain, come to the surface to cast. This causes the unsightly heaps of which we are all aware.

So how can we prevent the harmful effects of the baddie earthworms, while encouraging the benefits provided by the ones in the white hats? Well, a knowledge of their life cycles, plus knowing when and why they cast can help with a sensible approach to their control. The first point to note is that in any healthy soil, whatever may be growing, earthworms are present in abundance. This is particularly true in undisturbed turf, which unlike annually cropped land is not regularly disturbed by ploughing or cultivating. Up to one million worms per hectare were recorded in trials conducted at the Sports Turf Research Institute.

All these earthworms naturally are very hungry. They eat virtually anything organic, including living and dead plant and animal material. Thatch formed under fine turf is one of their favourite feeding places. So if you control earthworms too thoroughly by chemical means you could finish up with a worse build-up of thatch. If you add the benefits they give from improving soil aeration and structure, their general activity is beneficial. But the difficult trick is to balance this with the suppression of surface casts.

The three worms which cast are the two *Allolobophora* species *longa* and *nocturna* and the common *Lumbricus terrestris*. Like most earthworms, their activity is worst in heavy soils containing a large reserve of organic matter, and least on lighter, well-drained turf like the greens of links golf courses. Moisture also plays a part and casting is always more prevalent in moist springs and autumns than in a dry summer, when worms go deep down in the soil to avoid the effects of drought. At this time they go into a form of suspended animation, waiting for moisture to return. Obviously, this is less likely under heavy irrigation.

The damage caused by casts is obvious, but not always fully appreciated. They are unsightly, ruin the true running of a green, suppress grass growth, spoil surface drainage and encourage fungus disease, whilst the excreted fine-soil particles make ideal weed seed-beds. After a wet autumn, unless they are swept up, the casts can lead to muddy playing conditions all winter.

Finally, all earthworms, but especially those that live near the surface, also encourage moles – I speak with a lawn currently looking a bit like a miniature version of the western front. So, as most greenkeepers would agree, casting worms must be controlled. Adopting the right cultural measures will help; quite a lot can be achieved, for example, by regularly discouraging the production of the thatch, which gives the casting species a near-surface source of bed and board. A regular programme of slitting and coring where it is needed is therefore important, coupled with the removal of grass clippings and restriction in the use of organic surface dressings.

Earthworms also dislike acid conditions, so be careful of over-liming and in naturally chalky conditions use acidifying fertilisers like sulphate of ammonia and sulphate of iron. In a wet, heavy soil further improvements to the drainage system are also worth considering.

In past years, a number of different chemical pesticides were used to kill earthworms. These were usually aimed at the whole population, casters or not – I don't think in those days we knew the difference. These included mercuric chloride, lead arsenate, copper sulphate, sodium hypochlorite and potassium permanganate. Some of these are very nasty materials indeed and at least two of them may by law no longer be sold for any horticultural use. Apart from the now totally banned lead arsenate, which gave control for up to two years but also killed off most



**'The length of activity of the modern wormicides is usually less than older materials like lead arsenate, which also helps make them more environmentally friendly'**

other soil organisms, most had a short-term effect and needed repeat treatment.

Mowrah meal was a much safer alternative to all these and was used widely for earthworm control until about 25 years ago. Broadcast dry, it needed watering into the turf with a copious amount of water by hose pipe. After a fairly short period the worms came wriggling up to the surface, quickly died and could then be brushed up and removed.

This treatment undoubtedly helped to control a lot of worms, most of them sub-surface and probably casting species. The effect could be seen for up to two seasons. But it used a lot of mowrah meal, up to eight ounces per square yard was the recommendation, and thorough watering-in was needed to gain full effect. Removing the bodies, which otherwise could make an even worse playing hazard than casts, was another tedious operation. Therefore, as older greenkeepers will remember, all in all, applying mowrah meal was a very time consuming process. The organic matter left from this bulky material might itself also have helped encourage another generation of sub-surface feeding species.

In more recent years chlordane has been a successful successor to mowrah meal. The two forms available were the liquid Sydane 25 and Sydane Granular. It was relatively safe to apply, controlled worms for a fairly long period, but has been decreed to be excessively harmful environmentally. So, as most greenkeepers will now be aware, official approval for sale and supply ceased on 31 December 1990, and storage and use for earthworm control ceased to be permitted after 31 December 1992. After this date, unused stocks of chlordane should have been destroyed.

Fortunately, we have approved alternatives. One of the most useful is a mixture of gamma-HCH with thiophanate-methyl, which controls both earthworms and leatherjackets – a considerable bonus where they are troublesome. It is sold as Castaway Plus and is available in normal flowable and CDA formulations. The makers also claim that it gives selective control of casting worm species.

Another modern approved replacement is the carbamate insecticide carbaryl, sold in flowable formulation as Twister Flow by Rhône-Poulenc. Carbaryl is a pesticide with a wide range of uses as an insecticide, even for use against head lice!

The length of activity of the modern wormicides, or lumbricides to use the official term, is usually less than older materials like lead arsenate, which also helps make them more environmentally friendly. The proper time of application for all of them is when the earthworms are casting most actively, usually in wet periods in spring and autumn. In areas where levels of casting worms are high, repeat applications will almost certainly be needed to achieve complete control. Carbaryl is said to remain active in the soil for up to two months.

When and how much you use a chemical control will depend on the situation and the problem the worms are causing. Usually the problem is worse at the back end rather than spring, and it was particularly bad last year following a wet September and October. On light soils and where the playing surface is not used

# Worms turn

## CHEMICALS and the GREENKEEPER



over winter you might decide not to bother. In that case you must be prepared to deal with any weed seedlings growing the following year in the convenient seed-bed the casts have left for them.

But I suspect that many greenkeepers on heavier, wetter soils, especially if they are chalky, will find it pays them to apply wormicides as a fairly regular treatment. It will also pay to remember the benefits from the goodie, non-casting worms and

try to limit the control of the baddies to only what is strictly necessary. One day we might have a chemical that is guaranteed to distinguish between the two. Until then, care and caution appear to be the watchwords.

■ **The author, Geoffrey Ellis, is an independent consultant and writer with some 30 years experience in the agro-chemical industry. He runs a small nursery specialising in the production of wild flowers.**

◆ **The way it used to be... pictures from 'Lawns for Sports' published in 1924, show how 'Carters Wormkiller' handled the problem. And you're right - the end picture isn't spagheti!**

## FIGHTING THE FUNGUS

In an ideal world we would never have any problems with fungus attacks on the golf course if healthy and vigorous turf, with good disease resistance, could be maintained by careful cultural management to shrug off disease. Then there would be no need to use chemicals to keep down pathogenic organisms. However, very few are blessed with the ideal golf course turf, especially on greens, where fungal attacks are most likely to occur and cause damage and where sustaining uniformity and density is vital year-round.

This is not to say that courses which do not have disease-resistant turf on greens (ideally fescues and bent grasses, carefully managed for growth, sited on healthy, well-structured, free-draining soil, out in the open air to produce a stable system) should not practise good cultural control of disease. Indeed, this is essential if reliance on chemical control is to be kept to the minimum. Whilst there is a range of fungicides available for treatment of turfgrass diseases, the range is not limitless: chemical applications are expensive and any input of chemicals into the environment should be avoided if possible. It is always best not to have to deal with disease in the first place and the use of fungicides should be a line of last resort.

The principle of good cultural practise is to create an environment in which disease is less likely to occur. Again, management to encourage disease resistant species within the turf has to be a primary consideration, looking for good aeration and free drainage, together with careful control of fertilizer input, application of irrigation and timing of top dressings. This latter item is a frequent means of encouraging autumn diseases, when year-end dressings are applied late and cause some smothering of the swards at a time when top growth is slow and the grasses are damp.

In the same vein, operations to promote drying of the grass cover are always valuable. The switching of surface moisture is an obvious one in this respect, but of equal if not greater value is ensuring that greens are recipients of a draught whenever possible. A good breeze across a putting surface, encouraged by the thinning of trees and under-scrub, is one of the best 'fungicides' around.

Applying Sulphate of Iron as a routine dressing is often cited as a means of limiting incidence of fusarium patch. This is true up to a point, and there are other beneficial spin-offs from applying sprays of Iron. On the other side of the coin though, acidification of the soil profile can come about by excessive use, and it must always be remembered that Iron is not a fungicide. It may make an outbreak of fusarium less likely, but it will not stop one which has already started.

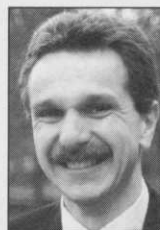
Working on the above principles, there are clubs that rarely, if ever, use fungicides to deal with disease problems. Nevertheless, there are many more reliant on chemical applications to keep putting surface turf in as good a condition as possible year-round, and these have to apply fungicides fairly regularly.

The main problem to be dealt with in relation to fungicide is (by far and away) fusarium patch disease. On average, the majority of clubs will treat for fusarium on greens three times in any one autumn/winter period, costing in the order of £1000-£1500 for an 18-hole golf course. This average treatment frequency may fall within a range of 1-5 treatments per annum depending upon the weather.

So, for most clubs, use of fungicide is a significant item within the budget for the green, merely allowing for applications on putting surfaces. Treatment of other sections of the course beyond immediate greens surround is very rare. Here, the cost-benefit of fungicide application is much less, as the effect of disease is much less damaging in the medium term.

Returning to greens, while application of fungicide is not cheap, nine times out of ten procrastination in its use is expensive too. A few spots of fusarium can run riot in quite a short spell, causing lingering damage. Never forget either that fungicides work best at the outbreak of disease, and the earlier that spraying is carried out (wind and rain permitting) the more likely the chance of complete success first time. Constant monitoring of disease outbreaks is essential if timing of spraying is to be to the best advantage.

When it comes to choice of fungicide for treatment of fusarium, in principle, systemic types are best for the bulk of the year, confining use of contact type materials to the very ➔ 21



by DAVID STANSFIELD




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# FIGHTING THE FUNGUS

**CHEMICALS** and the  
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19 • slow or no growth season (which obviously varies in extent depending upon geographical area, but also with respect to the nature of the turf). Systemic fungicides work well and have the longer term of preventative effect. Also, they have a broad-based effect, so can deal with secondary diseases, and they do tend to discourage worm casting. While there has been suspicion that systemics can encourage thatch fungi, the link is very tenuous and can be safely ignored for the most part.

The systemic fungicides which have been widely used to date have been part of the benzimidazole (Benlate, etc.) family, and closely related in their chemistry. While no doubt these fungicides will continue to be widely used in future, the good news is that a completely new systemic fungicide has come onto the market recently – fenarimol (Rimidin) – which gives more options in terms of alternation of fungicides, so long as care is taken to avoid severe yellowing from use on *Poa annua* dominated greens, as can occur.

Alternation in the use of the types of chemical used for disease control (where practical) is good practice when disease has to be treated regularly, but this is not just a case of using different brand names. Alternation needs to be between different groups of fungicides. The benzimidazoles are very similar in action, as are the dicarboximides (eg. Rovral and Mascot Contact). Fenarimol is different and so too are Chlorothalonil (Daconil) and Quintozene. The reason for alternation is to avoid the development of disease resistance. Even though there is no proven resistance to any fungicide in the UK, this has occurred in the USA, where chemical usage is much more intensive. Beyond choice of chemical, there is always the thorny ques-

tion of whether to use fungicides as a preventative or a curative treatment. The principle has to be to stick to curative applications wherever practical, to limit chemical input into the environment. However, in certain situations, eg. at clubs which suffer four or five outbreaks of fusarium every year when treating curatively, the application of systemic fungicide on a preventative basis from September onwards can actually reduce chemical applications – and leave better greens.

Using fungicides on the golf course for diseases other than fusarium is comparatively rare. However, it can be necessary from time to time and in these situations accurate identification is essential to ensure the right specific can be applied quickly to deal with diseases such as brown patch, severe anthracnose or dollar spot. Also, to ensure that fungicide is applied in the most effective way, eg. when dealing with grade two fairy rings or superficial fairy rings, or to avoid fungicide use when it could actually be harmful (eg. for take-all) or totally unnecessary (eg. for yellow tuft).

All in all, there is a lot to get right when using fungicides on the golf course even before getting to the operational end of applications themselves, ie. handling and spraying.

The more everyone knows about fungicides availability and disease identification, the better. After that, good training in spraying is vital, ensuring the lessons learned are actually applied. Then, fungicide use will be effective and safe. Even so, the launch of a new fungicide which has no Hazchem warning has to be good news.

■ The author, David Stansfield, is the golf course agronomist with PSD Agronomy Limited.

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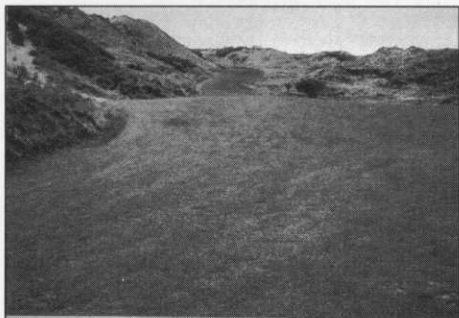
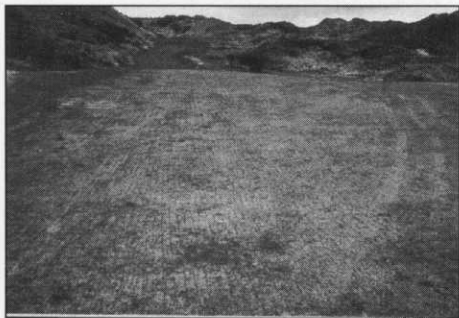


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# SOWING



The Moore Uni-Drill - and before and after results

There used to be three traditionally accepted methods of establishing grass on landscaped lawns, sports grounds, golf courses and embankments.

Now there are two others. Meet Uni-Drill and Liquid Sod

## Traditional methods

**1 Conventional Seeding:** This is the method usually applied to the bare prepared ground by drop or broadcast seeding. Germination by this method may take up to 30 days and before there are signs of establishment the seed is exposed to erosion, seed eating predators, drought and weed invasion, creating competition for the germinating seeds. Whilst satisfactory results can often be obtained by conventional seeding, it should be remembered that these factors may result in a need to re-seed at extra cost, not to mention the set-back in producing a satisfactory turf cover.

**2 Hydroseeding:** This is a method that was introduced in the United States in the 1950s. It incorporates water (which activates the seed), a protective mulch or seed carrier, fertiliser and the seed mixture and is applied to the open ground by a spraying machine in one application. This method reduces the cost over conventional seeding and it reduces the establishment time. However, hydroseeding still has the disadvan-

tages of leaving the seed to germinate naturally, again leaving it vulnerable to erosion, birds, drought and weed competition as well as fertiliser leaching.

**3 Rolled Turf:** This is established turf brought in from a commercial turf grower. By laying rolled turf there is immediate erosion control, immediate green-up (even in the off season) and good anti-leaching capabilities. Rolled turf however can be expensive to purchase and it may bring with it foreign soil. Purchasing ready grown turf may not necessarily offer the choice of species variety demanded and it needs an added labour cost for laying over the prepared site.

## The newcomers

**Uni-Drill:** Used to overseed Wembley Stadium in 1992, Moores Uni-Drill has won many converts, especially at the championship links courses in the North West of Ireland, where it has helped those under pressure to produce the best playing surfaces. It can be used with a small 25/35hp

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# THE SEED



Above: A tee prior to Liquid Sod application at West Middlesex GC ...and the same tee nine days later

tractor, the most commonly used in this sector, and follows ground contours to give an even planting at a constant depth. Grass seed planted at a depth of 12mm has revealed an excellent rooting structure, which holds the sward together better than shallow planted seeds, which tend to be more easily scuffed off. The drill has a slitting action, thus moving the first inch or so of soil, relieving soil compaction and aerating the soil in a single pass, making conditions ideal for grass growth.

Equally important, the Uni-Drill creates minimum disturbance of the playing surface, covering the ground in a one-pass operation, levelling, seeding and aerating. The slitting action stimulates regrowth and gives healthier and more vigorous rooting.

In Ireland probably the best example of the drill's success may be seen at Portmarnock. Preparing for a major championship is always a challenge for any greenkeeper, but in the case of Iain Ritchie, who had joined the club only six months before, this presented an even greater problem. When Iain arrived at Portmarnock, one of Ireland's most famous courses, he found that most of the fairways had very few good grass species in them and there were many bare patches. His priority, therefore, was to introduce new seed mixes into each fairway.

This he did using a Moore Uni-Drill and an Iseki 35hp tractor. His staff over-seeded each fair-

way in four directions, where necessary also over-seeded the semi-rough and the rough. This action not only introduced new seeds into the tired fairways but, as Iain observed, helped to break up surface compaction and allowed some of the established grasses to regenerate themselves by the new growth from their split roots.

Iain also saw that all of the grasses on the fairways had an increase in root depth and a more vigorous root growth, this having the effect of causing less surface damage. Within the year the course was playable to championship standard and since the Walker Cup Iain has kept up a once a year fairway maintenance routine, over-seeding other compacted and bare areas such as paths. Iain and the Portmarnock Golf Club have found the machine a good investment that has paid for itself in the few years they have owned it. As for maintenance, the club have spent nothing in the three years of ownership.

**Liquid Sod:** This is a uniquely developed process created in the United States and now being introduced into Europe. This process eliminates the problems of creating a sward by conventional methods, utilising as it does the latest technology in seed pre-germination.

The first stage is the 'patented' method of pre-germinating (or sprouting) the seed in a controlled, scientific environment using an optimum level of water, oxygen, temperature and nutri-

ents. The pre-germinated seed is then taken to a stage further in its development towards an ideal growth, giving it an advanced root system and crown or blade before actually arriving at the site in the form of plantlets.

The second stage uses a patented spraying machine and tank that mixes the plantlets with formulated fertilisers, water and a mulch. This mixture is then delivered to the site ready for spraying to the prepared surface without any damage to the plantlets.

The advantages claimed by the Liquid Sod system are summarised as follows:

◆ **Erosion Control.** The expense of laying turf in many areas for erosion control may be prohibitive. Ordinary seeding methods may take a longer time to establish. The Liquid Sod method has been known to stabilise soils on highly vulnerable areas in a matter of 72 hours.

◆ **Fertiliser leaching.** Because the plantlets in the process are growing at the time of application, the fertiliser that is added is utilised immediately. Thus the Liquid Sod method reduces the possibility of leaching.

◆ **Irrigation.** Newly seeded areas require irrigation and in some areas can take up to 54,000 gallons of water (a depth of 2ins) per acre per week for three weeks to promote growth and satisfactory establishment of the sward. Because the seed is pre-germinated in this process, the water used to establish the seed is eliminated and therefore there is a saving of several thousand gallons of water.

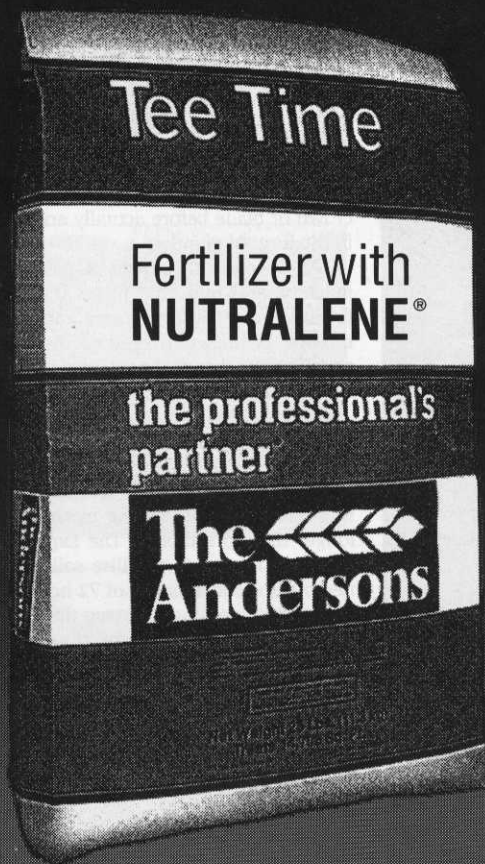
◆ **Germination.** The company claims that the Liquid Sod pre-germination process carried out under controlled conditions can increase the germination potential of seed mixtures by as much as 26%.

◆ **Weed competition.** When hydroseeding, water and fertilisers are used to cover soil which may contain weed seeds. Tests have shown that weed seeds brought to the surface during cultivation processes sprout rapidly. Liquid Sod seed is advanced to such a level that it can compete against weeds and can in some circumstances effectively eliminate the competition.

◆ **Predators.** Many areas of newly sown seed can be quickly devastated by seed eating birds. This is costly and time consuming. Liquid Sod provides a plantlet which has a substantial reduction in its vulnerability to seed consuming predators.

◆ **Time savings.** Golf courses, tennis courts, bowling greens, race courses and any other area using a turf surface requires quick establishment. The company claims the process will produce a mature sward of turf in a matter of weeks, ahead of any of the conventional methods. Areas in northern regions which have a short growing season, the company suggests, make Liquid Sod a viable method of creating a high quality surface.

◆ **Cost.** There are many cost advantages claimed: it gives an almost 100% guarantee of a satisfactory coverage compared to the conventional methods of sowing seeds. There is no need to re-seed because of failure or unsatisfactory cover. Also, depending on the seed type, nutrient requirements and general application techniques, Liquid Sod claims a substantial advantage in cost over the rolled turf method. Precise mixtures can be specified and sown in the proportion required, there is no invasion of foreign soil, labour costs are reduced and the price per square metre is lower by as much as 30% compared to that charged for rolled turf.



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# Why we

## JIM ARTHUR on the new European golf green specifications

**A**ny sensible business must take a hard look at money spent on development – in effect to see whether investment is justified or subsidies are deserved or even potentially productive long term, or could give, even in the much longer term, a reasonable prospect of improved efficiency or profitability. However golf is not, sadly, regarded as a business by so many who control the amateur aspect of the game, now widely enjoyed by so many from such a wide range of character, ability and background.

Golf, although representing a huge investment nationally, is too small an industry to be able to support pure academic research – there must be an expected if not attained end-result of commercial or practical value, as opposed to discovery for discovery's sake alone.

It is necessary to differentiate between fundamental research and work on evaluation assessment or investigation. Much can be gleaned from the study of contemporary work over the whole world of golf on specific parallel problems – with due caution against taking on board philosophies based on conditions which are not relevant to our (temperate European) environments.

Many of the world's major breakthroughs, for example in medicine or nuclear physics, have been the results of accidents! But one must have a seeing eye, as did Sir Alexander Fleming in making the connection which led to the development of penicillin. Frankly, pure research is so costly and so unlikely to lead to worthwhile discoveries in the short term that it must necessarily be confined to those bodies, ie. university departments, properly equipped with all the vastly expensive hardware from electron microscopes to multi-bank computers, which expense could not conceivably be justified for the benefit of what the outside world tends to regard as a fairly frivolous hobby!

There is in fact no commercial justification for the establishment of departments of serendipity from which once in a blue moon and with accompanying shouts of Eureka, inspiration produces shattering results.

The above philosophy directly relates to the procrastination and arguments appertaining to one tiny aspect of golf, namely the specifications for the construction of golf greens, now approved in principle

by the Joint Golf Course Committee of the Royal and Ancient.

By dint of a great deal of work behind the scenes and a good measure of compromise and give and take by all concerned, three specifications for construction have now been agreed, and (even more importantly) it was further agreed that there should be no question of 'compromise', taking a bit of this or a bit of that from one specification and adding it to another.

These three specifications need to be established primarily because far too few of those engaged in building new golf courses, whether developers, designers or constructors, know little or anything of the technical problems involved and, as is so often the case, seek advice from those with even less qualifications or practical experience. One can never stop fools being parted from their money, nor innocents abroad losing their all in setting up what they erroneously perceive to be what the customer wants.

The second reason for setting up and agreeing standards is the vexed and increasingly important impact of litigation on the golfing scene. Those building to agreed and approved specifications can at least gain some shelter from that protection. Deviations – especially by employing methods specifically prohibited in these specifications – can and have resulted in massive claims for total rebuilding of new greens, costing insurance companies – especially with added legal costs – sums well in excess of £1.5 million. Insurance companies are increasingly concerned about being taken to the cleaners and are refusing further insurance cover to miscreants.

Much has been written about these three specifications, which I will not repeat save to say that there is really no fundamental difference between all three in the standards laid down for the root zone itself. The differences relate to the drainage layers. Where there is effective drainage, as on some true links or even (more rarely) sandy heaths, with guaranteed drainage potential of 200 cm (8") per hour, then specific under-drainage is not needed (provided any constructional compaction is corrected).

With the vast majority of sites, under-drainage is vital. A herring bone or grid system of plastic drains is let into a prepared and consolidated base and any surface effect of



# need to keep our eye on Europe...

such drains masked by a stone carpet, which in turn is blinded by a filter layer to prevent infiltration of the root zone particles into the stone. Extra drains to provide intercept (cut off) drainage is specified in the case of greens cut into a slope – and also provision to deal with any low areas, e.g. the front perimeter of the stone carpet.

It is important that the ratio of particle size between successive layers does not exceed 1:10 if drainage is to be effective and particle drift prevented. The basic difference between the true USGA Green Section specification (not sand-only construction) – yet another modification being due in 1993 – and the UK system is largely in the size and depth of stone in the drainage carpet. On very flat sites, in order to achieve the desired minimum fall of 1:80 of the herring bone system under the UK specification, the base may be valleyed – unnecessary, of course, where the green rises from front to back at a slope of more than 1:80.

Long experience shows that using a larger stone ('25-40 mm clean' being specifically laid down) in deeper depths permits full mechanisation of construction and consequently cheaper costs. Whilst there may be exceptions when using very skilled and experienced operators when it may be possible to mechanise building to USGA standards – generally it is safe to state that 100 mm (4") of pea gravel will not support a 360° swing excavator, especially on our normal soft conditions, and the gravel of the USGA spec. merely gets pushed into the base. Neither the depth nor the stability of the pea gravel permits mechanical handling save under rock hard dry conditions – as in the States – and thus much of the construction involves costly and slow hand work. Working on plywood boards with high levels of labour-intensive hand moving of gravel sand and root zone mix can give excellent results, but at a cost.

Those who attended the Harrogate workshop prior to the BTME itself (as well as others) will have seen the USGA video on building greens and been horrified at the

errors shown, ranging from bulldozing turf, top soil and subsoil off in one indiscriminate mess for re-use on green surrounds later, to tracking bulldozers back and forth over fragile root zones, not to mention tractors and spinners lashing on lime and fertiliser so heavily that one could not see the machine, let alone the poor operator!

It is worth remembering that, at a conservative estimate, bearing in mind that the UK system with deeper layers of larger stone has been extensively used (not just by me alone) since the mid sixties, there are well over 3000 golf greens built to this system, none of which, given reasonable post-construction maintenance, has ever given a moments concern in well over 25 years. While agreement on the physical criteria laid down to identify satisfactory – and unsatisfactory – raw materials is important, it is even more important to be able to analyse reliably, consistently and logically, eg. root zone mixes especially. At present ten identical samples sent to ten testing laboratories will result in ten different results. This would not be so much of a problem if the same samples re-submitted a month later were reported on identically by the same ten stations, but sadly, too often, they are not.

For those who want more details of these specifications, they are available through BIGGA, but my main point in discussing them is that it is not the specifications themselves which are important (though agreement is always welcome) but the use to which such specifications are put. What are 'we' or 'they' going to do with them?

With current work on CEN standards for the European Community raising problems for each and every one of us, it is vital that not only these specifications are advanced, but that they are advanced by knowledgeable, convinced and qualified persons who can stand their corner.

With the German standards diametrically opposed to both ours and the USGA spec., with the French shrugging their shoulders and indicating, as always, that they will take

no notice of agreed standards anyway and with the rest of Europe looking to us for a lead, we, need, as usual, leadership, which as usual is lacking.

Perhaps if all concerned in British golf – from those governing the game from sheltered Elysian heights to all players, amateur or professional and to all greenkeepers from our top men to the lowliest probationer – realised what will happen to our golf courses if German views prevail, there would be less apathy and more active opposition. Currently, in Germany, new courses may not have fairways wider than 30 m with semi-rough 3-5 m, and the rough may not be mown more than once a year, whilst there must be large open plastic lined pits: at the side of each green to take the drainage and 'effluent' from the stone carpet, amongst countless other daft 'green' notions.

Frankly, while we may be prepared to put up with countless invasions on our life style, suffer multitudinous officious regulations as to what we

may or may not do, I feel that if the Germans start to impose their ideas on golf on us, then the Scots at least might well start World War III. It is no good putting this down to rabble rousing on my part.

If we do not impose our ideas and standards, others will be imposed on us and we need golf-minded, experienced, forceful advocates if we are to make any impact on Teutonic stubbornness and EC invasiveness and pettifogging regulations.

The day may yet dawn when golf will be regarded as a self-damaging occupation, to be shielded from the public gaze and confined to an incurable minority, with recruitment specifically prohibited as being harmful to the mental and physical health of younger generations, and even passive golfing (on TV) banned on the grounds that it might corrupt or damage the health of non-golfers.





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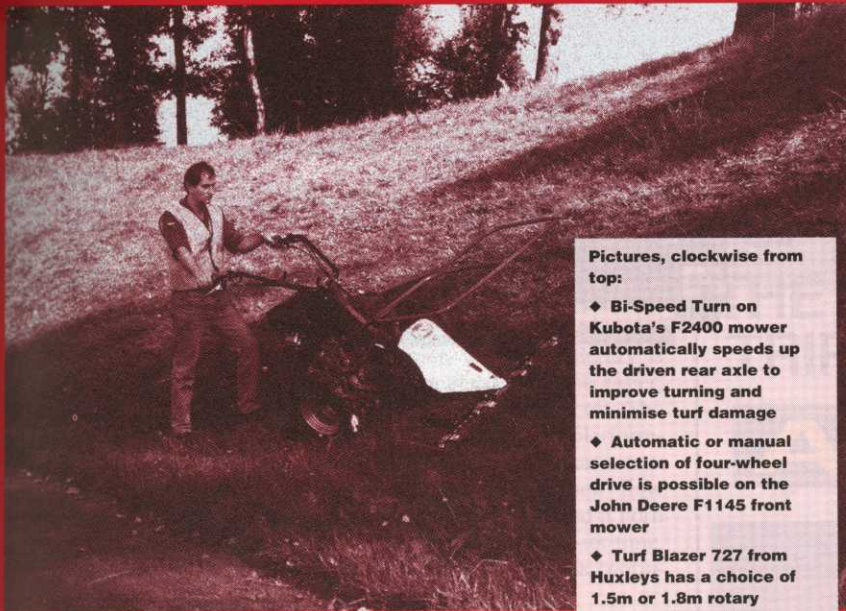
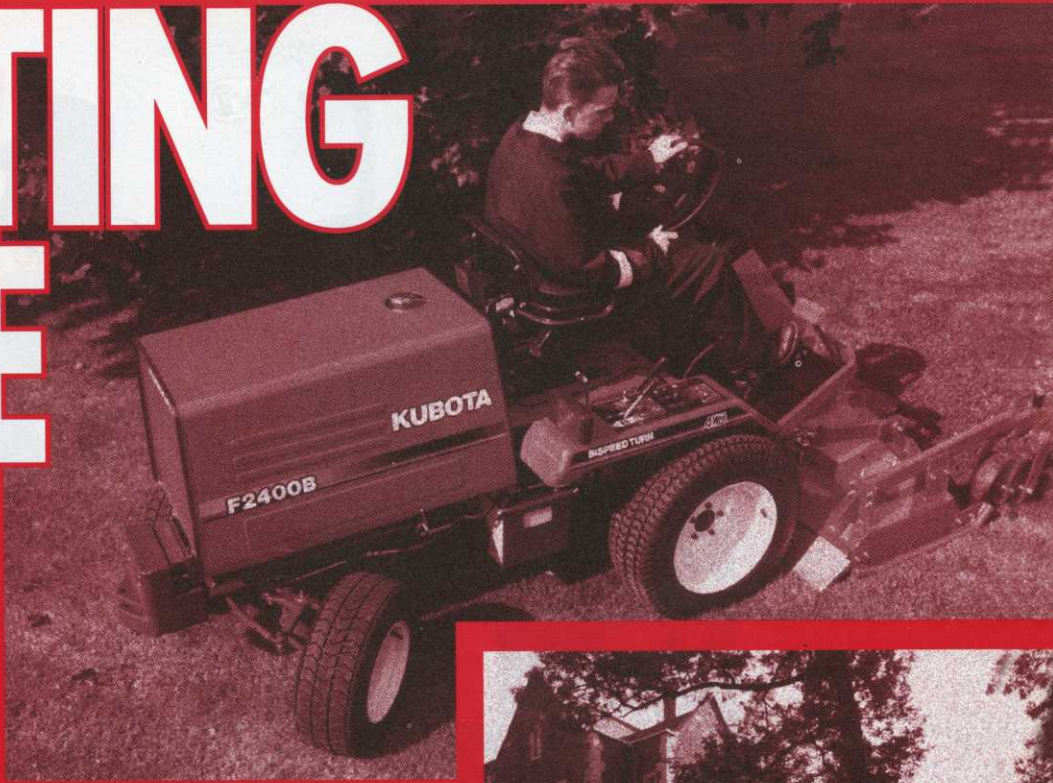


# CUTTING EDGE

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**Pictures, clockwise from top:**

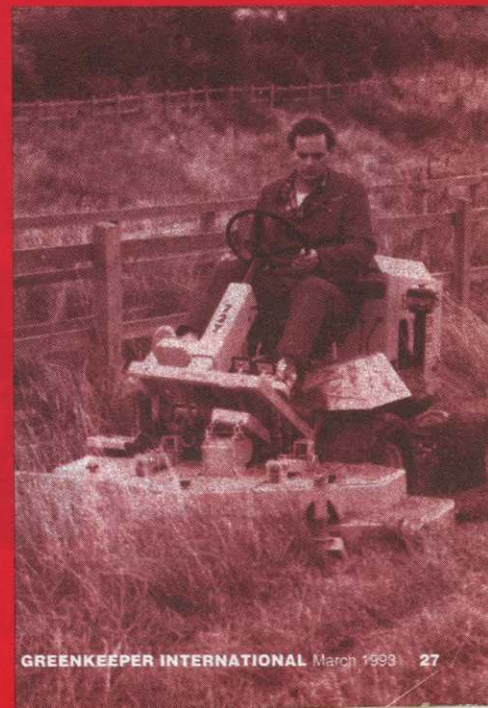
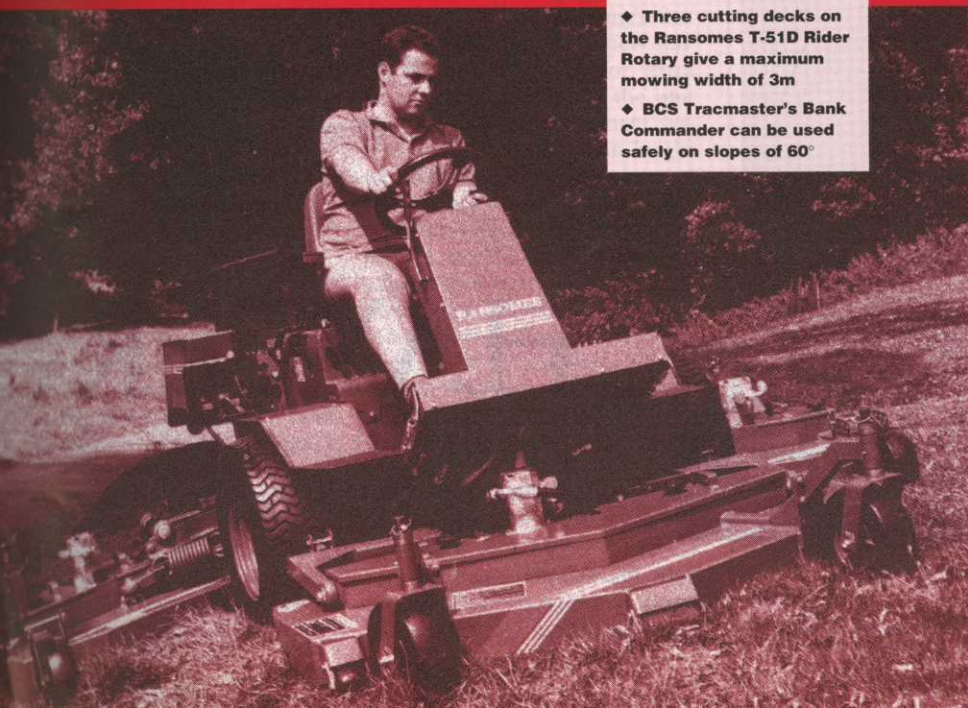
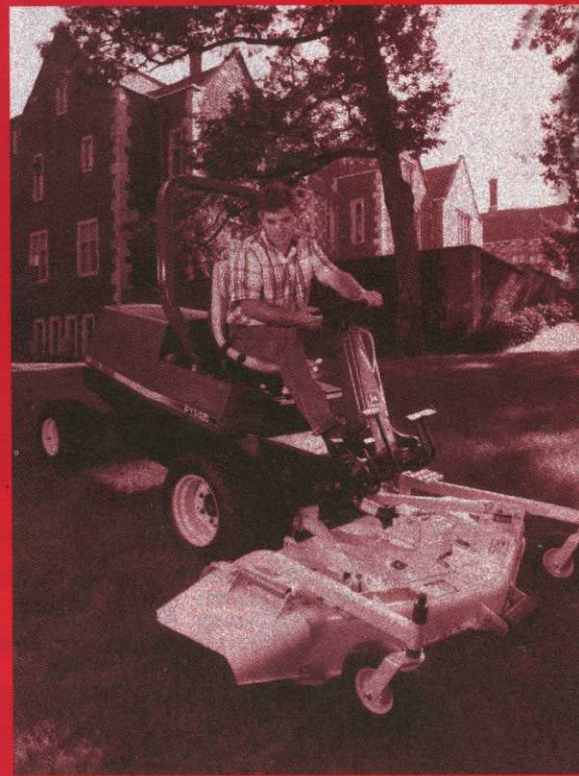
◆ **Bi-Speed Turn on Kubota's F2400 mower automatically speeds up the driven rear axle to improve turning and minimise turf damage**

◆ **Automatic or manual selection of four-wheel drive is possible on the John Deere F1145 front mower**

◆ **Turf Blazer 727 from Huxleys has a choice of 1.5m or 1.8m rotary mowing decks**

◆ **Three cutting decks on the Ransomes T-51D Rider Rotary give a maximum mowing width of 3m**

◆ **BCS Tracmaster's Bank Commander can be used safely on slopes of 60°**



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# CUTTING EDGE



**Integral collector on the new diesel-engined Walker Model D has an 8.7cu ft capacity**

**MICHAEL BIRD reviews the latest mower developments for keeping larger, longer, tougher grass areas neat and tidy**

Continuing refinement in the design, specification and operation of cylinder, rotary and flail mowers is making the task of maintaining large areas of grass increasingly more of a pleasure than a burden. Although the basic working principles of the cutting mechanisms have changed little over the past 30 years, the technical improvements introduced on both ride-on and pedestrian machines during the last decade means that there are few excuses for poorly maintained fairways, semi-rough or rough.

Assuming that funds are made available for routine re-investment in new equipment, then lack of training, mower maintenance or interest in the work are the three principal reasons why grass is not cut to a consistently high standard. In very few cases is the design of the machine at fault, particularly in the case of mowers built specifically to tackle medium to large areas of longer grass.

Developments in these machines continue apace on both sides of the Atlantic. The American passion for fairways which look like greens means that most of the big ride-on cylinder mowers finding their way onto British courses already have one or two seasons' work under their belts. This is no bad thing, especially on a unit which can cost upwards of £20,000. The latest arrival from the USA carrying the Jacobsen badge is the LF3810 Fairway Mower, a five unit self-propelled machine with a cutting width of 3m (10ft). Bringing to three the number of fairways mowers from Jacobsen, the LF3810 is powered by a 38hp diesel engine driving the wheels through a step-less hydrostatic transmission. Five or 10-blade reel options are available and the mower can be operated with three, four or five units in work.

There are few things more infuriating than an unnoticed oil leak to turf professionals. To eliminate this possibility on the LF3810, Jacobsen fits its Green Sentry leak detector as standard to the mower. The unit, which is built in to the main hydraulic system, is able to detect oil losses of as little as 85ml by means of a flow switch which monitors oil flow between two tanks. Because it uses a combination of volume and time, this system is able to differentiate between oil 'loss' from the tank caused when extending an hydraulic ram and a genuine oil leak from a joint, union or hose. Also, thanks to a temperature sensitive timer, the Green Sentry is able to compensate for the easier, faster flow rates of hot oil. The unit comes with a platform-mounted console which has a caution light to warn when flow exceeds a certain level and a horn which sounds after a pre-set time, indicating that the flow is continuous, as with a leak.

John Deere's 3365 professional turf mower is the company's first machine to feature the new ESP cutting unit. Standing for 'extra strength and precision', the unit has an improved adjustment system designed to maintain height of cut irrespective of bumps and shocks. Reels and bedknives are made of induction-hardened high impact steel, said to retain an edge longer while the reels are mounted in self-centring Timken roller bearings. Available with six, eight or ten bladed reels, the five unit 3365 has a 3.5m (138in) cutting width and is equipped with a 38hp diesel engine with cruise control.

A choice of two four-wheel drive functions is available on the new John Deere 24hp F1145 front rotary mower. 'On-demand' 4wd automatically engages and disengages according to ground condi-

tions, reducing tyre wear and fuel consumption, while 'full-time' provides maximum traction in poor conditions. The latter can be selected by the operator on the move, even in reverse gear.

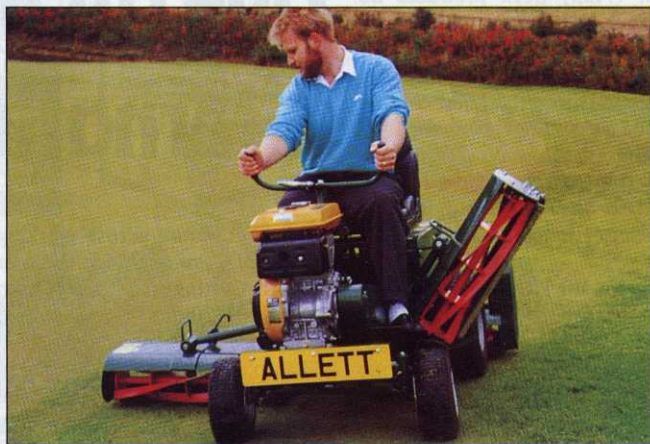
Said to have been designed to cope with 'world grass growth conditions', the new Fairway 300 from Ransomes has hydraulically-driven cutting units based on those used on the successful Motor 180D machine. Both height of cut and the cutting cylinders can be adjusted without spanners.

Width of cut is 2.9m (114in). Powered by a 38hp diesel engine, the Fairway 300 has four wheel drive as standard. An even bigger diesel engine - 51hp - is used in the latest top of the range Rider Rotary from Ransomes. Equipped with three rotary cutting heads spanning 3m (117in), the T-51D is designed for high output work on larger areas of longer grass.

Toro has replaced its RM223-D lightweight fairway mower with the RM5100-D, a five-reel ride-on machine with a 23hp

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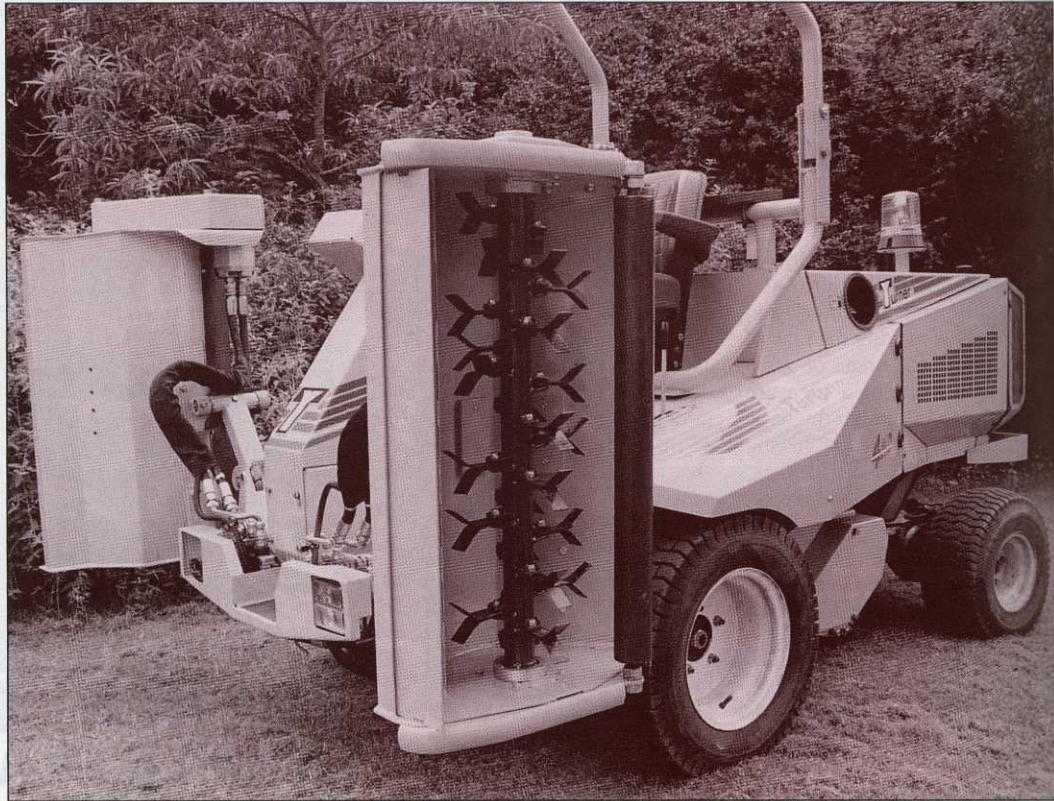
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# CUTTING EDGE

29 ➔ diesel engine, hydrostatic transmission and choice of two or four wheel drive versions. The main feature of the RM5100-D compared to its predecessor is a new electronics system known as Automated Control Electronics (ACE). This system is centred on solid state electronics which govern many of the mower's functions for improved operation, reliability and ease of servicing.

Examples of ACE's features and capabilities include electronically actuated hydraulic spool valves; fully automatic monitoring and adjustment of reel speed in line with forward speed; and centralised diagnostic monitoring to pin-point machine problems quickly and more economically. Also standard on the RM5100-D is a spring-loaded positive down pressure system for the five or eight bladed cutting units. Adjustable to four positions in 8lb increments, it increases down-force to maintain cutting reel height over varying terrain. Toro is also playing its part within the environmental movement, producing a rotary cutting deck which recycles clippings into the turf. Known as the Guardian, the 1.8m (72in) deck produces no external discharge, making for safer mowing and reduced mess. Special internal deflectors recycle the grass within the hood causing it to be cut and re-cut, finally forcing the clippings down into the turf. The Guardian can be retrofitted to all Toro Groundmaster 300 Series machines, except the 327.

Tractor lift kits are now available for the Beaver Articulator rotary mower from Hayter's. Using the tractor's hydraulic system or an optional 12 volt power pack, the kit safely raises the mower to give a ground clearance of up to 61cms (2 ft) for convenient movement between sites, reducing wear on the machine's caster wheels and axles. Blade changing and cutting height adjustment is also made easier by the lift kit, as is access for cleaning and servicing. The Articulator consists of a series of independently floating rotary mowing decks able to closely follow



Both sides of the Turner Turf Trim's fine cut flail can be used to maximise working life

## Fine cut flails 'a practical alternative to cylinders'

ground contours across working widths of 2.2m or 3.05m (88in or 120in). Cutting heights are from 25mm to 120mm (1in to 4.75in) and power requirement from 25hp to 50hp.

If sheer engine power is the main requirement, there are few rotary machines which come near the 100hp produced by the Turf Blazer Hydro-Power 180 from Huxleys. This 5m (16ft 6in) machine heads a full range of ride on and pedestrian rotary mowers being introduced in the UK by the company. Of principal interest to the golf course user will be the Turf Blazer 727 powered by a 25hp Yanmar diesel and a choice of 1.5m or 1.8m (60in or 72in)

cutting decks. Equipped with hydrostatic transmission, power steering and individual wheel brakes for tight turns, the mower offers cut heights from 38mm to 140mm (1.5in to 5.5in).

Kubota has announced two rotary mower developments for 1993. The first is a new 18hp lightweight (400kg) machine with a wheelbase of just 850mm for tighter turns in confined areas. Available with shaft-driven 1.22m or 1.37m (48in or 54in) side-discharge decks, the F1900 will be available from this spring. The second Kubota development is the addition of Bi-Speed Turn to its F2400 18hp four wheel drive machine. Already proven on the

company's compact tractors, Bi-Speed Turn automatically doubles the turning speed of the rear steering wheels when the steering angle exceeds 35deg. This is said to minimise turf damage caused by drag while producing manoeuvrability not normally associated with four wheel drive machines. The F2400 has hydrostatic transmission and can be equipped with a choice of rotary or flail mowing decks.

Fine cut flails are being promoted by Bomford Turner as a practical alternative to cylinders in areas where stones, molehills and other surface problems can greatly increase wear rate and downtime. The new Turner

Turtrim with three fine cut flail heads spanning 2.1m (83in) is said to give a finish virtually indistinguishable from a conventional cylinder mower under most longer grass conditions. However, the flails are designed to be maintenance free, never needing sharpening. Powered by a 28.5hp diesel, the Turtrim is available in two or four wheel drive versions, both with hydrostatic transmission. For the traditionalist, the company also offers interchangeable cylinder and rotary mowing heads for the machine.

For users looking for low weight, good manoeuvrability, the ability to collect clippings and a diesel engine, the new Walker Model D mower distributed by Bob Andrews looks to have most of the answers. Equipped with a 16.5hp three cylinder diesel and



Jacobsen's LF3810 fairway mower has the Green Sentry oil leak detection system fitted as standard

hydrostatic transmission, the machine offers a choice of three rotary mowing decks all linked to

an integral collector via a vacuum blower. Dual rear wheels are close coupled to maintain a minimum

turning radius while reducing the risk of compaction on finer turf.

There are always going → 33

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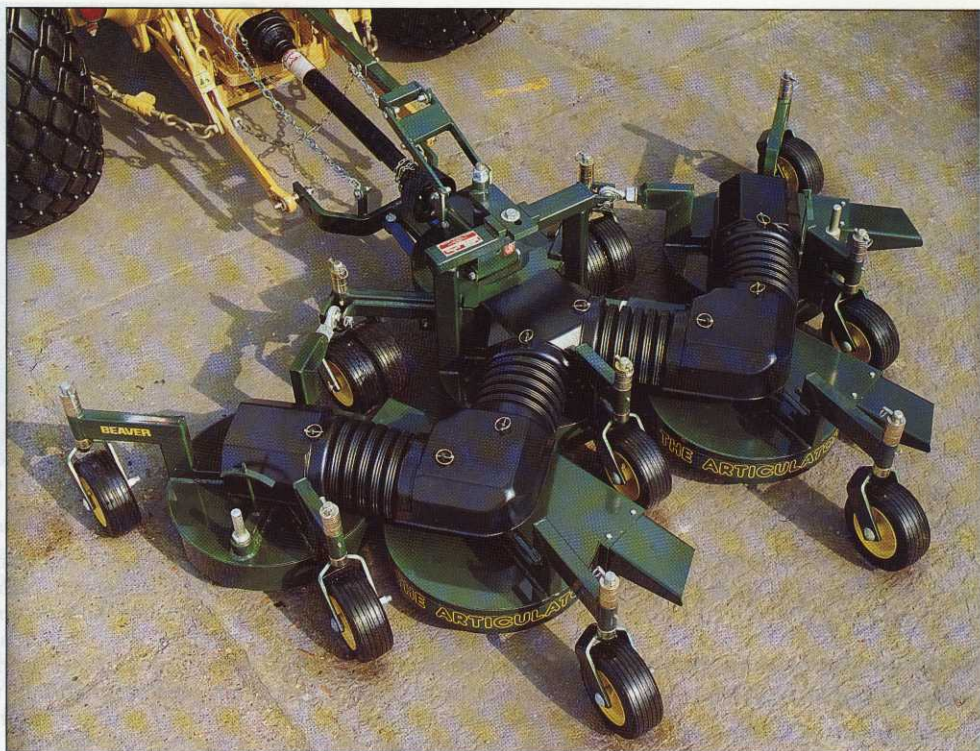
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# CUTTING EDGE

31 → to be situations where a ride-on mower cannot be used due to its size, weight or the cutting conditions encountered. Work on steep slopes is a typical example. For such applications, the new Bank Commander from BCS Tracmaster has a low centre of gravity, dual wheels and power steering to produce a stable and controllable mower on inclines up to 60deg. Fitted with a choice of 1.09m, 1.32m or 1.52m (43in, 52in or 60in) scythe cutter bars, the machine has a floating head able to ride over undulations. It is powered by a 12hp petrol engine.



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# JUST A DROP

**It is not in the nature of Greenkeeper International to be alarmist, though with water companies and the NRA declaring (Flying Divots, February) that it will take two wet winters of recharge to return to average conditions, the pessimistic view must be taken: water may well be at a premium yet again. This feature article, taken from a paper given in November to an audience of European golf course developers and planners, offers the view that water is a precious commodity and must be managed with care.**

**W**ith careful management the quantities of water required to maintain a golf course can be minimised. Nevertheless, whatever management systems are practised, a reliable water source will be required for any successful project: the quantities will vary according to the scope of the project, marketing philosophy, local climate, plant and soil types etc.

For 18 holes the quantities will vary from as little as 50m<sup>3</sup>/day for 18 greens only in the UK using part circle sprinklers, to circa 3000m<sup>3</sup>/day for a wall to wall project in the Mediterranean area. (1m<sup>3</sup> = 220 imperial gallons)

The availability of water, or lack of it, may well influence the entire philosophy of the project and in extreme circumstances may force its cancellation. Thus it is vitally important that this aspect is explored in full prior to significant financial commitment.

It will not have gone unnoticed that in this country the reduction in available water for irrigation purposes has been making headline news for the past couple of years,

though what may not have been appreciated is that the problem extends throughout the southern half of Europe and North Africa. In nearly all locations, ground water levels have been dropping and there has been insufficient winter rainfall to fully re-charge surface storage facilities and the aquifer, on which increasing domestic, leisure, and industrial demands have been made.

Unfortunately golf courses have been perceived as the villain of the piece: when public supplies are curtailed why should an 'elitist' sport have unlimited supplies? I do not propose to go into the agronomic or commercial arguments, except to say that the irrigation issue does get bad press at home and overseas, and the golf industry as a whole must improve its image. It must counter such ill-informed argument with a reasoned and responsible approach to the issues, in the hope that those responsible for the provision of water appreciate the position and take more kindly and realistically to requests for abstractions. A recent policy

statement from a left of centre Spanish political party requires all new golf courses to use Treated Sewage Effluent (TSE).

The obvious source of water, particularly for the smaller demand project, is likely to be the potable (drinking) water supply, which, if not already laid on, will need to be extended to the site. Few if any water supply companies will permit a direct connection between the public mains and an irrigation system, even if the flow is available at the right pressure, owing to the need to protect the public from potential contamination of the supply. Therefore a break tank will be required and thereafter a pumping system to extract the water from the tank to supply the distribution system. Compared with the possible alternatives, the capital costs are low, but there may be planning constraints. The 'snags' with this type of supply are principally two.

The first is the extremely high cost of the water. A recently quoted project in SE England was 69p per m<sup>3</sup>, and it was estimated that this project - 18 holes, greens, tees and

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Ornamental lake - note grass to water's edge

approaches - would require something like an additional 1000 rounds of golf purely to meet the operating cost!

Even if the economic argument can be satisfied, the other critical factor is the unreliability of the supply. At times of stress, owing to a reduction of the companies water reserves or the additional domestic load placed upon the overall reticulation system, supplies may be reduced or totally curtailed, this at a time when most needed.

In very exceptional cases, to overcome one or both of these limitations, a reservoir may be constructed to accept water from the public supply during off peak months at reduced charges, with

this water been drawn off during the irrigation season. For those of you in the UK using existing public supplies, check the supply is through a dedicated meter or you may also be paying a sewage charge for irrigation water!

Many courses and planned projects are in the theoretically enviable position of having surface water (rivers, streams or lakes) on or in close proximity to the site, but again there are snags, for in very few countries is a direct unlicensed abstraction from these sources permitted.

Licensing is required to protect the rights of other existing and potential users of water from the same source, and owing to ➔ 36

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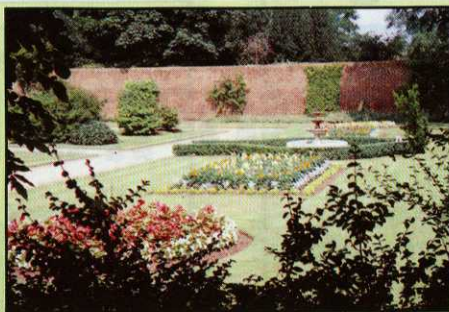
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# The answer

35 → the aforementioned crisis situation which has arisen, a licence may well be refused or at best limited to abstractions at off-peak periods and/or constrained to ensure that stipulated minimum flows are maintained in the stream or river. Thus there may well be a requirement for a reservoir. In some countries these supplies can be so seriously polluted that agronomic and health factors will have to be taken into account: ridding this water of undesirable deleterious material, so as not to effect the performance of the mechanical components of the system, may also increase the capital costs.

The operating cost may well be low, in this country typically the licence will permit the amount used to be charged for at approximately 1.5 pence m<sup>3</sup>. However, be warned – there are moves afoot to increase the cost per m<sup>3</sup> and to stipulate a minimum charge which may well in the foreseeable future be the maximum permitted by the licence. Nevertheless this should still be a long way off the cost of potable water.

The third principal source of water for golf course projects is ground water, ie. that contained in water bearing underground strata. It should be initially established if the site overlies such strata, and that the required quantities can probably be obtained. Again, the full licencing procedure must be followed. In most countries no work can start until such time as the relevant authority has given its consent, the full licence will not be granted until the borehole has been proved, and consent does not imply a license will be issued. As with surface water, to ration supplies a balancing reservoir may be required and certainly from our experience it is more economical to install even a small one, pumping for 24 hours from the borehole to extract at night for the irrigation cycle. Quality may be an issue.

There is no doubt that in some countries or regions of same, the authorities are, or will be, putting pressure on new golf developments to use treated sewage effluent. This solution, however, is not as straightforward as some would

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# lies in communicating

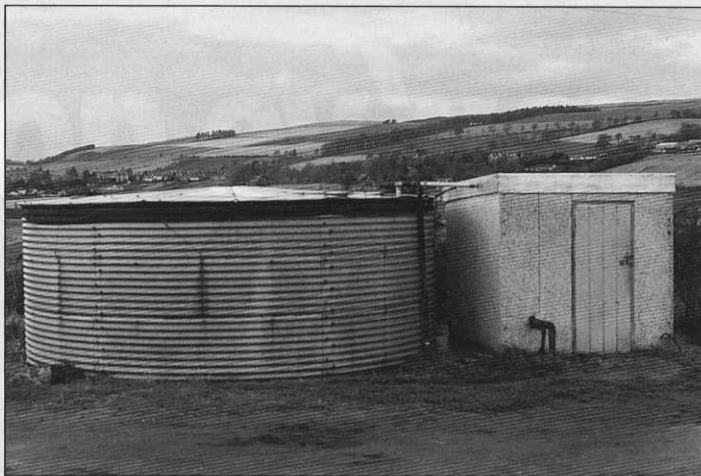
think, as there are quality and quantity issues.

The obvious quality issue is one of odour and, by implication, health. It must be confirmed that the quality will be such that all recognised standards are achieved at all times, (or alternatively at not insignificant cost if further treated). The chemical analysis may be such that a high salt content, (or in industrial areas heavy metals), is such that there may be short or medium term persistent harmful effects on the turf sward.

Discharge quantities may vary according to the time of day, and in holiday areas weekly, therefore it must be confirmed, or arrangements made, to ensure the correct quantities are available at all times for irrigation purposes. Although there may be no charge for taking TSE, there could well be a high capital cost in transferring the water from the plant to the site and further treatment to bring it to an acceptable level.

Technically, in this country, no licence is required. However the NRA will take into account the effect on flows in streams and rivers and may, if the discharge is critical to the environmental balance, object to its use.

Finally, on sites with certain soil types it may be possible, providing the golf course design and drainage plan take it into account, to store surplus rainfall in a reservoir for irrigation use. You will have noticed that whatever the source there will in most cases be a need for a balancing tank or reservoir, ranging in size from say a nominal 50m<sup>3</sup> for a 'greens only' project, to say 60,000m<sup>3</sup> or more for 18 greens, tees and fairways in the UK if the entire season's requirement needs to be stored. It is important to note that storage reservoirs



Typical public supply balancing tank for a UK greens only project



Winter storage reservoir drawn down at the end of the summer. Note unsightly view from adjacent tee

should for preference be situated off course, as inevitably they will become unsightly when draw-down, thus there is a requirement for additional land to be made available, which should be taken into account at the feasibility stage and subsequently at the

planning application.

To ensure the most economic and practical answer to this ever increasing problem, it is vitally important that the client, his golf course architect, agronomist and irrigation consultant, co-operate fully. Their combined knowledge

should, except in the most extreme cases, provide a solution. The irrigation consultant, with his wide range of experience, will establish with the agronomist the nett water requirements of the project and convert these into gross requirements (which are significantly higher), taking into account such factors as irrigation efficiency, overthrow, lake surface evaporation losses etc., and probably in warmer climes, landscape requirements. Thereafter he will establish how this water is to be sourced, confirming quality and quantity, and whether or not there is a need for a reservoir (if so its capacity), treatment etc., apply for licences and handle all the negotiations and all paperwork that entails. To ignore the water requirements at the planning stage is at the developers peril!

To summarise: Potable supplies – generally for smaller projects have a low capital but relatively high operating cost, the quality is good but can be unreliable. Surface water – low capital and operating costs, a reservoir may be required and a licence will be needed, quality should be confirmed as acceptable. Ground water – a high capital and low operating cost, quality generally is good, a licence and reservoir is required. Treated Sewage Effluent (TSE) – this is a minefield: probable high capital costs with major quality issues. Rain water – feasible in some cases, high capital, low operating cost. Reservoirs – these are required in most cases, costs (additional to land purchase) will vary dramatically depending on soil/strata types and, of course, volume required.

■ The author, Philip York, is an irrigation consultant with Philip York and Partners.



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**Just when things start to go right... something always goes wrong. Take comfort from Murphy's Law in the knowledge that other greenkeepers too are having their problems.**

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**Drop a line to the editor. Meanwhile, sit back, read on - and realise you're not on your own...**

# You think you've got problems..?

## Run, rabbit, run

Wind, rabbits and a severe lack of water are the three principal difficulties facing John Phillips, who single-handedly looks after the nine hole St David's City golf course in Dyfed, west Wales. If those three handicaps are not enough, the sight of small mounds of finely excavated soil on the fifth tee reminds John of a fourth problem which appears regularly at random around the course.

"Moles simply come and go as they please," he points out. "I've tried most deterrents but they just pop up again somewhere else, usually in the middle of a green or a tee. I'd welcome advice from other greenkeepers who have managed to get rid of moles."

Founded in 1902, St David's City Golf Club has the dubious distinction of being the most westerly course in Wales. Situated within the

Pembrokeshire Coast National Park, it enjoys spectacular views over Whitesands Bay towards Ramsey Island, while being directly exposed to the prevailing south-westerly winds which sweep up St George's Channel from the Atlantic Ocean. And therein lies the greenkeeper's main problem.

"There's rarely a day when the wind doesn't blow," comments John. "This causes erosion, difficulty with establishing new grasses and rapid drying out of the turf." The last-mentioned point is compounded by the fact that there is no irrigation on the course. As a result, John spends much of the summer carting water from a nearby well to each of his nine greens. Using a second-hand farm vacuum tanker of 1000 gallons capacity, water is sucked out of the well, carried to the green and forced out over a 30 yard arc via a hand-held hose and spray nozzle.

"The level of the well means that I am limited to about 500 gallons per green, applied every other day during the worst summer dry periods," he explains. "I would like to water more often, but we simply do not

have the supplies available." Water did dry up in 1990, so the greens were left to fend for themselves. Fortunately, the rain came before all the grass had died away. Being built entirely on sand, there is little moisture retention within the turf. This, reasons John, is not necessarily a bad thing: "The grasses that do grow are of very fine quality and extremely hardy," he explains. "Furthermore, in the 12 years that I've been here, the course has never had to close due to poor surface or weather conditions. Even when it snows, the combination of wind and fine, close turf prevents it from setting."

The one problem which gives John the biggest headache of all can be seen on and alongside all nine fairways on the course. Rabbit holes litter the ground like mini bomb craters creating hazards for golfers and the mower alike. "We are under attack by rabbits on three sides," comments John. "Their digging regularly results in lost balls and impossible lies. It also means that some part of the course is always under repair."

Lack of funds has kept the lid on



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John Phillips examines freshly-made mole hills in the middle of the fifth tee at St David's City golf club

machinery investment over the years. As a result, fairways are mown with an elderly set of standard trailed gangs which tend to scalp the undulating turf, further encouraging erosion and rabbit attack. "We desperately need a twin-roll floating head machine to limit the scalping," says John. "My second investment priority is for pumped irrigation to every green." However, with just 120 members and a major reliance on visiting golfers during the summer, it looks as if John could be hand watering the greens on this beautiful, yet remote gem of a course for a few more years to come.

#### Common as muck...

The approach of spring is viewed with more than a little trepidation by the two greenkeepers responsible for Minchinhampton Golf Club's Old Course, near Stroud in Gloucestershire. For Derek Hankins and his assistant Lionel Creed, D-day is an annual event, marked by an invasion which leaves the ground looking not unlike the Normandy beaches in places. The critical date is 13 May – the day each year that grazing is permitted once again on the common land on which the famous old course is situated.

"It's like a rodeo here during the middle of May," commented Derek. "Can you picture the scene? Up to 500 head of cattle arrive on the common from their winter quarters and see all the fresh, lush grass just aching to be eaten." The regulations concerning the use of the common, of which some 100 acres are leased by the club from the National Trust, state that only the fairways, tees and greens can be cut. The length of the grass, however, has no bearing whatsoever on where the cattle go or where they sleep, excrete and urinate. As a result, the first three hours every morning from 14 May through to late October see Derek and Lionel setting off in different directions around the 18 hole course. Shovel and switch in hand, they remove droppings deposited on the turf the previous day and night, placing them carefully in the rough and semi-rough.

Any thought of using them on the vegetable or rose garden cannot be entertained because the rules state that no manure can be removed from the common. When the piles of droppings get too large, they are spread far and wide by chain harrow. As a result, the grass and the grazing are, in Derek's words, 'absolutely fabulous'. Minchinhampton's Old Course has shared the common with livestock for close to 100 years, so golfers have become quite used to carefully lifting and replacing the ball on the fairways and greens' approaches.

One aspect of the National Trust's regulations on which Derek would appreciate a little greater flexibility concerns the fencing of the greens. "Under the bye-laws, we cannot fence any green without the permission of the land owner," he explained. "At the moment, we have



Derek Hankins, left and Lionel Creed remove horse droppings from the ninth green on the Minchinhampton Old Course

temporary fences around six greens, and these are only permitted after damage has been caused to the turf and repair is necessary. "It really is heart-breaking to mow a green only to see a horse or cow running or urinating on it minutes later."

The effect of urine on fine turf is devastating. "The grass is dead within a couple of days," said Derek. Hoof marks are easier to deal with, but it all takes time. Ask Derek how many days Lionel and himself spend each week on pure greenkeeping and his answer is "about two". The rest of the time is spent clearing, cleaning and repairing the turf.

Grazing cattle and horses are not the only headache faced on Minchinhampton Common.

Because the land is open for the enjoyment of the public on foot or horseback at all times for recreational purposes, the two greenkeepers have a number of other regular problems to deal with. It is not uncommon to see riders direct their steeds straight across a green, while summer weekends would try the patience of the most mild tempered person.

Car loads of picnickers, dog walkers, kite-flyers and 'nature' lovers descend on the common to take in the delights of this corner of the Cotswolds. However, their appreciation of golf and the greenkeeper's skills varies greatly. "I've chased games of cricket and tennis off the greens," pointed out Derek. "And at night, the joy riders appear. One green was churned up recently three times in a week by a car or motor bike."

In spite of all the aggravation, Derek and Lionel derive great satisfaction from the fact that they manage to keep the course in excellent condition for much of the year. The results of their efforts are highlighted by the club's 600-strong membership and a 12 month waiting list, proving that golf on the unique and totally natural Old Course at Minchinhampton has never been more popular.

#### Wired for defence

Two hawthorn hedges, a water-filled ditch and two wire fences topped with barbed wire have not proved a sufficient deterrent for trespassers wanting to get onto Wall-sall Golf Club's 120 rolling parkland acres. So, with full police permission, course manager, Steve Wood, has installed 'razor barb' wire in the most vulnerable areas within the southern perimeter of this picturesque wooded course, situated just three minutes from the M6 motorway and less than eight miles from Birmingham city centre.



Steve Wood with 'razor barb' wire

"The most common problem is ball theft after a golfer has driven on the 465 yard fifth hole," explained Steve. "However, much more serious is the vandalism caused to the greens and tees, with flags and markers stolen or broken. The irrigation equipment is also a prime target. In the past few years we have had to replace or repair sprinkler heads, control valves and solenoids to the tune of £4000, and that's no laughing matter."

Maintaining the security fence on the remote south side of the course takes one man eight hours a week during the summer. And even the 'razor barb' has not produced an entry proof barrier. Despite being made from high tensile steel, it can be cut neatly and quickly using bolt

cutters by anyone determined enough to want to gain entry. "The police have said they are powerless to prevent people breaking in," commented Steve Wood. "We'll simply have to persevere with our fencing systems."

Another time consuming task, adding at least an hour to the normal daily work routine around the 18 hole course, is the repair of bunkers and the surrounding turf following the ravages of foxes and their cubs. There are about ten pairs of foxes living on or close to the course and Steve said that the scene resembled a zoo in the early mornings. The biggest problem is caused by digging in the faces of the bunkers, with holes often appearing on the green's apron or even the putting surface itself.

"Repair is carried out by filling the holes with the excavated soil or sand," explained Steve. "However, the sand is often contaminated and will require changing to maintain the correct particle size. Foxes can create a lot of mess and damage." Control is difficult in an area surrounded by housing as many of the local people like to encourage the foxes, leaving food out for them at night. As a result, the preferred control method is by trap, releasing the caged animal in the countryside away from Birmingham. Early Sunday morning shoots have been arranged, but these have to be finished by the time the first golfers appear and also produce protests from the club's animal-loving neighbours.

Apart from controlling unwanted humans and creatures, the other major problem faced by Steve is the level of grass growth on the course during the spring and summer months. "If we don't cut the fairways every day, the grass becomes virtually uncuttable and the ball unplayable," he commented. "As it is, we have to brush the turf before mowing if it's at all wet from dew or rain." This action helps the grass both stand up and dry out, improving the throw from the mower and minimising the risk of clumps of wet, freshly-cut grass dropping onto the turf. The reason for the phenomenal growth is a subsoil of dense, yellow clay which holds the water and makes the course 'a real picture' during even very dry summers.

Of course, it's a different story in the winter and Steve and his five assistants have to plan their work accordingly. Although extensive drainage has been carried out on all fairways, the subsoil takes a long time to dry out, especially after extensive rainfall. This produces soft surfaces which cannot take heavy equipment without marking. "Construction work, aeration and many other turf jobs need to be completed by November or we face having to wait until the spring," pointed out Steve. "However, I'm sure there are many courses which could do with the water we've got, so I'm not complaining. It's all part of the joys of greenkeeping."

Michael Bird

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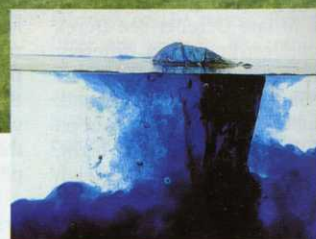


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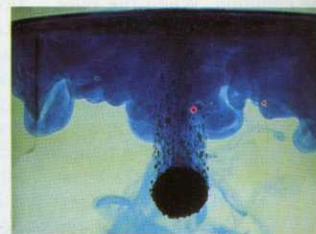
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◆ The Mark II version of the Turfquake has been announced. Using a large vibrating disc to form and fill a standard sized slit (50mm x 300mm), the Turfquake is able to work where other machines cannot go, claim the makers.

Developed originally to avoid soil carting need by displacing soil laterally using the powerful integral vibrator, it was also found to work well in normally very difficult conditions. Stones, hard ground, even some rock-types have been successfully slitted without surface disruption. With the ability to cut and fill a slit with a two-layer sand/gravel drainage medium in one pass, wheel damage to turf is kept to a minimum. Most fairways, even the largest, would be intensively sand-slitted within one or two days, given the right conditions. Small-bore pipes and cables can also be installed, but with a depth limit of 0.3m. The Turfquake will be on demonstration at Moreton Morrell College, Warwickshire on 17 March at the same time as the STRO seminar on Sportsturf Drainage. Details: 0773 827115.



de-mount system. It enables the vehicle to be speedily equipped and just as quickly put back into its normal operational mode.

The Eagle weighs around 200kg (without liquid) and the specification includes hydraulic folding and manual height control for the boom, clean water tank, electric controls, Hardi triplet nozzles and hose holder. A hand lance/hose reel is standard. The 'Eagle' will be from £4,030. Details: 0455 233811.



◆ 'Turf Mark', launched by ICI Professional Products at BTME, is a spray pattern indicator for golf courses and all other areas where it is advisable to mark where spraying has taken place. Available in water soluble sachets or in tablet form, 'Turf Mark', a temporary colourant, disappears in 1-2 days irrespective of weather conditions and will not stain hands, clothing or equipment. It can be used with any water soluble pesticide or fertiliser (as illustrated), without affecting chemical efficacy. Available as a measured dose, 'Turf Mark' sachets are boxed in 20's (£110.96) or tablets in a bottle of 25 (£17.40). Details: 0428 645454

◆ Novatee is a thick synthetic grass that is topdressed on site with a special non-compactable topdressing mix. This keeps the fibres standing up and allows the golfer to 'tee' up or hit down on a ball with irons – as on real grass. When irons are used on Novatee a small amount of topdressing flies out of the grass, giving the golfer the feeling of having created a proper divot. Novatee was created for use on practice areas, commercial driving ranges, or on the course where tees are not growing either from overuse or not enough sunshine. Distributor enquiries invited. Jean (John) Prevost: 0101-514 4861696 or Fax 0101 514 4869927.

◆ Supreme Mowing have further enhanced their 'Leader' range of grinding machines with the introduction at BTME of the new 'Golf Leader' cylinder and bottom blade grinder. The 'Golf Leader' incorporates Supreme's unique dual purpose grinding head, allowing equally efficient and accurate operation on both cutting cylinders and bottom blades. The machine conforms to the modular concept, offering either manual or combining automatic traverse or spin drive operation. Details: 0709 873436.

◆ The 1993 Sta-Brite Turf Care Supplies & Sports Equipment Catalogue is available now, a most user-friendly priced guide to over 500 products. Contact Sta-Brite on 0256 811811 for a copy.

◆ The new ICI Professional Products Amenity Guide has made an immediate impact on the industry, awarded 'Best Literature of the Show' at the '92 IoG show. Not content to rest on their laurels, ICI Professional Products are adding a further four pages (88 pages in total) to accommodate conversion tables and charts. In addition the guide has been designed to allow the printing of stand-alone sections featuring Turf Care, Fertilisers, Landscape Management, Grass Growth Control and Aquatics. These mini-guides were introduced for the first time at the BTME. Written, designed and produced to be user-friendly, the ICI Amenity Product guides are referred to on a regular basis by all those who have a responsibility for the management and maintenance of golf courses.

◆ SISIS Equipment (Macclesfield) Ltd are now sole Scottish distributors for the full Lescro range. Demonstrations are now being arranged and all sales and service enquiries should be made to: SISIS in Scotland, Middlefield Ind. Est., Falkirk, FK29HG. Tel: 0324 29635.

◆ Inter Seeds Ltd is the first seed company to announce its successful assessment and registration to BS 5750 Part II as wholesalers and distributors of seeds, together with the blending and mixing thereof. It proves that the management team have developed a quality system which they successfully operate and gives their customers an assurance that Inter Seeds Ltd is a supplier which has opened its doors to the rigorous bi-annual assessment by NQA of that quality system which the Standard demands. The BSI Standard stipulates that all registered companies maintain a detailed manual of procedures for all aspects of customer contact and contract review; of goods handling and inspection and testing; of assessment of their own suppliers and for the handling of complaints.



◆ Greenlink Products, European distributor of the Blazon spray pattern indicator, announces the introduction of Blazon E-Zee Pak water soluble packets, the first liquid spray pattern indicator to be available in water soluble packaging.

Blazon E-Zee Pak represents a break-through by combining the superior solubility and non-staining of liquid Blazon with the convenience of water soluble pre-measured packaging, designed to improve the quality and safety of spraying and reduce the cost of pesticide and liquid fertiliser applications. Each packet will treat 100 litres or more of tank solution. Blazon is available in the UK from Farmura and their distributors. Details: Greenlink Products 0268 413798 or Farmura Ltd 023 376 241/581.

◆ Many golf courses now face the problem of compaction and the weight of all machinery has become an important factor when deciding what to purchase. The designers of Hayter's T93 Greensmower, launched at BTME, have taken this into account. This new machine weighs 90kg (200lbs) less than the previous T92 model. A 16hp water-cooled Kubota diesel engine provides power to all drives through a full hydraulic system that includes a closed circuit transmission unit with dynamic braking. The tilting steering column and fully adjustable seat gives all-round operator comfort and helps to reduce fatigue. Mowing units are available with either 7 or 9-bladed, 13cm reels. Height adjustment is from 4.8mm to 19mm and there is a choice of grooved or smooth rollers. The Greens Conditioner has a variable penetration setting down to a depth of 1.3cm below the lowest height of cut. Three vertical thatch removal units have an overall operational width of 1.5 metres. These can be set from 0.6cm above ground down to 1.5cm into the turf. One of the big attractions of Hayter's new T93 is its price. Complete with Greens Conditioner it costs nearly £2,000 less than its nearest rival. Details: 0279 723444.



◆ Ritefeed Ltd have hit upon a unique marketing idea, an extended credit deal that gives would-be purchasers a chance to sample their fertilisers for upwards of ten months before agreeing to the terms of their 'Free Year Deal'. You tell them how much you use in a year, they tell you how much it will cost and a deal is struck. You buy your fertiliser only from them for the following four years – however, one of these years costs absolutely nothing – the charge is waived. Details from John Walker on 0772 253521

◆ Buckinghamshire based machinery dealer Risboro' Turf have obtained registration to BS5750 part II, only the second to achieve this in the county. The registration is the culmination of 18 months hard work.

Risboro' Turf, top UK Jacobsen dealer in 1990, 1991 and 1992, are major suppliers of equipment to golf clubs in Bucks, Berks, Oxon, Herts and North London and are also main dealers for Hayter-Beaver, Iseki, Lamborghini, BLEC, Honda Gravely and Charterhouse. They have recently started to manufacture their own range of pedestrian and tractor SORREL rollers. Tel 0844 274127.

# Achievements recognised

Whilst most of you were gritting your teeth and facing gales, blizzards, heavy rains and floods resulting from a series of meteorological depressions which raced in from the Atlantic, as the New Year unfolded, I joined the cream of Europe's turf managers heading for the sun and the Henry Cotton inspired Penina golf and hotels complex, set amongst subtropical gardens and orange groves which proliferate along Portugal's Algarve coastline.

The occasion? An opportunity to meet brothers-in-arms at the third, bi-annual PGA European Tour Greenkeeper's Conference.

Representing all the golfing venues which collectively forms the PGA European Tour tournament circuit, over 60 delegates – plus an international line-up of speakers – travelled from as far afield as Ireland, Scotland and England, most of mainland Europe, from Dubai and the United States in anticipation of the week to come...

We were not disappointed. Having been formally welcomed by Bruce Jamieson, Director of Agronomy, PGA European Tour, we set-



**Toro-PGA European Tour Student award winners in Portugal: from left, Paul Brannan, Glasgow; John Waite, Leeds; David Norton, Belfry and Tony Gooch, Torrington, Devon**

tled down to four days of evocative discussion and debate.

Keynote speaker, Dr James Beard, Director and Chief Scientist, International Sports Turf Institute, started the ball rolling with his absorbing paper entitled 'Construction and Maintenance of Creeping Bentgrass Putting Greens! This involved the quietly spoken Texan in leading a marathon, four-part discussion spread over the first two-days of the conference.

Hard pounding? Not a bit of it. Dr

Beard's relaxed delivery not only held his audience, it prompted spontaneous reaction from his listeners who included the redoubtable Walter Woods (St Andrews), George Brown (Turnberry), Derek Ganning (The Belfry), Chris Kennedy (Wentworth), Lawson Bingham (Sunningdale), Neil Whitaker (Woburn), Ken Barber (East Sussex National) and Ron Whitehead (La Moye).

Talking of the pressure put on greenkeepers whose courses staged tournament events, former Walker and Ryder cup golfer, Peter Townsend, now joint Managing Director, European Golf Design, criticised the practice of tricking-up greens to make them faster.

Citing the last Ryder Cup played on Kiawah Island as a case in point, Peter Townsend said "Tournament players are highly skilled – given good conditions they are capable of reducing any course to a round in the mid-sixties but sponsors and television might find that boring. Although I believe that it is desirable to 'tighten' championship courses for major tournaments, they should be fair."

Reviewing modern day golf course design considerations, Ross McMurray, European Golf Design, commented that it was becoming increasingly difficult to design good courses suitable for all types of golfers. "Today, we have to think about the big-hitter, the average player driving 200 yards and the beginner, only capable perhaps, of reaching 150 yards. It is hard to set-up a golf course which challenges all standards of abilities."

Striking a lighter note, Scotland's Man-of-Kent, George Brown, Golf Course & Estate Manager, Turnberry, regaled his audience with a humorous account of his annual battle to overcome coastal erosion, heavy rainfall and gale force, wind driven sand storms, which can quickly bury exposed greens – at the drop of the barometer.

Widening the topics under discus-

sion, Hermann Schulz, Head Greenkeeper, Gut Kaden Golf Club, Germany, spoke of the headaches he and his team faced in bringing his course up to PGA standards for the 1992 Honda Open.

Speaking in French – ably translated by Ian Dabson, (Monte Carlo Golf Club) – consultant Jean Pierre Leboucher reported details of a three-year study he had completed, assessing the effects of differing subsoils on root development – on golf courses and football pitches – in France.

Listing the wild-life which affected his course, Ken Glover, Superintendent, Lake Nona Golf Club, Florida, mentioned bald eagles, moles, armadillos and fire ants – oh yes, and alligators. 'If they (the alligators) get frisky I call in the local specialist – he nets them!'

Speaking about educational matters, Carol Borthwick, Elmwood College, Fife, outlined progressive developments "Which had allowed colleges in Scotland to respond to requests calling for HNC and HND training courses."

This had led to the formation of an HNC Greenkeeping Consortium – which works as a sub-committee of the Scottish Industrial Liaison Committee – chaired by BIGGA – and which included representatives from Langside, Oatridge, Dundee and Elmwood colleges plus the GTC.

Talking of BIGGA, I was pleased to meet four previous winners of the Aldwark Manor administered, Toro-PGA European Tour Student Greenkeeper Awards, enjoying the five-star ambience of Penina – and taking opportunities to mix with their peers during the daily sessions and equally apres conference.

The four, headed by David Norton, now number one to Derek Ganning at The Belfry, comprised John Waite, Leeds, Tony Gooch, Torrington, (Devon) and the youngest of them all, Paul Brannan, Glasgow. When I spoke to Paul at the first conference coffee break, he was wide-eyed with apprehension, though some five days later I spotted Paul (and Tony) in deep, after dinner, conversation with a bevy of French greenkeepers. A week works wonders!

Back in the conference room the arrival of Ken Schofield, Executive Director, PGA European Tour, put the seal on the week when he told delegates, "The work you do is vital to the success of the European Tour events. All players acknowledge the big improvements you have made to tournament courses. It speaks volumes for the efforts you put in, we appreciate it."

■ The author, Cedric Johns, is editor of TORO's magazine 'Pipelines'.

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# Your Open invitation

The 122nd Open Championship will be held at Royal St George's Golf Club, Sandwich, Kent from 15-18 July 1993.

The Association has again been asked to provide a Greenkeeping Support Team and those members wishing to be considered for this should forward their names and addresses to HQ as soon as possible.

The Royal St George's course manager, Mr Derek Scarborough, and his staff are looking forward to the support team's assistance. Preference will be given to those members who will be free for a period which begins Wednesday 14 July and finishes on Sunday 18 July. Priority will be given to those who have formed part of the support team in previous years.

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## National Education Conference

26-28 March 1993

University of Keele, Staffordshire

For the fifth consecutive year, BIGGA's National Education conference in the spring will feature a programme of international speakers.

*The speakers and their topics are:*

Professor Noel Jackson, The University of Rhode Island, USA: **Cool Season Turf Diseases in the USA and the UK**

Ian Tomlinson, Course Manager, Lausanne Golf Club: **The Problems Associated with Maintaining a Golf Course at 2,800ft Altitude in Switzerland**

Antony Mears, Course Manager, Dinsdale Spa Golf Club: **The Wild Side of Golf**

Dr Peter Hayes, Director, The Sports Turf Research Institute: **The Role of the Agronomist and Supporting Scientific Services**

Robert Brame, Agronomist, Mid-Atlantic Region, USGA Green Section: **Poa Annua: Wherever Did It Come From and How We Manage It**

Andy Cole, Advisory Agronomist, The Sports Turf

Research Institute: **Greenkeeping Qualifications - Are We On The Right Lines?**

Patrick Murphy, BIGGA Northern Section Secretary and Course Manager at Shipley Golf Club: **The Lifting, Excavating and Re-Building of a Golf Green with a Drainage Carpet Layer and Having it Back in Play in 17 Days**

Arthur King/Edward McCabe, Green Committee Chairman and Course Manager respectively, Brockenhurst Manor Golf Club:

**Course Management - Communication with Members**

Gary Grigg, Board of Directors, Golf Course Superintendents Association of America:

**Current and Future Issues in Golf Course Management**

Severin Schmitz, Course Manager, Golf Club Schloss Myllendonk: **How a Personal Computer Can Aid a Course Manager**

Ian Thompson, Course Manager, Wetherby Golf Club: **Trees and Tree-Planting for Golf Courses**

Anthony Davies, Course Manager, Prestbury Golf Club: **Right or Wrong - I Did It My Way**

George Brown, Course Manager, Turnberry Golf Course: **Being Open-Minded**

Professor Noel Jackson, The University of Rhode Island, USA: **Patch Diseases in Cool Season Turf Grasses**

Gordon Child, BIGGA South West Regional Administrator and Course Manager at Churston Golf Club: **Greenkeeping - Past, Present and Future**

Iain Ritchie, Course Manager, Portmarnock Golf Club: **Three Years at Portmarnock**

Robert Brame, Agronomist, Mid-Atlantic Region, USGA Green Section: **The Ten Pitfalls of American Turfgrass Management**

Copies of the Programme and Application Form are available from BIGGA HQ, Aldwark Manor, Aldwark, Aine, York YO6 2NF.

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**More speaker profiles from the glittering National Education Conference, to be held at Keele University, Staffordshire on 26-28 March. If you haven't already booked your place - DO IT NOW! Time's running out and if you're serious about your profession, you just can't miss this event. See the full line-up in the advertisement on Page 43 and call BIGGA HQ on 03473 581.**



**Patrick Murphy**, the Scotsman with the essentially Irish name, cut his greenkeeping teeth at Broomiehall GC as a fifteen year old apprentice before moving into headship immediately after completing his indentured term. This was when he joined West Linton GC in Peeblesshire, where he stayed for about 18 months before being tempted across the border to join Shipley Golf Club.

The day is engraved on his memory, Friday the thirteenth of February 1970, though far from being a unlucky omen it has brought him good fortune over the years, and he has remained a loyal Shipley man for all of that time, a creditable achievement.

Listening to Patrick, you'll soon realise that his enthusiasm for Shipley knows no bounds, though his 23 years as head greenkeeper on the course have not been without their moments. For example, his first STRI report back in 1970 suggested that Shipley's greens, laid some fifty years earlier, had been neglected for far too long and were in need of major surgery, with conditions beneath the surface indicating that a long slog lay ahead. Along with the regular 'fixes' - moves such as deep aeration, verticutting, scarifying, hollow tining and mole ploughing - a decision was also made to lift, drain and re-build one green each year, starting with the worst and progressing onward as funds became available.

It is not recorded how the first re-build went, though one must assume it was hugely successful; for some fourteen greens have been recipient of Patrick's skills over the years. Now the fifteenth such green has been lifted, (actually the sixteenth hole) excavated, re-built and put back into play in seventeen days! How he does he do it? Come to Keele and find out!



**Robert (Bob) Brame**, has what many British greenkeeper's might regard as the perfect pedigree, for he began his career in 1970 as a humble ground crew member at a public golf facility, rising through agronomy farm assistant in 1971, assistant golf course superintendent in 1972, thence through a number of senior jobs as superintendent proper at such grand places as Guadalajara Country Club in Mexico (1972-74), Timber Trails Country Club, La Grange, Illinois (1974-78), Lafayette Country Club, Indiana (1978-80), and the famous Broadmoor Country Club in Indianapolis from 1980 through 1990 - an impressive and essentially practical record.

Bob took his Bachelor of Science degree in 1972, majoring in Agronomy at Purdue University, and he is now (since 1990) the Mid-Atlantic agronomist for the USGA Green Section, covering the states of Delaware, Kentucky, Maryland, Ohio, Pennsylvania, Virginia and (almost heaven) West Virginia. Bob's experience includes all the major turfgrasses grown in the USA as well as those predominant in the British Isles, and he has worked closely with Stanley Zontek, with whom many are acquainted following previous hugely

entertaining lecture presentations.

Bob's two presentations both have intriguing titles, beginning with 'Poa annua, wherever did it come from and how do we manage it'. He will conclude our glorious proceedings as the final presenter on Sunday 28 March with a presentation entitled 'The Ten Pitfalls of American Turfgrass Management'.



**Andy Cole**, a regional advisory agronomist with the STRI, is eminently suited to address the gathered throngs at Keele on the subject of 'Greenkeeping qualifications - are we on the right lines?', for he has practical experience of all sides of the education equation.

For a start, he's young enough to remember still his own stint on the learning curve, having qualified at Leeds University in 1986 with a B.Sc Honours degree in Agricultural Science, following this almost immediately by becoming an advisory agronomist with the STRI, hugely valuable experience.

Two years ago Andy took to the lecture platform full time, joining the staff at Warwickshire College in training would-be young greenkeepers toward C&G Greenkeeping and Sportsturf Management, whilst also lecturing to degree level those working toward a BA in Equine Studies (Turf Management). Though his year or so at Moreton Merrell was not without pleasure, Andy freely admits that the lure of advisory work was so great that he couldn't keep away and he is effectively the prodigal son returned (Aug 92), rejoining the STRI as probably one of the first to be appointed on a regional basis, covering a huge chunk of the country including Birmingham, Leicestershire, Hertfordshire, London and Kent.



**Iain Ritchie** has the eye of an artist, his canvas the 27 glorious holes of Portmarnock, Ireland's glorious jewel. Stemming from a love of the game, Iain began his career by working with those who construct golf courses - a classic education for any greenkeeper - before moving into the maintenance side, first at Dullatur and following this with a five year spell as head greenkeeper at Ladybank, another gem of a course.

Moving to Portmarnock Golf Club in 1990 as their course manager, Iain has seen a great deal of action in the past three years, including the staging of many major competitive events and in particular his own 'baptism by fire', the world's premier amateur championship battle, the Walker Cup. His 1990 pre Walker Cup overseeding programme was quite an event in itself, succeeding in obtaining a 90% strike rate with some three tons of fescue/bent mixture applied through a Moore Uni-Drill.

The subject of a profile report in Greenkeeper International December 1992, Iain will elaborate on his championship maintenance programme, including those experiences briefly touched upon in the magazine, his

aptly titled address being 'Three years at Portmarnock'.



**George Brown**, a Kent man by birth, has been around golf since the age of thirteen, having caddied over the Royal Cinque Ports, Royal St George's and Princes courses from

that tender age. George left school at 15 and joined the green staff at the 27 hole Princes course, Sandwich, remaining there for nine years before marrying, moving to Alton in Hampshire and taking up a position as pro-greenkeeper.

Three years later he left Alton to work for a wealthy family in Kent, looking after their small estate, following this in the early seventies with a return to Princes, this time fulfilling a childhood dream by returning as head greenkeeper at his old course.

In 1979 he accepted an offer to move to Broome Park G&CC, near Canterbury, to supervise the construction of the new golf course and other sporting facilities. Once established, he took on the role of manager and director of golf, staying until 1986 when a further opportunity arose, for him to become golf courses and estate manager at Turnberry and to supervise the preparation of Turnberry for the 1986 Open Championship, scene of Greg Norman's greatest triumph.

George, whose talk is titled 'Being Open-minded', is a former County Cap and Kent Open Champion, as well as being a former chairman of the Ayrshire section of BIGGA.



**Gordon Child**, who is regional administrator for the South West and the course manager at Churston Golf Club in Devon, will forgive me if I tell those very few readers who do not know him personally - he is of sufficient maturity to be able to carry off the subject of his choosing, 'Greenkeeping, - Past, Present and Future', almost by remote control!

Yes, Gordon has been supremely active in the profession of greenkeeping for what seems like an eternity, founding his sporting connections as a professional cricketer for Yorkshire before moving into a career that has become his life, his joy and his obsession.

He is the power-house behind Westurf, the regional exhibition that has gained a national reputation, and he is father figure to just about every greenkeeper in the West Country, proof positive that a man obsessed can take others of like mind along with him, witness the success of the SW region and their unswerving loyalty to their mentor.

Furthermore, there is none more active in the furtherance of greenkeeper education than 'our Gordon', and I am giving away no secrets when I tell you that his talk will be not only an educational trip down memory lane, but I suspect it will be peppered also with more than a liberal scattering of 'reet grand Yorkshire humour' - don't miss it!

◆ Contact BIGGA HQ for booking details.

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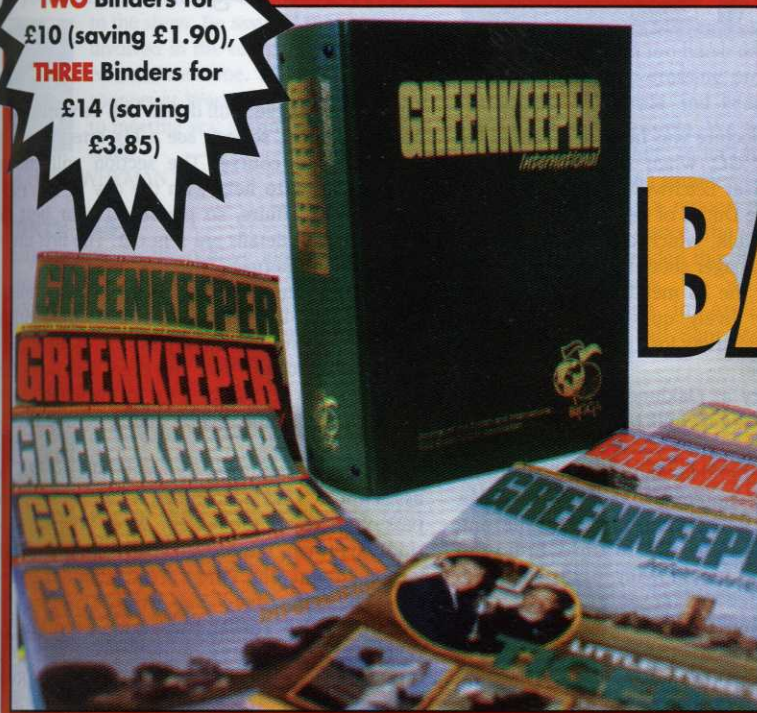
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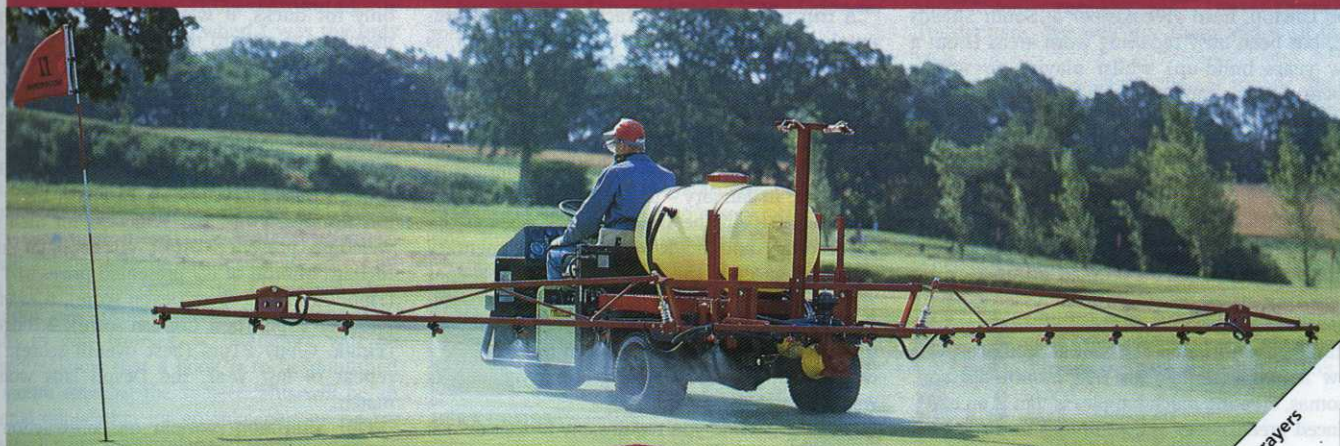
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AD REF 25

# AROUND THE GREEN

## Keeping in touch with news and comment from the regions

Will reporters please note that *Around The Green* copy for May must reach the editor before April 1st.

### LONDON

Our condolences to the family of David Phillips, owner of Aldenham Golf Club, who passed away last year. David's help with section seminars and events was always appreciated and he will be sadly missed.

On a happier note, congratulations to Andrew Phillips on his new appointment as head greenkeeper of Glynhir Golf Club, Dyfed. As you all know, Andrew served on the London committee for many years and we thank him for all his efforts. His successor at Hadley Wood GC. is Craig Handyside and we wish him good luck for the future.

Our 1993 section qualifying event for the Hayter Challenge Tournament will be held on Tuesday 20 April at Highgate GC. The 18-hole competition will be held in the afternoon (followed by high tea) at a cost to be advised. Entries will be accepted by 'phone.

An Emergency First Aid course will be organised for April and anyone interested should contact me. It will be a four hour session and will certainly be important for your work environment.



Finally, any news, ideas or tournament entries can be directed to me by telephoning 081 959 5629 - during the evening.

TONY DUNSTAN

### CLEVELAND

Bob Lawton, head greenkeeper at South Shields GC, has been busy repairing worn areas (from a few years build-up) whilst playing to winter greens. He has modernised his irrigation system with a new Toro 3000. His past qualification is City & Guilds Phase II (with distinction) and he is currently studying the Phase III Supervisory course.

Bedale GC have acquired the services of Simon Lawn, who has completed a three year college course as well as having worked in America. He is proving to be a most useful asset to Gary Munro's team.

Ian Pemberton, first assistant at Saltburn GC is now a happy father, his five month old son, Thomas, creating much happiness. Ian is an experienced greenkeeper and continues to further his career (after many years at Middlesbrough) by currently studying City & Guilds Phase III.

David Malcolm, who was first assistant at Brass Castle, has moved to Germany and has been working since October at a course just a half hour by road from Frankfurt. The course, not yet complete, is built on a clay soil, has greens built to USGA specs and seeded with a fescue/bent mix.



Notes for your diary: The section will be visiting GEM Products, Accrington, Lancashire on 18 March, whilst our spring tournament is arranged for 20 April at Bedale GC - tee off 1.30 pm.

BRUCE BURNELL

### MID ANGLIA

Our first winter lecture was held on 5 January at Beadlow Manor GC, when Duncan McGilvray (course manager at Letchworth GC) gave a presentation on "The Duties of the Golf Course Manager". Duncan's talk, which clearly laid out the goals a course manager should be aiming for, was well received by the 25 members who attended, producing some lively questions and debate. Many thanks to Beadlow for again providing such excellent facilities.

On 26 January at Oaklands College Richard Knifton of Fabrications and Mowers gave a presentation on the Jacobsen MkIV Greens King. Sixteen members attended and some very useful information on maintenance and operation was supplied. Thanks to Richard for his time and excellent presentation, also to Chris Bishop of Oaklands College for allowing us to stage the workshop there.

By the time you read this you should have received entry forms for the spring, summer and autumn golf competitions. Due to the healthy financial situation of the section, the committee has decided to keep the cost of golf at the same rate as last year: £17. The Spring Tournament will be held at Mid Herts GC on Thursday 22 April and will be a 36 hole event as opposed to the 27 holes played last year (subject to confirmation). The closing date for entries is Monday 5 April. Anyone wishing to enter must send the appropriate form - with payment - to the competition secretary: Chris Brook, 15 Gibson Close, Hitchin, Herts. by the date stated. Telephone entries are not acceptable.

A trip to the Jacobsen factory (not, unfortunately, in Wisconsin USA, but in Kettering), is organised for 23 March. If you would like to attend, please call Gerald Bruce (secretary) on 0442 865832.

It was heartening to see so many section members at the BTME workshops and seminars at Harrogate in January - undoubtedly another success for BIGGA. The Duke of York opened the proceedings and made a most complimentary speech regarding the role of the greenkeeper within the great game of golf, and of the recognition that is now more frequently given to our contribution. If you have not yet been to Harrogate I would strongly urge you to go next year - it is well worthwhile.



Should you require any further details regarding any of the section events, please do not hesitate to contact me on 0582 490746 (work) or 0525 402550 (home).

PAUL LOCKETT

### AYRSHIRE

A games night was held at West Kilbride GC recently, the winners being: Darts - Derek Wilson (Bogside), Dominoes - Gary Crosbie (Dumfries & County), Putting - Jim Paton (West Kilbride), Bowls - Lee Shannon (Bogside).

The spring outing has been arranged for Southerness GC on Tuesday 20 April, with transport by

bus to be arranged. Full details will be with members very soon, so let's see a big attendance at this excellent course. The section will run a monthly draw to help with the day to day running of our affairs, so please do your best to respond when details are sent out. The first draw will be at Southerness.

We are running a summer four-ball competition this year as the normal winter competition has not been successful, largely due to the miserable weather conditions. The event will be home and away, so let's have a go at involving more greenkeepers in the section and in getting everyone to mix.

Our new committee has been elected, so to assist those who have news, views or ideas to pass on, here are the names: Derek Wilson (Bogside) chairman, Ian McNab (Dumfries & County) vice chairman, Jim Paton (West Kilbride) secretary. The committee - Bob McKay (Prestwick St Nicholas), Neil Turner (Ardeer), Steven Kraggs (Dumfries & County), Robert Bruce (Trade), George Brown (Turnberry), Harry Diamond (Kyle and Carrick), and Duncan Gray (Prestwick).



To conclude, our congratulations to Andrew Kerr (Prestwick St Nicholas) on his recent marriage to Liz. May all their troubles be little ones!

DUNCAN GRAY

### DEVON & CORNWALL

Our first meeting of 1993, held once again at the superb venue of Fingle Glen on 13 January, was our section seminar. With weather conditions fit only for ducks, it was left to our more hardy members to take to their flippers to play 'water' golf for the nine hole ICI Devon v Cornwall match. As usual the trade supported us by taking eight stands in the reception area, and these proved especially successful in view of the awful weather outside. Our thanks to Avoncrop, Devon Garden Machinery, Fisons, PJ Flegg, Rigby Taylor, Roffeys, Vitax and Willcocks for their most welcome presence. After an excellent lunch, Richard Minton of ICI presented prizes to T Pipe (Honiton) 17pts (best Devon score), S Evans (St Enodoc) 13pts (best Cornish score), B Ridgeway (Fingle Glen) 21pts (best overall score). As a repeat of last year, the Devon lads won the match.

Our afternoon seminar on construction and education was held in the ICI sponsored conference room, with Nick Rigden, head of horticulture at Cannington College, presenting a paper on the new National Vocational Qualification (NVQ) and the partnership it has with the training manual (a document which every club should have for the future training of their greenkeepers).

Our second speaker, Jim Arthur, presented a paper on "Construction and the Analysis Fallacy", as usual keeping his audience riveted to their seats. A question time rounded off a highly entertaining and interesting programme. Our thanks to Nick Rigden and Jim Arthur for presenting excel-

lent papers, and to course manager Bill Pile and all the staff at Fingle Glen who made our day so successful. Our gratitude also to Martin Breeding, M.D. at Fingle Glen, for again allowing our section the use of Fingle Glen's facilities, and to Richard Minton (ICI) and all our trade sponsors.

Your help is needed to promote the 1993 WESTURF Trade Show, to be held on Wednesday 28 April at Long Ashton GC, Bristol. Many of you must know groundsmen & committee members at your local sports club, so why not invite them



RICHARD WHYMAN

to the show. Be assured that everyone involved in the turf care industry will be most welcome. We also need your support at Westurf, so I look forward to meeting you all on the new BIGGA stand.

#### NORTH EAST

Section events for the coming months are as follows: March – A visit to Abcon North East Ltd (Top Dress Supplies), Blaydon. April – Breaking with tradition, we are opting for an inland course rather than one on the coastline, and on 22 April will for the first time play our Spring Tournament at Ryton GC. July – Annual match against club secretaries, date to be advised.



JIMMY RICHARDSON

September – Autumn Competition, 16 Sept at South Moor GC. October – Annual matches, a) versus East Lothian, b) versus Cleveland.

#### NORTH SCOTLAND

The latest of our members to be married is George Paterson of Fortrose. We wish him and his intended all the best. It's nice to see that his assistant, Stuart, has settled in well since his move from West Kilbride and I hope he has by now found suitable housing for himself and his family.

Another BTME has come and gone, getting better every year. I missed attending last year so saw a big difference since 1991. It will be difficult to improve next year but I'm sure the powers that be will manage it. It was great to renew old acquaintances and forge new friendships. I sometimes wonder if we don't learn more when chatting over a pint in the evening than during the day? Unlike my last visit, when I was the only North member present, this time there were many fellow members amongst the large Scottish contingent. Let's hope this month's National Conference is as successful.

By now, the first of our spraying courses should have taken place, with the initial eight members having been put through their paces and (hopefully) succeeded in gaining their certificates. Should anyone else be interested in going on such a course please contact me. I have had a few enquiries concerning COSHH regulations with regard to golf courses, so members will be pleased to know that a book is to be published this month covering the subject. This will be an essential publication for greenkeepers as we try to keep abreast of new rules and regulations.

The section library is up and running now and members who wish to borrow a book should phone me on 0862 894402, or Gordon Moir on 0334 74021.

No new memberships have been received this month, so how about a little recruitment drive? Are there any greenkeepers on your staff or at a club nearby that are not members? If so, tell them of the BIGGA benefits and persuade them to join. I have membership details and spare magazines that I can send out if you contact me.

As spring approaches, hopefully bringing with it early growth and warm weather, I trust the

# AROUND THE GREEN



winter has not been too harsh on your course and that once your top-dressing programme begins, the greens will settle and keep your members happy – if that's possible. We have had our first bad winter for a while, so let's hope it will be followed by a good long summer.

Finally, following a request at the AGM for a dinner dance, the section committee have decided that if sufficient interest is shown, we will stage one in Aberdeen in April. Interested? – please call Sam Morrison on 0224 705083.



IAIN MACLEOD

#### NORTH WEST

The section's third winter lecture on Wednesday 20 January clashed with the BTME at Harrogate, yet we still had a reasonable turn-out. Pat Murphy, the Northern section secretary, gave us a most interesting talk and slide show based on his experiences when reconstructing a green and having it back in play in seventeen days. The talk was very well presented and judging by the questions fired at Pat, I feel sure that the audience felt more confident to attempt such a task after listening to him. On behalf of the NW section I would like to thank Pat for sharing his time and experience with us.

By now you should have received your fixture list of events for the summer months. Also included is an information letter regarding entry forms and deposit information for golf events. I am afraid that we have had to take these measures simply because, when catering arrangements are made in advance, all meals must be paid for. Unfortunately, the section funds have had to be utilised to pay for late cancellation far too often.

A new competition has been launched, a four-ball better-ball knockout to be played for over the season. Each round will be over 18 holes, the event culminating in a 36 hole final. The rules: There will be closing dates for each round, and to ensure that each team plays at least two rounds, first time losers will go into a separate competition. Entry forms (or queries) to Paul Pearse, 1 Swan Close, Poynton, Stockport SH12 1HX.



BERT CROSS

Finally, I would like to welcome all new members to the NW section, and if anyone has any queries at all, please contact me on 051 724 5412.

#### SOUTH WEST

Apologies for missing the last edition – pressures of work and all that. 'Christmas at Chipping Sodbury' – doesn't have much of a ring, does it? However, our last event of 1992 was a roaring success when 63 members and trade turned up for a day upon which the sun shone, the course shone, and the meal outshone everything. Roffey Brothers of Bournemouth were our new sponsors, bringing with them a new product for our approval – 'sunshine in 25 litre drums'. Just apply to the course and play – simple. Our sincere thanks to Chipping Sodbury for allowing us to play, for being a clay-

based course it had suffered more than most during the unkind autumn & winter floods. The course had literally re-opened the day before our visit, this after several weeks of flooding, and it wasn't long before the rains returned causing it to close again. Talk about the Devil looking after his own!

Peter Cox struck the opening tee shot of the day, his caddy handing him his trusty driver before retiring to a safe distance directly to the right of the tee. Seconds later he was diving for cover as Peter's ball flew off the nose of the club and thudded into the trees directly behind. Peter stood, red-faced, before declaring loudly that he didn't want the caddy to have to walk too far to find the ball. Some shot!

The new foursomes format proved to be an interesting change to the usual singles, the full result being: 1st – P Godwin & R Gates. 39 pts. 2nd – N Wilson & P Cox. 38 pts. 3rd – M Gray & S Frankom 37 pts. 4th – P Worster & P Hampton 36 pts. (Also on 36 points were J Kane & S Shipley, J York & N Turner. Two's were scored by Messrs Kane, Shipley, Pople and Stephens.

Major sponsors for the day were Roffey Bros., also Messrs Avoncrop, ICI, County Mowers, Vitax, BS Mowers, Sierra, Sisis, TH White, West Country Groundcare & Rigby Taylor.

Thanks also to Clive Richards and his staff for preparing the course against all the odds. Congratulations are due to Clive on securing the position of head greenkeeper and our best wishes go to him.

The educational season is coming to a close with our second batch of twelve passing the FEPA modules 1 & 2. Some twenty section members have also passed our Emergency First Aid Course and, after a slightly slow start, twelve have gone through our Chainsaw Training Course. Fourteen clubs have also had COSHH assessments prepared by our resident expert, and it should be noted that this service is on-going and can be arranged by just a telephone call to me. Please indicate any other subjects for inclusion in next winters' programme.

The golf season is just around the corner, starting on 21 April at Henbury with the Spring Tournament and Regional qualifier. This used to be the Iseki Tournament, but is now sponsored by Hayters under the new title – Hayter Challenge Tournament. We welcome them and wish them well.

There is also a slight change to our annual Summer Tournament, this year played at Enmore Park GC on 6 July. Tee-off times will run from 11.30-12.45 am, and the evening meal and prize-giving will be at 5pm.

Finally, Westurf. If you manage turf, you can manage Westurf. So 28 April at Long Ashton is when we will need some help on the gate. Also before, during, and after the event. If you can help, please get in touch, we need you. We also need you pouring through the gate in great numbers. Be there!



PAUL WORSTER

#### EAST SCOTLAND

In various reports during 1992 it was my sad duty to inform members of several bereavements. I begin 1993 the same way. It is with regret that I must report the death of Grace Bullock, beloved wife of Seahouses GC head greenkeeper, Ralph Bullock, who passed away just before Christmas. Our deepest sympathy go to Ralph and his family at this very sad time.

We will be seeing Ralph shortly when we visit Seahouses for our Annual Spring Tournament on 6 April. Forms are already distributed and members should note that entry forms must

47 ➔ be returned by the date stated.

This looks like being another very busy year. I attended the BTME at Harrogate – and what a week that turned out to be. This year was the first time I had attended, but never have I been to such a well organized event. The education seminars and speakers were first class and the machinery displays were second to none. Neil Thomas and his staff must be congratulated for a job well done. For those members who often complain by saying 'what is BIGGA doing for me,' – take my tip and attend some of these events. I am sure your eyes will be opened.

To the many well behaved lads from Scotland who attended, I will also say 'well done'. But please, don't keep me up so late next year – I usually rise at 5am, not the other way round!

You will be pleased to know that the full 1993 programme is now prepared and will be out shortly. Indeed, the committee is so far advanced that even the winter lectures are organized.

The committee selected to organize the British Tournament at Dunbar from 2-4 August will be meeting shortly to finalise details. We are hoping for a large turn-out from the East, so as soon as the entry forms are out – return them! Especially if you don't want to miss out on the highlight of the year.



Finally, a question – is your subscription paid? If it isn't, pay it now. Last year our membership figures were the highest ever so let's all make an effort to increase these once again.

WILLIE BLAIR

#### NORTH

I am pleased to inform you that 30 members from our section attended the extended Emergency First Aid course and now hold certificates of qualification. Yes, there were a few light-hearted moments with Lucy, the female dummy, – I shall say no more! On a serious note, may I thank Kenneth Bick and Dick Burley who represented Medical Training Services on this excellent instructional course. Just to remind those who attended, three Master Greenkeeper credits are awarded. Once again I must apologise to those who wanted to attend but were turned down – quite simply, the course was full. As I have said before, get your names down early to avoid disappointment.

Our winter lecture series comes to an end on Wednesday 17 March at Cleckheaton GC, when Lloyds hold their workshop. The time to arrive is 1.30 pm. Perhaps you might call me if you plan on coming. The reason? to get an idea of numbers attending. My number is 0274 568128.

All the golfing venues are now in place and by the time you read this you should have received your mail-shot with the details, as follows: Spring Tournament, Wednesday 21 April – Sandmoor GC. Presidents Day, Thursday 10 June – South

# AROUND THE GREEN



Leeds GC. Roses Match, Tuesday 3 August – Fulford GC. Invitation Day, Tuesday 17 August – Pannal GC. Autumn Tournament, Wednesday 6



October – Kirkbymoorside GC. The Christmas golf has yet to be arranged. On a final note, may I thank all section members who helped to make BTME a huge success.

PAT MURPHY

#### EAST MIDLANDS

I am devoting most of this month's section report to relate a harrowing experience suffered by Gordon Mitchell and his staff at Leek Golf Club, following a break-in. On 6 January, Gordon reported to work to find his sheds had been broken into overnight. A considerable mess was in evidence, with fire extinguishers having been discharged inside the building and equipment vandalised. After calling the police, Gordon and staff began taking inventory inside the shed to determine if anything was missing. Some time later, one of the staff complained of feeling ill.

Shortly afterwards, continuing with the inventory, Gordon noticed that his poisons cabinet, located inside the shed, had been broken into. A number of Phostoxin containers had been opened and some of the contents had been strewn on the floor and were giving off toxic gas. An ambulance was called immediately and Gordon and staff were rushed to hospital where they spent the night in intensive care. Through having the Product Safety Data Sheet available from Gordon's files, doctors were able to make a quick diagnosis and administer correct treatment. Having contacted Gordon some three weeks after the event, I am happy to report that both he and his staff are OK, although all of them have had to take time off work and are still suffering after-effects.

This incident not only emphasizes the value of following the correct procedures in the handling and storage of chemicals, but highlights that even when taking all reasonable precautions, as Gordon had, a risk element is never completely eliminated. Any member arriving at work to find a similar scenario will be well advised to learn from Gordon's experience and to don protective clothing before entering a chemical storage area that may have been violated, or if in doubt to call the fire brigade, who have breathing apparatus.

I think this is also a good time to mention again the importance of first-aid training for greenkeeping staff. A knowledge of basic procedures or, even better, the presence of a qualified first-aider, may one day make all the difference. Short courses are available and organisations like the St. Johns Ambulance will arrange training on site for golf clubs if there are sufficient numbers. Paddy McCarron at the Leicestershire and Glen Miller at Ullesthorpe have both recently completed such training, and I believe it is something we should all consider. I can supply details to any interested parties.

Now, to the rest of the section business. I am pleased to offer congratulations to Chris Lewis on his appointment as head greenkeeper at Market Harborough GC., and to welcome the following new members to the section – Paul Brazier, currently studying at Cannington College, and Mark Caldwell, recently of Torksey GC., Lincs. I hope to see you all shortly at the Spring Tournament – if I ever finalise the arrangements. Finally, please note that my secretarial 'hot' line is 0509 650140.



TONY HOWARTH

#### CENTRAL SCOTLAND

Unfortunately, this month's report begins with some disappointing news regarding the 1993 Spring Tournament. Due to circumstances beyond our control, Gleneagles Hotel have had to cancel our booking for 6 April, though we are hopeful that another date may be arranged for next year.

On a brighter note, Falkirk Tryst GC have granted us courtesy of their course on Wed 28 April, start 9.30 am. My sincere thanks to club secretary Don Wallace for his help and for accepting us at such short notice.

Due to this change of venue, both 1993 tournaments are scheduled to take place in virtually the same area of the section, Falkirk Tryst in April and Glenbervie in October. Hopefully, this will not effect attendances and we can revert to our system of moving around the section in 1994. I did approach Downfield GC in Dundee, but they were unable to accommodate us.

Having spent a grand week at BTME in January it was heartening to see so many Scottish members in attendance, especially a healthy contingent from Central Scotland section. From what I can gather, our members had such a good time that plans are already afoot for a return in 1994, though there is a strong rumour that alternative transport arrangements are being made – I wonder why?

As we approach the start of another golfing season, with a little luck it may herald drier conditions than over the past months.

What was one of the wettest winters for many a year may soon be just another statis- ➔ 58



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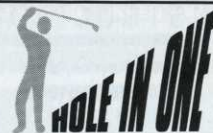
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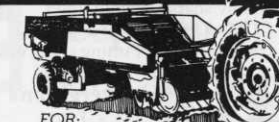
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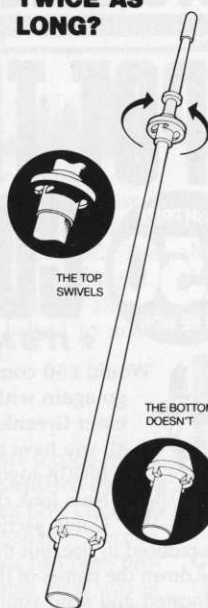


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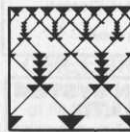
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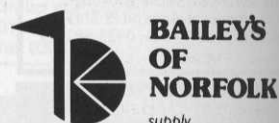
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**NOTICE TO MEMBERS**

# Annual General Meeting

The BIGGA Annual General Meeting will be held on  
**Wednesday 21 April 1993**  
at 2.30pm in the Royal York Hotel, York  
(immediately adjacent to the Railway Station)  
— **NEIL THOMAS, Executive Director**

Copies of the audited accounts will be available from Section Secretaries during the four weeks prior to the Meeting.

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**Higham Lane, Tonbridge**

Contractors with proven experience in golf course construction are invited to apply for the inclusion on a select list of contractors for this project. Subject to the receipt of planning permission tenders are to be invited in early April 1993 with anticipated commencement of the work on site, mid June 1993. (Anticipated 10 week contract period).  
The work will involve the construction of the greens and tees, land drainage, path construction and the construction of five passing bays in Higham Lane. Contractors will need to demonstrate their experience and ability to work on the construction of a golf course and will be required to complete an application form which is obtainable from:

**Borough Leisure Services Officer,  
Tonbridge & Malling Borough Council,  
Lesser Building, Gibson Drive, The Air Station,  
West Malling, Kent ME19 6LZ  
or by phoning 0732 844522 ext. 3473.**

**Completed application forms** with all supporting information must be returned to the Council no later than **Tuesday 23rd March 1993.**





## Wyke Green Golf Club

requires a

# HEAD GREENKEEPER

for an 18 hole course situated west of London.

Applicants must possess a recognised qualification and be experienced in all aspects of course management.

The ability to lead and motivate staff, organise work programmes and maintain health and safety requirements is essential.

Practical knowledge of modern greenkeeping machinery and budgetary control is also required.

Salary negotiable. Accommodation available.

Apply in confidence with full CV to:

**Secretary/Manager, Wyke Green Golf Club, Syon Lane, Osterley, Middlesex TW7 5PT**

Previous applicants need not apply.



invite applications for the position of

# DEPUTY COURSE MANAGER

Reporting to the Course Manager, you will be responsible for the daily operation of the planned course maintenance, machinery and the irrigation system.

Aged 25+ you will possess City and Guilds in Greenkeeping Levels I, II and III and Spraying PA1 and PA2. Experience with USPGA greens and Penncross turf would be an advantage together with the ability to manage and motivate staff.

Salary is negotiable.

Apply in writing including a full CV to:

**Lachlan Morrison  
Course Manager, Mapledurham Golf Club,  
Chazey Heath, Mapledurham, Reading RG4 7UD**

**Tel: 0734 463629**



## Thorpe Hall Golf Club

require a

# DEPUTY HEAD GREENKEEPER

Applicants should be qualified and experienced in all aspects of greenkeeping with sound practical knowledge and the ability to motivate staff.

Excellent prospects for someone wishing to extend their career.

Salary negotiable.

No accommodation available.

Apply with CV to:

**Thorpe Hall GC  
Thorpe Hall Avenue, Thorpe Bay  
Essex SS1 3AT**



## Gullane Golf Club

wishes to recruit a

# COURSE MANAGER

to take responsibility for the Club's three courses and ensure the maintenance of the Club's high standards.

This is a new position carrying an attractive remuneration package.

If interested please write for a full job description to:

**The Secretary  
Gullane Golf Club, West Links Road, Gullane,  
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(under new ownership)

requires for extension from 18 to 27 holes:

### ◆ DEPUTY HEAD GREENKEEPER

### ◆ GREENKEEPERS

### ◆ ASSISTANT/APPRENTICE GREENKEEPERS

Applicants must be fully experienced in all aspects of greenkeeping and with a sound knowledge of modern equipment and irrigation.

Experience of course construction is required, particularly greens, tees and bunkers.

Salaries are negotiable but based on BIGGA recommendations.

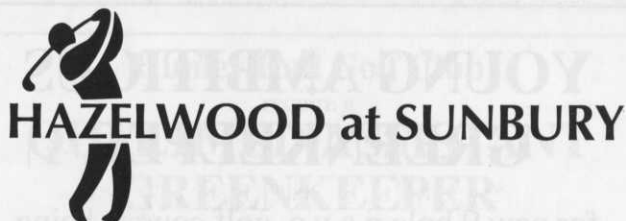
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## HEAD GREENKEEPER

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Each centre will comprise of a Floodlit Driving Range, Golf Academy, Putting Practice Area, Bunker Practice Areas, 9 Hole Golf Course (regulation length), and Clubhouse.

The first centre is at Sunbury-on-Thames, Middlesex. Course construction is due to be completed in May. The Driving Range and Clubhouse will open in August '93, and the Course is scheduled to open in April '94.

Applicants should be qualified, experienced in all aspects of greenkeeping, and have a practical knowledge of modern equipment, irrigation systems, and management techniques.

An ability to plan, lead and motivate staff is essential.

Written applications including a full CV to:

**The Chief Executive, Hazelwood Golf Limited,  
3 Harewood, Rickmansworth, Hertfordshire WD3 4EZ**

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Applicants should apply only in writing, in the strictest confidence, giving full career details including current earnings, to: Julie Taylor, Company Secretary,

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## HEAD GREENKEEPER

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Applications are invited from highly experienced greenkeepers in fine turf management who have a sound knowledge of both the technical and practical aspects of golf course management, sand greens and computerised irrigation systems.

The Head Greenkeeper will report to the Golf Courses Manager and have the ability to motivate a professional workforce to achieve the highest standards possible.

Salary will reflect the importance of this position and be commensurate with the calibre and experience of the successful applicant.

Applications in writing with full CV to:

**Mr Mike Bottomley, Golf Course Manager,  
The Warwickshire, Leek Wootton, Warwicks CV35 7QT**

## YOUNG AMBITIOUS GREENKEEPER

for new 9 hole p.a.y.p. golf course, being  
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to become

## HEAD GREENKEEPER

£14,000 per annum (no accommodation)

Applicants must have either passed  
City and Guilds Phases II and III,  
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Qualifications for this position include an in-depth  
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marketing experience is also required in order to expand and  
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The basic salary is anticipated to be not less than £30,000.00,  
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All applications will be treated in the strictest confidence.

Please apply in writing, enclosing a full Curriculum Vitae to:

Box No. GI.3.A., BIGGA, Aldwark Manor, Aldwark, Alne,  
York, North Yorkshire YO6 2NF.



**Woodsome Hall Golf Club Ltd**  
requires

## DEPUTY HEAD GREENKEEPER

This leading West Yorkshire Club is inviting applications for the  
above position, with a view to the successful applicant succeeding  
the head Greenkeeper in five years time.

- Salary negotiable
- Minimum of 10 years experience
- Technical and practical qualifications
- Pesticide certificates
- Sound knowledge of modern irrigation and machinery
- Capable of controlling and motivating staff.

No accommodation.

Apply in writing, enclosing CV to:

The Honorary Secretary, Woodsome Hall Golf Club Ltd, Fenay  
Bridge Huddersfield HD8 0LQ



**Strathaven  
Golf Club**

requires a

## HEAD GREENKEEPER

Applications are invited for the above position to take charge at  
this 18 hole Championship course. A thorough knowledge of  
modern greenkeeping practices, irrigation systems and  
construction methods, along with the ability to organise and  
motivate staff is essential.

Salary is negotiable according to qualifications and experience.

For an application form contact:

General Manager, Strathaven Golf Club, Glasgow Road,  
Strathaven ML10 6NL

**Ashford Manor Golf Club**

requires a

## QUALIFIED ASSISTANT GREENKEEPER

Applicants must be experienced in all aspects of  
greenkeeping and have good knowledge of modern  
machinery and irrigation systems.

No accommodation is available.

Please apply in writing with CV to:

The Secretary, Ashford Manor Golf Club,  
Fordbridge Road, Ashford, Middlesex TW15 3RT



**Southerndown Golf Club**

require a

## DEPUTY HEAD GREENKEEPER

Applicants must have suitable qualifications and experience in  
all aspects of course management. A thorough knowledge of  
machinery and maintenance is essential together with the  
ability to motivate and direct staff.

Salary is negotiable depending on experience.

Applications in writing to include full CV by 31st March to:  
The Secretary, Southerndown Golf Club, Ogmores Road,  
Ewenny, Bridgend, Mid Glamorgan CF32 0QP



## QUIETWATERS

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require a

### DEPUTY COURSE MANAGER

for their 36 hole complex.

Applicants should have suitable qualifications and practical experience in all aspects of course management and maintenance of equipment. The ability to motivate, lead and work with existing staff is essential.

No accommodation available.

Apply in writing with full CV (in confidence) to:

Course Manager, Quietwaters Golf & Country Club,  
Colchester Road, Tolleshunt Knights, Maldon, Essex CM9 8HX

## Hunley Hall Golf Club

require a

### QUALIFIED ASSISTANT GREENKEEPER

to commence as soon as possible

at a new golf course due to open in the Summer.

The successful applicant must demonstrate sound knowledge and practical experience at good greenkeeping and equipment maintenance.

BIGGA rates of pay.

Apply in writing with CV no later than 3 April 1993 to:  
J Askew, Hunley Hall Golf Club, Brotton, By Saltburn,  
Cleveland TS12 2QN

## Overstone Park Golf Club

require a

### DEPUTY HEAD GREENKEEPER

for a new and exciting 18 hole golf course situated within walled Victorian Parkland Estate and due to open in July 1993.

Applicants must possess a recognised qualification and be experienced in all aspects of course management, as well as having a practical knowledge of modern greenkeeping machinery.

The successful applicant will have the ability to lead and motivate staff as well as being able to organise work programmes.

Salary negotiable – No accommodation provided.

Suitably qualified candidates should send a full CV to:

Phillip Helmn, Course Manager, Overstone Park Golf Club,  
Billing Lane, Northampton NN6 0AP

## Ham Manor Golf Club

require a

### DEPUTY HEAD GREENKEEPER

Applicants must have suitable qualifications and experience in all aspects of course management.

A thorough knowledge of machinery maintenance is essential, together with the ability to motivate and direct staff.

An attractive package which includes three bedroomed accommodation and a salary in line with BIGGA rates is available to the successful applicant.

Applications in writing to include CV to:

The Secretary, Ham Manor Golf Club,  
Angmering, West Sussex BN16 4JF



## Highwoods Golf Club Limited

requires an

### ASSISTANT HEAD GREENKEEPER

The successful applicant will be fully qualified, he must demonstrate sound knowledge and practical experience at good greenkeeping and equipment maintenance.

Salary negotiable – No Accommodation.

Apply in writing with CV to:

The Secretary, Highwoods Golf Club Limited, Ellerslie Lane,  
Bexhill-on-Sea, East Sussex TN39 4LJ

## GREENKEEPERS AND COURSE MANAGERS

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## Clevedon Golf Club

requires a

### GREENKEEPER

- Fully qualified
- At least 10 years experience
- Clean driving licence
- Closing date 22 March 1993

Apply with CV to:

The Secretary

Clevedon Golf Club, Clevedon, Avon BS21 7AA  
Tel: 0275 874057

## Oake Manor Golf Club

near Taunton, Somerset

require a

### DEPUTY HEAD GREENKEEPER

New 18 hole Golf Course  
opening July 1993.

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48 → tic as we begin to shape our courses for the challenges that lie ahead.

To any member who is starting a new job this season, our best wishes for your future success.

JOHN CRAWFORD

## SURREY

Another well supported winter lecture was held at New Zealand Artisans club in January. The speakers were Carl Crome of Envirogreen, whose topic, not unnaturally, was chemical waste disposal, and Jon Allbutt, who revealed details of the recently introduced new laws relating to health and safety at work. Watch out for these, they affect us all and are sure to cause some headaches. Thanks were expressed to speakers and to the club, for once again hosting the event.

The section run trip to BTME proved a highly successful venture and everyone who took advantage of the trip seemed to have enjoyed themselves. Ian Kerry kindly paid for the coach trip, with accommodation (in the excellent Moat Hotel) subsidised by the section.

I am frequently asked why our section news is somewhat brief. I prefer to think of it as short but sweet and as such would welcome news and contributions from members. On that count, I was pleased to hear about Jim Russell's car, which mysteriously 'moved itself' across the hotel car park in Harrogate. It later transpired that a frantic airport-bound resident, blocked in by Jim's car, made several abortive appeals for him to move it before eventually having it shifted.

A reminder that our first golf event of 1993 is the Spring Tournament at Coombe Hill on 22 April. This is also a qualifier for the Hayter Challenge Tournament. The Veterans Cup will now be played for at the Autumn Tournament.

ROGER TYDEMAN

# AROUND THE GREEN



## MIDLANDS

On 14 January we held our first lecture of the winter period, with some 35 people in attendance. The subjects were STRI advisory visits, given by Andy Cole, and a talk on grass seeds given by a representative of British Seed Houses. We thank them both for their valued time, also British Seed Houses for the refreshments.

Our next lecture will take place at Telford G&CC on 26 March, starting at 1.30pm. Representing Oakleys, the local Jacobsen dealers, will be Mr E Simcox, whose talk will be centred around machinery maintenance. The second speaker, Carl Crome, will discuss the Envirogreen service and how it works. Refreshments will be provided by Oakleys and Jacobsen.

It was sad to hear that Matt Williams, assistant greenkeeper at Moorhall GC for some years, was made redundant in January. We all wish him well in finding a new position soon.

Our first tournament will be played at Moseley GC on 14 April. If you have not received an entry form, contact me on 0789 762912.

DEAN CLEAVER



## BUCKS, BERKS & OXON

Would anyone like to do battle for the BB&O in matches against the Surrey section, the Mid-

Anglia section and the section secretaries? The last match, of course, must not be seen as a 'grudge' match, but let's say that any member of a losing team will have their name printed in the section news - leaving them open to ridicule! These matches will be held over the summer, starting on 1 June at Stoke Poges. There is no handicap limit, so all are welcome. If interested please contact our match captain, David Goodchild, on 0296 415337.

Gentlemen's Dinner. After the success of our inaugural event, this year should be even better. So don't miss out, get all of your friends together and bring them along for a round of golf, a three course meal and the opportunity to listen to David White, the flamboyant editor of Greenkeeper International, all for £25 a head. Demand is expected to be heavy, so please contact me ASAP with numbers required - Black tie or lounge suits only. Date: 17 March, Venue: Beaconsfield GC, Time: tee-

off approx. 12.30 pm.

The 1993 Spring Tournament will be held at Burnham Beeches GC on 28 May over 36 holes. This is also the Hayter Challenge Tournament qualifier. Your entry form will be with you soon. Due to the section sustaining heavy losses on golf day meals, anyone who does not pay before the deadline will NOT be permitted to take part - you have been warned!



We have a selection of BIGGA ties (light blue and red) at a special price of £4, so if you want to look the part, ring me to place an order - now.

RAY CLARK

## KENT

Our forthcoming Spring Tournament is to be held at Rochester & Cobham GC on Monday 10 May. This event will also incorporate the initial qualifying round for the Hayter Challenge Tournament. I understand that it will run on the same format although sponsorship details are to be finalised. The regional qualifier will also be held in Kent, during early summer at Weald of Kent GC.

Finally, may I thank all those who helped me to maintain Barnehurst Golf Course over the past 14 months or so, by the loaning of materials, machinery, man power and tools. As you may have been aware, times were a little tough: with the impending departure of the parent club and a natural unwillingness to provide some of the bare essentials for proper maintenance. So to all of our machinery and material suppliers, local golf clubs and greenkeepers - a heart felt thank you. You have all contributed to Barnehurst being in probably the best shape it has ever been (he wrote modestly). Well, a very complementary report from the STRI is proudly displayed in the clubhouse. So this may be my last report as head greenkeeper of Barnehurst Golf Club, a place



where I have been associated for nearly 20 years. I can perhaps look forward to performing the same (expanded) role when Barnehurst is renamed Mayplace Golf Course.

PAUL COPSEY

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- March 26-28: BIGGA National Education Conference, University of Keele, Staffordshire
- April 21: BIGGA Annual General Meeting, Royal York Hotel, York
- April 28: Westurf Trade Exhibition, Long Ashton, Bristol
- May 25-30: Amateur Championship, Royal Portrush, Northern Ireland
- June 9-10: Landscape Industries '93, National Agricultural Centre, Stoneleigh Park, Warwickshire
- July 5-8: Royal Show, NAC, Stoneleigh park, Warwickshire
- July 15-18: The 122nd Open Championship, Royal St Georges, Kent
- July 18-24: International Turfgrass Research Conference, Palm Beach, Florida, USA
- August 2-4: BIGGA National Golf Tournament, Dunbar Golf Club, Scotland
- August 18-19: The Walker Cup, Interlachen, Minneapolis, USA
- September 7-9: IoG Show, Peterborough, Northants
- September 24-26: Ryder Cup, The Belfry, Sutton Coldfield, Warwickshire
- October 11-12: Toro/PGA European Tour Student Greenkeeper of the Year Award, Aldwark Manor, York
- October 12-13: Kubota Challenge, The Belfry, Sutton Coldfield, Warwickshire
- December 6-7: ICI Premier Greenkeeper of the Year Award, Aldwark Manor, York



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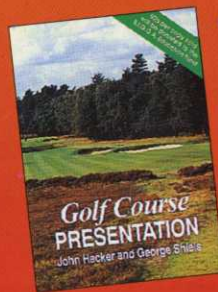
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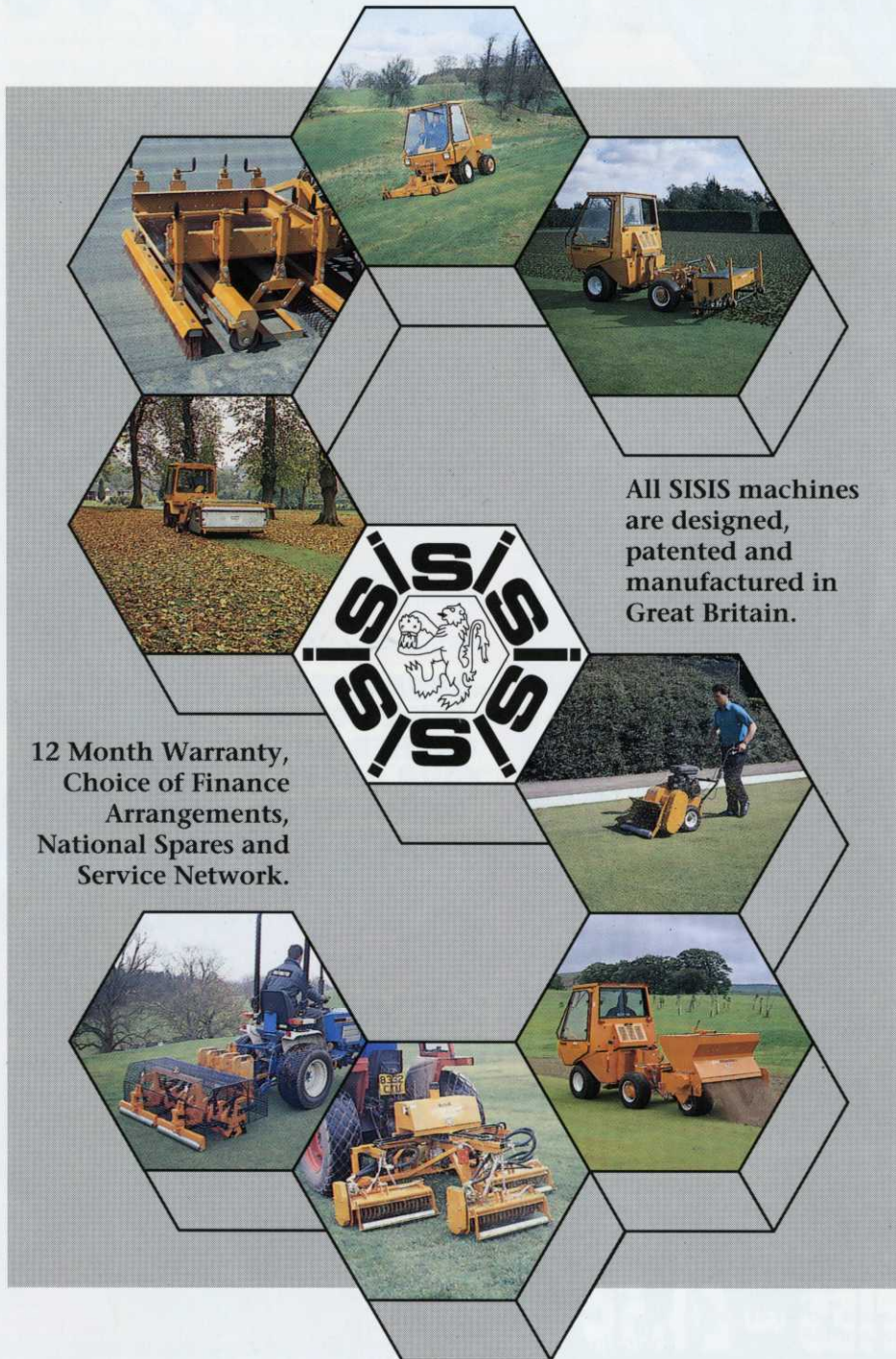
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