

# and demand

plethora of the latter, some with adjoining hotels, all vying for a slice of the same limited market. Some, like East Sussex National, have been the centre of much media coverage and indeed golf can be played at East Sussex National on two immaculately maintained courses, but it will cost the earth for that privilege.

One of the main problems facing the industry today is that too many 'executive' style courses are being built at over-inflated cost, often designed by ex-tournament professionals who have become self-acclaimed golf course architects seeking a living by other means. These 'signature' courses have a glitzy and glamour approach, with the aim of producing even more spectacular courses seemingly for the sole benefit of being photographed for glossy magazines, which help to increase membership and sell a few adjacent houses. Many have become 7,000 yard monsters and are far too severe and demanding for the vast majority. They also tend to be

maintenance nightmares, requiring an almost unlimited budget, which in turn must be reflected in the cost of memberships and green fees. It comes as no surprise that many such ventures have either collapsed or are facing financial ruin, as potential customers are frightened off by the exorbitant costs featured. Indeed, many such courses have been forced to reduce green fee charges considerably, merely in order to survive.

Similar projects are unlikely to get off the ground as the current recession bites deeper, the reality being that there are just too many of these 'top end of the market' ventures. The escalating costs in once favoured regions such as the Algarve and Costa Del Sol (now nicknamed Costa too Much!) should have rung alarm bells for the developers back home. It is beyond doubt that the average British golfer is just not prepared to pay the vast sums demanded, and this has resulted in these sun-drenched courses playing host

**Main picture: High cost constructions will push fees beyond the reach of most golfers.**

**Top: Picturesque, but possibly too difficult.**

**Centre: Constructions on this scale need to be well financed and planned, and, lower picture, this way of contouring fairways may beat deadlines - but at what cost to soil structure?**

'All too often courses are built too quickly by inexperienced contractors, attempting to meet project deadlines and oblivious of those who must follow to maintain such 'creations'.'

## Supply and demand

mainly to Germans and Scandinavians – often high hand-cappers – who take in excess of four hours to complete a motorised round and are quite willing to part with large sums for the privilege. However, even in Spain the bubble appears to have burst – as both hoteliers and golf Clubs have found to their cost – and there are many new ventures 'on hold' awaiting financial investment.

The other main problem facing the industry is perhaps even more damaging. I refer to the actual construction and specifications used in creating these new courses. All too often courses are built too quickly by inexperienced contractors, attempting to meet project deadlines and oblivious of those who must follow to maintain such 'creations'. Contractors are often too severe and reveal scant regard for future maintenance, as also do green surrounds that are often an afterthought, with bunkers having more in common with front line trenches. Materials used in green construction are seldom properly tested for particle size, porosity and bulk density, with sub-standard local soil mixed with sand from the nearest gravel pit often being used in the mistaken belief that this saves time and money. It is little wonder that seed-take is poor and 'ponding' and compaction occurs so readily after play begins, resulting in the use of temporary greens on a brand new course!

Once the 'architect' and contractors have been handsomely rewarded and have headed off to another site, the onus for solving these problems falls upon the shoulders of the poor greenkeeper. Sadly, this scenario is all too common and still continues to be the case up and down the country. Even with the availability of modern technology and research there are probably more badly constructed courses now than ever before. It therefore comes as no surprise to learn that at least one client is attempting to sue his contractor for failing to deliver the goods. In most instances these problems could easily have been averted by using qualified personnel and seeking proper advice in the first place. All

materials need to be laboratory tested to meet necessary criteria, with designs critically examined to assess their suitability.

Perhaps there is a need to look beyond our shores for guidance as to the direction our beloved game is heading. In France, 75% of all new courses are aimed at the public sector and built at an appropriate cost. Even in the USA there are very many more public courses per head of population compared with the UK, with most playable for a very modest dollar output indeed. The real need in this country is for more low-cost public or pay as you play courses, offering membership at realistic cost, as well as numerous par three and nine hole courses which would encourage family participation or the occasional leisurely evening round. Both architects and developers should turn the clock back and stop trying to emulate Augusta National or Pine Valley!

St Andrews is a shining example of how this may be achieved; namely courses that may be enjoyed by every standard of golfer. Courses do not need to cost several millions to build, nor do they need the tag 'championship' listed in their sales brochure. A well drained course, including properly constructed greens and tees and capable of accommodating at least 40,000 rounds each year and offering a moderate test of golf can be built for under £1 million, inclusive of irrigation to greens and tees. The course should also be capable of relatively quick and efficient maintenance within a modest budget, which can then be reflected in the cost to the golfer.

There will of course always be a need for a few 'up-market' country Clubs, but they should be minimal and built only to satisfy a genuine need. If the average golfer is not to be 'priced out' of the game, there must be a realism attached to the direction in which the game is heading. Only then can we claim that the real 'Demand for Golf' is being met.

● The author, Laurence Pithie, is course manager at Minchinhampton Golf Club and is Britain's first Master Greenkeeper.

## Greenkeepers forced to go back to basics as pesticide products dry up

Once upon a time there was a reasonable choice of pesticide products available to the greenkeeper. Though new products were always slow in appearing, the big agricultural producers made available some of their new products for the smaller specialist companies to develop for the turf market and there was always regular dialogue; with products being granted back-to-back registration. With others, some interesting joint development programmes were undertaken.

With ever tightening budgets for development and the increasing demand for more information about efficacy and safety from MAFF for Approval purposes, products nevertheless came onto the amenity market, slowly but surely. Quite rightly, the emphasis is now on having products that are as environmentally friendly as possible and on them being applied through more accurate machinery.

But what has happened? Has the amenity sector been abandoned because of its traditional low demand for pesticides? We seem to be going into reverse, with products being

discontinued because of the non-availability of raw materials, together with mysterious periods of product shortages due to 'supply difficulties'.

The weeds, worms and diseases are not going to go away, in fact there are indications of an increase in the number of problems occurring, especially in grass grown on special cultural media and 'foreign' grass mixtures. Where are all the new bio-control agents developed for use in turf? We hear of great strides being made in bio-control in commercial horticulture and if *Bacillus thuringiensis* is now commercially viable as a product to control caterpillars, I must ask where is the work to evaluate a similar product to control chafer grubs in turf?

If amenity horticulture is not a viable market for the development of new specialist products that will be environmentally acceptable, I would like to hear from those who might have been in a position to help but won't or can't, possibly because the 'big boys' will not make their products available.

Is there a more sinister side to this conundrum? Some of the big chemical producers

are on the other side of the channel and one wonders if they are aiming to strangle our very important small, indeed some not so small, specialist producers and create a monopoly situation after 1992?

The real worry in all this is that the enterprising greenkeeper may well be forced to revert to practices of many years ago to control pests and diseases. Already we hear talk of some that are using home-made remedies or using approved products for non-approved purposes.

It is sad to see these potentially dangerous and illegal practices creeping back in a profession that elsewhere is raising standards to new heights.

So come on, let's hear it from the manufacturers – what are you doing to help the greenkeeper? Or have you abandoned us and are without the courage to say so?

● The author, Jon Allbutt, is a regular contributor to the pages of Greenkeeper International. He is an independent practitioner in the fields of testing and training pesticide and herbicide application methods and in unravelling the mysteries of ministerial regulations.

A Greenkeeper International tribute to supporters of  
the Greenkeeper Education and Development Fund.  
Number 1: COLIN GREGORY, formerly of ISEKI Ltd.



# Golf's Mr Memory

**T**here's a tale often told which features The Pope and Colin Gregory and of Colin being called to the Vatican for an audience with Pope John Paul II. With the audience nearing completion, Colin escorts John Paul II out onto the veranda of the Holy Palace, high above the thronging masses that congregate there, the better to receive the cheering accolades. The crowds are suitably impressed – including a group of British tourists clustered at the very back of St Peter's Square, looking on in awed silence. Finally, unable to contain his curiosity any longer, one tourist turns to another and asks: "Who is that on the veranda?" "Don't know who the big fellow in the white robe is," comes the reply, "but isn't that Colin Gregory beside him?"

If this seems a bit of a tall story, there is nonetheless an element of truth encapsulated – for Colin Gregory is the very epitome of the character who is known by everyone and who equally knows everyone and everything (or knows a man who does!) – he's a veritable walking memory bank.

To further illustrate the point, I'll tell of the time when playing golf with three greenkeepers, some 400 miles from home and on an unfamiliar course. On my back swing I became aware of a car stopping nearby and of a face peering out to witness my less than classic execution. I stopped in mid-swing and a voice laughingly observed "I could never forget a swing like that – how are you, boy?" Yes, it was Colin Gregory, a man I had only met once before and who just happened to be passing by! "Did you know who that was," I later asked my colleagues, "yes, of course", came the unanimous reply, "everyone knows Colin Gregory!"

To greenkeepers, Colin is perhaps best known as the man behind the Iseki Tournament, though he is and indeed always has been associated with our industry; right from starting work. Now beginning a new phase in his career as Managing Director, Hardi Ltd, we met again recently and he

told me something of his interests and ideals.

Colin was born into a Norfolk agricultural family, his father a branch manager with Dalgety, and began his career at Ransomes, Sims and Jefferies Ltd in 1966 as a "poor, underpaid apprentice", going through the works, progressing to the experimental department and at aged 19 entering into 'Service Department – Agricultural'. I said that the man has a phenomenal blotting paper-like memory, and this was borne out by his actually lecturing to dealers within weeks of being trained in the Combine Training School – a 19 year old whizz kid! Still an apprentice, at 20 he moved into the sales office as the link man for A to E clients and with the apprenticeship over at 21, Colin was quickly transferred to southern Ireland to help develop sales, both there and in Northern Ireland as well.

Three years and many, many sales later, this adopted leprechaun conducted his craft with consummate skill – often over a pint or two of Guinness and late into the night, as is the Irish way – before returning to England and a new post with Lely (the interview gleefully conducted with John Hawkins at high speed whilst travelling on the A1), as northern England and southern Ireland Area Manager.

The dealer network, then principally agricultural, continued and grew, for those were pioneering days when the sales force trailed their wares behind a company car and Colin was instrumental in introducing Cultiseeders, Buryvators, and a Turfsprayer – his first introduction into the turf-care market – for Lely. Chance often plays a part in any career progression and in 1979 Lely took on the franchise for the innovative Iseki range, which was introduced at the Highland Show. Jack Wilkinson, the man who started the new company, Lely Iseki Tractors, left suddenly and Colin became sales manager almost overnight, taking him headlong into the fine turf care market full time. In a span of six years the sales of Iseki tractors grew by some 300%, largely

# Of Colin and the BIGGA connection there is a record of success from the very start



through Gregory inspired intensive demonstrations and vigorous marketing, this success not surprisingly attracting interest in Japan. In 1985 the parent Iseki, intent on setting up their own UK operation, had meetings with John Hawkins (then MD of Lely) and Colin Gregory, resulting in the formation of Iseki UK Ltd, with John and Colin as sole British shareholders, in 1986, the business opening in St. Neots and moving in 1989 to Bourn in Cambridgeshire. John Hawkins had always declared a wish to retire at 55, and in 1990 he did so, this bringing a Japanese managing director, the first of two such Japanese Nationals, in his wake.

Colin, however, remained the driving force of Iseki, and of the hugely popular Iseki Tournament, until fate once more took a hand, strangely enough, again from a man bent on retiring from business and casting his net for a worthwhile replacement. Literally 'headhunted', Colin was whisked into the top job of Managing Director, Hardi Limited, just a few weeks ago and it is at Hinckley, Leicestershire that the wheel turns full circle.

Of Colin and the BIGGA connection there is a record of success from the very start, when a decision was made to bring sponsorship by way of the tournament in 1988, beginning at St Pierre, followed by equally successful events at Moor Allerton, Moortown and most recently at Hillside. I fancy he is something of a would-be greenkeeper himself, for his enthusiasm for the Association and its cause knows no bounds. He positively bubbles with eagerness over our growth, sings the praises of BTME as much as if it were his own baby, and is totally committed to our ideals.

Of the man himself, like almost everything he touches, he

seems to have a grand and clear cut plan. He married the delightful Rosemary back in his early 20s, following a courtship that began when he was first nursed back to health by her in a Norwich hospital. He's a keen though very occasional golfer, left handed like myself, with an eagerness to see his son Paul (13) into his hometown St Neots Golf Club and moving toward a 'proper' golf swing, "unlike yours and mine," he chuckled. He positively dotes on daughter Rachel (16), loves gardening and caravanning and, not surprisingly, loves his work.

I said the man has an amazing memory, and this was proved when he took me on a whistle stop tour of the Hardi building. In a little over one week he knows everyone by name, reels off specifications and part numbers with consummate ease and knows the vast range of Hardi spraying products (and their every application) by heart. He's an early bird, treasuring the brief period between seven and eight before 'phones start jangling to recharge his thought batteries and prepare for the day ahead. I asked him to account for his success in what has always been a highly competitive market. "Knowing the product thoroughly is vital," he said, "together with understanding fully the needs and demands of those in the marketplace. This, coupled with a relaxed, non-pressured, atmosphere creates confidence." He then added, again with the typical Gregory chuckle, "and, of course I never forget to ask for the order!"

His immediate aims at Hardi are equally clear cut. He will increase Hardi's share of the agricultural market and develop and expand the amenity market. As they say in all the best movie success stories - this will be a saga that will run and run!

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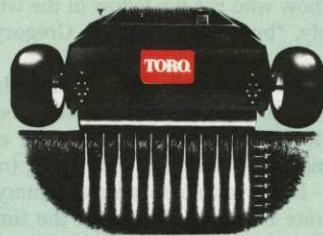
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# FUNGICIDES

## What they are and what they do...

**T**he management of golf greens is a difficult enough task at the best of times, but just when you think you have things under control (and that includes the golfers!), along comes a funny-looking patch of discolouration right in the middle of the green – an attack of disease! But which one and how should you treat it? Sounds familiar perhaps, but it happens to even the most organised and professional of greenkeepers.

Thankfully, frequent articles and literature from manufacturers and other technical sources, largely with excellent graphic illustrations, have prepared most greenkeepers and they quickly recognise the disease characteristics and apply the appropriate treatment. Even if the disease is not identified there is excellent help at hand in the guise of Neil Baldwin at the STRI, together with various highly competent manufacturers representatives.

But why do we get the attack in the first place? Dr Beard from the USA once said that within the turf sward there lived in perfect harmony every organism known to man. Suddenly one of them multiplies and the balance is upset and a disease attack occurs. This can be caused by several different factors ranging from soil pH, plant health and fertility through to weather, the overall environment on the

surface of the green – even the type of bunker sand used.

Every day our management influences the balance of these microbes, but we cannot control them. Balanced use of the correct quantity and type of fertiliser will influence growth and inner health, whilst mechanical treatments will reduce surface moisture concentrations and increase root activity – though along with the marching army of golfers this can create wear or physical damage by bruising the plant, all of which may make it more vulnerable.

Fungicides help us to limit the damaging effects which an explosion of one or other microbe might cause, doing this by effectively killing them, either singly or in groups, and achieving this by 'contact' or 'systemic' action. Different chemical components attack the microbes, reducing their numbers and altering the balance – and thus bringing about a balance that is more stable. A potential problem exists with the use of these fungicides in that over-use of single chemical groups can produce resistance in the disease. We have all heard of Warferin resistant super-rats and of rabbits that can survive myxomatosis – well now Mother Nature has fought back on the turfgrass disease front as well and indeed there is even *poa annua* that is resistant to paraquat!

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# Fungicides

16 → reduce those conditions that may encourage an attack. Alkaline surface conditions may encourage fusarium, for example who has fusarium around bunkers (which are filled with high pH sand)? In addition, take-all patch is predominantly a problem on high pH greens.

Each and every disease has its own set of preferred conditions which aid its rapid development. Unfortunately conditions to reduce one disease may assist the development of another, for example autumn nitrogen of the wrong type and out of balance with other nutrients can encourage fusarium, whilst the presence of nitrogen in winter can suppress anthracnose.

Careful selection and application of materials can help: the use of iron to toughen the plant from the outside is well known and widely used, but what of potassium for cell wall thickening and therefore protection from the inside?

Work in Australia has concentrated on selecting the appropriate 'antagonistic' organism from the soil, multiplying it and re-applying it in a top dressing to effectively attack the disease biologically. At present there are no known top dressings commercially available incorporating this system but such introduction must only be a matter of time.

Work in the USA has developed along the route of organic fertilisers, which are thought to encourage the development of micro-organisms antagonistic to turfgrass disease causing factors. These may also be an aid in disease control by providing additional nitrogen to the plant (a point mentioned earlier), but as yet the actual mode of action is unknown. Current work on this front has shown some suppression of dollar spot and brown patch on bent-grasses, but there is still some way to go in producing effective recommendations.

Do not write off chemicals. All manufacturers are actively looking at new actives (and at new uses for old ones), with undoubtedly one of the more interesting developments being the use of microbes to manufacture actives. This has the advantage of reducing harmful wastes and producing purer actives which can truthfully be said to have been 'naturally made'!

The first herbicidal product to be made in this way is already marketed and in use in agriculture and is proving very effective.

In summary, may I suggest that greenkeepers should be vigilant in avoiding conditions that favour disease whilst encouraging those conditions that hinder such diseases, and avoiding the possibility of chemical resistance; perhaps by varying the chemical groups that are used.

Finally it must be a case of 'watch this space', for it will only be a matter of time before alternative treatments and methods are here to help us.

● The author, A John Hinton, is the amenity specialist for Kings Horticulture Ltd.

Something to say? Share your thoughts on any greenkeeping matter with readers of the industry's most respected magazine. Send your letter to The Editor, Greenkeeper International, 13 Firle Close, Seaford, East Sussex BN25 2HL. We reserve the right to edit submissions.

## ■ Chlordane demise 'fraught with problems'

■ I refer to the article 'The Worm Keeps Turning', which appeared in December, and to the manufacturers reply on availability of 'Castaway Plus'. Despite protestations of the product being as 'readily available today as it has been for some years', the real truth is that the product is not available. A recent letter received from the manufacturers states "due to tremendous demand for this product during the latter months of 1991 we have, temporarily, sold out of this product". It does not take too much intelligence to realise that they have either been caught with their marketing pants down – or they are trying to pull a fast-one! Only a fool could fail to realise that demand was bound to be higher, since the option of a wettable powder is, by me anyway, backward and unacceptable.

Jon Allbutt is right in his assertions, the demise of Chlordane is fraught with problems, and the options that are available, eg. Controlled Droplet Applicator (CDA) Castaway Plus and wettable powder Twister are, in my opinion, lesser attractive alternatives. It was interesting to also note in their letter that they suggested changing the order to one of these alternatives. I am of a generation that has grown up with the ability to see straight through such transparent ruses and I am not amused!

A CONCERNED GREENKEEPER  
Name and address supplied

■ I write to extend my thanks to the Scottish North Section for their excellent idea of provid-

ing funds toward expenses for two regional members to attend either a major BIGGA conference or seminar. Being positioned remotely on the map, attending something of this nature would not normally be considered by a great many in our area. The idea of a section competition, answering greenkeeping questions, is quite an ingenious way of providing a prize, one that enabled the winners to broaden their greenkeeping knowledge.

Needless to say, my trip to Harrogate for the BTME was both very enjoyable and worthwhile. I obtained new information from various seminar speakers, kept my ears open for invaluable tips from proven greenkeepers and other members of the trade and made many more friends. I look forward to returning to such an event in the near future.

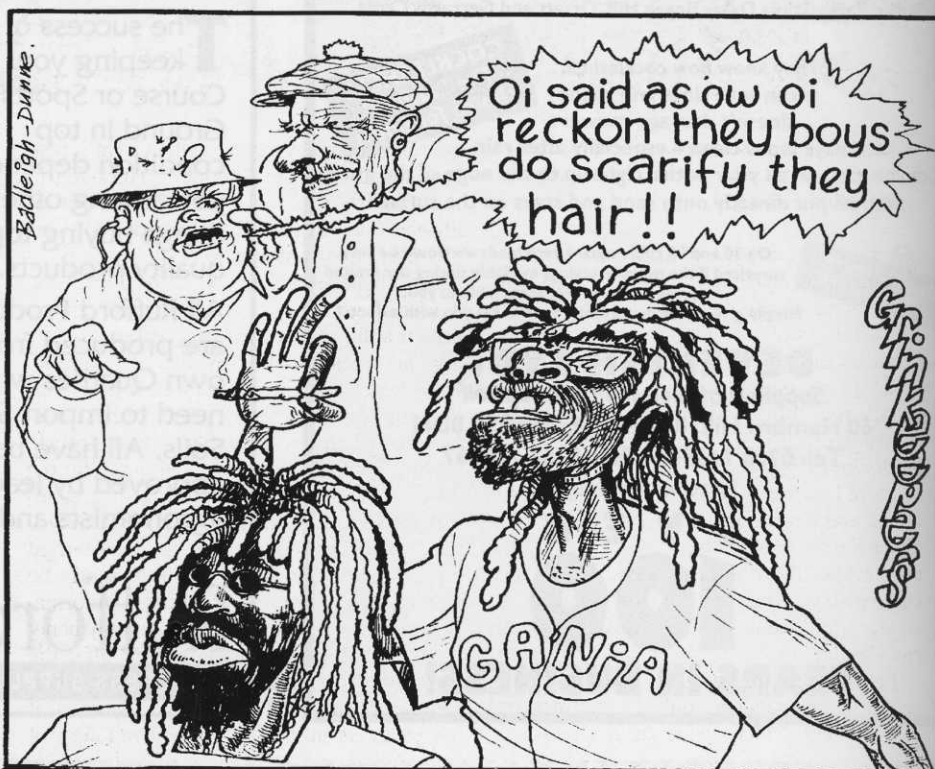
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■ May I take this opportunity through the magazine to say a few thank-yous. First, to the committee of the North Section (Scottish Region) for giving me the opportunity to attend BTME in Harrogate in January. I had a most enjoyable week and gained valuable knowledge which, no doubt, will prove beneficial to me in the future.

I must also pay tribute to some of my colleagues who made it such an enjoyable week, especially my room-mate, Dougal Duguid.

GORDON I MCKIE  
Tain, Ross-shire

## Badleigh-Dunne





# Letters

## ■ Looking forward to UK Spec ■ Success of 'Harrogate Experience'

■ If the vast number of consultants and 'experts' who advertise are as good as they claim, why in the golf course building boom do we see so many courses (and alterations to older courses) undertaken with such poor specifications and elementary errors in design and construction?

In many cases it appears not only to be the clients wish alone to reduce costs, but also a contractors eagerness to maintain a higher profit margin. And who picks up the long term legacy? Well, I think we all know the answer, don't we? One of my main concerns is the amount of money that some are taking from the game and business of golf as a whole, whilst putting nothing back.

This brings me neatly to another related matter brought to my attention recently. A well known design and construction company, perhaps faced with dwindling construction work, is 'diversifying' into contract course management and is touting for business. First they write to all those whose courses they have constructed, offering to report on how a course built to such 'high standards' is in such bad condition, invariably claiming to be due to the incompetence of current maintenance staff and equipment employed, and offering to turn the situation around. This of course, only if they take over the maintenance lock, stock and barrel - rendering the current workforce and machinery redundant!

This very nearly happened at a fellow greenkeeper's course, and having seen it during construction (cutting corners, following doubtful

specs., using dodgy sand and spent mushroom compost for greens and turfing with turves grown on a clay/loam base etc.), taking all things into account the course was coming along quite splendidly after many early teething problems. When the owner saw the report however, he was on the brink of firing everyone and taking the contract. Fortunately, an independent observer took the trouble to examine the course along with the head greenkeeper, the owner, and the report, and was easily able to convince the owner of the folly of any such action. Normality has been restored, but the warning remains and greenkeepers and course owners should be on their guard for unscrupulous sharks.

On a happier note, it is good to note that some results may come from the STRI green construction trials and perhaps one day we shall see a universally agreed UK Spec., taking full note of those pioneers who have successfully constructed hundreds of perfectly specified greens, and hopefully one that will not mean as many different things as the oft misquoted and misunderstood USGA Spec. seems to mean to many constructors. It cannot come a minute too soon.

**PAUL COPSEY** Barnehurst GC  
Kent

■ I was privileged to be the key note speaker at this year's BIGGA Turf Management Exhibition and Conference held in Harrogate. As a speaker who visits many of these events all over the country I thought it appropriate to

write and congratulate all those concerned in its organisation.

It was a very professional event in which all greenkeepers should be proud to be associated. For my part I hope that my presentations, which were designed to help with the sometimes difficult green committee, proved to be helpful and useful.

I wish your readers all the very best in 1992 and the "Harrogate Experience" continued success.

**GRAHAM PHILLIPS** The Marketing Group,  
Warrington, Cheshire

■ As a recently joined associate member of BIGGA I feel I must write following a wonderful week at the BTME at Harrogate, which was a great experience for me. I attended workshops for two days, following these with excellent seminars and a wonderful exhibition - all of which I found very educational.

The education available for greenkeepers is splendid, but how about some for, say, ordinary Club members such as myself, who may not realise the pressures which green staff at all levels have to endure. Would it be possible for a BIGGA 'rep' to organise a 'winters night' at Clubs around the country and thus help us to understand some of those pressures?

Now I am looking forward to the National Education Conference at Cirencester, where I am hopeful of gaining yet more knowledge and perhaps meeting up with other associate members.

**AILSA WADE** Glasgow

# CHEMICAL CALCULATIONS

by G Keith McKee

**When you use a chemical product, do you really know what the accompanying information means?**

As my company expands into Europe, much of my time is now spent visiting golf courses on the continent, which is both enjoyable and challenging. Enjoyable because I visit some beautiful golf courses set in delicious scenery and challenging because I find the European greenkeeper to be knowledgeable and yet demanding of still further knowledge.

Before I started such visits I had the ill conceived opinion that greenkeepers across the Channel were vastly inferior to their counterparts in the UK. In reality I have found their knowledge and quest for knowledge to be far greater than that of the average British greenkeeper.

Quite frankly, my original opinion of the European greenkeeper could be summed up by a headline which appeared in The Times

newspaper some years ago when a thick pea-souper fell over the Channel: "Thick fog in the English Channel - The continent of Europe is isolated". In other words - UK was the most important and best.

I still believe that the UK is the best in the world of golf and that the British greenkeeper still produces the best turf grass playing surfaces in the whole of Europe. However, I am not quite so convinced that they all know how they produce these surfaces, or what they are applying to their turf.

Their confusion may well be aided by the 20 to 30 or more companies producing so-called fine turf fertilisers. In reality, only a handful of these companies will have carried out meaningful trials and consequently be able to pass on useful and accurate information to the greenkeeper. Often the only benefit some of the 'fine turf fertilisers' offer the bemused greenkeeper is a lower cost when compared with another product. However, if the products do not do the job required of

them, low cost is of no benefit at all and cost should be one of the last considerations to influence the greenkeepers decision. The key question the greenkeeper should always ask is 'what product do I need to purchase to obtain the desired end result'.

On the continent, educational standards are such that greenkeepers are given the knowledge and expertise to quickly identify which product they need and, of equal importance, which products are not suitable for their course. Greenkeepers in Italy begin work on the course with this type of information - for they are not allowed to be classed as a 'greenkeeper' until they have attended the Italian Golf Federation School for Greenkeepers. I am regularly asked, for instance, for the full breakdown of my company's products (a question I cannot ever recall having been asked in the UK), including how much of each of the following are present:

- ammoniacal nitrogen
- ureic nitrogen

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# CHEMICAL CALCULATIONS

- nitrate nitrogen
- slow release fertiliser
- organic matter.

From this type of information the greenkeeper can start to decide on precise fertiliser requirements: remember a mixture of ammoniacal and ureic nitrogen are considered to be less encouraging to *poa annua* than nitrate nitrogen. Slow release fertiliser content is another common discussion point, in particular the question is asked: what percentage of the nitrogen content is in the form of slow release? At least 40% of the nitrogen in a slow release fertiliser should be in the form of slow release for the full value to be achieved. If it is less than that, it is hardly worth paying for!

Organic fertiliser is another case in point. Ask if a product is really 100% organic, or find out if it is just malingering under a "green" umbrella. A sales person should be able to supply all this type of information - and if not, they should be able to obtain it very quickly. If they cannot supply the information - don't buy from them!

Having gathered all the essential information, the greenkeeper can begin to establish his programme for the year using kg/units of nitrogen, phosphate and potash etc. Research has shown that turf requires:

Nitrogen: 100-250 Kg/ha (10-25 gms/m<sup>2</sup>) per annum;

Phosphate P<sub>2</sub>O<sub>5</sub>: 20-50 Kg/ha (2-5 gms/m<sup>2</sup>) per annum;

Potash K<sub>2</sub>O: 80-150 Kg/ha (8-15 gms/m<sup>2</sup>) per annum.

Sand greens will require higher rates of nitrogen (approx 300 Kg/ha) and potassium will be at the higher end of the recommendations. In both sand and soil greens, phosphates and potassium requirements should be dependent upon soil analysis.

So when you are presented with a compound bag of fertiliser, how do you work out what its nitrogen, phosphate and potash values are in kg/units per hectare? On the back of the bag you will find a panel with

the declaration contained thereupon, for example:

Nitrogen .....14%  
Phosphorus Pentoxide P<sub>2</sub>O<sub>5</sub>  
.....2% (0.9%P)  
Potassium Oxide K<sub>2</sub>O

.....4% (3.3%K)  
Application rate.....35 gms/m<sup>2</sup>  
(My company always double mark the fertiliser, eg. 2% P<sub>2</sub>O<sub>5</sub> [0.9%P])

If there is a requirement to convert P<sub>2</sub>O<sub>5</sub> - P or P - P<sub>2</sub>O<sub>5</sub> the equation is quite easy:

$$P \times 2.9 = P_{2}O_{5} ; P_{2}O_{5} \times 0.44 = P$$

$$K \times 1.12 = K_{2}O ; K_{2}O \times 0.83 = K$$

As a further example let us take a spring and summer fertiliser 14-2-4 applied at 35gms/m<sup>2</sup>:

35gms/m<sup>2</sup> = 350Kg/ha of total product (35gms x 10 = 350 Kg/ha.

To find the nitrogen take 350Kg/ha ÷ 14% = 49 units of N per ha.

To find the P<sub>2</sub>O<sub>5</sub> take 350Kg/ha ÷ 2% = 7 units of P<sub>2</sub>O<sub>5</sub> per ha.

To find the K<sub>2</sub>O take 350Kg/ha ÷ 4% = 14 units of K<sub>2</sub>O per ha.

Look at a complete range of fertilisers and select the products that fulfil your requirements, remembering that fertilisers may be mixed and matched to give you exactly what you require for an annual treatment. For instance, there is no reason why an autumn fertiliser should not be used in summer time if this achieves the desired goal.

To give an idea of unit figures from a complete range, see the examples at the foot of this page.

Many greenkeepers in the UK are already using the kg/unit method of assessment, though many are not. In continental Europe it is the norm. If we are to raise our technical standards then we must ask questions and demand answers. Let us again prove that here in the UK we have the best golf courses run by the best greenkeepers, that we lead the way in the golf world in Europe and beyond and can show that 'fog in the English Channel' is not a problem.

● The author, G Keith McKee, is European Turf Advisor, Fisons plc, Horticulture Division.

### Example of unit figures from a complete range

(figures in brackets are kg/units of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O per hectare).

	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Spring and summer	14 (49)	2 (7)	4 (14)
Mosskiller	14 (49)	0 (0)	0 (0)
Turf tonic	7 (25)	0 (0)	0 (0)
Super N	24 (84)	0 (0)	0 (0)
Zero phosphate	14 (49)	0 (0)	7 (25)
Autumn	6 (21)	4 (14)	12 (42)

A typical feed programme could be:

	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Two dressings turf tonic	49	0	0
Two dressings super N	168	0	0
One dressing autumn	21	14	42
<b>TOTAL UNITS</b>	<b>238</b>	<b>14</b>	<b>42</b>

As can be seen there are numerous combinations to fulfil your requirements.