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Official publication of the  
British and International Golf Greenkeepers Association

**APRIL 1991**



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**EDITOR**

David White

Tel: 0323 891291 • Fax: 0323 895593

**DESIGN/PRODUCTION EDITOR**

Tim Moat

Tel: 0904 610611 • Fax: 0904 643074

**SALES AND MARKETING MANAGER**

Bill Lynch

Tel/Fax: 091 413 7218

**ADVERTISING SALES EXECUTIVE**

Carol Dutton

Tel/Fax: 0207 570117

**PRINTING**

Hi-Tec Print, Unit 7, Universal Crescent,  
Houghton Road, North Anston Industrial  
Estate, Dinnington, South Yorkshire S31 7JJ  
Tel: 0909 568533 • Fax: 0909 568206

Greenkeeper International is the official mag-  
azine of the British and International Golf  
Greenkeepers Association and is published  
monthly at BIGGA Headquarters, Aldwark  
Manor, Aldwark, Alne, York YO6 2NF.  
Tel: 03473 581/2 • Fax: 03473 8864

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Circulation is by subscription. Subscription  
rate: UK £29 per year, Europe and Eire £39.  
The magazine is also distributed to BIGGA  
members, golf clubs, local authorities, the turf  
industry, libraries and central government.

**Editorial Offices**

All magazine contributions should be sent to:  
The Editor, Greenkeeper International, 13  
Firle Close, Seaford, East Sussex, BN25 2HL.  
Tel: 0323 891291. Fax: 0323 895593.  
Although every care will be taken, no respon-  
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ISSN 0961 - 6977

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# GREENKEEPER

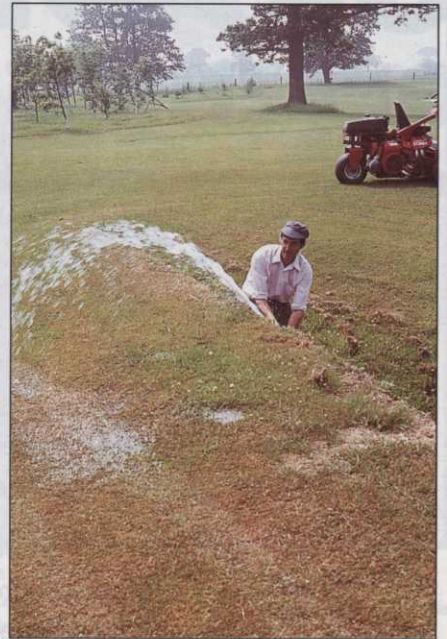
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The magazine team with Lord Whitelaw at the official launch of 'Greenkeeper International'

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## FACES & PLACES

■ Willie Blair wrote to tell us the good news regarding Gavin Ballantyne, who folks in the Lothians will recall has been first assistant at Craigmillar Park for many years. Gavin has been appointed to the post of Head Greenkeeper – Turnhouse Golf Club. Greenkeeper International joins with his many friends in wishing him good fortune.

■ The North-West section are naturally delighted to announce the acceptance by SISIS Sales Director, Arthur Harrison, of Life Presidency of their section, made vacant by the untimely death of Eric Staniforth MBE, their good friend and loyal President for many years. It is perhaps fitting that Arthur should fill this prestigious position, for he and Eric were close friends and colleagues, perhaps for as long as Eric held office.

■ Philip Swain called to tell us that Colin Murphy, a dear friend of many members in the South West and South Wales, had been in hospital but was now on the mend. Colin was particularly impressed by the overwhelming numbers of 'well-wishers' messages and wanted to thank those who were thinking of him. We join with his colleagues in wishing him a complete and speedy recovery.



■ Peter Wimbush (left), is the new General Manager at Aldwark Manor, having joined Richard Wood's team after a lengthy stint overseas. Talking on the telephone with him, we were pleased to learn that the recent flooding that occurred on the new nine-holes at Aldwark, though causing some damage, is not terminal and the opening date of June '92 is still on schedule. In the meantime, Peter is hoping to brush up on his golfing prowess, which at one time was a useful seven though now is what he described as a 'lapsed fifteen'. Look out for him when you visit BIGGA headquarters.

■ BIGGA member John Nudds, Head Greenkeeper, Gerrards Cross GC, has talents in many directions – including creating advertising slogans – and was first prize winner in the competition staged by Huxleys Grass Machinery recently to name their new turf maintenance vehicle currently being developed at their New Alresford premises. The name HUXTRUC was chosen from an entry of some 200 suggestions and although three greenkeepers chose the same name, the tie-breaking slogan "Huxleys' reputation is enough to sell any machine", was John Nudds alone. John won a specially engraved decanter, with joint runners-up Darren Hoskins of Royal Winchester GC and Alex Macauley of Lochmaben GC both received magnums of champagne. Huxleys tell us that a data sheet on the HUXTRUC can be had by 'phoning 0962 – 733222.

■ The name Charterhouse has a positive ring of quality and longevity about it, yet it is a company that is just eight years old.

In those eight years they have built an enviable reputation for quality of product and service that is reflected in the move taken to develop a completely new and very much up to the minute headquarters in Haslemere. At a press launch on opening day, Managing Director David Jenkins expressed great optimism for their future, feelings that were bolstered by a 'bullish' market which has seen an increase in their turnover by 50% and which is supported still further by encouraging business throughout Britain and Europe.

Jenkins further expressed the view that entry in the European free market was a unique opportunity for them to increase still further and that as a company they based their business plans to mirror the German economy, which Jenkins sees as the most accurate European barometer. European expansion in the sports world is seen by Charterhouse as a golden opportunity to further their market share, with France and Germany in particular looking to Britain for the knowledge we are known to have and a lead in producing machinery to help them with growing and maintaining turf.

The new Charterhouse HQ is at Weydown Ind. Est., Weydown Rd, Haslemere, Surrey. GU27 1DW.



**David Jenkins, left and Phillip Threadgold outside Charterhouse new premises at Haslemere**

New magazine represents 'a giant step forward' for the industry says Viscount Whitelaw

# A President and a gentleman

It is no secret that our President, Viscount William Whitelaw, is no mere figurehead when it comes to representing the Association. It was therefore no great surprise – though indeed an enormous delight – that he took time from his unbelievably busy schedule to pay a visit to Aldwark Manor recently to see for himself the progress we have made. That his arrival should coincide with the publication of the March issue of Greenkeeper International was perhaps too good an opportunity for us not to invite his views, and we were all delighted with his astute observations and acclaim for what he described as 'a giant step forward and a huge improvement in the Association's publishing of information critical to the future education and advancement of the professional greenkeeper.'

As a golfer of no mean skill and a most astute observer of all things pertinent to our profession, Viscount Whitelaw shares the view of all modern greenkeepers that a better future lies in following the path of increased knowledge through education and training, and in setting high standards through exemplary professional conduct. It became clear to us all, as he talked freely of his aspirations for the Association, that preservation of the environment was uppermost in his mind, applauding as he did the great efforts greenkeepers make in upholding the environmental balance and of the responsibility we demonstrate both as professionals and as inhabitants of the universe.

Touring our offices, he was greatly impressed to learn of the steadily increasing numbers joining the Association and was struck by our use of computers in keeping up-to-the-minute records. To prove the point, Debbie keyed in his own member-



ship details, a move that provoked his comment, 'it's a far cry from the old days of biscuit tins and card index boxes – a fine example of moving greenkeeping technology still further into the future.'

Elucidating on advancements observed in golf administration since the publication in 1989 of *The Way Forward*, he opined that in such a relatively short time it was encouraging to see many Golf Clubs taking the contents seriously and acting upon the recommendations. He also hinted that there was an 'imminent' likelihood of further recommendations in the offing – involving important structural changes in administration – the impact of which is likely to advance the further development of our Association – particularly in the sphere of education. On that score we wait with bated breath and hope to report further revelations in our May issue, following Nick Park's report and question and answer session on *The Way Forward* at the BIGGA Education Conference in York.

Before leaving, Lord Whitelaw took further time to chat with board members and magazine staff before posing for the almost obligatory photographs, which in a day blessed with overcast skies and drizzling rain could not have been too comfortable. Looking fit and relaxed and remaining good humoured to the end, he left us with the lasting impression that we are fortunate indeed to have him as our President; and that he will continue to campaign vigorously on our behalf – who could ask for more?

**The weather wasn't kind but the welcome was warm for Viscount Whitelaw, pictured outside BIGGA headquarters with Chairman Ivor Scoones, left and Executive Director Neil Thomas. Education Officer David Golding is on the right**



Viscount Whitelaw with the magazine team, from left, Tim Moat and David White, and Bill Lynch and Carol Dutton

# 4

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# Turning on

With two years of drought conditions still fresh in the mind and the prospect of still further water restrictions in the offing for 1991 and beyond, the subject of irrigation is one that remains uppermost on any priority list. Consultant Agronomists JOHN HACKER and MIKE HARBRIDGE cast a thoughtful eye over problems associated with applying both too little water, and too much...

## Too little water

It is taken for granted by most that a lack of water is detrimental to grass growth and quality. Indeed a severe water deficit can lead to a number of changes to grass growth including:

- Increased root depth.
- Increased root/shoot ratio.
- Decreased tillering.
- Decreased leaf number.
- Reduced shoot elongation.
- Decreased size and total area of leaves.
- Thicker cuticle.
- Smaller cells, intercellular spaces and xylem cells.

Not all of these are necessarily bad for the greenkeeper, indeed we would all like to increase the rooting depth of our greens as it enables the roots to exploit a much greater area for water and nutrient reserves. Overall, however, a severe water deficit over a prolonged period is bad for grass growth, wear tolerance and appearance.

## Drought – Just what do we mean?

So what do we mean when we talk of drought? Jim Beard, in 'Turfgrass; Science and Culture', identifies two types of drought which he defines as "a prolonged water stress that limits or prevents turfgrass growth." Drought can be divided into two main types:-

**Atmospheric Drought** – This is where the transpiration rate exceeds the absorption rate even though available soil water is adequate.

**Soil Drought** – In this instance there is a water deficit causing drought due to a lack of available soil water. This can be due to several reasons including:

- A prolonged period without rain.
- Soil type.
- A high evaporation atmosphere

The only practical way of treating atmospheric drought is by syringing (applying light sprays of water) during periods of high temperature, usually around mid-day. This increases the water vapour near the grass surface and therefore reduces the amount of water drawn out of the grass. Such periods are uncommon in Britain although last summer was probably the exception to the rule. In continental Europe and the USA atmospheric drought is much more likely because of their higher summer temperatures. Drying winds may also induce atmospheric drought although the only real treatment for this is to plant windbreaks, thus reducing wind speed. This is only really an option with greens or other areas which regularly experience such problems.

Soil drought is the usual reason we apply water to greens although physiological drought can also occur. Physiological droughts are caused by high external salt



**Dry patch disorder – an increasing problem**

concentrations which induce a water deficit within the plant. This can be caused by saline conditions or, in the seedling stage, by large fertiliser applications. Large concentrations of salts on the leaf and stem caused by fertiliser application also causes foliar burn. This is why it is recommended that irrigation be used to wash in certain fertilisers, i.e. Ammonium Sulphate, if rain does not occur within 48 hours.

## Dry patch disorder

Dry patch disorder is a soil drought and has been found to occur on sands and sandy soils. A soil exhibiting dry patch is very difficult to wet as the soil becomes hydrophobic and fails to retain moisture. The soil then dries out and the sward wilts. The hydrophobic condition of the soil is thought to be due to either a coating of the sand grains by fungal mycelium or by calcium or magnesium soaps and is found to occur at the sand/thatch interface. Dry patch can be overcome by spiking and applying a wetting agent before thoroughly soaking the affected area.

## Wilting

How then do we know when drought is occurring? The first sign of drought on most plants is wilt and it is unlikely that anyone reading this article will not be familiar with the flaccid leaves associated with drought, even if only on the house plant that you forget to water whilst away on holiday.

Wilting is increased by high temperatures, wind movement, solar radiation, low active humidity and impaired water absorption. It is the latter factor – impaired water absorption – that many forget or ignore when thinking of drought. For even if water is present in reasonable amounts, the plant may not always be able to take it up. So before you accept that irrigation is necessary after a week of dry weather, check to see if there is any reason why water is not being used by the plant. Water absorption may be impaired by either a lack of available soil moisture or by a limited, non-functioning root system. The latter can be caused by a number of factors, including:

- Lack of aeration.
- Compaction.
- Waterlogged soil.
- Excessive nitrogen fertiliser.
- Severe leaf defoliation.
- High soluble salt levels in the soil.



**A sand/soil mix suitable for a golf green – free draining**

# the taps

Many of these are commonly found on golf greens and relieving compaction or aerating the soil may do wonders for drought resistance by increasing root depth. Swards with high levels of thatch are also more likely to wilt due to shallow rooting. The following maintenance and play practices will therefore greatly effect drought tolerance.

- Amount of play on the area.
- Turf maintenance practices.  
i.e. renovation, fertiliser and mowing practices.
- Soil structure and texture.

If your greens are regularly subject to drought perhaps you should take a good look at these aspects. You may not be able to affect the amount of play but you can alter maintenance practices and, if necessary, improve the greens soil by either topdressing or reconstruction.

## How grass copes with drought

Drought, of course, is a common natural event and the extensive grasslands of the world often only exist because grass is able to withstand prolonged periods without water and can therefore live where other plants cannot. Grasses have developed a number of strategies for surviving drought periods:

- a) Seeds – seeds are very drought resistant and many grasses are able to exploit this by having very short (ephemeral) lives ending in seeding i.e. *Poa annua*.
- b) Dormancy – grasses also have other dormancy strategies. They often produce stolons or rhizomes which lie dormant in times of drought. Grass crowns are also very drought tolerant.
- c) Water absorption capability – Certain grasses are more able to survive drought because of physical characteristics that allow a greater water absorption capability. These include:
  - Greater root depth.
  - Larger number of roots and greater degree of branching.
  - Greater root growth activity.
  - Larger root hair growth.
  - Mycorrhizal associations.

The drought resistant hard fescue is quite deep rooted while the root system of a bentgrass mown sward may be only 50 – 100mm deep.

- d) Xeromorphic features. – In addition to increasing their water absorption capabilities, many turfgrasses also possess inherited structural modifications that reduce water loss by transpiration. These features include:

- 1) Decreased leaf surface area.
- 2) Altered size, spacing, number and location of stomata.
- 3) Increased cuticle thickness.
- 4) Surface hairs.
- 5) Less intercellular spaces.
- 6) Diminutive conducting tissues.
- 7) Rolling or folding of leaves.

- e) Drought Hardiness – Drought injury to turfgrasses has been attributed not to lack of water but to mechanical injury to cells resulting from drying and re-moistening processes. In view of this some grasses have developed ways in which injury can be minimised. These include having small cells which suffer less mechanical injury from drying and re-moistening and having a high carbohydrate content. Factors which reduce drought hardiness include:-

- High nitrogen fertiliser rates.
- Potassium deficiency.
- Shading.
- Intensive traffic.
- Excessive irrigation.

So bad maintenance practices, such as excessive nitrogen or irrigation, can effect the grasses own natural hardiness to drought.

Many of these natural survival techniques are, however, unacceptable to the greenkeeper, as survival may mean a yellow or even

dead surface. This is, of course, not desirable on a golf green and so supplementary water must be applied. Turfgrass species and cultivars are, however, being selected and bred for their drought hardiness and thought should be given to sowing appropriate grasses where drought is likely and irrigation is not possible or prohibitively expensive.

## Too much water

While water deficits are often our main concern, water in excess can also bring problems. Standing water on playing surfaces not only disrupts play but can also affect plant growth. Excess water may be due to a number of causes including:

- Poor drainage.
- Excess rainfall.
- Excess irrigation.
- High water tables.
- Flooding from adjacent rivers or sea.

Such excess water can deplete soil oxygen levels within 1 – 2 hours and lead to an increase in carbon dioxide concentrations. This can lead to restricted root growth, thatch accumulation and a decline in turfgrass quality and vigour.

## Turf diseases

The activity of many turfgrass diseases are increased by a high atmospheric water vapour content which can be increased by irrigating at the wrong time of day. These include diseases such as brown patch, fusarium, powdery mildew, slime mold, pythium, copper spot, dollar spot, red thread and typhula. Dew on turf can also increase disease incidence by permitting fungal spore growth and spread. While dew can provide as much as 6" – 10" (150 – 254mm) of water per year in a cool humid climate, this benefit is greatly outweighed by its disease promoting properties. As all greenkeepers know, switching is commonly undertaken to remove dew and encourage the surface to dry quickly. Early morning watering which removes dew has been found to substantially reduce brown patch disease on bentgrass.

However, water excess is not always at fault where disease spread and development are concerned. Soil moisture stress (drought) has been shown to increase susceptibility of *Poa pratensis* to dollar spot. In addition, drought has also been shown to favour the crown and root rot phases of *Helminthosporium* disease, although water stress does reduce the leaf spot phase.

## Nutrient losses

Excess rainfall or irrigation will, on freely draining soils, lead to nutrient losses by leaching. The prime nutrient lost in this way is Nitrate, which is not held by soil colloids but is freely available in a soluble state in the soil. Such leaching will lead to poor growth and low wear tolerance unless nutrient losses are replenished.

## Scald

In hot climates turfgrasses can collapse and turn brown under standing water and intense light. This is known as scald and is, fortunately, not commonly found in Britain.

## What's the answer?

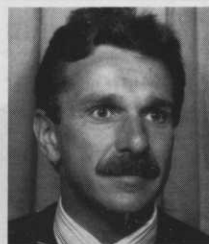
Too much water is bad and yet too little is worse, so what is the answer? How much water do we really need to apply? That is the tricky question we shall investigate in "Estimating Water Needs", which will appear in the June issue of Greenkeeper International.

● **John Hacker and Mike Harbridge provide specialised consulting services in agronomy through Professional Sportsturf Design (NW) Ltd.**



**localised drought on a high spot**

# Taking an axe to the Poa attacks



**Is Poa annua your problem? We asked DAVID STANSFIELD, Senior Agronomist with the Sports Turf Research Institute, to offer advice on ways in which the species might be controlled or eradicated, which he suggests is a matter of managing competition between species**

The range of plants which will grow in any particular situation, whether on a golf course or not, depends upon a range of factors affecting the individual habitat. These factors include soil type and condition, drainage qualities for both surface and ground water, levels of fertility and the climate and micro-climate. When management is added to this range of factors another level of species selection comes into play, selection which can be acute with intensive management techniques – as are applied to greens and allows only a restricted range of species to grow – or can be low intensity with the effect of the growth of many different types of plants, e.g. in deep rough. The balance of maintenance applied then affects the relative proportions of individual species within a population.

On golf courses, user pressure per unit area is also acting as an element of species selection, and is affecting the proportions of the different grass species present, particularly where intensive maintenance is applied, as on greens. The heavier the weight of play – measured in rounds of golf per year and/or usage per unit area of putting surface – the greater is the selection pressure against species that grow and reproduce (and hence recover from damage) relatively slowly, these being replaced by primary colonisers of bare ground.

So what is all this ecological theory leading to? The age-old fight against annual meadow-grass in putting surfaces, how to keep this to a potential minimum, and what is this potential in a variety of circumstances receiving a low input management system.

During the past two summers, ultimate priority has been given to keeping a grass cover on greens, and in extremis any grass will do. Nevertheless, it has been plainly evident that those Clubs who are in the enviable position of having greens turf with a high content of bent grass, or indeed bent grass and fescues, survive the best. It has to be said too that even Clubs with a good, modern watering system working on annual meadow-grass dominated greens got by pretty well. But without good watering, even for just a few days, the meadow-grass greens were a total failure and became unplayable.

This latter situation raises a spectre for the future for many (and in the very near future at that for some), because water is becoming an increasingly valuable commodity and it cannot be automatically assumed that water will always be available for turf irrigation on demand, unless Clubs have the space to construct large lakes or reservoirs for storage of winter water. These lakes will have to be large, for 1 m<sup>3</sup> of water is only 220 gallons and with flat-out watering 205 m<sup>3</sup> will be needed for 18 greens. Hence, even though working towards true links turf has tended to be pushed on to the back-burner for a couple of years in many instances, it is still an important, not to say vital, issue in UK green-keeping. Given the uncertainty of weather for the future,

in no way is this going to diminish, be summers wet or dry.

True links turf provides a surface for play for virtually the whole year barring frost (some of the time) and snow. It will hold together in most droughts (though not without water in 1990) as well as drain well in the wet. However, true links turf will only thrive if management is geared to maintaining the good features of a very specialised habitat at the seaside, growing turf on a very sandy soil which receives lots of wind and salt spray, to maximise the competitive abilities of bent grasses and fescues against annual meadow-grass and to sustain these with a low output of resources. Even then, if there are problems with a green design that allows too few acceptable pin positions, or the level of play outstrips the inherent ability of the turf, enhanced by management, to withstand wear, then indigenous species die back leaving bare ground into which annual meadow-grass can establish.

On seaside links it is still practical to expect to find 80% – 90% of the turf composed of bents and fescues, with Poa and maybe Yorkshire fog making up the remainder. Moving inland though, finding fescues in significant populations on established greens is something of a rarity away from the backs of bunkers. They are most common on neutral to alkaline land (chalk downland or limestone heath) but never to the same level of presence as occurs on seaside greens and varying in proportions according to the weight of play per unit area. On acid soils a course has to be very lightly played for fescues to retain any real presence at all in putting surface turf.

Away from coastal sand bent grass is by far the most important turf grass and, as things stand, this means browntop bent grass rather than creeping bent grass. Can we then expect to find complete stands of bent grass forming

stable populations on greens? The answer is no, and indeed there are great disadvantages to maintaining a monoculture anyway, particularly with the risk of disease (take-all patch in the case of bents) ripping through the whole stand. What we can expect is a mixture of bent grass and Poa annua in varying proportions, according to the nature of the habitat of individual greens (not courses). A bent grass green is a bent grass-dominated green.

The variation in proportion of bent to Poa within green turf can range from 70:30 to 30:70 respectively, with an even mixture of, say, 50:50 being realistically a good average make-up inland for the majority of greens. It must be borne in mind though that the potential level of bent grass content which can be achieved in any one situation is conditioned by factors outside of the control which can be exacted through greenkeeping; for example size, shape and situation of individual greens, the level of play and the local climate. Thus there are limitations as to what can be achieved from green to green