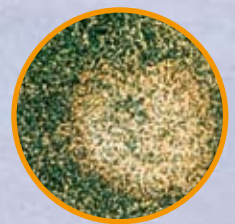


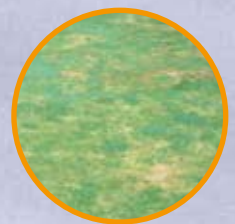
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YOUR DRAINAGE ON YOUR GOLF COURSE

By Geoffrey Davison

FEATURE



Neat one-pass slit installation by sand injection



Fine sand slits at close centres

Sports-turf drainage in general, and golf course drainage in particular, has come a long way since the simplistic days of “just putting some pipes in wet areas”.

Before making decisions about any drainage problem ask three questions and make sure that the answers are made with full knowledge of up-to-date technology. Only by having this approach can the best results be achieved at the lowest possible costs.

Question 1.

WHY EXACTLY DOES AN AREA HAVE A DRAINAGE PROBLEM?

Answer 1. All wet ground is the result of rainfall, recent or perhaps much earlier. There may be one or more reasons why, at times, this precipitation causes some areas to be unduly wet:

- (a) Rainfall in excess of the existing pipe drainage capacity.
- (b) Soil Texture not sufficiently permeable.
- (c) Soil Structure compacted.
- (d) Surface run-off from higher ground.
- (e) Sub-surface seepage from higher ground.
- (f) “Saucer” surface contours.
- (g) Intensive use – eg. Pathways.
- (h) High water table.

Until the causes are correctly diagnosed, the most effective cures cannot be established.

Question 2.

WHAT EXACTLY ARE THE MOST EFFECTIVE REMEDIES?

Answer 2. All the eight possible causes listed above have to be taken into account:

(a) Existing pipe drains. Measures such as repairing broken pipes and clearing blocked outlets are sound maintenance. It may be that the existing pipes are working but that there are too few of them. However, if the pipe system is generally mal-functioning the best and most cost effective course may be to leave it to make whatever contribution it can and to install a new well designed pipe system into the area.

(b) Soil Texture. Very few soils have a texture which provides ideally high permeability. The progressive addition of suitable sand does help but basically it is a case of having to accept that the soil texture is what it is!

Sand slits can provide an effective soil by-pass route for excess water.

(c) Soil Structure. Although it is very difficult

to change Soil Texture it is possible and very beneficial to create and maintain a good open Soil Structure. Really effective and frequent aeration is essential, not only for drainage but also for healthy root growth and good quality turf.

(d) Surface Run Off. On bare soil, surface run-off from sloping ground is obvious. On grassed areas it may not easily be seen, but it still happens and must be intercepted before it reaches the playing surface. Swales, ditches, pipe-drains with permeable backfill to the surface or combinations of these may be required.

(e) Sub-Surface Seepage. Many thousands of tonnes of water are held within the sub-strata of nearby, or even distant, higher ground. This water is under great pressure especially when it is deep within hills. It may take hours or even centuries to make the, sometimes long, journey, but if it can force its way out, it will do so. Wet areas can be formed at points where this underground water has travelled through the sub-strata and come to the surface. Deep drains are needed to intercept this flow before it reaches the playing surface. Pipes in the actual wet areas may not be the answer.

(f) Surface “Saucers”. It is surprising how often it is not appreciated that some wet areas are actually surface “saucers”. Surface water cannot escape and the slopes feed it towards the



Profound aeration creates countless millions of tiny cracks and fissures



Trenching to install a pipe drain



One pass narrow sand slitter



Rapid, one-pass installation of small sand slits at close

centre. This is often the case on greens! Adjusting the surface contours to provide run-off points is an effective remedy

(g) Intensive Use. Severe compaction on limited areas such as pathways may require very intensive drainage, or perhaps the turf could be replaced by other material.

(h) High Water Table. This may be a feature of the location. Lowering the level is possible but expensive. A professional survey may be required. Individual wet areas can be isolated by deep ring mains, sometimes with an automatically controlled pump. With the water table height reduced within the ring, normal drainage can be installed.

Question 3.

HOW EXACTLY CAN THESE CURES BE IMPLEMENTED?

Answer 3. These points apply to fairways and rough. "Greens" are dealt with separately as another item at 4 below, as also is "Installation" at 5 below.

(a) Existing pipe drains. If the existing drains are sound but too far apart, new drains can be installed to increase the drainage capacity by bisecting the spacings. On fairways, problem

areas will usually need pipes to be at not more than 5m centres.

The overall drainage capacity can be further enhanced by crossing the pipes with sand or sand/gravel slits @ 90degrees to the pipes and @ 1m centres. Wider spacings are proportionately less effective. Such major slits need to be 40mm to 50mm wide by 250mm to 300mm deep. Tested good quality back-fill is essential. Gravel or granules can be used but only if covered by a topping of good sand. Gravel or granule back-fill up to surface level is not cost effective. It is soon in-filled by fines and ceases to function. It is also a playing hazard and detrimental to the texture of the top-soil.

Where new pipe systems or sand slits are to be installed, always bear in mind that the key to modern drainage technology is "intensity". Fewer drains or fewer slits cost less but are less effective. The design of new pipe drainage really needs to be part of a comprehensive plan which includes other measures such as sand slitting, ditching, etc. Sound professional advice about this may be good value.

(b) Soil Texture. Sand top-dressing is beneficial to the playing surface but it takes regular applications over many years for it significantly to change the texture, and therefore the permeability, of the root zone material. Only a suitable depth

of a soil with a texture which has a particle size distribution of not less than 75% sand can provide the desired high permeability. Good fertile soil may not be highly permeable, but it can grow good strong turf; let it do that and impose the required permeability by installing a well designed intensive slit drainage matrix.

(c) Soil Structure. The value of creating and maintaining an open soil structure cannot be over-emphasised. It is hugely beneficial to root growth and grass health, and absolutely essential for good drainage.

Yet this prime requirement rarely receives the necessary regular and effective attention. The occasional application of a (perhaps outdated and not very efficient) aeration machine totally fails to achieve what is required. The objective of aeration is to increase the ratio of voids-to-solids within a soil's structure. In order to "make space" for this to happen, an aeration machine must either take out cores or, slightly and evenly, lift the surface. Machines which merely make holes or slits in the turf by poking the surface really achieve very little.

(d) Surface Run-Off. Inspections of individual areas readily show where the water is coming from. Adjusting the surface contours by temporarily removing the turf and re-shaping the formation grades can create wide and mow-able interception



Narrow trenching for slit drains



Neat clean trenching

swales. It may be possible for these to lead to discharge points, but in some instances ditches and/or pipe drains with permeable fill to surface level may also be required.

(e) Sub-Surface Seepage. It may be difficult in some cases to know exactly where the seepage is coming from. Trial holes may be required to establish both the direction and depth of the flow.

Interceptor pipe drains need to be appropriately deep and backfilled with suitably permeable back-fill. It also may be necessary to install a full-depth vertical water-proof membrane on the lower side wall of the trench before backfilling it in order to arrest flow which is occurring at various depths.

(f) Surface Saucers. Turf can be neatly cut and placed to one side while formation levels are slightly re-shaped to form one or more run-off points. With the soil cultivated and firmed, the turf can be re-placed immediately so that there is only minimal interruption to play.

(g) Intensively Used Areas. Depending on where it is situated, there is a choice between turf with very intensive localised drainage, or replacing the turf with some other pathway material such as woodchip, finely chipped stone, gravel, etc.

If turf is the choice the drainage pipes would need to be crossed by closely spaced major sand slits which in turn may need to be crossed by minor slits @ 250mm centres.

(h) High Water Table. Where parts of, or even entire, golf courses have been built on areas with a high water table, there is always the temptation to wish that they had been built somewhere else! However, they are where they are and can be very pleasant courses.

A high water table can be a difficult, but not insuperable, problem.

Localised areas such as part, or perhaps all, of a fairway can be dealt with by installing a suitably deep and continuous outer ring drain. Unless a pipe from this can lead to a lower outlet, it will be necessary to construct a deep chamber which is evacuated by a submersible pump controlled by a float switch. The evacuated water will have to be fed into an outlet which discharges outside the ring main. Normal drainage can then be installed within the ringed area which now has a lowered water table. Where larger areas require major works, a professional survey and expert advice is required.

Installation

Who does the work?

Major schemes are best carried out by proven specialised contractors.

They have the required machines and experienced staff. Good contractors will charge fair but competitive prices. Major contracts will require substantial outlay. All quotations must be made to the same detailed design and specification. Any bid which is much lower than the others is always suspect and best not accepted.

Where funds are in short supply, a lot can be achieved by carefully planned in-house operations. This is especially so on smaller areas and where skilled green-keeping care is required to provide a neat finish. Most drainage contractors really do not want this smaller type of work.

A long term in-house programme can be implemented over a period of years as and when the green-keeping staff have the time available. Work need not take place when ground conditions are unsuitable or when it would interfere with the playing schedule.

Suitable equipment can usually be hired, but it is much more convenient and less costly

for a club to own at least the one essential small specialist machine. A compact tractor mounted trenching machine which is capable of excavating larger trenches for pipe laying, and also neatly cutting out narrow trenches for sand slits, is always useful on a golf course. Trenching is often also needed for irrigation and other work apart from drainage.

Conclusion.

Pipe drains can take away excess water. Sports-Turf Drainage requires that this water must penetrate down to the pipes much more rapidly than the slow rate which is permitted by permeating through soil.

There are only two options. The soil has to be replaced by a sandy root-zone mixture or it has to be by-passed by an intensive sand slit matrix.

Modern Sports-Turf Drainage is not as complicated as brain surgery but it has now become a fairly complex technology. Scheme design and specification are crucial. Time spent in considering the various points outlined in this article will help to achieve the best results at the lowest costs.

Geoffrey Davison is always happy to have entirely complimentary telephone discussions on any aspect. His number is 01568 797024.

Contact Details

North Staffs Irrigation – 01785 812 706
 Speedcut contractors Ltd – 01865 331 479
 Turfdry – 01283 551 417
 Duncan Ross – 01257 255 321
 Philip Dixon Contractors Ltd
 – 01772 877 289

Please also see Page 61 in the Buyers Guide section for further information

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NEW PRODUCTS



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Rolawn has expanded its range of specialist topsoils. Following the introduction of Beds & Borders Topsoil in spring, two further additions have been introduced; Vegetable & Fruit Topsoil and Turf & Lawn Seeding Topsoil.

www.rolawn.co.uk



FAREWELL TO PITCHMARKS

A Berkshire company has recently launched an innovative product that they claim could mean an end to pitchmark damage for good.

The 'Pitchmark Repairer' evolved from an idea by West Berkshire Golf Club Professional, Paul Simpson, who was concerned at the damage consistently caused to greens by unrepaired pitchmarks. Aware that many players were either reluctant to repair their marks or found bending down difficult, he set out to find a solution that would be practical, robust, inexpensive and easy to use for all golfers.

The Pitchmark Repairer is a small device made from glass-filled nylon that simply fits over the end of the putter grip, enabling golfers to easily repair pitchmarks without bending. It is secured with a patented sliding collar mechanism and fits all normal grip sizes. The Pitchmark Repairer fits easily into a pocket or can be attached to the player's bag or belt.

www.pitchmarkrepairer.com



GET READY TO BE BLOWN AWAY

Bernhard & Company has launched a specially selected range of new turf products featuring powerful Debris Blowers and Recirculating Turf Vacs.

The new PTO Debris Blower comes in two models, the DB2700 and DB3600. Completing the line up is the new powerful engine-driven Debris Blower DB1800, which can be towed by most utility vehicles.

Three models feature in the new Recirculating Turf Vacs range - the TV40 and TV60RE, which can be towed by most utility vehicles and the tractor-mounted TV60RH.

www.bernhard.co.uk



EXPANDED RANGE

Leading British manufacturer Dennis has expanded its range, introducing a petrol engine version of its renowned Premier cylinder mower, which is popular with sports clubs, football stadia, contractors and local authorities.

For customers who prefer not to use diesel, the Petrol Premier offers the opportunity to purchase a top quality, heavyweight mower which gives an enviable striped finish.

www.dennisuk.com



PEDESTRIAN ROTARY

In time for the 2009 cutting season, Etesia is launching the PRO51X - a rugged professional 51cm pedestrian rotary designed to withstand the rigours of commercial use.

Plenty of power is essential for any rotary mower to give top performance. With this in the forefront of their minds, Etesia has chosen an engine from Honda's professional range to power the PRO51X - the GXV160. This commercial grade air-cooled OHV unit produces ample power to deal with the toughest of grass, yet still has some in reserve. The machine is self-propelled and has variable forward speed allowing the operator to adjust the mower's travel to suit prevailing conditions.

www.etesia.com



NEW DEEP TINE AERATOR

Groundsman Industries has launched its new Deep Tine Aerator model 30D 6150.

Available accessories include a large range of quick change tines for solid, needle and hollow-coring plus the proven Flex-blade Core Collector Attachment to core and collect in one pass.

www.groundsmanindustries.com



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GOLF – THE CURE FOR THE GRUMPY OLD MAN

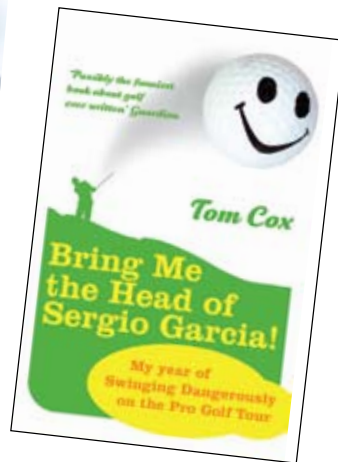
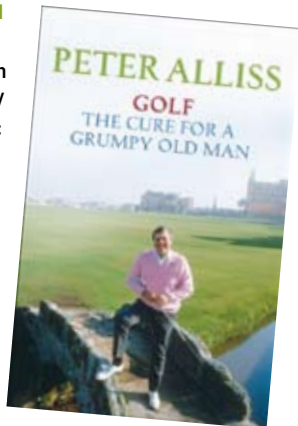
Peter Alliss has been entertaining huge TV audiences for the BBC and ABC in America for many years. In this new anecdotal but thoroughly practical book, Peter Alliss sets out to promote golf as the answer to middle-aged discontentment.

Peter Alliss has no difficulty giving compelling reasons as to why golf is the perfect game for adults - breathtaking scenery, fresh air, camaraderie and instant therapy.

He describes how to go about taking up the game, what equipment is necessary to buy and who to contact for lessons. With the aid of line drawings, he describes the basic techniques of golf, how to maintain a consistent swing and how to build up self-confidence.

Golf - The Cure For A Grumpy Old Man is aimed at regular golfers whose skills have deteriorated and would-be golfers who need the guidance as to which path to follow. Alliss's humorous but always-helpful book will confirm the great game as a really accessible and hugely enjoyable pastime to pursue for both men and women.

Available from all good bookshops.



BRING ME THE HEAD OF SERGIO GARCIA!

Tom Cox, the author of three books: Nice Jumper, which was shortlisted for the 2002 National Sporting Club Best Newcomer Award; Educating Peter and The Lost Tribes of Pop.

Founder of The Society of Secret Golfers, Tom Cox's latest book tells the story of how he devoted himself to golf.

Bring Me The Head Of Sergio Garcia! is available from all good book shops.

NEW PRODUCT GUIDE

Rolawn has produced a new Trade Product Guide.

Containing information on the Company's expanded range that in addition to turf and topsoil, now includes soil improver, lawn seed and fertiliser and bark, the guide details specifications, key benefits, applications and pack sizes for each product.

The Trade Product Guide is available from Rolawn Depots...

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Tony Hawes, Course Manager, Potters Bar Golf Club



Whats your Number?

Name: Stephen Bernhard
Company: Bernhard & Co
Position: Managing Director/Chairman – or Chief Bottle Washer?!



How long have you been in the industry?
“44 years in all, where over 35 have been specific to golf and turf.”

How did you get into it?
“My family has always been in the horticultural business. I started Bernhard and Company after having worked in our landscape business, running the design and turf side of things.”

What other jobs have you done?
“In this business, there isn’t much I haven’t done - mechanic, machine operator, tree mover, landscape contracting, nursery production, agronomy, greenhouse manufacturer and wholesale operations - all leading toward specialisation in our area of turf maintenance. I am a qualified international truck driver too.”

What do you like about your current job?
“It changes constantly - and I like seeing my staff grow, taking over more and more of the company. I have a brilliant team and I’m very proud to

work alongside them.”

What changes have you seen during your time in the industry?
“Two of the most significant changes I have seen in my time are the lower heights of cut and the importance of green speed. They have had a big impact on golf course maintenance practices throughout the years.”

What do you like to do in your spare time?
“I love to paraglide in any mountain region around the globe.”

Where do you see yourself in 10 years time?
“Above a mountain, suspended under my wing and watching the condors circling with me.”

Who do you consider your ‘best friends’ in the industry?
“I have many in this industry, but John Malinson has put up with me for a long time!”

What is your lucky number?
“Don’t really have one but 7 will do.”

Pick a number: “55”

Stephen has picked Stephen Fell from Lindon to take part in next month’s feature.



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BULLYING AND HARASSMENT AT WORK

One area of workplace relations that has received increasing headlines in recent years is the topic of bullying and harassment at work. Indeed, ACAS, the government sponsored employment advice service has even prepared a leaflet on the subject.

As the title suggests, the terms 'bullying and harassment' are often used interchangeably but, of course, conduct may constitute bullying or harassment – not necessarily both.

Harassment is defined by the ACAS Code as "unwanted conduct affecting the dignity of men and women in the workplace. It may be related to age, sex, race, disability, religion, nationality or any personal characteristic of the individual and may be persistent or an isolated incident". The key is that the action or comment is viewed as demeaning and unacceptable to the recipient.

Most of the headings contained in the definition are unlawful conduct under various pieces of UK discrimination legislation.

Bullying is far harder to characterise but is again defined by ACAS as "offences intimidating and malicious or insulting behaviour, an abuse or misuse of power through means intended to undermine, humiliate, denigrate or injure the recipient". The leaflet then goes on to give a number of examples too numerous to be repeated here due to space constraints. Further details can be had from the ACAS website:

<http://www.acas.org.uk/index.aspx?articleid=797>

The trend in recent years has been for anyone who is subject to management they dislike or disagree with to claim they are being bullied when, in reality, they are merely being asked to perform the job

they are required to do. In that context, one man's strong manager is another man's bully and sometimes the dividing line between the two can become blurred.

However, if you consider that you are the victim of bullying and/or harassment in the workplace then you have a number of legal remedies open to you. In the first instance, however, we would always recommend that your first port of call, wherever possible, would be an informal discussion with your manager. Often, the perpetrator is simply unaware of the affect they are having on the victim and an informal discussion can work wonders.

However, if this does not resolve the situation, the club is required to have a formal grievance procedure which is likely to enable you to raise the matter with the Greens Convenor and/or the Captain of the club in order to achieve a resolution.

If that fails, as a last resort, you have a right to bring a claim in the employment tribunal for constructive dismissal as long as you have at least one year's continuous service with your present employer. If your claim is not of harassment on one of the discriminatory grounds listed above, then no qualifying service is likely to be necessary.

We would, however, caution that you do not take this step without first obtaining expert legal opinion as to your prospects of success as constructive dismissal is notoriously difficult to prove in an employment tribunal.

Finally, if your health suffers as a result of adverse treatment at work then you may have a claim for personal injury. Once again, you will need to speak to a specialist solicitor if you feel you have a claim in this regard.

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