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Small scale drainage projects need not be costly

This month James de Haviland looks at 'DIY' drainage solutions...

If water is collecting in areas that were once free draining, the first job is to find out why. Digging a small hole with a spade or taking a core sample can help identify if there is a compaction layer and its depth. Regular spike tests can also help spot when a compaction problem is building. Deep aeration may cure the problem.

In other cases, an existing primary drainage system may not be functioning as well as it could. Blocked, collapsed and silted up main drains obviously will not work as well as they should and will struggle in a really wet period. If these drains feed into open ditches, it also follows that water needs to be able to get away.

With the basics in place, supplementing an existing system with additional drainage to cope with localised problems need not be difficult or too costly. This can be done by installing a slit or trench backfilled with sand, gravel or purpose developed material such as Lytag. Or a new run of drainage pipe can be installed and linked to an existing pipe.

Tools that can be used to create backfilled drainage slits include the AFT Sandbander that comprises a 1.0 cubic metre stainless steel hopper and hydraulically powered vibrating single filling blade. It can create a 25mm wide slit to a depth of 250mm.

The Shelton Gravel Band Drainer will again produce a slit, which can be 6 or 25mm wide, and will deposit a band of kiln dried sand, gravel or Lytag at depths adjustable between 100mm to 350mm.

For either type of blade slitter to work effectively, ground conditions need to be just right; too wet and there is a risk of damaging the turf and smearing the soil. In soils with high clay content side smear can lead to 'lateral' compaction along the sides of the slit. If the soil is too dry, the slits can be difficult to produce cleanly and the ground may be too hard for the blade to ease through the soil.

'Microband' drainage using sand, gravel or other infill medium

will typically comprise slits of between 250 to 300mm in depth, with spacing at 400, 600 or 800mm centres. Buying a system may cost upwards of £9,000, but hiring in the equipment on its own or with an operator experienced in doing the job is another option. With support from club staff, hiring in a slitter and operator for several greens could see a costs average out at as little as £650 per green.

Taking powered slitters one step further, Shelton and AFT also offer larger trenching units. Trenching machines can do a great deal more than produce a 'slot' into which a drainage medium can be backfilled. They can be used to lay drainage or irrigation pipe as well as be used to install underground services including water and electric cables.

Although it is tempting to compare this type of kit with 'microband' drainage tools, the way in which trenchers can be used is different. For a start, a chain trencher such as the AFT 45 can produce an opening that ranges in width from 40 to 200mm and can be up to 1.20m deep. There are also pedestrian powered chain trenchers available. These include machines from Barreto, Vermeer and Ditch Witch.

Small project work

It follows that you do not need to use a trencher to dig a trench; short runs can be dug by hand and need not be as onerous as you think. It follows that some simple planning will also help.

- Keep backfill dry. Removed soil needs to be kept dry and should be sheeted if left in a heap that is likely to be rained on

- Use a turf cutter. This will help speed reinstatement as well as provide a clear indication of the trench direction and size. You can hire in a suitable 'sod cutter', with entry level machines that will help cut a turf slice costing from around £1,500

- Use boards and planks. When working on greens and tees, boards and planks can help protect the playing surface

- Tyres and compaction. If possible, reduce the inflation pressure of equipment tyres to the permitted minimum. With trailers and turf trucks, avoid overloading



Using a probe to pick up compaction can help when there is a localised draining problem; if there is no compaction, why is it that water is not draining away? The trick is to see if water is held up in its passage to a main drain and to work out the best way to speed its passage through the soil.

- Timing. Try to plan small drainage jobs so they can be completed in as short a time frame as possible

- Plan supplies. When ordering drainage project supplies, seek advice to source the most appropriate materials



LEFT: Slit trenchers come in a variety of designs and can be used to apply a band of material from the turf surface down to the water table. Operated correctly, these tools can help improve local drainage issues economically, but sound primary draining is also important. On larger jobs it pays to work with a drainage specialist.

RIGHT: When carrying out 'small' drainage projects, planning ahead will help get the job completed, even when the trenching tool is a spade! Clearing turf with a 'sod cutter' helps and can make restoration considerably easier. Pictured is the start of the drainage work carried out by Matt Le Brun at the Rasomes Jacobsen course at the company's Ipswich base last year.



Turfdry remedies waterlogged golf greens

Rob George, Head Greenkeeper at the scenic Thorndon Park GC in Essex has been most complimentary about the Turfdry Drainage System:

"For some time we had some drainage issues on seven greens. The problems were highlighted more over the wet winter months and after much deliberation it was decided to do something to ensure golfers could enjoy the beauty of Thorndon Park Golf Club all year round.

The Turfdry system was presented well, the materials used are of excellent quality and the entire package is delivered very professionally.

The club decided to do a trial green first which just happened to be our chipping green which is right outside the club house and in full view of everyone, so the pressure was on to not only ensure

the job ran smoothly but the system worked as well.

True to form and word the Turfdry installation and system has worked perfectly. Comparing this green to the remaining problem greens, the chipping green is miles ahead. It has certainly been put to the test this summer with copious amounts of rain being thrown at it and the new drainage system has performed superbly.

Whilst the installation of the system may look invasive and scary the results speak for themselves, this green was back in play within 4 weeks and has not had any adverse comment or defect. The Turfdry Drainage System is highly recommended and Turfdry is a very professional organisation".

The remaining six greens at Thorndon Park GC will be drained in October 2012, and



in September Turfdry will be installing similar systems at Great Barr GC, Birmingham, and Wyke Green GC, Middlesex, where the system was first installed on other greens eight years ago.

For further information please visit www.turfdry.com or phone 01283 551417.





Climate control

Climate unpredictability makes it far tougher for courses to stay on top of weather extremes. John Sutherland chats to those in the know to gain a keener insight into what needs to be done to ensure clubs stay on course





Following one of the hottest ApriIs on record, which saw barely a drop of rain in some parts of the UK, we were hit with the year's first hosepipe ban.

Not only was it unseasonably early but almost immediately after the announcement was made, the nation fell victim to two months of perpetual precipitation with rainfall that entered the record books.

This pattern of monsoon-like rainfall and scorching heat would be more at home in India than the UK but the reality is that this pattern of weather is likely to continue, coupled with colder, snowier winters.

We've seen the impact on sports such as football, with top-flight games cancelled, such as Sunderland's fixture in August. In golf, the issues are arguably greater because of the variety of turf types and a more varied landscape. So how can greenkeepers put in place contingency plans for Britain's weather extremes?

"The main issue is managing wet weather and ensuring adequate drainage," explains Richard Windows, a turfgrass agronomist for STRI (Sports Turf Research Institute) who works with Scottish clubs.

"It comes down to adequate

Images show Sunningdale GC, 18th green on Old Course (TOP RIGHT) and 13th green (INSET RIGHT)

soil management and effective drainage. With good organic matter reduction and regular sand topdressing, clubs can better arm themselves for the onset of poor weather."

Windows talks of the "increasing need" on soil-based greens for underground drainage systems. Such installations need not cost the earth either, he says, At £3,000 to £5,000 per green, the works are within the reach of most clubs' budgets and compare favourably with the £30,000 he says covers complete reconstruction.

He works extensively with clubs in the Glasgow area, one of the wettest parts of the UK with 1,600mm to 1,800mm of rainfall annually. He adds: "I always recommend this method as it's very successful and allows improved year round performance". He advises digging narrow trenches and laying closely-spaced drainage pipes at 2m to 3m centres. "On top of this, implement an accurate organic matter management programme involving regular sand top dressing (at a rate of 120-150 tonnes per hectare per year), hollow coring and Graden sand injection scarification. The combination of drainage and accurate organic matter management will ensure courses can minimise the effects of severe wet weather. Improving

sward species composition is also important to minimise the effects of changing and more extreme weather patterns.

"Finer grass species like brown-top bents and fescues are better able to cope with climatic extremes and also perform better throughout the year. By improving the sward species composition you will help reduce the chances of disease, which thrive in wet, mild conditions."

At Sunningdale, course manager Murray Long knows that the best form of attack is a stout defence. "You have to plan your maintenance regime so when poor weather hits, you don't grind to a halt. A good soil maintenance plan has been key in the seven years I've been in the post, which means the right soil and turf conditions are set out for the whole season, including regular aeration, organic matter testing – and at its heart, good drainage. "It sounds obvious but planning is the only way to prepare for what the weather throws at you.

Historically, golfers have viewed the Berkshire club as a pure sand course, but this isn't the case, Long insists, as it has an underlying clay structure in many areas - an enemy of free drainage. "Our annual plan is based around our many ditches. Primary drainage takes excess



“The reality is that this pattern of weather is likely to continue, coupled with colder, snowier winters”

water from the ditches into our reservoir and we then work out from that point, and highlight problem zones, which can then be tackled in isolation.

“Once the primary drainage does its job, the secondary drainage networks, gravel banding and sand slitting work more efficiently. We have a well thought out aeration plan tailored around the golfing calendar in the summer. We also slit greens weekly, alternating the depths throughout the winter months.”

Greenkeepers’ fear during wet weather is that the playing qualities of greens cannot be maintained to the desired standards. “Providing good drainage and firm surfaces is the foundation for delivering high quality and consistent surfaces whatever the weather,” insists Windows. “On top of this, good turf husbandry and regular refinement involving brushing, grooming and rolling will maintain optimum playing conditions and healthy turf without having to mow turf short.”

Long agrees, after discovering that the drainage practices at Sunningdale are vital in ensuring year-round play. “Fundamentally, if the greens are free draining they can be maintained throughout the year at any time. We can get on to our greens 99.9% of the time

because we plan long in advance. We’re averaging 600 to 650 tonnes of topdressing, split between the two courses which, combined with slitting and primary and secondary drainage systems, means the weather hasn’t forced our hand.”

For some of the major events held at Sunningdale, such as the international final qualifying for the British Open, a contingency plan is always in place, so if bad weather does descend, play doesn’t suffer unduly. “By recognising the areas that are most at risk, we can pre-empt problems. We’ll ensure there’s enough staff, enough wet weather resources and the right knowledge of what the problems are beforehand, so we’re not faced with an issue that we can’t handle. We’ve now addressed most of the minor issues, so we need to do increasingly less to prepare for major events.”

For clubs in the South-east such as Sunningdale, the biggest hurdle has usually been retaining water, not trying to remove it. So for Long, the wet weather has in some ways proved a blessing in disguise, allowing him to store more water than he would normally. “We’re pretty much self-sufficient now,” he states, “and collect as much as we can in our reservoir, which minimises the quantity we need to



draw from boreholes and mains suppliers.”

Not all clubs have the resources of Sunningdale. What does he suggest for those on a smaller budget? “My best piece of advice would be to improve water collection, which is also part and parcel of having effective drainage systems.”

Good course management is not only about hands-on work but also about knowing your weak links. Every course will have its hotspots, so minimising footfall can play a critical role. Course vehicles assume a big part in the modern game, and it’s no different at Sunningdale. “To ensure good grass cover in the winter months, we rope off sections of the course to avoid damage from buggies. Winter planning is as much about traffic management as anything else. We’ve fitted a GPS tracker to all our buggies, which notifies us of where they are at all times, and

allows us to send a warning to one if it strays into restricted zones. If this happens too often the buggy will cut out, preventing damage and saving us money.”

While it’s increasingly difficult to predict the weather, what we do know is that sound planning is paramount.

The growth in weather forecasting technology is proving a useful tool short-term in the golf club’s armoury and one that Sunningdale makes the most of. “We’ve used Headland Amenity’s Weathercheck for some time, and with some pretty good results,” explains Long.

“What forecasting does do is give you further ammunition to prepare, and the Met Office’s forecasting phone app also comes in handy when walking the course. With our location, and the fact we have a lot of high land around us, neighbouring courses can sometimes get the rain and not us.

Ultimately, it allows us to put better contingency plans together, which is really the key to dealing with poor weather.”

The application of weather forecasting could become more widespread thanks to a new computer model from the Met Office that can better predict cold winter weather a season ahead.



Sunningdale GC, 5th on the new course (below)

While these developments are significant, experts were quick to play down the idea that it is a solution to the problem. Met Office spokesman Dave Britton said: “We don’t want to over-egg new developments. It’s moving us one piece forward in the very complicated jigsaw behind the weather.”

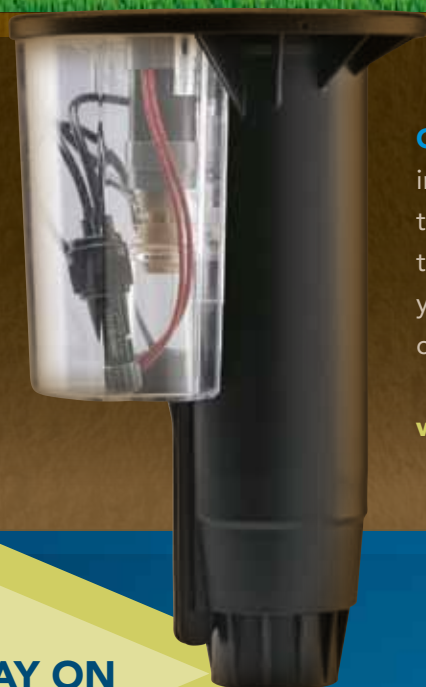
Judah Cohen, director of seasonal forecasting at the US-based Atmospheric and Environmental

Research (AER), said: “The research is potentially very important. Winter forecasting remains a difficult challenge and much work is needed to improve our forecast models.”

The Met Office had shown “great creativity” in exploring gaps in our knowledge and deficiencies in the models, she added. “But frankly, the bar for seasonal forecasting is set pretty low so any advance is very welcome.”



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Pest and disease conquer the horse chestnut

Dr Terry Mabbutt reports on the bleak future for one of our iconic trees

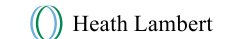
White flowering horse chestnuts (*Aesculus hippocastanum*) are iconic trees, not native but with a long, distinguished and healthy UK pedigree.

That was until the first few years of the new millennium when the species was hit in quick succession by an alien insect pest and an exotic disease, which essentially sealed their fate after some 500 years as top amenity and landscape trees in the UK. White flowering horse chestnut has consistently been planted for beautiful candelabra like blossoms and its well-shaped canopy frequently used in avenue tree planting. Fruits and seeds (conkers) have provided enjoyment for countless generations of children.

White flowering horse chestnut is native to a broad swathe of south-eastern Europe and Western Asia, having being introduced from Turkey during the middle of the sixteenth century. The less common but equally fine looking red flowering horse chestnut (*A. x carnea*) is a naturally evolved hybrid between white flowering horse chestnut and a related North American horse chestnut (red buckeye – *Aesculus pavia*), the original hybridisation probably taking place in Germany in the early 1800's.

Until recently both were popular trees for planting in all sorts of amenity, landscape and sporting situations including golf courses. However, virtually no horse chestnut is now being planted due to activity of the horse chestnut leaf miner, which although not fatal ruins the summer canopy of white flowering horse chestnut, and bacterial bleeding canker a bark

RIGHT: Horse chestnut 1. White flowering horse chestnut



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