

Hugh Tilley speaks to greenkeepers about their methods of aeration – and the equipment used

One of the golf greenkeeper's greatest preoccupation in growing grass is with aeration and compaction. In simple terms for optimum growth turf needs air at its roots and open soil structure to allow diffusion of gasses. Both toxic gas and soil pans inhibit root growth thus it is essential to eliminate compaction and aerobic conditions. USGA specification greens with drains covered by a stone drainage carpet and a mix of course (sand) particles in the growing medium above are one way of keeping the root zone open, but many old established greens are not built this way, nor do tees and fairways have the same attention as greens. As a result most courses have some need for some mechanical means of ensuring or opening up the soil structure.

Surface compaction and other impediments, such as an organic matter layer can be alleviated or nullified by slitters and corers, and these will be covered in subsequent features, however it is essential to get the structure right at greater depth and this may mean machines such as the Verti-drain – the word has become generic as there are now other machines which do a similar task. There are also several alternatives which have arrived on the scene in the last decade, such as the

Terra-Vent and Terra-lift (don't confuse the two they are totally different companies) and the Robin Dagger Soil Ameliorator, all of which rely on a blast of compressed gas or air injected through a spike inserted deep into the soil, and this blast 'heaves' the soil to fissure it. The Terra-lift company use their own operators and incorporate seaweed meal into the fissures and inert material into any holes left in the surface. Some other machines have the same capability.

More recently the 'SubAir' has been introduced into UK, this operates on USGA spec. (or similar) greens to suck or blow air through the soil using an engine driven fan. An essential prerequisite of this system is that the soil is already reasonably 'open', and has an under drainage system. Originally introduced in USA the system is being franchised for UK by Industrial Power Units.

SubAir at Puckrup Hall GC

Trevor Williams, course manager at Puckrup was one of the pioneers with the SubAir System in UK, partly because his brother works for IPU, which give him inside and early information about the system. Since that time IPU have modified and refined the ground fittings, improving the efficiency of the system, but Trevor is still happy with 'his' system and plans to extend it so that it can be used on more of his greens – currently he uses it on just three. The system is different

REAL WORLD TEST AERATORS GREENKEEPER INTERNATIONAL

INVEST IN THE HYDROJECT AERATOR.





SubAir at Puckrup Hall GC

from mechanical aerators in that it does not attempt to make fissures, but simply to move the 'air' within an existing sub strata by either building a partial vacuum or a pressure in the (under) drainage system built into the green. The main advantage of the system, according to Damien Monaghan, the assistant who mainly uses the machine, is that it significantly increases playing time, and it can be used to draw water down and out of the green.

At Puckrup Hall the machine is taken out twice a week and coupled up to the drainage sump at the edge of each green for about fifteen minutes per hole. Connecting is quick and simple, just a matter of plugging a spigot into the drain, and the motor is started. A large bore pipe with quick release clips fits to either fan input or output depending on whether the system is needed to suck or blow. At Puckrup they alternate between sucking and blowing. IPU have a sophisticated

gas analyser, but Puckrup do not feel any need for this, nevertheless Mick Tinning of IPU has analysed the root zone gas and says that the machine is being effective at replacing the undesirable – or stale air with fresh – and getting the oxygen level up to the desirable 20.9% level. However on the basis that the proof of the pudding is in the eating, root development on the treated greens can be seen to be as much as twice the length and bulk as on untreated areas. Nor does it just tend to grow down a spike hole.

The machine at Puckrup Hall is a trailed model which is light and easy to hitch to a Cushman or similar. It is powered directly by a Briggs and Stratton Vanguard petrol engine with self-starter, and this has proved reliable and a 'good starter.' There is minimal servicing and the unit does not appear to be excessively noisy – no complaints have come back from golfers.

SO EFFICIENT, PLAY RESUMES AT ONCE.



The finest of turfs – that's what this greenkeeper achieves with Toro's unique water injection HydroJet aerator. Able to tackle very wet or rock hard ground conditions, it allows play to resume immediately. On the golf green, bowling green, cricket wicket or tennis court, HydroJet



Deep penetration and water injection

complements conventional aeration methods. And for large turf areas, Toro's Fairway and HC4000 heavy duty aerators cover up to 1.5 acres per hour with ease. They're each examples of how we've worked to provide you with precision engineered tools for the perfect finish. Give us a call.

We'd like to walk your course with you and discuss your needs. You can trust Toro expertise and quality. For a down to earth investment simply telephone 01480 476971 and we will arrange for a local dealer to contact you.



Bringing perfection to play.

The expectation is that use of the SubAir will save any need to deep tine aerate the greens, however the club does have a tine aerator for use on other areas.

Trevor admitted that it was early days in using the machine, but he has sufficient faith in the effect and improvement that he expects to incorporate the sump fitting into more greens so that the SubAir can be used on them too.

Terra-lift at Worlebury GC in Somerset

Greenkeeper International spoke to greens' chairman Derek Mogg about the Terra-lift system. In fact the club has used the C&P Soil-care company's 'deep drill' rather than the Terra-lift, this being as the name implies a drill. It expects to continue using this service every other year. The Worlebury course is situated on 'a hill of limestone rock' and often this rock is close under the surface on the greens, thus it is essential to get a machine which can cope



such conditions – the 'Deep Drill' does, drilling through the rock, furthermore the machine is hired complete with operator which solves staffing. Another point Derek made was that the drills do not break up the surface nor

leave large holes. The machine has been used on all parts of the course.

Huxley Soil Reliever at Tynley Park near Hook

Tynley Park is an eighteen hole

private parkland course situated on clay. It was opened in 1975 and had relatively small greens and very limited tee space, something which it is planned to rectify shortly with remodelling and some extension of several holes –

SubAir. The perfect answer for a perfect green.

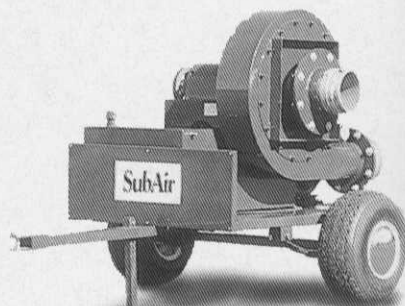
SubAir is a revolutionary approach to aeration and drainage stimulation for modern greens.

Optimum root zone conditions are created all year round by SubAir's unique ability to make a green breathe and to control root zone moisture conditions.

- Strong, deep root growth, not thatch build up
- Black Layer becomes a thing of the past
- Temperature moderation to defrost and prevent summer scorching
- Stimulation of natural microbiological nutrient production

The bottom line is healthier greens that spend more time being played on and less time in maintenance. Simple but effective.

If raising the quality of your greens while keeping the members playing is high on your score card, call Mick Tinning today on 01902 452138 and find out how SubAir can reduce your courses handicap.



SubAir™
by

Industrial Power Units Ltd

Sutherland Avenue Wolverhampton WV2 2PA Great Britain
Telephone +44(0)1902 452138 Facsimile +44(0)1902 454159

REAL WORLD TEST

AERATORS

GREENKEEPER INTERNATIONAL

making it a par 71. Peter Henderson took over as head greenkeeper two years ago and says that he is already getting members praising the improvement. One of the most important machines in this improvement has been the Huxley Soil Reliever which the club bought two seasons ago and has used extensively ever since.

Peter said that getting the grass roots down is particularly important. In the past getting grass to grow has been difficult, and there has been little root growth making it very easy to rip the turf up. As a result the machine is used on greens with no 'heave'.

Both hollow and solid tines are used, of 3/4in diameter, the former going down to about 150mm deep – any deeper and tines snap, while the solid tines which are also used for approaches, are put in to about twice this depth. Peter said that they had tried thinner tines but began getting breakage or bending. It would be possible to get the solid tines in deeper, but the friction and vibration becomes excessive and so penetration is limited to about 300mm (12 in.).

Tylney Park had several competing machines out on demonstration before buying the Huxley machine. Peter commented that the Soil Reliever did the best job and was the fastest thus this was the one bought. An essential

'option', at least for the Tylney course in Peter's view, was the hydraulic top link as this allowed easier and faster depth adjustment which can be carried out while the machine is working.

Regular coring of the greens is "bringing up a lot of rubbish," Peter commented. A 70/30 top dressing is used with incorporated seaweed meal to provide nutrition. A top dressing of two bags of gypsum per green has also been used in an attempt to improve the soil structure.

The Soil Reliever is used behind an Iseki 545, which has a creep gearbox. These very slow ratios allow the club to get very intensive tining, and typically a 75mm square pattern is used. Faster operation, while possible, is seen as causing greater damage to the surface.

The machine had not suffered any undue breakdowns, and although (accidental) operating

the power take off too fast has inflicted some damage to tinwork and the rear guard, this was no criticism of the machine itself. Routine greasing round and maintenance is undertaken by the greens staff while more major service work is carried out by Huxley's – very well and very promptly.

In summing up the Soil Reliever, Peter said, "I can't have a bad word about it – it has been a breath of life for these greens".

Wiedenmann Terra Spike at Celtic Manor - Newport

At Celtic Manor there are two Terra Spikes, the newest being a 'Speed Link' model which was introduced at the end of last year. Although both are similar the Speed Link has several modifications including a new higher speed gearbox, modified tine carriers with a different 'heave' adjustment, and a new setting

bar. Setting is easier and more accurate and Patrick 'Cal' Callaby, head mechanic, commented that the new machine offered greater versatility and greater choice in setting it up. The new model also has heavier and better guarding. The original machine is two seasons old and has undertaken a lot of work being used on tees, fairways and approaches over two courses. Most of this is carried out using 25mm solid tines, spiking down to about 200mm and normally with a medium degree of 'heave' set, but some work has been done on hollow tining approaches.

Celtic Manor currently has 36 holes but within the next two years will offer a third course. A feature of the soil is that when wet it can pack and pan like clay, thus making intensive aeration essential. A major underdrainage scheme is to be undertaken shortly.

Jim McKenzie, course manager, stated that pressure on keeping the courses open throughout the year will be increased as the associated hotel is currently being enlarged considerably, and there is also a major conference centre to be built. He added that annual rainfall in South Wales was very high, averaging about 450 inches per annum. The first Terra Spike was bought after careful consideration, and a belief that it was a better machine than its competitors.

Both Terra Spikes are used with MF 362 tractors which have creep gear ratios – although often the work is carried out in a faster ratio. The machines are supplied and supported by Ted Hopkins Agricultural Engineers, who is local but well known and trusted by Celtic Manor Hopkins have extended their turf care work considerably in recent years.

Some repair work has been needed on the original machine. Metal fatigue on the main frame required some welding work, and a strengthening gusset was added – this modification has been incorporated into the newer machine. That Wiedenmann (UK) were prepared to listened to the user and act on greenkeepers' suggestions was a strong plus point.

Greasing round has been extended from twice a day to once a week, but the grease used has been altered to the Lubrica-

Terra Spike at Celtic Manor





tion Engineers high viscosity grease. This has also minimised the likelihood of getting grease drooping onto the greens.

Charterhouse Verti Drain at Kenilworth Golf Club in Warwickshire

Kenilworth's machine, pictured, is now about five years old, it is a 1.45m wide Greens model which is used behind an Iseki Compact tractor of 36hp. Keith Weston, course manager, said that they have been using it almost continuously since about September last

winter and it has been used on greens, fairways and approaches, several times over, but seldom on tees as irrigation pipe was laid too close to the surface and so is liable to damage.

Operation with 3/4 in. solid tines is usually down to about 11in. deep, and the fairways have been treated two and three times during the last winter. Keith has used the machine with 1/2 in. tines to give closer spacing, but found some bending but, more importantly, he found stones can get jammed between the tines so

causing the ground to be ripped up. The club has also used 3/4in hollow tines on the greens, but mainly as a dethatching tool – thus at very little depth.

The 'heave' adjustment has been used but in Keith's experience soil conditions are far more important than the actual setting on the machine. He admitted he found adjustment something of a mystery. The other fact he has noticed is that as the soil structure at Kenilworth has improved so the effect or ability to 'heave' has diminished.



In common with other machines of this type there are a considerable number of bearings to be greased, but Kenilworth too have changed to Lubrication Engineers 1233 grease which they find stays in the bearings longer, they now only grease round every other day. Keith commented that the grease was "really sticky – you don't want to get it on your clothes." Again this has solved the problem of getting old grease pushed out of the bearings and falling onto the turf.

In summing up Keith said that he found the Verti Drain so much better than any other option on the course, he does no slit tining on fairways, and he certainly wouldn't be without the machine. Repairs during the whole time the machine has been at Kenilworth have been minimal, just two new main bearings in the last year and one or two shock absorbers to be replaced but no major problems nor any structural damage.



THE DEEP DRILL SERVICE FOR SPORTS TURF

Why suffer turf problems associated with compacted soil?

Our Deep Drill machine will create a pattern of sixty 5/8" holes, up to 10" deep, on a 5" spacing, in one movement, leaving an unmarred surface.

- RESULTS IN ● Relief of compaction ● Improved aeration and percolation of water to the root zone ● Deeper, wider and more vigorous root development ● Holes offer a way of introducing fresh media to the soil ● Healing time of three to four days ● Drills through dry patch.

BENEFITS WITHOUT SIDE EFFECTS FOR GOLF FAIRWAYS, GOLF TEES, GOLF GREENS, RUGBY PITCHES, BOWLING GREENS, HOCKEY PITCHES, CRICKET SQUARES, CROQUET LAWNS, AND FOOTBALL PITCHES



SOILCARE

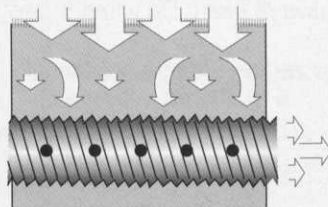
C & P SOILCARE LIMITED, Unit 3, Bush Farm, Nedging, Ipswich, Suffolk IP7 7BL. Telephone/Fax: 01449 741012
Mobile telephone: 0860 493521

SubAir makes greens breathe.

SubAir is the revolutionary system of green aeration that has a unique ability to make a modern construction green "breathe".

A high volume airflow in the drainage system draws fresh air deep into the root zone and purges the gases poisonous to grass roots. All without disruption to the playing surface. Simple but effective.

If raising the quality of your greens while keeping the members playing is high on your score card, call Mick Tinning today on 01902 452138 and find out how SubAir can reduce your courses handicap.



SubAir™
by

Industrial Power Units Ltd

Sutherland Avenue Wolverhampton WV2 2RA Great Britain
Telephone +44(0)1902 452138 Facsimile +44(0)1902 454159

AD REF 46

AD REF 550