be "read" by a scanner via radio frequency. This code is fed into Datatag’s mainframe computer and registered together with make, type and model of the machine. The frame and engine identification numbers are also recorded. Once the machine is sold, details of the owner are added. In the event of it being stolen, incident details including crime reference, police station and officer handling the case will be fed into the computer. The tags are small and have been designed to withstand vibration, electrical and magnetic interference as well as an acid attack. They are unobtrusively secured to the machine with two-part epoxy adhesive. Visible Datatag decals warn would-be thieves of their presence. Datatag is already the standard method of identification and registration in industries such as motorcycles and watercraft. As a result, the system is universally accepted by Police and Customs who receive, free of charge the equipment to read the tags as well as access to the Datatag computer.

Risboro Turf would like other garden machinery manufacturers to join their bid to beat crime. "The whole issue of theft is a great problem, and we hope that the rest of the industry will follow our lead. We appreciate the problems that particularly smaller sports clubs and organisations have in funding machinery budgets, and want to do everything we can to ensure their investment is protected. Datatag has a proven track record as a reliable method of identification and retrieval. It is time for the industry to move into the 21st century with a more responsible attitude towards crime prevention," said Richard Taylor.

Many years ago activated charcoal was widely used by greenkeepers and groundsmen to neutralise chemicals or effectively clean through tanks or spraying units. It was effective, but as it was very difficult to use and dirty to handle, it fell out of favour. Now technology has come to the rescue and produced Clean Carbon offering all the time proven benefits of activated charcoal but in a water dispersible pelleted form which is clean, easy to handle and highly effective.

Clean Carbon has some very interesting applications in addition to its deactivation of organic chemicals in emergency or annual preventative maintenance, such as use as a warming agent. An application of Clean Carbon can warm up the soil surface via the sun’s rays by three degrees above ambient temperature for times when those few extra degrees are critical. Clean Carbon also deactivates organic based pre-emergence herbicides when overseeding is undertaken.

Activated charcoal is capable of binding many materials such as organic pesticides, petroleum products and hydraulic oils; as such, it is a very handy product to have around in case of those all too frequent disaster situations.

For further information telephone 01455 234677.

Rufford Top-Dress Supplies has just launched a series of educational leaflets. The first issue features top dressing and further topics will include rootzones, sands, soils and turf reinforcement. You can obtain a free copy from Rufford Top-Dress Supplies Limited Fairway House, South Stage, Broadway Salford Quays, Manchester M5 2UQ. Telephone 0161-877 8552.

Replacing the MULE 500, is the new Kawasaki KAF 300 C Mule 550. The most obvious change is a standardisation – the 550’s big brother 2500 and 2510 4X4 both have seating for driver and passenger – to a "two seat" configuration rather than the single front seat of the Mule 500.

The original range of Kawasaki Mules was launched more than five years ago as an extension of the companies All Terrain Vehicle expertise. All are designed on the "low ground pressure" principle offering operators with a minimal ground damage requirement machines with high payloads and simple and thrifty operation.
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NEW PRODUCTS

While the visual changes are obvious Kawasaki has carried out detailed work to further enhance the small Mule's performance and ease of operation. Price: £4050.

**BTME '97 was Wiedenmann UK's most successful show with enquiries and sales up considerably on previous years. Pictured with the most popular product on the stand, the Terra-Spike P160 are from left: Director, David Rae; David Bate, Regional Sales Manager, England and Wales and Michael James from the Scottish sales team.**

Director David Rae said "The Terra-Spike Speed Link which we believe to be the most versatile deep-spiker in the UK marketplace was making its first appearance at Harrogate. We recently introduced the new speed linkage which enables the machine to be operated at much higher speeds, resulting in an increase of over 80% in productivity and this naturally created a great deal of interest at the show including a number of sales. "This is our seventh visit to Harrogate and we have always found it to be a very worthwhile event for us. Going by this years results, there is no doubt we will be back."

There are now strict European Standards for personal protective equipment for users of hand-held chainsaws to minimise risks.

Stihl of Germany, has developed and produced a new design for boots for users of chainsaws which have been tested and approved. The boots are to EN345 which indicates that they have passed stringent cutting tests at a chain speed of 20 metres per second achieving Class 1 status.

They are made of brown leather in sizes 4 to 14, cost £99 per pair, and are zero rated for VAT.

The boots are just one of many items of Stihl personal protective equipment and the full 1997 range of Stihl power tools available in the latest Stihl catalogue.

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Terra-Spike Speed Link which we believe to be the most versatile deep-spiker in the UK marketplace was making its first appearance at Harrogate. We recently introduced the new speed linkage which enables the machine to be operated at much higher speeds, resulting in an increase of over 80% in productivity and this naturally created a great deal of interest at the show including a number of sales.

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

One of the golf greenkeeper’s greatest preoccupations 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 gases. 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 to 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
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.
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 approval 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 with 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.

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

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Terra Spike at Celtic Manor

As tination is limited to about 300mm but the friction and vibration or bending. It would be possible said that they had tried thinner while the solid tines which are which the club bought two sea-
tions including a new higher speed gearbox, modified tine car-
ners with a different 'heave'

Terra Spike at Celtic Manor

Greasing round has been
extended from twice a day to once a week, but the grease used has been altered to the Lubrica-
The free flow of air through the soil is an essential requirement for the development of healthy, dense turf. Compaction of the soil restricts the passage of air, together with moisture and nutrients to the grass roots and is a major cause of plant stress.

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tion Engineers high viscosity grease. This has also minimised the likelihood of getting grease dropping 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.

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