

recent case, a turf manager called me up and said that fusarium patch had developed rapidly on three of his greens, almost overnight and he was concerned that the problem was going to spread to the other greens. Before applying a fungicide, he asked if he could send samples of turf to me to confirm the disease and to ensure that there was no other disease problem present. On receipt of the samples, I could see that the sward contained *Poa annua* and that the majority of the sward on each of the samples was uniformly dark brown with little deformity to the leaf tissues. On turf affected with fusarium patch, you are likely to see a deterioration of the sward with the leaf tissues becoming rotten and matted towards the centre of the affected area. Generally speaking, you would see a dark brown border of active disease development surrounding bleached and dying plants. In the early stages of infection, the plants are indeed dark brown and catching the disease at this stage would lessen the chance of scars developing in the sward. But experience told me that this damage didn't look right for disease. Analysis using the microscope confirmed that the dark brown plants in the sward were in fact pearlwort, a weed that grows in discrete patches and that can tolerate close mowing but which had discoloured due to the adverse weather conditions. By looking down on the sward from a height, the *Poa annua* and the pearlwort can be difficult to differentiate but under close examination their differences are quite apparent.

By far, the most common 'patch disease' problem that I see comes from greens that have a problem with surface or rootzone drainage. Large patches of the sward, up to 0.5 m across, can discolour very quickly if the roots are trying to grow through a waterlogged rootzone. Even pure sand rootzones can have problems with water movement and symptoms of waterlogging can be seen equally on these as on soil-based greens. Patches tend to develop on the surface of these affected areas for one of two reasons. If the sward is of variable composition, any patches of *Poa annua* will show signs of stress more readily than the other grasses present in the sward. Alternatively, the green may have localised low areas or areas of compaction which tend to hold water longer than others and it is these that may be showing the symptoms. Either way, analysis of the rootzone will show a characteristic symptoms on the roots and in the most extreme of cases, a sulphurous or sickly smell that indicates that the rootzone conditions are anaerobic. Further analysis of the plant material can confirm whether or not and fungal disease is developing on the turf in these adverse growing conditions although generally, if any fungus is present, it will be colonising the stressed turf as a saprophyte rather than as a parasite.

Other misidentified patch disease problems include the frequently observed patches of bleached or banded leaf tissues that occur during late spring/early summer. Again, it is often patches of *Poa annua* that show up most clearly as being affected by this bleaching of the leaf tissues. Extensive analysis of plants in samples received with these bleached tissues has failed to show any associated fungal pathogen, either on the leaf tissues themselves or colonising the root and crown tissues. In all cases of this problem that I have seen, samples of affected turf will green-up on their own if they are placed inside a laboratory for a few days. On the course, the plants will eventually green-up and generally the bleached symptoms only last for a week or so. Many possible causes have been proposed for these symptoms, including virus damage (which has never been substantiated), but it is most likely that this is a physiological effect caused by the difference between day and night temperatures (possibly in association with available nutrients) on the chlorophyll production within the leaf itself.

So, if a patch of discoloured turf appears on the sward, how do you tell if it is fungal disease? Firstly, identify the grasses in the affected and adjacent unaffected areas. If, for example, you have patches of *Poa annua* in an otherwise bentgrass sward, could the prevailing environmental conditions have caused a specific change in the leaf colour of the *Poa annua* and made it more apparent? Patches of *Poa annua* (or Pearlwort) in a sward may well change colour rapidly with changes in temperature, moisture and nutrient availability. If you have a uniform sward and discoloured patches appear in it, there is, generally speaking, more of a chance that the symptoms have been caused by fungal disease – but not always! Check that the rootzone freely draining. Any small, localised areas that tend to hold water can cause dramatic changes to the sward over a relatively short period of time. The best way to

check this is by smell. Take a hole-cutter core sample out of the affected area, open it up and smell it. If it makes you throw your head back violently (and you suddenly don't fancy your lunch), maybe there is a slight drainage problem. Grass roots need to breathe and if the rootzone is holding too much water they can't and the plants will show you that they can't. Bleached leaf tissues can be caused by fungal disease, for example red thread and fusarium patch (established infection) but it is probably fair to say that if the affected leaf looks healthy apart from it being white, there is a good chance that the problem has a physiological rather than fungal cause. Fungi will cause bleaching of the tissues once they have removed the nutrients from them and they will often leave the leaf tissue dry and desiccated or water-soaked and rotting. Alternating heat and cold will affect the ability of the plant to produce chlorophyll (the green pigment in leaves) and so, if

'banding' or uniform 'bleaching' occurs, check the recent weather conditions for a likely cause. If the leaf tissue is discoloured on the upper surface but the lower surface remains green, the problem is almost certainly physiological. With all so-called physiological problems, it is possible to have related fungal disease. One of the most obvious is development of fusarium patch disease on a sward that is suffering stress due to a waterlogged rootzone. Patch disease can therefore develop over local physiological problems. It is always worth getting a sample checked if you are in any doubt at all. Everyone, no matter what their experience or background, can be fooled in to making a wrong diagnosis if they go by the foliar symptoms alone.

Some patches that develop on the greens, tees and fairways will be caused by fungi. Many fungal diseases will occur, for example, in one place on a green and spread across the entire surface, or the initial outbreaks will remain fairly unchanged but increase in number over time. Presently in the UK, we are unlikely to see some of the severely disfiguring and rapidly-damaging turf diseases that are a constant worry for turf managers in warmer climates, but it is possible for some of these to show up here as our climate changes. Since new fungal diseases are continuously being identified in the areas of horticulture and agriculture, it is naive to assume that the range of disease problems we encounter in turf will always remain constant. New fungal diseases will develop and the actual cause for some problems that we are presently aware of, will be formally identified. Insects and other invertebrates can also cause patch damage to turf, with some causing a discrete, distinct and very regular yellowing of the turf that you would swear was caused by a fungus. If a patch develops on the sward, don't automatically assume a fungal cause, consider the potential options before you decide on any course of action and if you want to know for sure, get a sample analysed – you may be surprised what we find.



Selected grass clones were killed by flood stress when an early spring heat wave warmed a water-logged soil



Grant Moir, of the R&A Rules Team, explains some of the finer points of the rules to the team flanked to his right by Colin Irvine, Muirfield's Course Manager



Craig Gilholm, Muirfield's Deputy Course Manager explains to the team how the bunkers should be raked

Rough Justice

Ernie Els was the man who coped best with the rough weather and the penal Muirfield rough and fought off three play-off rivals who had progressed up the leaderboard in easier conditions on the Saturday

Few people could possibly have felt that Ernie Els' victory in the Open Championship at Muirfield was not deserved. The big, likeable South African coped with the roughest of the weather on the Saturday better than anyone and, although he wobbled on the Sunday, he had the wherewithal to survive the wonderful devil-may-care approach of Thomas Levet with whom he eventually went head-to-head in the sudden death element of the play-off.

The final day produced excitement of the highest order, even if everyone's pre-match favourite, Tiger Woods, wasn't in the shake-up. He suffered an off day in conditions which amplified every mistake and he endured his worst round as a professional - an 81 which put pay to his genuinely realistic hopes of a Grand Slam.

That a player of Ernie's quality - he has been a top ten in the

world player for most of the last 10 years - did finally lift the Claret Jug is a tribute to the test that was set the players.

Colin Irvine and his team presented the course to perfection, despite rainfall totals in the lead up to the event which would not look out of place in Equatorial forests. The rain meant that the course may have been a little greener than he would have liked but Colin must have been delighted that the only comments that came from the players were positive... even considering the fact that the rough was of man-eating scale!

As ever the BIGGA Greenkeeping Support Team was in attendance, providing invaluable support to Colin's own team as well as enjoying the great privilege of seeing the world's greatest players from inside the ropes.



The 2002 BIGGA Open Support Team

The Great BIGGA Bunker Competition entered its eighth year and to celebrate Kim Macfie put up an extra Hayter Harrier mower - a rear roller rotary - for the Support Team member whose estimate was closest to the actual number of bunkers found during the week.

The Media mower was won by Chris Smart, of the Mid Glamorgan Press Agency, whose wife, Kay, won it three years ago. The Support Team Mower was won by Steve Oultram, of Wilmslow GC. Steve also won a bottle of whisky.

Among the entrants in the Media Competition was Peter Allen, of the Drivetime Show on BBC Radio Five Live, who entered the competition live on air at the end of an interview with Greenkeeper International Editor, Scott MacCallum, on the Wednesday

afternoon. Unfortunately Peter's estimate, of 990, was just a little shy of the total, which probably could be put down to the large number of people who made the cut.

Another man to be interviewed by Five Live during the week was Bert Cross, who, along with Peter Boyd, manned the BIGGA Cabin. Bert explained the role the Support Team did and this assisted with the smooth running of the Championship.

* The BIGGA Greenkeeping Support Team has provided support to the resident greenkeeping team at every Open Championship since St Andrews in 1984.

Bunker History

Year	95	96	97	98	99	00	01	02
	St A's	Ly'm	Troon	B'dale	C'stie	St A's	Ly'm	Muirfield
Bunkers	112	185	84	117	115	112	197	148
Rd 1	214	501	344	355	539	148	557	359
Rd 2	201	577	272	406	468	164	547	372
Rd 3	130	269	107	226	202	65	224	175
Rd 4	156	271	136	153	265	71	257	169
Total	701	1618	859	1140	1474	448	1585	1078



Chairman Richard Barker congratulates fellow Beedles Lakes man Matthew Cort on his fine performance in the Championship



Tiger Woods comes off the final green on the Sunday



Tiger's caddie Steve Williams hands a ball to Iain Gunn



Iain walks off with the ball tucked away in his pocket



The BIGGA Marquee got particularly busy on the Saturday afternoon



The Muirfield team switch the first fairway prior to play



Peter Boyd completes some paperwork while Richard Saunders relaxes



John Deere is the official supplier to Muirfield and the green and yellow machinery was visible throughout the week

Quote of the Week

"There's Ellis in Bunkerland". Support Team Member, Scott Reeves, on seeing colleague Mark Ellis, on TV in the final day working on the Thomas Levet match.

News Snippets

- Every BIGGA member who worked on the Tiger Woods' match was greeted by the great man himself with a shake of the hand and a, "Hello, I'm Tiger Woods." They were Gavin Robson, Steve Oultram, Fred Deamen and Iain Gunn. Each was also given a ball with "Tiger" embossed upon it.
- Gavin Robson, Course Manager at Lingdale Golf Club, is owed £1 by Justin Rose who borrowed the coin to act as a ball marker on the opening round and then forgot to return it at the end of the round.
- Another man who lost out financially was David Beardwood, of Kingsbarns GC, who lent a penny to Warren Bennett to act as a ball marker. He promised to return it later but that was the last David saw of his money. Information supplied by David Beardwood, of the BIGGA Greenkeeping Support Team.
- A Referee was red faced in a match accompanied by Support Team member Stuart Hogg, of Fortrose and Rossmarkie GC, when his mobile went off as they were walking down the 3rd fairway. Information supplied by Stuart Hogg, of the BIGGA Greenkeeping Support Team.

- Pierre Fulke got the knack of Muirfield's four par-3s by the final round making 2 at each of them. Information supplied by Bill Merritt, of the BIGGA Greenkeeping Support Team.
- Paul Lawrie let his temper get the better of him during the final round. After finding a bunker on the 5th he smashed his 4-wood into the ground snapping the head clean off. Information supplied by Paul Neve, of the BIGGA Greenkeeping Support Team
- Tom Watson was discussing popular music with eventual runner-up Steve Elkington, during the second round. "Why is it always 'Raining Men' that is mostly listened to with the youth?" asked Tom. "Something to do with the weather," came the reply. Information supplied by Anthony Davies, of the BIGGA Greenkeeping Support Team.
- It was a really Welsh reunion during one match on the second day. Player Bradley Dredge was Welsh; the Scoreboard carrier was Welsh (and the son of Walker Cup Captain Clive Brown), and the Support Team member was Welsh. Information supplied by Welshman Peter Lacey, of the BIGGA Greenkeeping Support Team.
- Open Hero Gary Evans' caddie was adamant that he wasn't going to wear the red bib allocated to him on the second day as it was Manchester United colours. He was given a white one instead. Information supplied by Kevin Hodges, of the BIGGA Greenkeeping Support Team.
- A bees' nest appeared on the tee at the 14th during the first round and bees were emerging from it as the players hit their shots. Information supplied by Kevin Hodges, of the BIGGA Greenkeeping Support Team.



The Open's equivalent of Henman Hill



The Support Team divoted the course every evening



Craig Gilholm cuts the 17th green on the Wednesday evening



Saturday wasn't a good day to be outside



The Tractor Boys

Roland Taylor takes himself around the showrooms to see what's on offer in the world of the compact tractor

As this article was being prepared it was announced that AGCO, manufacturers of Massey Ferguson tractors, was closing its UK factory in Coventry. Sales of its tractors are to continue in this country and throughout the world. The reason given was the state of the agricultural industry, which has seen a considerable loss of sales over the last few years. It is little wonder that manufacturers have been turning their attention more and more to the turf care market. Companies, which have in the past not been very interested in this sector, are now introducing models specifically designed for it. This has led to some interesting developments as companies vie for what is a relatively small market.

From an end users point of view it is certainly worth looking carefully at what is on offer as there are some high specification packages around. Interest rates are still low so there are also some attractive financial incentives in the form of HP and leasing to be had.

With SALTEX on the horizon there is no better time than now to take a look at what is on offer. As an appetiser we have looked at the latest models and some of the stalwarts as well.



TEXTRON

Earlier this year the Iseki TK538 joined a range of models from 17hp to 66hp. This new arrival has a 38 hp diesel engine and a 16 forward and 16 reverse transmission with shuttle shift which means you can change direction from forward gear to reverse. There is a differential lock for extra traction on difficult terrain or when working in certain conditions.

The power steering has its own pump and there is a second unit dedicated to hydraulic rams, plus additional valves for the front lift and other hydraulically operated attachments. A Rear PTO is standard and there is an option of a mid-mounted one. Both are operated via a switch.

The tractor comes fitted with a ROP or there is the cab available.

For those readers looking for more power there is the 46hp TK546, with a lifting capacity of 1700kg.

JOHN DEERE

The new 4010 series is claimed to be the first in the industry to incorporate electronically controlled hydrostatic transmission. These new systems the eHydro(tm) and ePowrReverser(tm) (who thinks up these names) are only available on the 4310 (30hp) and 4410 (34hp) models.

These are a spin off from the larger agricultural tractors and they are said to provide greater productivity and easier adjustment of the tractor output to match more precisely the requirements of a specific attachment. Push button controls, more efficient diagnostic servicing and heavy-duty construction are also incorporated features.

The eHydro(tm) transmission includes eMatch(tm), a facility that enables the operator to customise the tractor's transmission response to meet the needs of the particular task being carried out. By combining the speed and load matching plus the optional cruise control, greater accuracy with less operator fatigue is said to be achieved, especially at low speeds.

The ePowrReverser(tm) transmissions provide clutchless shuttling between forward and reverse, especially useful when using a loader. Deere say this is the only true power reverser on a mid chassis tractor in the compact market.

Other features include, lateral floating 3-point linkage to follow the ground contours and fully independent PTO operation. Operator comfort has been taken into account with large uncluttered driving area and tilt steering wheel, plus all the controls are positioned within easy reach.

Tractors in the 4010 series are from 18hp to 48hp, some models offer a choice of hydrostatic transmission or gearbox.





RECO

Kioti have been building tractors since 1947. Their DK range spans from 35hp to 51hps and the power units are said to meet the strictest emission levels in the world.

All models have a mechanical gearbox with synchromesh shift and creep speed is standard. The hydrostatic power steering has its own pump and produces a maximum turning angle of 58 degrees.

The hydraulics and rear linkages have a number of features fitted as standard including, position and draft control, swinging draw bar and two double acting spools valves.

The design and layout of the driving area with its fully adjustable seat is said to keep operator fatigue to a minimum.

ROPS frames are included on all models and a luxury safety cab can be fitted to the top two models in the range.

Tractors in the Kioti DK series have a 2 year warranty with unlimited hours, parts and labour.

CHARTERHOUSE

The big difference of Antonio Carraro tractors is the facility to turn the driving position through 180 degrees so that the unit can be either used with out-front attachments, the same as a specialist built machine or, alternatively, as a conventional tractor. Another feature is a full oscillating chassis this, according to the manufacturers, makes them highly manoeuvrable with a tight turning circle. Four wheel hydrostatic drives with differentials to both axles give extra traction when required. There is plenty of choice of power within the range. The Supertrac 5400 and 8400 HTM are available with 48hp or 74hp diesel engines and the Ergit TRX/TTR offers a choice of 60, 64, 75 or 87hp.



The answer to your tractor needs is at SALTEX on W80

Well balanced, compact yet powerful, the Renault PALES outshines all others when it comes to high output, reliability and low long term running costs

- ◆ 52, 67 or 76hp versions
- ◆ 2 or 40kmh 4-wheel drive available
- ◆ Optimum weight distribution for minimal compaction
- ◆ High rear linkage lift capacity up to 3578kg
- ◆ Ideal for use with a front-end loader
- ◆ Extensive range of tyre options available



Renault Ltd, Tel: 01608 662727

www.renault-tractors.com



RENAULT

The Tractor Boys

KUBOTA

All models in Super B series are powered by the company's own E-TVCS (Three Vortex Combustion System) indirect diesel engine with a choice of 17hp, 21hp, 24hp or 27hp. This line up is said to have improved performance and easier to operate.

Main features include, integral power steering which is controlled by a micro-computer plus, Bi-speed turning, (not fitted as standard on all models) this automatically engages to give fast turning and reduce the risk of turf damage. Kubota say the hydraulic pump boosts power levels to those found on larger tractors. There is a choice of either hydrostatic or gearbox transmission depending on the model. Four-wheel drive and differential lock are standard throughout this series.

Top of the range is the M5700 designed for practicality, this tractor has no unnecessary extras to increase the cost.

AGCO LTD

The MF1200 series consists of six compacts with a horsepower range from 16.5hp to 40hp. Diesel engines are standard and there is a choice of either hydrostatic or mechanical transmission models. Depending on the specifications other features can include power steering, oil cooled disc brakes and hydraulics capable of lifting 550kg on the three-point linkage.

In the larger size, MF2200 series there are 47hp, 54 hp or 64hp diesel engines units available. Specifications include mechanical or advanced electro-hydraulic controls, plus low profile and centre of gravity models for situations where extra stability is required.

RENAULT LTD

All PALES tractors are now fitted with a Twinshift system that enables the operator to electro- hydraulically double each mechanical gear by activating two buttons on the gear lever. For travelling between sites there is now the option of a 40km/h transmission

There are a total of 24 forward and 24 reverse gears and these can be selected without loss of traction or momentum. All the controls are now colour coded and are sited to ensure they fall naturally into the hand, thus reducing operator fatigue. A dedicated hydraulic circuit for powering equipment can be fitted.

The PALES range has models from 52hp to 76hp.

NEW HOLLAND

At present this company lists a 27hp, 38hp and 45hp compact tractors, all are powered by liquid-cooled diesel engines. The small unit has a mechanical gearbox with a 9-forward and 3-reverse speeds, alternatively you can have 2 or 3 range hydrostatic transmission.

With the two larger tractors there is a choice of either hydrostatic or mechanical 24 x 24 creeper speed transmissions. Both these models have 1,486kg rear linkage lifting capacity. DualPower enables the operator to alter the power in the selected range, by flipping a switch. Another feature is SuperSteer(tm) front axle with SensiTrak.

MOTOKOV UK

Two new models of TYM tractors a 31 hp the HPT330 (hydrostatic transmission) and 70hp T700 are joining the present range of 31hp, 39hp 43hp and 55hp models. Either a 'Green' Kubota or John Deere diesel engine is fitted depending on the specification. The smaller powered units have ROP as standard and the larger ones come complete with an air conditioning cab. The company says that all models have flat floors for ease of access and operator comfort. TYM tractors come with a host of extra features as standard, plus 2 year warranty.



CLAYMORE GRASS MACHINERY

The Yanmar name has long association with compact tractors and many makes use the company's diesel engines as a power source. It is hardly surprising to find they also produce their own brand. Claymore offers four models 17hp, 20hp, 24hp and 28hp. All have hydrostatic transmission and a 2WD-4WD shift system.

SMALLHOLDER TRACTOR COMPANY

A new 37hp model the ST20040 has been recently released. Powered by a 37hp diesel, this 2-wheel driven tractor features 12 plus 12 shuttle transmission, 2-speed PTO and twin spool values. ROP and power steering are standard. Another model about to be released, is the ST2050 a 52hp model with 2- and 4-wheel drives.

There are a number of important points to take into account when considering buying a particular model

* A tractor is a relatively long-term investment, so future needs should be a consideration, plus the track record of the company who will be supplying it.

* Tractor powered equipment is continually being improved and in some cases new models require more power so again this should be taken into account as far as lifting and PTO or hydrostatic drives are concerned.

* Safety, noise, vibration and fatigue all need to be addressed.

* The prices of replacement parts vary considerably between different manufacturers.

* Check out exactly what comes with the tractor. Often the engine and drives are the same or similar. It is all those other bits and pieces, that are included in the price, that make the difference.

As said earlier, there are some value-for-money packages around so its worth delving a little deeper before deciding and SALTEX presents an ideal opportunity to start investigating.

