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Reinventing the *Wheel*

Part 2

Lee Manvell gives an update on the new Powakaddy wheel which BIGGA helped develop last year

Following what was possibly the worst December and January weather since the turn of the millennium any kind of good news story for golf course owners and greenkeepers has to be celebrated.

We reported back in October that PowaKaddy had collaborated with BIGGA on the design and testing of a new winter wheel solution for electric trolleys. At the time we couldn't possibly have predicted how severe the weather would be over the winter and how vital this new product is proving not only for golf course owners and greenkeepers but also retailers and of course those hardy golf enthusiasts who wanted to play come rain, frost or snow. Granted many courses were completely closed for extended periods particularly in the run-up to Christmas and mid January but for many others PowaKaddy's new winter wheel facilitated incremental green fees and ancillary revenue.

With the 'open tread' design inspired by lawn protection products, PowaKaddy's new winter wheels very rapidly received widespread approval from greenkeepers, golf course owners, retailers and golfers. In the development phase the new winter wheel was rigorously tested by PowaKaddy's design team in conjunction with a BIGGA advisory panel.

The wheel's key performance attributes, such as weight distribution, traction, turning ability and the subsequent affect on the grass blades, root damage and soil compaction were scrutinised and in all cases the new winter wheels passed with flying colours and was ready for launch.

Terry Hale, PowaKaddy's Chief Executive acknowledges the key role that Course Managers have played in the immediate impact of the new winter wheel solution. "The support of greenkeepers up and down the country has been the absolute key to the success of our winter wheels launch. Our on-course retail partners needed the buy-in from their Course Manager to be able to stock the product and I am pleased to say that the vast majority to date have embraced the concept".

Once the green staff had given the green light it then required golf retailers to stock the product at a time when they would be looking to run down stock as the year came to a close and in turn for PowaKaddy electric trolley users to part with their hard earned cash for a new golf accessory.

As Simon Homer, PowaKaddy's Sales Director explains, the uptake from both retailers and consumers has been extremely encouraging.

"We sold in the new wheel in limited numbers pre-Christmas to test the water and to ensure that the right process was being adhered to in terms of garnering support from individual Course Managers. The reaction was fantastic and we have some great anecdotal stories of golf professionals, faced with very low traffic coming through the door due to the weather, enjoying big demand for the wheels and giving their pre-Christmas turnover a welcome boost".

Once such retailer was Richard

ABOVE: Glenn Porter, Head of Engineering, Powakaddy.

Mudge from Staverton Park Golf Club, "We are very pleased that PowaKaddy have come up with such an innovative product. At Staverton we do have trolley bans so the Winter Wheels have been a lifeline to our members as it allows them to play throughout the wet wintery conditions without damaging the course. Our Head Greenkeeper had no hesitation in giving them the thumbs up"

Probably more importantly for the long term impact of the new winter wheels as a revenue stream for golf course owners and retailers is that there hasn't appeared to be any adverse reaction from Course Managers once the winter wheels had actually been out on the course for an extended period of time with multiple users and dozens of round played in wet wintery conditions.

The usual symptoms with standard wheels would be damaged grass roots, muddy trails, compacted turf and skid marks but the open tread design, based on a principal seen in lawn protec-

tion mesh mat systems, evenly distributes the load over a smaller surface area avoiding compacting and denting.

At Haywards Heath Golf Club in West Sussex they have seen the benefits of the Winter Wheels and Andrew Smith – Senior Professional is delighted with the performance, "'The new PowaKaddy Winter Wheels have proven to be an invaluable asset. On soft ground the new wheel causes negligible damage. They have enabled at least 40 of our members to enjoy playing golf throughout this winter."

With the launch period proving so successful and sales figures in the first two months well above plan PowaKaddy is rolling out the winter wheels to as many golf clubs and retail partners as possible for the remainder of the winter while still being sensitive to the need for education and communication between the major stakeholders within a golf club.

As Simon Homer explains "it is imperative that the consultation process between greenkeeper and retailer, that has been so vital to the success of our winter wheels to date, continues as consumer demand for the product increases. We have to make sure that the benefits of the product are effectively communicated to all parties so the positive impact on course conditioning is fully understood."

With the emphasis very much on education PowaKaddy has embarked on a comprehensive trade focused PR and communications campaign, including extended articles in the key golf trade press, trial sets being issued by PowaKaddy Sales Managers and the production of a promotional video to visually demonstrate the key features and benefits of the winter wheels. In addition the company made its debut at the BTME show in Harrogate at the end of January to showcase the product and facilitate as many one-on one-conversations with greenkeepers as possible.

"The feedback from the BTME show was extremely encouraging and an important element in the ongoing consultation process" commented Homer. Popularity of the winter wheels has been so high that PowaKaddy now plans to extend the availability to sister brand Hill Billy trolleys later in the year.

ABOVE: Andrew Smith, Senior Professional, Haywoods Heath, who gave a testimonial on the Powakaddy video.

With no ill effects on course conditioning for greenkeepers, increased traffic, rental fleet revenue and member satisfaction for golf course owners and incremental business for retailers during the slow winter months, PowaKaddy's winter wheels are certainly ticking a lot of boxes.

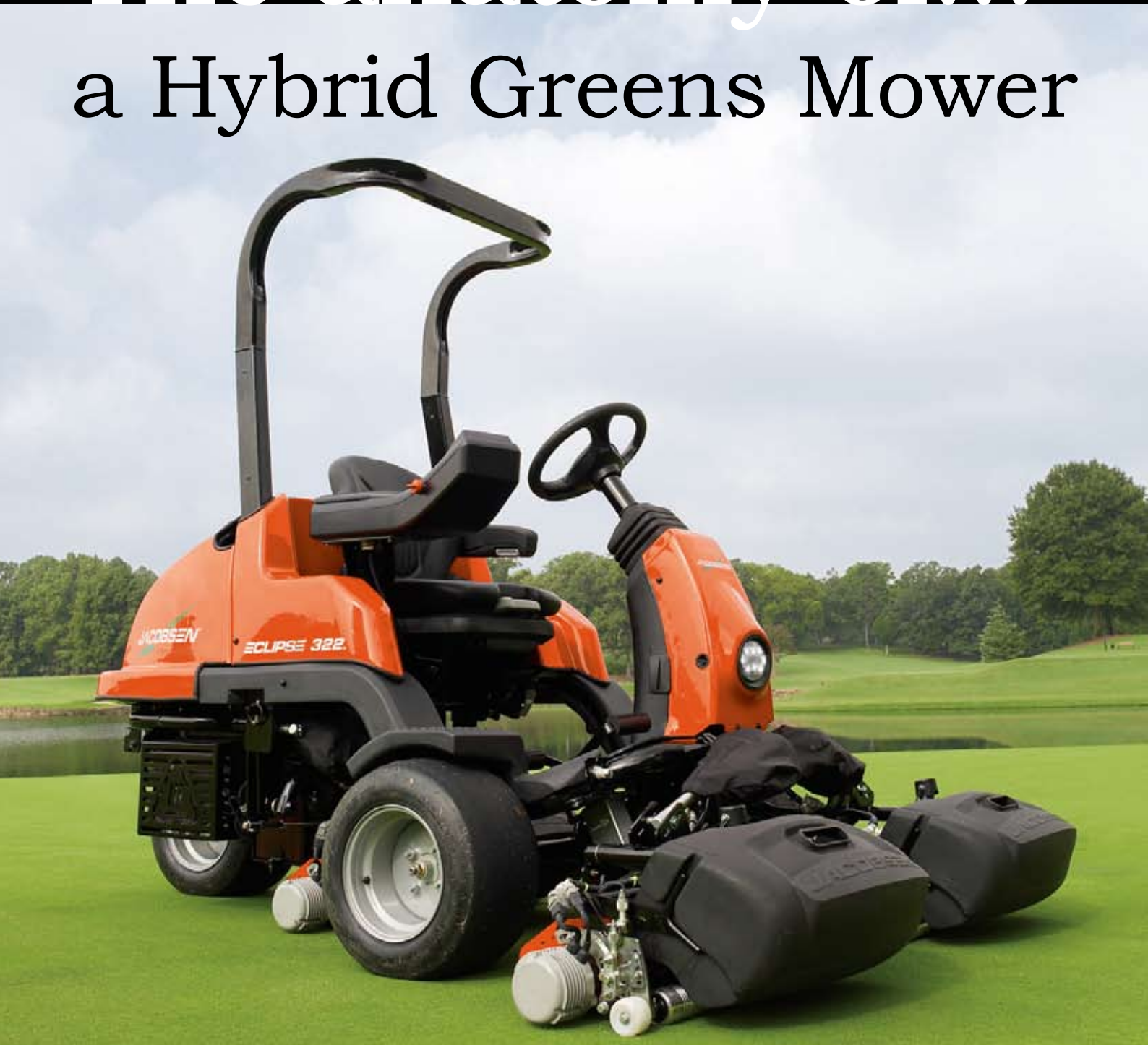
Ultimately the final word must go to the hard core golfers that keep this industry ticking over. For older players or players with injuries, an electric trolley is the only way they can play and for many others it is a major part of their enjoyment of the game so it is heartening to see a new product introduced that is not just marketing fluff but has tangible benefits to the end user.

Lee Manvell is Group Product Manager for Powakaddy

The third of the series, in which James de Havilland takes a closer look at the intricacies of current machinery

The anatomy of...

a Hybrid Greens Mower



James de Havilland casts his eye over the new Jacobsen Eclipse 322. Another nail in the hydraulic oil drum?

Jacobsen has styled its diesel electric Eclipse 322 so it looks just like a 'conventional' diesel hydraulic machine. Operating costs should be lower due to the efficiency of the driveline.

Step-by-step Analysis...

Jacobsen Eclipse 322 hybrid greens mowers

Nestling under the mower are extra batteries. These provide buffer energy to ensure instant power is always available to the mower.

Jacobsen Command Arm and steering column are both adjustable. To sit on, the Eclipse 322 feels much the same as a Jacobsen diesel hydraulic mower.

There is not a great deal to see under the engine cover, with good service access. Steering system is genuine 'fly by wire' and claimed to offer good 'feel'.

The cutting units come with a choice of options to include groomers...

... and verticutter. The Eclipse 322 is a full spec offering that happens to have diesel electric power.

Diesel electric power is hardly new. From ships and submarines through to giant dump trucks and rail locomotives, diesel electric power has demonstrated its ability to be both reliable and economical. It is when it comes to 'shrinking' the technology, however, that the system has failed to take off. But times they are a changing...

It is all too easy to look at the Jacobsen Eclipse 322 in isolation. It is, after all, the only ride-on greens mower to use electric motors to drive both its cutting units and traction wheels.

This eliminates the hydraulics that we have come to regard as the default transmission medium for both. It all seems pretty straightforward, so perhaps you could ask why it has taken so long to produce such a machine.

There are a host of reasons, but key among these has been a scarcity of electric motors that are right for the job. Big ships, locos and dump trucks are large enough to allow the use of pretty hefty generators and drive motors. A diminutive greens mower has to consider both the size and weight of all its components.

In fact, Jacobsen produced the Greens King Electric for in the '90s and there are hundreds still at work. But this mower was not without drawbacks that included heavy motors and not enough power to drive groomers and roller brushes.

In 2004 the John Deere 2500E 'hybrid' greens mower helped keep interest in ride-on diesel electric power alive, the Jacobsen pedestrian Eclipse 100 electric greens having been on sale for several years. But it is in getting the right motors for both the cutting units and traction system that has to date been a stumbling block. There is then the need to develop a control system that links everything together. It is all rather more involved that it first appears.

The Eclipse 322 also eliminates the use of any hydraulics. The steering system is electrically powered, proximity sensors on the rear steering wheel providing near 'mechanical' feedback so the operator 'feels' the wheel loading up as full lock is approached. This may not seem like much of a design challenge, but Jacobsen has gone to great lengths to make the Eclipse 322 drive as much like a conventional machine as possible.

Similarly, the raise lower system for the units had to be purpose developed for the mower. In place of hydraulic rams are motorised screw jacks.

In simple terms, motors take over the job of lowering and raising the units in and out of work, again eliminating any hydraulic hose runs. Everything relies upon electric power.

At this stage it is worth looking at where all the power comes from. Starting with the engine, this is a 2-cylinder liquid cooled 13.3hp Kubota diesel. Next is a 48-volt continuous generator that produces up to 5.8 kW.

This provides electric current to a 2.2 kW AC traction drive motor. As to the units, these are powered by three 0.97 kW DC motors.

Those who are less familiar with

electric power units will note the traction motor is AC, alternating current, the units driving the cutting cylinders having DC, direct current, drive. The reasoning behind all this can get complex but in very broad outline Jacobsen has selected and developed the most appropriate drive units to do the job.

AC motors tend to be favoured for traction, DC providing the fixed operating speeds that are vital to ensuring matched reel speeds for a consistent quality of cut.

Quality of cut and reduced operating costs

It is actually the quality of cut issue that was a key driver behind the development of the Eclipse 322. An electric motor will develop its full operating torque as soon as it gets power.

This essentially allows an electrically powered reel to run up to its cutting speed pretty much as soon as it is switched on, with any load on the system being taken care of at the same time.

Wheel rotation and reel speed are both constantly monitored to ensure frequency of cut (or clip rate) are maintained precisely as programmed, regardless of operator skill and the influence oil temperature would have were it applicable.

Richard Comely, Ransomes Jacobsen Product Manager, suggests tests have shown the use of diesel electric power is extremely efficient too.

When compared to an all-hydraulic greens mower, average fuel consumption of the Eclipse 322 was up to 43% lower. That is a real eye opener.

To put this into context, a club running a ride-on greens mower that gets through 3,500 litres of fuel a year could reduce consumption by around 1,500 litres. With red diesel at 0.65p/litre, that is about £1,000.

The savings do not stop at fuel use either. The Eclipse 322 has no hydraulic oil or filters either. Although modern mowers can run much further between requiring a full hydraulic oil and filter change, it will still cost a couple of hundred quid to do the job when it is necessary.

It does look like a diesel electric Eclipse will have the operating cost advantage over is diesel hydraulic sibling.

What's it like for the operator?

Few in the UK have had the chance to actually drive the Eclipse 322 yet, but Jacobsen are keen to point out that driving this new greens mower should not be any 'different' in operation terms from an existing diesel hydraulic mower. In fact you could pretty much jump on the Eclipse and only realise it was diesel electric by the different noise it makes.

As previously mentioned, the steering system has been developed so it has a 'mechanical' feel to it, despite the fact that there is no mechanical link between the steering wheel and rear steered wheel. The joystick used to raise the units is said to operate just as it would if used to open a number of hydraulic valves too.

Without having sat on the mower and driven it, the way it reacts to the travel pedal is something that may initially feel a bit different. With hydrostatic drive, the travel pedal is just that, releasing pressure on the pedal slowing the mower. Lift off the pedal, and the mower will stop.

On the Eclipse 322, Jacobsen use the AC electric traction motor to

also control the speed of the mower. So the operator will use the travel pedal in just the same way as on a hydrostatic model. When it comes to actually stopping, the brake is automatically applied when the mower comes to a halt, automatically releasing as power is reapplied by pressing the travel pedal.

Other elements of the Eclipse are pretty much in line with existing Jacobsen ride-on greens models. The steering column tilts and the pivoting control arm, to which the main joystick and control switches are fitted, also adjust to suit.

A soft mat helps isolate the operator from any vibrations, its texture providing a degree of anti-slip; useful when climbing on and off the mower on dew laden mornings. There is also a ROPS frame and high intensity LED headlight and LED centre unit lighting.

Frequency of Clip and operation speeds

Those familiar with the Jacobsen Eclipse 100 pedestrian greens mower will be familiar with the Frequency of Clip, FOC, control. The FOC can be adjusted from 1.27 to 6.35mm for Eclipse 322 models fitted with the 11-blade cylinders and from 2.03 to 9.91mm for the 7-blade option. This allows the course manager to specify exactly how all 18 greens will be cut, irrespective of who is sitting in the operators seat. If the machine slows down, the cylinder speed is reduced to maintain the desired FOC, and similarly, as the machine travels quicker across the green, the cylinder speed increases pro-rata.

The desired FOC can be programmed in to any number of machines, ensuring that each and every green is cut to exactly the same specification.

The actual mowing speeds can also be set up to a maximum of 9 km/h. Again, this allows the Eclipse 322 to be set-up to suit particular demands more easily. Top transport speed, incidentally, is 14.5 km/h but even this can be adjusted down if necessary.

What's it like to look after?

Here we can only summarise what access is like to key elements of the mower. The rear hood flips up for access to the engine and related ancillaries, with what appears to be good access to every day service items.

The centre cutting unit swings out for easy access for routine cleaning and maintenance too. But what really shows is a lack of clutter. It is when you take a look at a hydraulic mower alongside that you realise just how many pipes there are with this type of machine.

Summary

Everything you would expect to find on a Jacobsen ride-on greens mower is available for the Eclipse 322, including the choice of cutting systems. Classic XP cylinders, verticut units, Quick Roll attachments, spikers, a Turf Groomer, choice of roller and a powered roller brush are all present and correct.

It is this 'normality' that is perhaps lost in the 'hype' surrounding the powertrain. The Eclipse is a greens mower with well proven cutting units.

The fact that it could well be cheaper to run and easier to set up to precisely match specific demands is the icing on a very tempting cake.

The Greenkeeper and The Rules of Golf

PGA

Edward Johnson, Tournament Controller for the PGA, highlights some of the key points to consider for all greenkeepers and identifies a number of on-course rules of golf issues that are often misunderstood and applied incorrectly by many Greenkeepers up and down the country

A greenkeeper has many roles at their own golf club. However, using the Rules of Golf to understand and implement the correct procedures for marking a golf course is not always something high on their agenda.

THE TEEING GROUND

The game of golf begins at the teeing ground. The Rules of Golf defines it as a rectangular area two-club lengths in depth. Therefore, when setting the tee markers, greens staff should always ensure that they are positioned at least two club-lengths forward from the back edge of the tee. The width of the tee markers is also important to consider. It is recommended that greens staff use a minimum of six paces to allow enough room for a field of golfers to tee off from, with this being especially important on Par 3's to protect the turf on the teeing ground. Also, As Rule 11-1 states that a player may stand outside the teeing ground to play a ball within it, it is also recommended that the markers are thus set that if a player wishes to take advantage of this option, his stance will be on the same level as the ball.

Additionally, the area surrounding the teeing ground must also be considered. A golfer should be able to make an unobstructed swing even if he tees his ball at the extremity of the two club-length area. Therefore, any trees, artificial obstructions (e.g. tee boards) or advertising banners that may obstruct the golfer when taking his stance or swing should be identified and the markers adjusted if necessary. As a reference, it is recommended that a paint spot is put down next to both tee markers in case these were moved during the course of a tournament round. This then gives players a fair chance to play from the correct position at all times and also so a greenkeeper or Official can replace the tee marker in its original position. Much emphasis is placed upon setting up the course at its full length, but accurate rules interpre-

tation should not be compromised for this to be achieved.

Although not strictly a rules of golf issue, the direction of the tees must also be considered. Although sounding obvious, a golfer will be much better prepared to play a hole if the tee is pointing straight down the fairway instead of Out of Bounds for example. The use of a "T Bar" is extremely useful for this which is simply two pieces of plastic tubing stick together in the shape of a 'T'. If the two ends of the horizontal part of the 'T' line up with the two tee markers, then the vertical part of the 'T' will always point down the middle of the Fairway and thus provide the green keeper with a perfectly square teeing ground.

Finally, left hander's should never be forgotten! There is no doubt that they are in the minority, but it is important to ensure that on the teeing ground a left handed golfer is afforded the same room to manoeuvre as a right handed player. This sounds daft but it is amazing how many times this can be forgotten.

Tee markers too close to the back of the tee

Water Hazards & Out Of Bounds: How Should They Really Be Marked?

Unfortunately in golf, all golfers from time to time encounter water hazards and out of bounds (OB). When penalties are involved from a golf Club Championship to a big professional golf tournament with massive prize money, clear and accurate definition of both these areas are absolutely vital.

With regards to water hazards, if stakes (and in some cases, lines) are installed, the Rules of Golf advise that they should be placed as nearly as possible along the natural limits of the hazard, i.e. where the ground breaks to form the depression containing the water - not on the water line itself. All too often, stakes are installed at the bottom of banks, as close as possible to the water. However, if the course is subjected to heavy rain and the hazard overflows, the player would be entitled to a free drop if his ball has come to rest in such overflow under the 'casual water' rule. This would be far too advantageous for the player and not what the rules of golf intend!

If lines are installed, it is recommended that they are painted slightly on the inside of a stake. This means that the stake is out of the hazard and thus if the ball rolls against a stake which is then taken out of the ground by a player and creates a hole (an abnormal ground condition), the player would get free relief under rule 25-1.

If however the hole created by the removed stake was inside the water hazard, the player would be denied relief and would have to play the ball as it lies (in the hole) or take relief under the water hazard rule (Rule 26-1).

When marking water hazards, it is also important to visualise where a player would be dropping his ball after hitting his ball into water. For example, with a lateral (red) water hazard, a player is entitled to take relief within two club-lengths of the point where the ball last crossed the margin. As the player is already subjected to a one shot penalty, it would be unfair to penalise him further by expecting him to take his drop on a sloping bank, with a difficult shot ensuing. Also, should you have your stakes and lines on a slope, it will increase the chance of a ball when being dropped under the water hazard rule (Rule 26-1) to bounce or roll back into the hazard thus creating a re-drop situation.

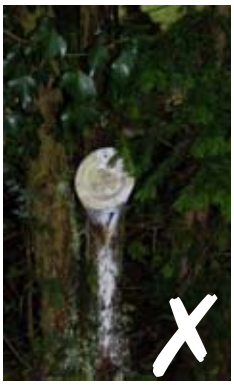
Should the ball be unable to be replaced on this spot following the re-drop, it is more than likely that the player will end up placing on a flat part of the course as this will be the nearest point where the player's ball will stay ay rest. Therefore, stakes and lines defining lateral hazards should be marked on as flat a ground as possible.

With regard to OB stakes, they should be clearly identifiable from post to post, ideally placed approximately 15 paces apart and avoiding intervening bushes and trees etc. They should also follow the natural boundary of the course ideally following as straight a line as possible.

If the stakes and/or lines were to wobble their way up a hole, the Committee (and then the greens staff) are likely to be leaving themselves open for an ear bashing from disgruntled players! For example, a golfer whose ball has unfortunately crossed such a line will naturally be upset if he has to return to the tee, whilst his playing partner who is further from the fairway, but in bounds due to poor marking, avoids penalty.

When marking water hazards and OB, it is vital that all stakes and lines must have a logical beginning and end. Stakes and lines must also be tied in either to a wall or a fence to ensure that a player is never in doubt whether their ball is in a water hazard or Out of Bounds. Also, if lines are used, they must be painted clearly and of at least 3 inches in width to ensure that it is a clear whether a ball is in or out the water hazard or Out of Bounds. Although somewhat time consuming, a double layer of paint is also recommended and the results will certainly be worthwhile!

A current trend among green staff is for water hazard and OB stakes to be cemented into the ground. This obviously reduces course vandalism and theft, but from a rules perspective it can cause confusion for the player and create erroneous rulings. The rules state that stakes defining water hazards are obstructions and ideally, they should always be movable. If not, the player (a) would not be able to move the stake if interference exists, and (b) if the ball is lying in the water hazard, he would not be entitled to free relief as the stake would now become an immovable obstruction. In addition, with OB stakes, although the rule states that a player is not entitled to move them in order to play a stroke, if the Committee wishes to redefine areas and therefore relocate them, the course would be subjected to damage by doing so.



Water Hazards: So Is It Yellow Or Red?

It is amazing how many people get confused in the difference between a yellow water hazard and a red (lateral) water hazard. The colour chosen is not a decision to be taken lightly. How the hazard is marked will influence the players dropping options if his ball ends up in the water.

In simple terms, a water hazard is marked yellow if it is practical for a player to drop a ball behind the water, keeping the point where the ball last crossed the margin between himself and the hole. However, instances will arise, where it is not practical or even possible for a player to physically drop a ball behind. For example, a hedge or a building may border the hazard, or alternatively, the immediate dropping area comprises of thick woodland or even out of bounds. In these instances, the hazards