Is in-house care key to equipment longevity?

In the recent GI survey, you told us you wanted to see machinery in action on BIGGA members’ courses. So, we sent James de Haviland to Heythrop Park to discover how they care for their machinery.

Although you would not know it from its mature setting and well-established greens and tees, the 7,100 yard golf course at Heythrop Park Resort, near Chipping Norton, Oxfordshire only opened in April 2010.

Part of an estate that covers over 400 acres, the course is maintained with a fleet of Toro mowers. Phil Helman MG, Estate Manager, was brought in to oversee construction, grow-in and ultimately set up the maintenance structure for the new course.

“Choosing one manufacturer to supply all the mowers was down to more than just securing a good finance deal”, he explained. “I wanted to get to know one supplier and supporting dealer well enough to minimise the number of calls I would have to make when I needed replacement parts or ran into a problem.

“We tried all the key makes and models of mower and settled on Toro because the company offered models that suited our particular needs. This doesn’t mean I have ruled out buying from another manufacturer or even that the Toro kit we use is the ‘best’. It is just the complete fleet met our needs and we have been extremely pleased with the equipment’s dependability and performance in the four years it has been with us.”

Of course, a key to reliability is ensuring it’s properly maintained, set up and cared for. A critical element is having good in-house workshop facilities and a mechanic to keep everything in order – which Heythrop have in the shape of Dave Capes. Phil admits this is not something all golf courses could justify but he suggests it makes practical and financial sense.

Toro has honoured the two-year warranty it set out when the mower fleet was purchased, Lely UK having been satisfied that Heythrop could indeed maintain the mowers to a standard that would enable it to meet any warranty claim.

“We purchased additional warranty on all the Toro mowers as it seemed a good idea,” Phil says. “As it turned out we had just the odd minor issue. But we wanted to buy peace of mind. As it now stands, the mowers have all completed four years and we hope to keep them for two further years once the HP fees...
have been paid off next year.

Adding that the chances are that the whole fleet will be replaced at the same time, both Phil and Dave suggest the key to continuing to get the best from the mowers is ensuring not just that they are looked after but that their respective workloads are also evened out.

"I keep a close eye on each mower's hours," adds Dave. "As an example we run two 5610D fairway mowers. One will be set up to mow the fairways, the other the aprons. As this means one machine will do a lot more hours, I will swap them over to even out the hours over the season."

All the mowers are given the nicknames of famous golfers - Phil believes operators tend to be more sympathetic to a machine with a name as opposed to just a number.

The current fleet comprises four Toro 1000 pedestrian greens mowers, two Toro 3250D ride on greens mowers, two Toro 3100 sideward apron tees mowers, two 5610 fairway mowers, two Toro 4100 semi rough mowers, four Toro workman MDX utility vehicles, a Toro workman HXI utility vehicle, three Frider tractors, one Charterhouse verti-draiser, Bobcat woodchipper, three Siasl siden strips, a Siasl fairway scarifier and a Flymo multi sweeper.

Stimpmeter and Trueness

All this talk of equipment does not get in the way of delivering what golfers want; consistent greens, defined approaches, manageable roughs and true fairways.

The team all have worked hard to ensure the greens deliver a reliable and consistent playing surface. They adapted an old petrol powered Toro green mower to carry three GreenTek True-Surface Vibe V rollers to consolidate the greens. "The greens are both hand and ride-on mown, but we did struggle to come up with consistent green speeds," says Phil. "Since we have used the greens roller, our stimpmeter values have improved to make the greens a lot faster. The variable degree of vibration delivered by the rollers allows the firming to be altered to suit a specific green."

"The greens are currently running at 11 feet 9 inches. To measure trueness, we simply set up a stimpmeter as a golf ball rolls in the hole, then roll a further ten balls down it. Trueness is simply calculated by how many times the ball drops. We then broadcast the green speed and trueness results on a PowerPoint presentation in the pro shop."
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Stimpmeter and Trueness

In house grinding

At the end of 2012, Don’t wish to have Bernhard Express Dual cylinder and Anglemaster gridding equipment installed in the workshop was realised, a move he feels will really help in getting the best from the mowers. Towards the end of last season he was forced to turn out mowers with dull cutting units, the rapid growth of the fairways in particular not allowing him the time to send units out for attention by a third party.

“It took me a bit of time to really get to grips with the grinders,” says. “Now I know what to do for each type of cutting unit and at present I am working out a regrounding cycle for each mower. But I can now sharpen a given mower as soon as it is necessary as opposed to hanging on until I can see a period when it may be in less demand. Sharp blades are obviously critical to a good finish but sharp cylin- ders and on-cut mowers draw less power. This boosts longevity and economy.”

Is the equipment up to the job?

The list of changes the team at Heythrop would like to see made to its Toro mowers is not a long one. The roughs and fairway models, two rotary Greensmaster 4100D and two 5140 Reelmaster units, have had net ball guards added to help protect operators when mowing and unable to see a ball being played. A guard option was not offered when the mowers were commissioned.

On the two rotary Greensmaster models, the folding outer section pivots have needed replacing as they get worn in transport. Bigger pivots would help although they are easy to renew.

The Greensmaster 3250 would benefit from offset units – to prevent tyre marks or ‘tramlining’ when mowing the greens - an easier to access central box and unit for emptying and cleaning. Both these issues are addressed on the current TriFlex 3400 models.

The Sidewinder models used to mow the tees and aprons were found to scuff when making tight turns. Replacing the turf tyres on one of the two mowers with ribbed semi-smooth alternatives solved the problem. On a service note, the cost of front brake pads for the Workman’s utility vehicles raised an eyebrow but is countered by other parts, such as wheel bearings, having a very reasonable price tag.

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Please select the relevant category:

- Full Member
- Affiliate Member

The entry fee of £90 includes all golf fees, lunch both days and dinner on Monday evening. Please note that there is no accommodation provided.

Name ..........................................................
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Post Code ..................

Mobile .........................................................
E-mail .........................................................
Membership No. ..........................................
Handicap ....................................................
BIGGA Section ...........................................
Golf Club ...................................................

Payment method (please tick)

- I enclose my cheque made payable to BIGGA Ltd for £90
- Please debit my Mastercard / Switch / Visa / Delta card with the fee of £90

Card number ..............................................
..........................................................................
Start Date ........ Expiry Date ........
Last 3 security digits .........................
Issue No. (Switch/Delta only) ..............

Signature ....................................................
Date ...........................................................

Deadline for entry is 6th September 2013.
Completed entry forms should be sent to: BIGGA National Championship, BIGGA House, Aldwark, Alne, York YO61 1UF

The main tournament for the Challenge Trophy will be played over 36 holes, medal play, with the best overall gross score producing the BIGGA National Champion, who must be a greenkeeper member. The greenkeeper player with the lowest nett score will be presented with the BIGGA Challenge Cup.

There will be prizes for the first five over 36 holes in the gross category. The top three in the nett competition will also receive prizes. After each day of 18 holes there will be prizes for winners of handicap divisions. The BIGGA Regional Teams Cup and prize will be calculated from the 8 best nett scores over the first day of play. There will also be various nearest the pin and longest drive competitions, featuring prizes.

This year’s BIGGA National Championship, sponsored by Charterhouse and Kubota, is at the superb Frilford Heath Golf Club on October 7-8, with the first prize of £500 worth of vouchers.
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Or E-mail your details to: rachael@bigga.co.uk

Ensure you receive confirmation of entry by return email.

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Blinded by science?

If you’re rebuilding a putting green to a USGA spec you need to be aware of the various specifications – here Andy Stanger and Stephen Prinn discuss the pros and cons of using the intermediate ‘blinding’ layer

Despite the USGA’s restrictive specifications for putting green construction, golf course managers are presented with a multitude of choices when faced with the task of building new putting surfaces. The decision to eliminate the coarse sand intermediate layer is often made to reduce construction costs, but the long-term cost of its exclusion must be fully understood before such a decision is made.

The rapid growth in demand for golf after World War II quickly identified a weakness in the construction methods of the time as surfaces were failing under the increased amounts of play. As a result, the USGA commissioned several research projects in the 1950s to identify the most successful rootzone mixture for putting green construction, which subsequently led to the first putting green specification being published in 1960. (Fig. 1)

The specification required the intermediate layer to be 35-50mm thick and contain sand particles that were at least 1mm in diameter or greater. A particle size contrast ratio for the sand and gravel was recommended at this stage but it was made purely on the grounds of preventing particle migration, no perched water table or water retention properties were mentioned at this time.

The difficulty of sourcing such material, sieving costs and installation time quickly led to this layer being recognised as a very costly element of the specification and the necessity of its inclusion was brought into question. Accepting that the blinding layers had a role in preventing particle migration, the focus of several studies in the 1960s found its ability to increase the water holding capacity of the overlying rootzone material through the creation of a ‘perched water table’, although the USGA had not listed this as a reason for its inclusion. Humel (1993) cites that and Miller and Bunger, (1963), observed increased water retention in the overlying soil when placed over a either a sand layer or gravel layer and that having any coarse textured layer within the profile will result in a ‘perched water table’, increasing the soil water retention of the entire profile.

As the USGA had never listed water retention as a feature for its inclusion, the coarse sand layer remained in the second edition of the specification published in 1973, on the original grounds of its role in preventing particle migration and insisted that absence of an intermediate layer meant the green would not qualify as a USGA green.

The focus of study then reverted back to the original claims to ascertain whether the intermediate layer actually did prevent particle migration. Brown and Duble (1975), Johns (1976) and Brown et al. (1980) all found particle migration to be minimal in the absence of an intermediate layer, (Fig.3).

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vious construction failures in the absence of an intermediate layer may have been due to mistakes being made during the construction process itself.

Brown et al. (1980) also incidentally identify the turfgrass roots as being instrumental in binding rootzone mixture materials and contributing to a lack of particle migration. Despite the fact that the research conducted over the last two decades dispelled the idea that an intermediate layer was necessary to improve moisture retention and prevent particle migration, albeit with suitable chosen materials, the USGA included it again in their third edition published in 1989. This was the first occasion that the intermediate layer was listed as an integral part of the perched water table concept. However, by this time it was common knowledge that hundreds, possibly thousands, of putting greens had been installed without an intermediate layer (Hummel, 1993).

Many of these greens had proved to be successful though in some cases, greens had failed within the first two years of construction due to particle migration and drainage failure. As the exclusion of the intermediate layer from construction was likely to continue, it was suggested that the USGA should provide a specification for greens that did not intend to include one.

The USGA published its fourth edition of the specification in 1993 with the express aim of making putting green construction more affordable. This was the first specification to offer an option to omit the intermediate layer from the construction process and the first time the term ‘bridging’ was used to describe the prevention of particle migration in the absence of the intermediate layer.

This alteration was later described by Jim Moore, the USGA’s director of construction education as, “the biggest change the USGA had ever made to its guidelines” (Billord, 2005).

This change, however, came with a very clear caveat, “strict adherence to these criteria is imperative; failure to follow these guidelines could result in greens failure.” Following publication of the fourth edition, numerous studies, conducted in the 60’s and 70’s, were replicated using the most modern specifications for rootzone materials to allow a true comparison to be made between two and three layer construction methods.

All found that the absence of the intermediate layer/signature by increased the moisture content and decreased the air filled porosity levels within the overlying rootzone. Taylor et al. (1994), Snyder and Cinzer (1997) and Baker and Blins (2001 a,b). In addition, two studies also tried to quantify and value the additional water held in the rootzone in the absence of an intermediate layer. Both studies explained how the additional water held would allow the turf manager to delay irrigation by one or two days in temperate climates but suggested that this would probably not be of significant agronomic importance. Taylor et al. (1994), Baker and Blins (2001 a,b).

The USGA’s most recent edition published in 2004 has continued with the option to omit the intermediate layer and broadened some of the particle size ranges in all categories of the construction materials. As a result of further research funded by the USGA in a bid to make construction more affordable, the evolution of the USGA putting green construction method has undergone intense scrutiny and rigorous testing since it was initially published in 1960.

The USGA may have revised its specification to allow the absence of an intermediate layer but that in turn has presented the turf manager with two methods of construction and offers no bias toward either method.

Table 1 (Advantages and disadvantages of the intermediate layer) highlights desirable characteristics that would support the decision to select either form of construction method. The presence of a coarse sand intermediate layer would provide the turf manager with a free draining rootzone that if built correctly would provide a layer of insurance and safe guard against particle migration and ultimately drainage failure.

The decision to opt for the reduced moisture retention within the profile may appeal to some turf managers in order to reduce the likelihood of fungal disease outbreaks.

However, it could be argued that the evapotranspiration rates (ET) used to equate this water to practical use are theoretical maximal and that under average ET conditions in temperate climates, with appropriate crop coefficients applied, this additional water could potentially provide sufficient water for grass growth for perhaps three or four days.

With increasing water usage restrictions and rising water costs, this attribute of a putting green without an intermediate layer could be an extremely desirable characteristic to the turf manager.

The weight of evidence would suggest that a putting green with cost less to build and cost less to maintain after installation if the intermediate layer is left out of the construction process.

This appears to be a very easy decision to make except for one overriding factor, the cost of getting it wrong. If mistakes are made when selecting the construction materials or during the construction process, the green will undoubtedly fail and eliminate all the short and long term cost savings made by omitting the intermediate layer.

Whilst cost is an important factor in the decision process it should not be the only one that influences the decision to leave out the intermediate layer.

Geographical location, availability of materials, irrigation capabilities and contractor experience should all be considered before selecting the most suitable and appropriate method of construction to suit the needs of each individual situation.

Table 1: Advantages and disadvantages of the intermediate layer

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Fig.2: Time consuming advantages and disadvantages of the intermediate layer
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Fig. 1 Three containing orientation of a coarse sand intermediate layer (Hummel, 1989).

Fig. 2 The absence of an intermediate layer caused particle migration into the gravel carpet (Brown et al, 1979).

REFERENCES


The top ten reasons to lightweight roll

When I initiated my first lightweight rolling putting green study at Michigan State University (MSU) in 1993, I had no idea I would still be researching it 20 years later. Questions abounded about whether rolling frequency should be limited because it might increase the possibility of compaction and plant tissue bruising or contribute to the loss of root mass, simply cannot tolerate the traffic put upon it by continuous rolling.

The numerous freeze/thaw cycles that occur in temperate regions of the world result in soil frost heaving, which leads to bumpy soil surfaces in the spring. It is customary to roll turfgrass surfaces before the first spring mowing to minimise the potential of scalping.

Similarly, when heavy rains are followed by hot humid weather, thatch can swell, creating puffy turf that is more prone to scalping. Under these climatic conditions, rolling before mowing can decrease the potential of scalping.

Because of my extensive research with the practice, I have repeatedly been asked to list ‘The Top Ten Reasons to Lightweight Roll.' I'll admit to originally scoffing at the idea, but the truth is, I was the perfect individual to do research with the practice, I have research without the practice. So here we go!

1. Alliterate heaving and minimise scalping when climatic conditions dictate

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2. Broadway weed, moss, algea reduction

No research plots have ever been designed to examine the impact of lightweight rolling on broadleaf weeds, moss or algae encroachment, yet related research has documented that lightweight rolling decreases each of them. In an MSU study in 1996, putting greens rolled three times per week had fewer broadleaf weeds and less moss than greens that were not rolled.

Furthermore, in 2008, University of Arkansas Masters student Jay Richards reported that lightweight rolling decreased alage encroachment.

3. Exactly why regular lightweight rolling would decrease these pests is not known, but two different theories have the most merit.

The first is that regular rolling increases turfgrass density thus reducing the potential of the pests. The other theory is the pests (possibly moss) simply cannot tolerate the traffic put upon it by continuous rolling.

4. Decreased localised dry spot

A lightweight rolling study performed at MSU from 1995 to 2000 revealed that greens rolled three times per week displayed significantly less localised dry spot than greens that were never rolled. Soil samples from the study showed that rolled plots retained more moisture and had more root mass than root zones that were not rolled. Interestingly, increased soil moisture content and root mass could lead to less localised dry spot on the turfgrass putting surface.

In the past several years it has become easier for researchers and golf course superintendents alike to measure volumetric soil moisture content because Time Domain Reflectometry (TDR) technology has been vastly improved. TDR measurements taken on lightweight rolling studies have consistently shown that lightweight rolling does increase soil volumetric moisture content.

5. Height of cut raised and green speed retained

Figure 1 (below left) shows green speed retained after first mowing height/rolling study. Plots mowed at 0.5cm were rolled three times per week and were compared to plots that were not rolled and were mowed at 0.4cm.

At the beginning, plots maintained at the higher height of cut had slower green speeds compared to plots mowed at the lower height of cut. However, after a week and a half of rolling, plots maintained at the higher height of cut achieved green speeds as fast as (and in some cases faster than) plots mowed at the lower height.

Interestingly, rolling resulted in enough residual green speed that the higher height of cut maintained the green speed of plots at the lower height of cut the day after rolling. Since that original study, several other studies have been performed that validate those findings. Furthermore, Rutgers University has documented that rolling and increasing the height of cut decreases anthracnose, and MSU has reported decreases in brown patch.

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5. Decreased cutworm activity - maybe?!?

OK. This might be a stretch, but bear with me. If nothing else, you'll learn I am an honest individual. At the Hancock Turfgrass Research Center at Michigan State, we usually do not get enough black

When I initiated my first lightweight rolling putting green study at Michigan State University (MSU) in 1993, I had no idea I would still be researching it 20 years later. Questions abounded about whether rolling frequency should be limited because it might increase the possibility of compaction and plant tissue bruising or contribute to the movement of diseases spread by soil and ground surfaces.

Just ten years ago lightweight rolling was primarily used to alleviate foot traffic on greens and increase green speed for tournaments. If it was used at all, it was used very infrequently.

Today, because of improved results from numerous studies, lightweight rolling has been embraced as a means of creating healthy turfgrass and increasing customer satisfaction.