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 Helmn 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

BELOW: The Toro fleet on delivery in 2009

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 3250 ride on greens mowers, two Toro 3100 sidewinder apron/tees mowers, two 5610 fairway mowers, two Toro 4100 semi rough mowers, four Toro workman MDX utility vehicles, a Toro workman HDX utility vehicle, three Ford tractors, one Charterhouse verti-drainer, Bobcat woodchipper, three Sisis slitters, a Sisis fairway scarifier and a Blec multi seeder.

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 have all worked hard to ensure the greens deliver a reliable and consistent playing surface. They adapted an old petrol powered Toro greens 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 rolls enables 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 so 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."

In-house grinding

At the end of 2012, Dave's wish to have Bernhard Express Dual cylinder and Anglemaster grinding 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," he says. "Now I know what to do for each type of cutting unit and at present I am working out a regrinding 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 cylinders 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 Groundsmaster 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 Groundmaster 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 mowers 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 utility vehicles raised an eyebrow but is countered by other parts, such as wheel bearings, having a very reasonable price tag.

ABOVE: Ribbed tyres have replaced the original turf tyres on one of the Sidewinder mowers. This enables the unit to turn with minimal scuffing when mowing tees

RIGHT: Each mower has its hour, service and repair record listed on this white board. Naming the mowers and applying large decals to their flanks may seem eccentric but it personalises the machines. Operators wash the mowers after use with a high volume hose

BELOW RIGHT: Converting a petrol powered greens mower to operate a triple set of True-Surface variable vibration rate rollers has proved worthwhile, increasing green speed while ensuring they're consistent

"The key to getting the best from the mowers is ensuring not just that they are looked after but that their respective workloads are evened out"

The 17th century Heythrop House (above) provides an impressive backdrop, the green itself emerging from a tough winter when pictured in mid-April.

The rootzone is made up of 80% sand and 20% fensoil and seeded with a traditional bent and fescue seed mix. Greens are currently running at 90% fescue and 8% bent. A joint overseeding schedule and very labour intensive removal programme is carried out to ensure the remaining 2% rogue grasses that 'creep in' over the year don't stand much of a chance.

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Frilford Heath GC

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 1950's 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 lead to this layer being recognised as a very costly element of the specification and

A soil modification procedure for greens involving a perched water table

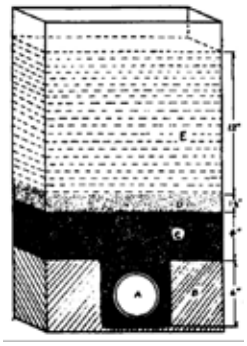

Fig.1, 1960 USGA Construction Specification Profile (USGA Greens Section Staff, 1960)

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 1960's 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 into the gravel layer to be minimal in the absence of an intermediate layer, (Fig.3).

These studies alluded to the fact that a 'proper sized gravel' must be used in order to prevent particle migration and suggested that pre-

Fig.2: Time consuming installation of a course sand intermediate layer (Hummel, 1993)

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 already 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", (Willnerd, 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, previous studies, conducted in the 60's and 70's, were replicated using the most modern specifications for rootzone material to allow a true comparison to be made between two and three layer construction methods.

All found that the absence of the intermediate layer significantly increased the moisture content and decreased the air filled porosity levels within the overlying rootzone, Taylor et al. (1994), Snyder and Cisar (1997) and Baker and Binns (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 Binns (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 introduced 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

Table 1: Advantages and disadvantages of the intermediate layer

USGA Specification	Putting Green
Intermediate Layer	**No Intermediate Layer**
Advantages • Reduced moisture retention • Improved air filled porosity • Insurance against particle migration	• Reduced construction costs • Shorter construction period • Increased moisture retention • Available water held in closer proximity to the roots • Reduced irrigation demands
Disadvantages • Increased construction costs • Higher irrigation demands • Lower water retention around root proximity	• Longer construction period • Reduced air filled porosity • High risk potential for particle migration if improperly constructed

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 maximums 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 will 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.

Fig.3: The absence of an intermediate layer showed minimal particle migration into the gravel carpet (Brown et al, 1980)

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.

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REFERENCES

Baker, S.W. and Binns, D.J. 2001a. Vertical distribution of moisture in golf greens following gravitational drainage: the effects of intermediate layer and drainage layer materials. Int. Turfgrass Society Research Journal. Vol.9. p463-468

Baker, S.W. and Binns, D.J. 2001b. The influence of grain size and shape on particle migration from the rootzone layer to the drainage layer of golf greens. Int. Turfgrass Society Research Journal. Vol.9. p463-468

Brown, K.W and Duble, R.L. 1975. Physical characteristics of soil mixtures used for golf green construction. Agron. J. 67:647-652

Brown, K.W., Thomas, J.C. and Almodares, A. 1980. Organic matter sources and placements during root zone modification as they affect seedling emergence and initial turf quality – preliminary report. USGA Res. Rep PR-3851

Hummel, N.W.Jr. 1993. Rationale for the revisions of the USGA green construction specifications. USGA Green Section record. March/April. P7-21

Johns, D.Jr. 1976. Physical properties of various soil mixtures used for golf green construction. M.S. Thesis. Texas A&M University

Miller, D.E. and Bunger, W.C. 1963. Moisture retention by soil with coarse layers in the profile. Soil Sci. Soc. Amer. Proc. 27:586-589

Snyder, R.H and Cisar, J.H. 1997. The choker layer. USGA Green Section Record 35 (4):14-17

Taylor, D., Williams, F. and Nelson, S. 1994. Water retention in golf greens: Sub-root zone layering effects. USGA Green Section Record. March/April. P17-19

U.S. Golf Association Green Section Staff. 1960. Specifications for a method of putting green construction.

USGA Journal of Turf Management. 13(5):24-28

U.S. Golf Association Green Section Staff. 1973. Refining the greens section specifications for putting green construction. USGA Green Section Record. 11(3)1-8

U.S. Golf Association Green Section Staff. 1989. Specifications for a method of putting green construction. USGA. Far Hills, N.J. 24 pages

U.S. Golf Association Green Section Staff. 1993. USGA Recommendations for putting green construction. USGA Green Section Record 31 (2):1-3

Willnerd. S. 2005. Building a better green. Golfdom. August. 61(8): p. 86, 88, 90.

The top ten reasons to lightweight roll

One of the world's most eminent turf professors – and a huge hit at the Turf Managers' Conference – gives us a detailed lowdown on lightweight rolling

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. In the nineties, the initial objective of lightweight roller research was to gather data to determine whether the practice was safe. 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 mechanical means.

Just ten years ago lightweight rolling was primarily used to alleviate frost heaving, prep seed beds or increase green speed for tournaments - if it was used at all.

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

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 create such a list, and I finally gave in to the requests. So here we go!

10. Alleviate heaving and minimise scalping when climatic conditions dictate

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.

9. Seed bed preparation

Rolling is important for the establishment of turfgrass sites for several reasons. First of all, on high value areas, it is imperative to roll the site multiple times before seeding to compress the root zone and reduce or eliminate soil settling during or following establishment.

Second, numerous turfgrass books rightfully preach the importance of having good seed-to-soil contact during the establishment of turfgrass sites, and the best way to have good seed-to-soil contact is to roll the site immediately after seeding.

Additionally, in a putting green establishment study performed at MSU, plots rolled multiple times per week filled in quicker and were ready for play sooner than putting green plots that were not rolled.