RECONTOURING YOUR PROBLEM GREENS

By Tim Butler

CONTINUE TO LEARN

Severe contours and slopes on golf greens are a commonly found problem, leading to limited locations for hole placement, excessive wear in certain locations on the green and frustration among many golfers.

We have all played on courses where at least one hole was almost impossible to play, with golf balls often landing nicely on the green only to roll miserably off. This problem, I have found from experience, is often apparent on older courses, which, when designed, were playable due to high mowing heights practised at the time. However mowing heights of one-tenth inch are now common and ball roll-speeds have increased dramatically.

When many older courses were built, green-speed was also not an issue. In recent years, though, the 'need for speed' has really caught on among many golfers and to be honest many greenkeepers and course managers are faced with desperate plights to maintain quality playing surfaces in situations where the hole can be located in only a very limited number of areas.

The first thought that springs to many people's minds is reconstruction, yet in reality this is not feasible for many courses. Most course managers do not have the luxury of being allowed to close particular greens for many months on end in order to facilitate complete reconstruction. And the cost is prohibitive to many in the industry.

This is where the concept of changing the contours of problem greens comes into play. The idea revolves around slightly changing the architecture of problem greens to make them more playable with less severe slopes. I realise that certain courses will not be able to change their green architecture due to historical reasons. But there will be a large number who will probably be able to slightly alter their problem greens without overly changing the character of the course.

THE PROCESS

I have come across a few golf courses that have had similar problems and decided to try this method. They include the Chevy Chase Club in the USA.

The concept starts with carrying out a detailed study of problem greens to get an understanding of the slopes on the green.

At this stage, a sportsturf agronomist with a deep knowledge of rootzone specifications needs to be brought in to get an in-depth understanding of the soil physical analysis. The agronomist needs to find out as much information as possible about the existing rootzone because some rootzone material will need to be acquired if it is decided to raise part of the green profile. It is imperative that one finds out the exact percentage of course, medium, fine, very fine, silt and clay particles that are present within the rootzone. Once this is done, the agronomist should be able to source a rootzone material or get a rootzone mix blended for the purpose. If the selection process is not carried out properly, then the project will likely turn into a failure within a few years.

Areas that are excessively high may possibly be lowered and low areas may be raised. Grade stakes are put in place to ensure that slopes and grades are delivered. Basically the turfgrass in areas that are planned to be changed should be stripped off to a depth of about a half to one inch (2). As this is being carried out, each sod strip should be numbered to ensure that it can later be laid back exactly in the position from which it was removed (2).

Any material removed from high areas is usually kept to fill in low ones, provided that the rootzone is suitable and contains low organic matter levels and so on. It is imperative that the underlying gravel and drainage layer on the green is not disturbed during the work and extra care must be taken to keep heavy machinery off the green.

If rootzone material is added to low-lying areas, then adequate rolling or compacting is needed to minimise settling effects prior to re-installing the green sod. In some instances, courses may opt for new sod instead of the original, which is all right provided that care is taken to ensure that the thickness of sod will match in with depth allowed for on the rootzone.

Issues with differences in grass colour are often experienced when sod is imported into the course. This colour difference, likely due to nutrition, will disappear over time. Once the sod has been set in place, some shrinkage is likely and scalping from mowers should be avoided in order to keep weeds out and aid recovery.

Once the sod is in place, sand dressing is usually applied to the sod seams and good irrigation carried out. The aim is to get the sod rooting as quickly as possible, so that the green can be opened up. Once rooting

occurs, core cultivation and heavy top-dressing are often applied to open up the rootzone, reduce any compaction and promote rooting (2).

Slight settling is likely and a heavy top-dressing programme may be needed to level off the surface. Great care must be taken of remodelled areas to ensure that rooting mass increases rapidly allowing the green to re-open as quickly as possible.

RESEARCH

The first thought that might spring to many people's minds is the issue of changing the depths of the rootzone profile. Many golf greens are constructed to USGA specification with a 12in rootzone sitting on top of a gravel layer. Some may feel that lowering the high spots and raising the lower ones on their greens during the recontouring project may have an adverse effect on water movement through the rootzone.

Having said this, I would like to talk firstly about two difficulties that arise on many courses: localised dry spot (LSD), and black layer. Localised dry spot is found on all turfgrass types and rootzones, but is particularly prevalent on sand-based rootzones. LSD is caused by soil particles becoming coated with organic substances, which repel water, causing the soil to dry out and preventing rewetting (Vargas, 2006, Pers. Comm.).

This condition is naturally-occurring and I know from experience that many course managers throughout Ireland and the UK are spending a lot of money on wetting agents and cultural practices, trying to control this phenomenon. Black layer is a common problem on sand-based rootzones. Chemically, black layer is a deposit of metal sulphides, which form when hydrogen sulphide gas reacts with metal elements in the soil (1). Black layer occurs under anaerobic conditions. Research by Nektarios et al. (1999) reported that drainage in golf green rootzones is not always uniform and that, in an unsaturated rootzone, water may move laterally along the rootzone/gravel interface to lower areas in the green rather than vertically from the rootzone into the gravel layer (3). This may lead to dry areas forming at high points and saturated zones in lower areas on the green (3).

Due to this problem, research was undertaken at Michigan State University under the guidance of Professor Kevin Frank to look at the influence on water movement through the profile, of building a variable depth rootzone on a golf green. The rootzone was 8in deep in high areas and 16in in low-lying parts of the green. The green was fitted with time domain reflectometry probes to measure soil volumetric water content.

Results showed that modifying the depth of rootzone mix improved the uniformity of volumetric water content across the surface of the putting green. This shows that success can be achievable if very careful planning is given to a recontouring project. It is critical, though, that raised areas do not receive more rootzone, as this may lead to more localised dry spot issues. It is also important to remember that, during normal construction activities, a rootzone depth of at least 12in is given from low to high areas (3).

Recontouring golf greens is commonly practised with varying degrees of success. This process may help to improve the course from both a playability and management viewpoint and reduce the large expense associated with reconstruction. However, a specialist agronomist is vital to ensuring the future success of a recontouring project.

ABOUT THE AUTHOR

Tim Butler is studying for a PhD degree in Turfgrass Science at both University College Dublin, Ireland, and Michigan State University, USA. Contact Tim at *timmbutler@hotmail.com*

REFERENCES

1. Berndt, W.L. 1987. Black layer formation in highly maintained turfgrass soils. Golf Course Management. 55(6):106-112

2. Graves, D., and Kinnelly, T. 2003. Recontouring a Golf Green Without Total Reconstruction. USGA Green section Record. September/October: 18-21.

3. Frank, W.F., Leach, B.E., Crum, J.R., Rieke, P.E., Leinauer, B.R., Nikolai, T.A., and Calhoun, R.N. 2005. Effect of Rootzone Material and Depth on Moisture Retention in Undulating USGA Putting Greens. USGA Turfgrass and Environmental Research Online 4(11):

4. Nektarios, P.A., Steenhuis, T.S., Petrovic, A.M., and Parlange, J.Y. 1999. Fingered Flow in Laboratory Golf Putting Greens. Journal of Turfgrass Management. 3(1): 53-67.