

Pesticide-free golf course management



Martin Nilsson, head greenkeeper at Copenhagen Golf Club in Denmark, provides insights on how to maintain turf health with minimal inputs

Taking care of a nearly 100-year-old golf course without the help of plant protection products (PPPs) is a basic condition for our golf club. It is not something the club has adopted on its own accord.

The story of using PPPs on our golf course began to come to an end in 1999, when the Danish parliament decided to phase-out their use on publicly owned land.

Around 2003 or 2004, the use of herbicides and insecticides stopped, which left only fungicides to manage disease on greens curatively. In 2011,

we applied our last fungicide and have now been pesticide-free for more than 10 years.

A UNESCO World Heritage Site

I began working as the head greenkeeper at Royal Copenhagen in 2006. The brief from the present board of directors was to make the golf course ready for a pesticide-free future. The optics were on greens management. Weeds were an issue too, but greens were deemed more important. As the health and stability of the greens has changed for the

better, that focus has changed.

The golf club is situated in a public park, less than 10 miles north of Copenhagen. The park spans 1400 hectares and welcomes more than seven million visitors each year. It's a beautiful place with open pastures and mature woodlands with massive oaks, beeches and horse chestnuts.

The main attraction is the 2000 deer living in the park. It is possibly one of the most heavily protected natural and cultural heritage sites we have in Denmark, being both an EU Natura 2000 habitat and a UNESCO World



“The rate of success depends on your site-specific conditions and your resources”

A little about the club's history

The club was founded in 1898, which makes it Scandinavia's oldest golf club. The 18-hole layout is from 1928, but the architect is unknown today. The golf course was renovated in 2008-09 by Tom Mackenzie. The renovation left the existing push-up greens from 1928 more or less untouched beside adding some greens extensions and lifting and relaying the turf in order to tie into the new greens' surroundings. Bunkers and tees were renovated, added or erased depending on how they fitted our modern game. It is a wonderful place – worth a trip – but it is not an easy job to maintain a golf course to modern standards and expectations without plant protection products, an obligation to use fertilisers and water as little as possible, and with 2000 deer running around.

Heritage Site.

The park is managed by a forest directorate. The directorate jokes that the pecking order in the park is firstly the deer, secondly its human visitors, and in a distant third is the golf club. This fact is also part of the basic conditions. We have an obligation to minimise the use of fertilisers and water. There are no signs, benches or waste bins, only tee markers and flags.

Not an overnight success

Disclaimer: Pesticide-free management is not for all golf

courses. For some it simply may not be realistic, while for others it will be catastrophic. The worst-case scenario is an overnight shift to no pesticides, because it catches the golf course off balance. Moving from an equilibrium based on PPPs to one without is a long-term plan and the rate of success depends on your site-specific conditions and your resources.

When we start talking about pesticide-free turf management, the conversation begins with fungicides and disease management on greens, particularly snow mould and more

recently dollar spot.

This was also the case in Copenhagen. How do we move away from *Poa annua*-dominated greens to more disease-resistant grass species, in our case red fescue?

As time went on and the greens turned around and became less and less disease-prone in autumn and winter, the highest priority changed to weed management, firstly clover and plantains on greens and greens surrounds. Insects (mainly chafergrubs) are a pain, but we don't have any solutions.

We manage the golf course with a focus on red fescue as the dominant grass species. Given our site conditions, climate, resident deer population and current legislation, it's the right choice. That could change if any of these factors shift – for example, a worsening climate, the emergence of new diseases or the introduction of improved grass species. But for now, red fescue remains our best option.

We also use other grass species. On greens and fairways we use browntop bent, on some of our shadier greens we use creeping bent. Modern-type rye grasses are also used. Although we use other grass species, our agronomic decisions are based on the competitive parameters that the red fescue likes.

Know your fundamentals

If you want to be successful maintaining red fescue, the fundamentals need to be present:

- **Good drainage** – water needs to go away
- **Air** – you need sun and wind, not shade
- **Space** – red fescue doesn't like too much traffic
- **Good soil** – it can be USGA specs but native soil, like in our case, can also be good
- **Good irrigation** – a key parameter to make red fescue thrive
- **Proper, traditional greenkeeping** – this part is on you

Death is an integral part of our management. Some grass must die so the fescue can colonise and thrive. Disease actually helps, so does famine and drought. It is a delicate balance, because fescue is a slow coloniser and if you are too successful killing the other grasses, the golfers will disapprove. But if you are too afraid of having 'bad periods' then you will never succeed. To get things moving you must be outside the equilibrium for periods of time.

In the first five years of moving towards red fescue-dominated greens surfaces, the risk of disease damage was very high. After an additional five years it was medium/high, moving onwards to medium/low until today I would rate it low risk. Playability on greens is more or less year-round now and has been for years.



“Death is an integral part of our management”

You will need help. Most turfgrass knowledge is based on conventional turfgrass management and turfgrass research. There are many knowledge gaps when it comes to pesticide-free turf management. Find like-minded colleagues. You will feel alone. A group of likeminded greenkeepers creates an immensely strong network and pool of knowledge. Look for leads with non-conventionalist turfgrass researchers. Your issues will not be normal.

Points of difference

Below are some of the things we might do a little bit differently on greens. It is not rocket science. It's a combination of traditional greenkeeping, the disturbance theory, and minimum stress, low nutrition. The riskiest bit is if you do everything full-on from the very beginning.

- Topdress (if we do) on a 4-week basis. Follow the fescues slow growth pattern
- No aeration during autumn and winter
- No or very limited use of verticutting

- Stop mowing from mid-October, but still rolling
- Mow no shorter than 4mm
- Try to keep moisture levels around 15-20%
- Stop fertilising in early august (winter is coming)
- N-inputs 40-70 kg/year
- Zero phosphates
- If needed at all, only potassium during the first part of the season. Later, it can increase the risk of snow mould

The purpose of writing about how my team manage our course without the use of PPPs is not to say that all should duplicate us. The purpose is to inspire and to instill confidence in that it is possible to manage golf courses with lower inputs and even lower than you would comfortably say is achievable. It is possible to optimise downwards without dropping in quality. **GI**

This article was written by Martin Nilsson and is based on a presentation he gave at the Swedish Greenkeepers Association Conference in November 2024.