Making great sport happen

ROYAL COPENHAGEN GOLF CLUB

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: Tuesday 15th May 2018
Consultant: Alistair Beggs

Royal Copenhagen Golf Club

Date of Visit:	Tuesday 15th May 2018
Visit Objective:	To review prevailing conditions on site and to offer advice on future management.
Present:	Mr Hans Ole Voigt – Green Committee, Mrs Ina Agerbaek – Green Committee Mr Martin Nilsson – Course Manager, Mr Alistair Beggs – STRI
Weather:	Dry, warm and sunny. Temperature 24°C

Headlines

- Significant progress has been made with many aspects of course management since the last STRI visit in 2016.
- Greens continue to perform very well, and the latest set of performance data and laboratory data confirm this.
- Clover contamination is much reduced, and the use of iron sulphate sprays is working well.
- The conditioning of green surrounds and fairways needs further attention.

Key Actions

- Greens are performing very well. Controlling speed and firmness are the key issues now that organic matter levels have been reduced.
- Weaker greens at PG, 1st and 18th should be overseeded with bent along with the 12th green.
- Green surrounds need to be fed more liberally and the club should explore enhanced irrigation provision in the future.
- Fairway programmes have been reviewed but there is limited evidence of progress so far. Further sanding, light feeding, and seed drilling with fescue is needed, with irrigation to follow.
- Plans to develop a new short game practice area on wet ground is fraught with problems. See recommendations for further comment.

Objective Measurements Summary Table

Measurement	Average	Target Range	
Soil Moisture (%)	16.6% (range 14.3-20.5)	15-30%	
Hardness (Gravities)	127 Gravities (range 121-129)	85-110 g	
Smoothness (mm/m)	17.6 mm/m	<25 mm/m	<19 mm/m
Trueness (mm/m)	6.0 mm/m	<10 mm/m	< 6 mm/m
Green Speed	10 ft 3in	8 ft 6 in- 9 ft 6 ft	9 ft 6 in – 11 ft
Organic Matter 0-20 mm (%)	4.63%	4-6%	
Organic Matter 20-40 mm (%)	3.07%	<4%	
Soil pH	6.9	5.0-7.0	
Phosphate (P_2O_5)	114 mg/l	>10 mg/l*	
Potassium (K_2O)	27 mg/l	>30 mg/l*	

Key: In Target | Marginal Variance | Out of Target

Photo Observations and Comments

Figure 1: The greens are a real strength of the golfing experience at Copenhagen. The fescue/bent turf is offering exceptional ball roll qualities so early in the season.

Figure 2: The texture and density of the turf is quite superb. This is a close-up of the turf on the 5th green. Bents are more obvious in most greens than they were last time.

Figure 3: Thinner and weaker greens are to be found at PG, 1st and 18th(pictured). In all cases Poa annua is more prevalent and swards are still pitted. The 12th which is a newer construction is higher in fescue and thinner at this time of the year.

Figure 4: Green profiles are excellent and root growth is strong through 100mm. Good organic matter control in the surface is obvious when profiles are examined. This is leading to surfaces that are firm and fast, confirming Copenhagen's reputation as a great ground game course.

Figure 5: Green surrounds are weaker. Clover control is much improved but rye and weak fescue does not offer the most robust of sward mixes. Additional feeding together with irrigation and wetting agent provision need to be considered.

Figure 6: The surround at the 15th is much improved. This was infested with white clover last time the course was visited. The use of iron sulphate to improve visual appearance and playability has worked very well. Plantain contamination needs constant attention.

Figure 7: Efforts to improve fairways are underway but texture and density are still poor. Work on quality of cut, brushing to improve texture, light feeding to improve density and fescue seeding to improve fine grass stocks.

Figure 8: The poor quality of cut is demonstrated by this photograph of the turf on the 13th fairway. Rye is difficult to cut but there is still too much tearing and ripping taking place.

Figure 9: The new putting green is progressing well. Focus on increasing the frequency of cut, and dropping the height to 6mm after regular light dustings of dressing.

Figure 10: The wet area proposed for the new short game area is far from ideal for development. Consider relocating to higher ground in the vicinity of the current par 3 course.

Recommendations and Comments

Greens

- With organic matter levels reduced into the ideal range there is little more remedial work to do in this respect. Keep aeration and dressing inputs at the current level although there may be merit in increasing 8mm solid tining through fronts of greens to mitigate excessive firmness if the summer is dry and this becomes a problem. Current clegg values are at the top end of what is considered ideal for a club golf.
- With greens as firm as they are, make sure green approaches are firm too. Transferring key treatments such as dressing, aeration, light feeding, and wetting agent treatments are critical to further success.
- Chemistry results are pleasing. The only change I suggest is boosting K levels occasionally to keep them in target (See Summary Table).
- Moisture levels are reasonably comfortable although some fronts and bunker margins dropped to single figures during testing. Irrigate to maintain VMC levels in the region of 15% and to do this a programmed wetting agent approach (Revolution or equivalent) will help. If margins and heads dry out, consider hose end diluter treatments and a retentive wetter such as Primer or equivalent.
- Smoothness and trueness values are incredibly good for early season greens. Although bents are more prominent than fescue at this time of the year and appear to be a little lateral in their growth in places, this is not disturbing ball roll in most cases. Don't worry about aggressive refinement at this stage. It is not necessary. Do more once fescues are stronger later in the season.
- Green speeds are good and with a high content of fine grass in most of the greens pace is a natural inherent quality. Ensure excess speed is avoided because it only makes the game more difficult for less able golfers and slower for all. Watch the 12th green which has a high fescue content as is thinner. Additional light feeding, and bent seeding is advised here along with only judicious use of the Smithco iron.
- Greens that do require attention include the 1st, 18th and putting green where Poa annua populations are greater and swards are pitted from a combination of deer damage and Fusarium disease. Extra light feeding, and dressing treatments are warranted in all cases, and it is agreed that high quality bent cultivars should be injected into these platforms. The best way to do this would be to hire or borrow the Terra Float unit from Ian Tomlinson. This way bent can be introduced repeatedly through the latter end of the season without disturbing golf. Use browntop bent cultivars such as Arrowtown, Charles etc. The Barenbrug cultivars you have in stock e.g. Barking and Heriot are fine as well.
- The new putting green is progressing well. Look to increase the frequency of cutting now and as levels improve with regular light dustings of dressing, gradually reduce the height of cut to 6mm in 2mm increments. Liquid feeding with ammonia or urea or a combination of both is favoured applying no more than 5Kg/Ha N per time. Liquid feeds are kinder to young turf during the grow in phase.
- We discussed the potential development of a new short game area on the wetter ground adjacent to the driving range tee and new putting green. I am concerned that this area holds water in the winter. In order to produce a high-quality product here (and stick with indigenous materials) my judgement is that the surface would have to be lifted considerably to ensure good base drainage. This would be expensive and may create problems with sourcing a suitable fill material. Instead, is it worth considering the development of a new short game area at the top of the hill on the double green currently used for the par 3 course? Some re-routing of the par 3 layout may be required but the rudiments of a short game practice green are already in place here, and the project would be easier and cheaper to complete.
- The other option is to build a USGA type platform in the proposed area. Some raising of the base would be necessary with this option too, and drainage would need to be installed as well. Explore all options carefully before a final decision is made.

Green Collars, Surrounds and Approaches

- Green surrounds and greens are much cleaner of unwanted and unsightly species (particularly white clover) than they were during my last visit. The regular use of iron sulphate has helped greatly, and this should be used repeatedly to keep this and other unwanted species e.g. plantain etc under control. The 60Kg/Ha rate has proved to be the most efficient in this regard.

- It is important to balance unwanted species removal with light feeding to boost grass recovery. This is particularly important on areas where foot traffic is concentrated e.g. left side of 18th etc. Here a thin stand of rye with meadow grass prevails making for a less than presentable surface and one that is difficult to play finesse shots from. These areas need to be fed more liberally to boost base growth and then seeded and rested during the autumn/winter months.
- In the longer term, more effective irrigation delivery to outer surrounds is needed. This would provide a far greater level of control than is currently available. Explore the feasibility and cost of this option for all green complexes including approaches which should be addressed as a priority.
- Wider use of good quality wetter type products would help too. I appreciate that there is a cost to this but if these areas are to improve these are the measures that need to be taken. Ideally greens, approaches and surrounds would all be included in monthly wetting agent delivery treatments.

Fairways

- Efforts are being made to improve the quality of turf on fairways. The purchase of a new sprayer and larger dresser represent real progress and sand dressings are being applied and should continue to be applied in approximate 250 tonne loads two or three times a year.
- Swards are too open at present and feeding inputs need to be increased. My advice would be to axe the 10:1:9 product and use either urea, ammonia or both in liquid form at a rate of 5Kg/Ha per application as often as necessary to create the density required. If you prefer to use a granular or solid product use a material based on nitrogen only e.g. 8:0:0 or equivalent. The continued use of P and K is likely to favour the coarser rye grasses we do not want.
- Try and improve the quality of cut. I appreciate the difficulty of cutting tough rye's, even with the revised 8 bladed units, but the finish is still not good enough. There is too much tearing and ripping taking place. More brushing prior to mowing may help here too. Mow as often as time and resources allow. Simply increasing the frequency of cut can help all these issues.
- Consider drill seeding with fescue later in the season. Stick to fescue only. I do not agree with overseeding with fine leaved rye's in this situation.

Signed

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Agronomist to The R&A Championship Committee
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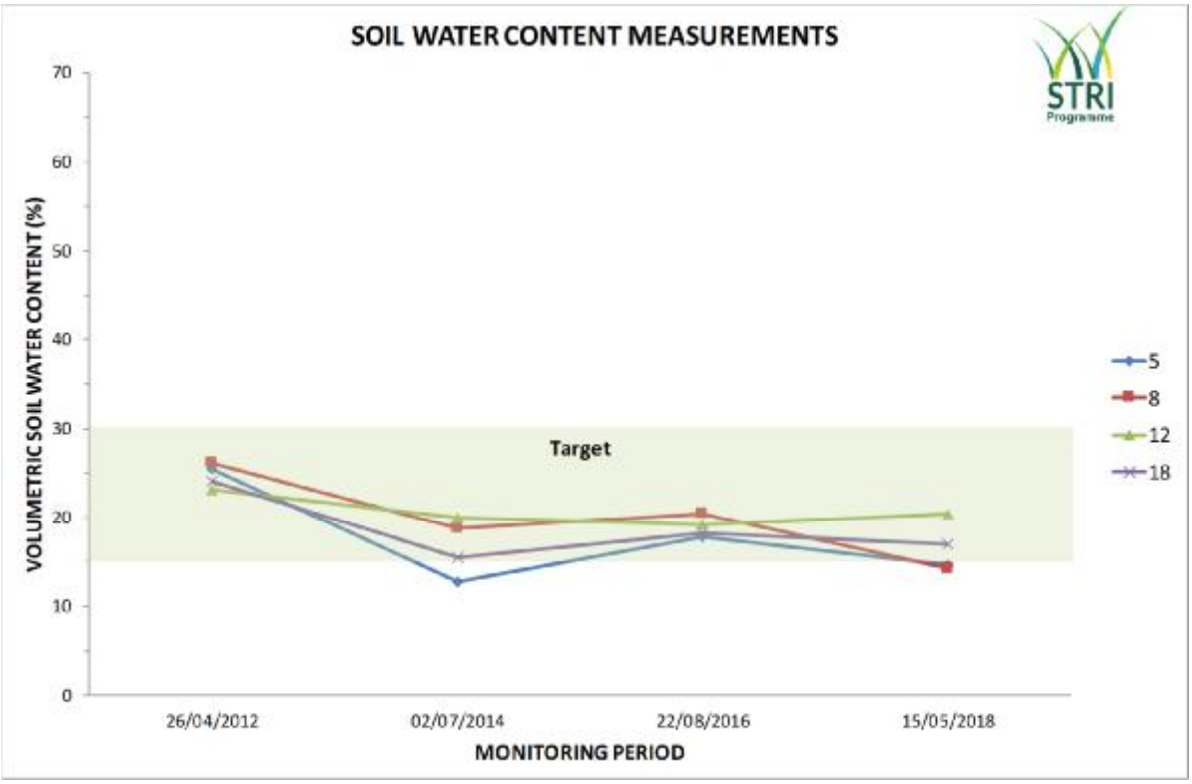
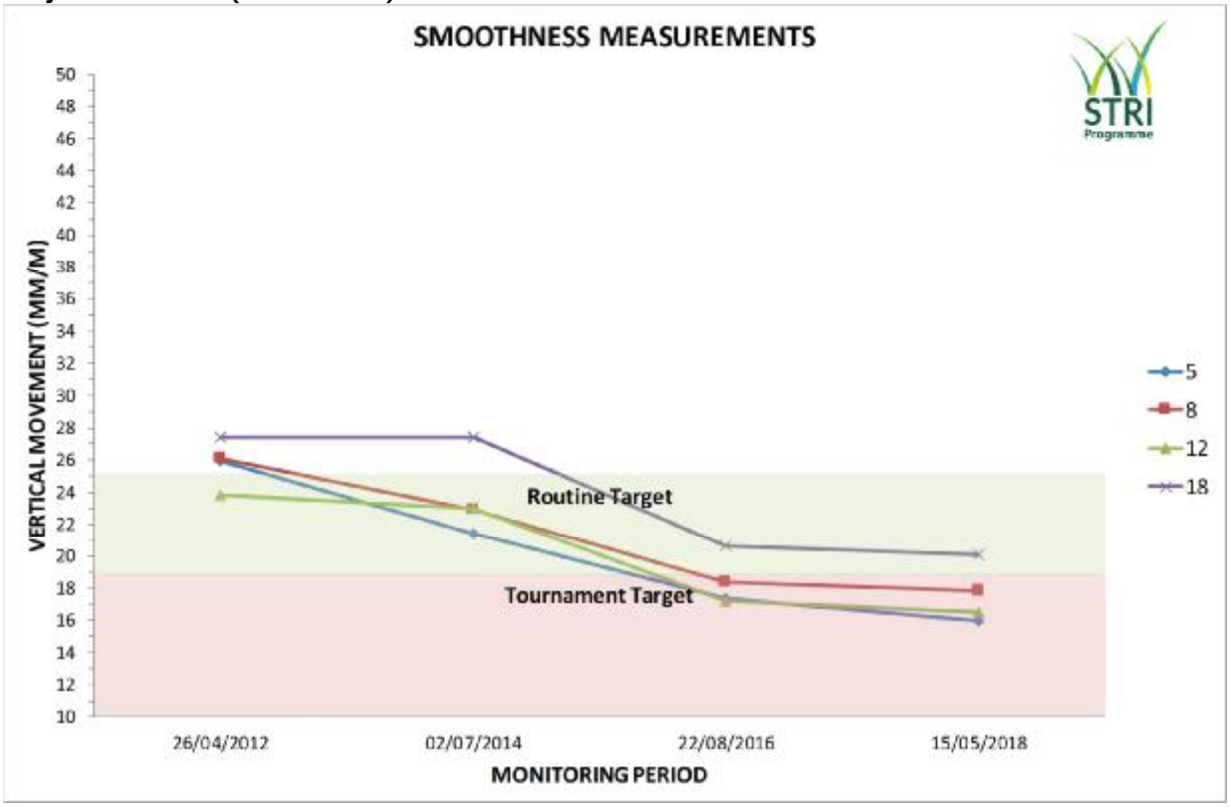
Objective Data



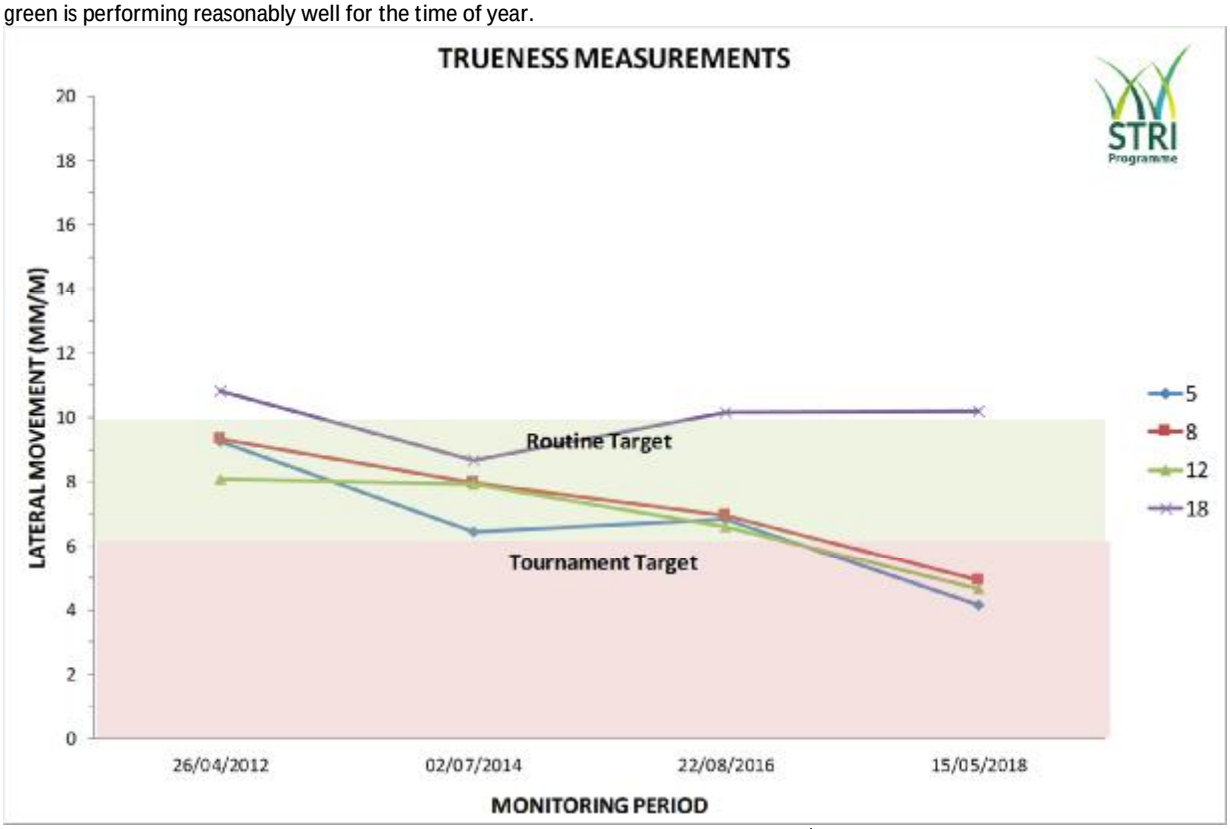
Objective Data Graph 1: Prevailing weather patterns in the build up to this visit were dry. Consequently, VMC levels were relatively low although there was little visible turf stress because of the excellent sward composition and good root development. Nevertheless, it makes no sense to stress swards unnecessarily and my advice is to keep VMC levels around 15% minimum to maintain optimum turf quality and performance. Use the moisture meter rather than visual appearance to dictate whether or not turf needs irrigation.

Objective Data Graph 2: Greens are incredibly firm. This is a product of dry conditions and a reduction in surface organic matter levels since the last inspection. With greens averaging clegg values in the high 120's care needs to be taken not to present too much of a challenge particularly on greens where front protection is offered. Some softening to fronts should be considered using flexible irrigation and aeration strategies when clegg values exceed 130 gravities.

Objective Data (continued)

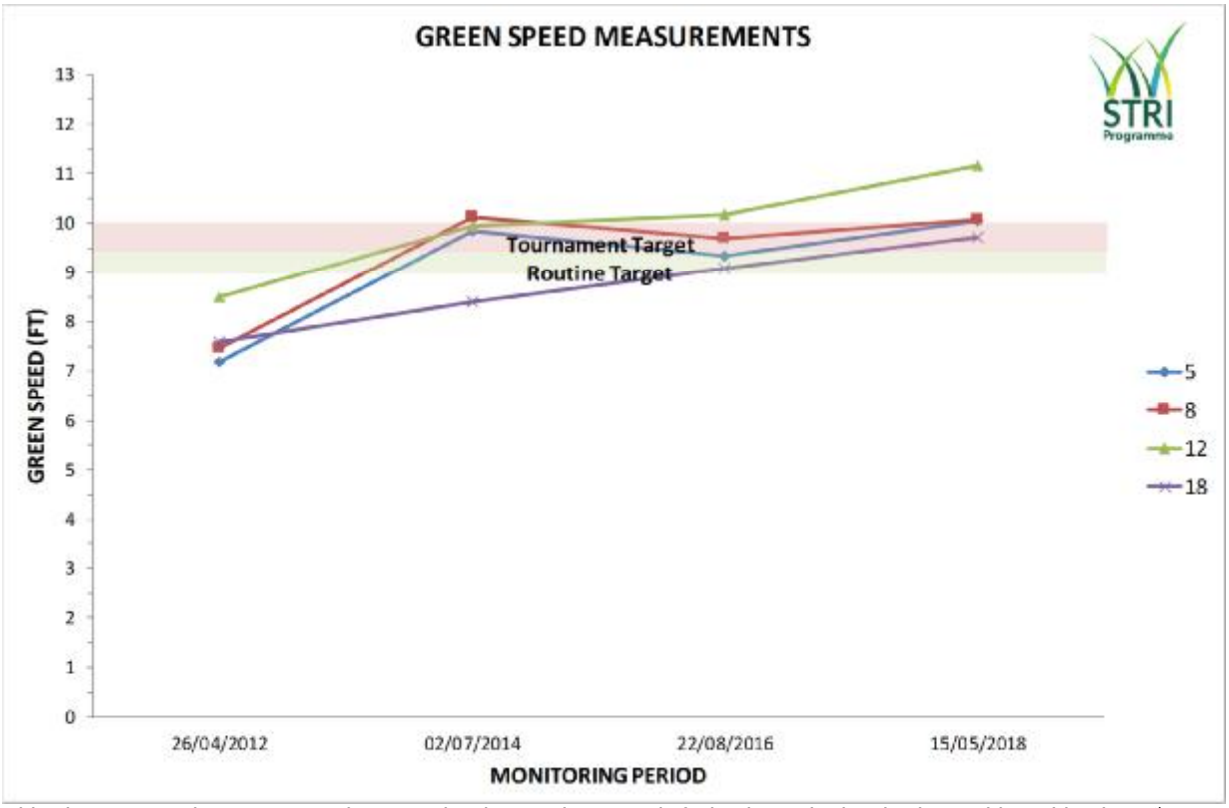


Objective Data Graph 3: Smoothness data are excellent across all indicator greens. They sit within summer target levels which is an incredible achievement for this time of year. Values are better than they were in August 2016. Note the poorer performance of the 18th green because of its higher Poa annua content and the legacy of pitting from disease and deer scaratching. However, even this green is performing reasonably well for the time of year.



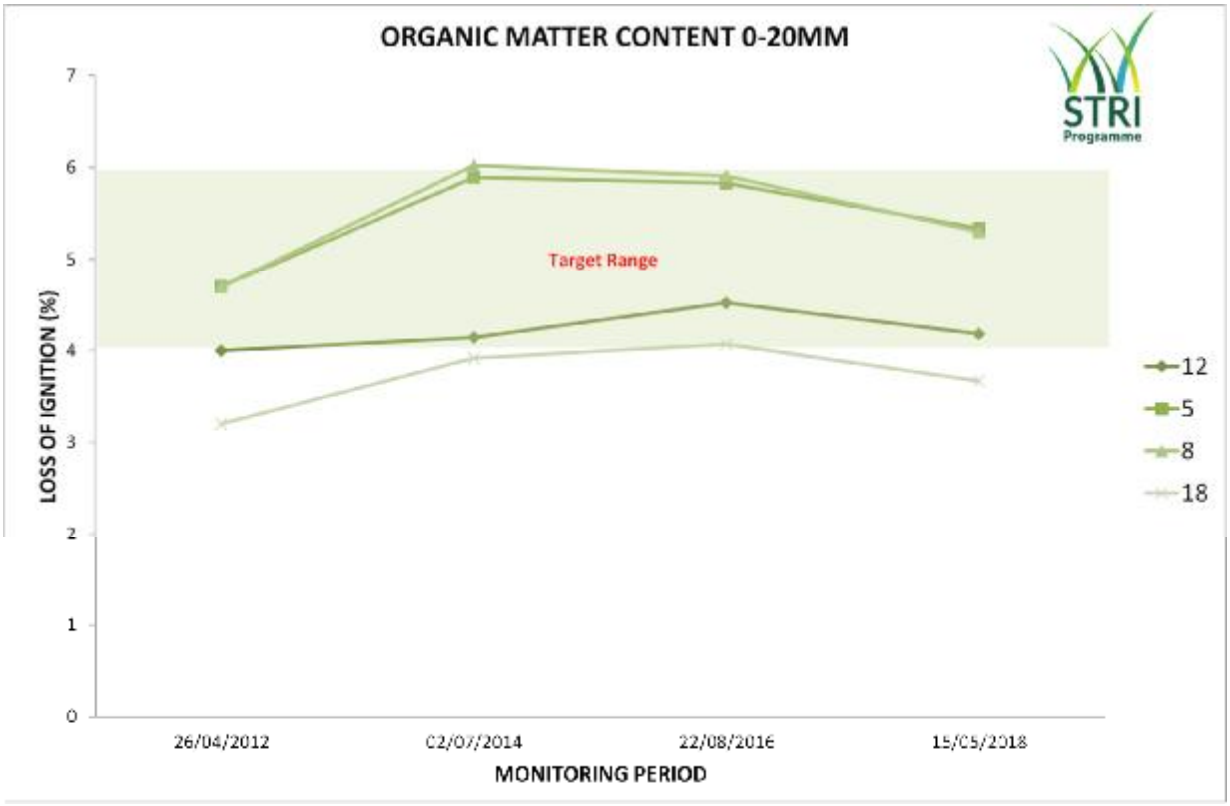
Objective Data Graph 4: Trueness results are very good as well although the pitted 18th, which is offering good smoothness did not score as well in this category. Lateral deflection is still an issue here because of seed head and disease pitting.

Objective Data (continued)

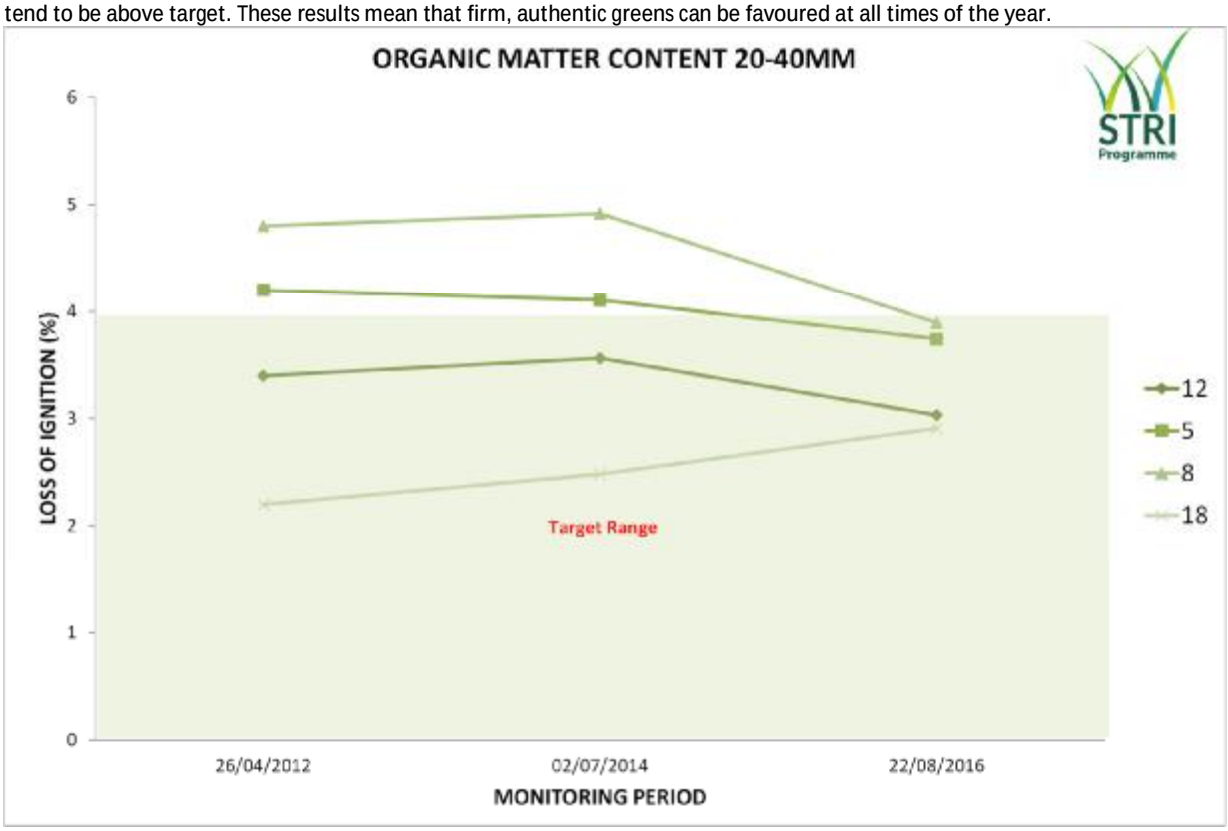


Objective Data Graph 5: Green speeds are good and are at the top end of what is required. Indeed, I would consider the 12th green to be too quick for member play at this level. Aim to deliver 9ft 6ins for member play on a routine basis and adjust rolling inputs accordingly. The 12th green needs more grass and this should be achieved by feeding in the short term and overseeding bent in the longer term. Collectively this set of green performance data is exceptionally good for mid-May and really show the value of having well managed fescue dominant greens in this climate.

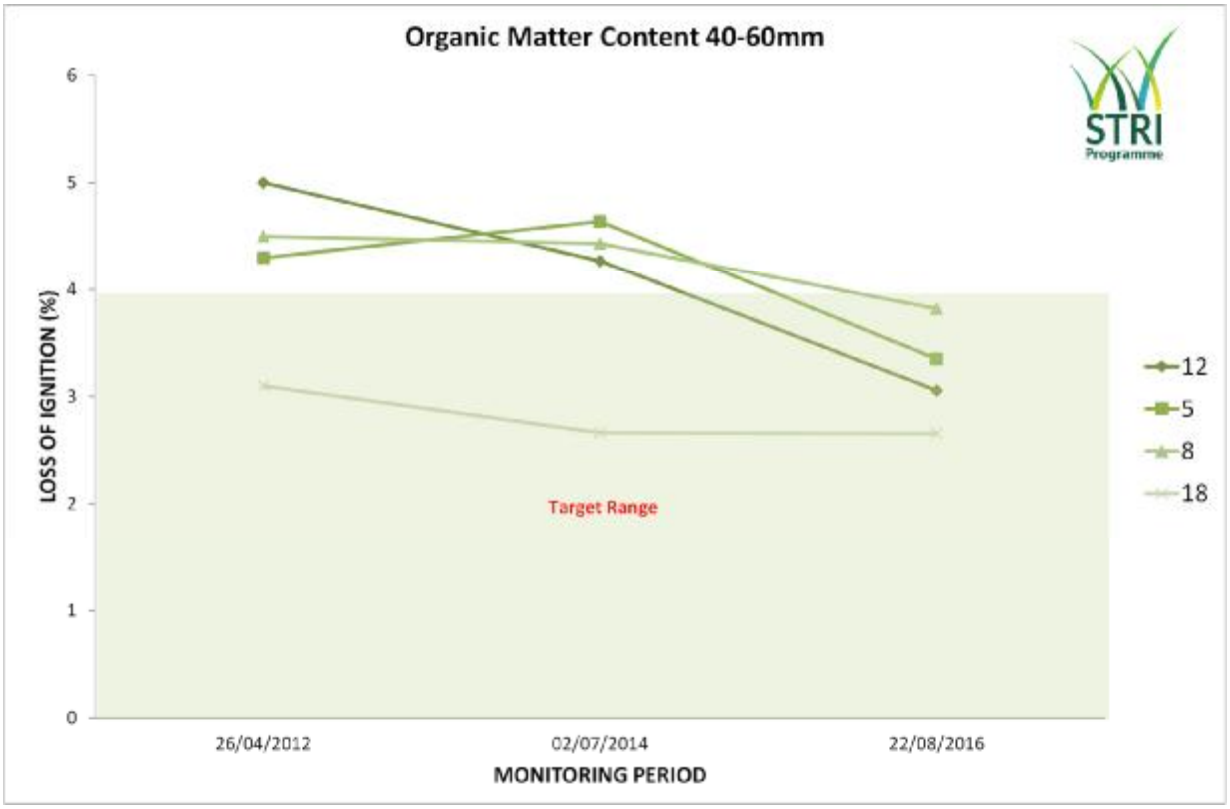
Soils Laboratory Data



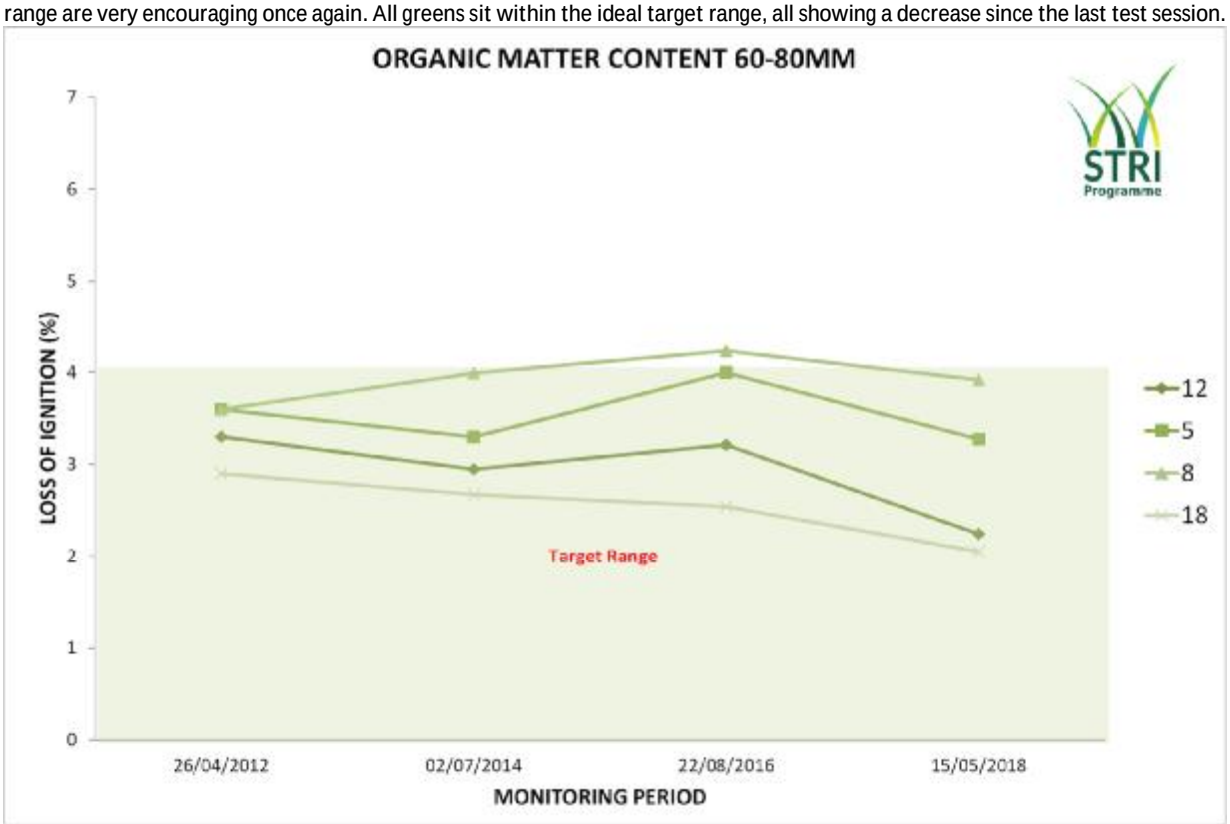
Soils Laboratory Graph 1: Organic matter levels in the critical top 20mm are pleasing. All greens show a gentle reduction since the last test session in 2016, and all greens are either in target or slightly below target. To put this in context, most clubs that are tested tend to be above target. These results mean that firm, authentic greens can be favoured at all times of the year.



Soils Laboratory Graph 2: A similar set of results can be found in the 20-40mm depth range. Although the 18th shows a slight increase since the last test session all greens remain within target.



Soils Laboratory Graph 3: As depth increases we have less control over the outcomes. Nevertheless, results for the 40-60mm depth range are very encouraging once again. All greens sit within the ideal target range, all showing a decrease since the last test session.



Soils Laboratory Graph 4: At 60-80mm all greens are in target and all greens show a reduction in organic matter since 2016. Overall, I am very happy with organic matter management and profiles are performing optimally because of this. Maintaining current intensities of aeration and sanding should help retain good characteristics.

STRI

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SOIL CHEMICAL ANALYSIS

CLIENT:

COPENHAGEN GC

RESULTS TO: **AJB**

DATE RECEIVED:
18/04/2018

Lab No.	Source	pH	P_2O_5 (mg/l)	K_2O (mg/l)
A16749/1	5	6.5	109	28
A16749/2	8	6.6	109	24
A16749/3	12	7.5	69	28
A16749/4	18	6.8	169	28

Mr M A Baines, Soil Laboratory Manager

THE RESULTS PERTAIN ONLY TO THE SAMPLE(S) SUBMITTED AND TESTED.

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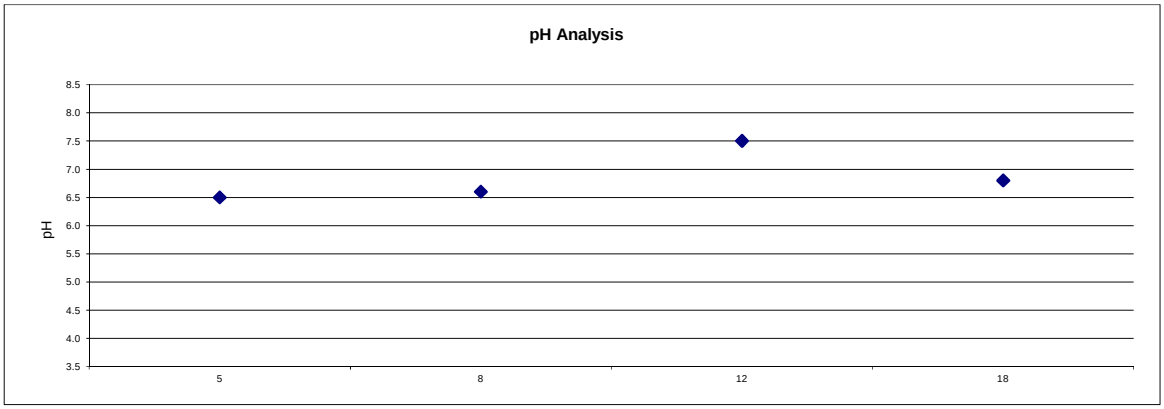
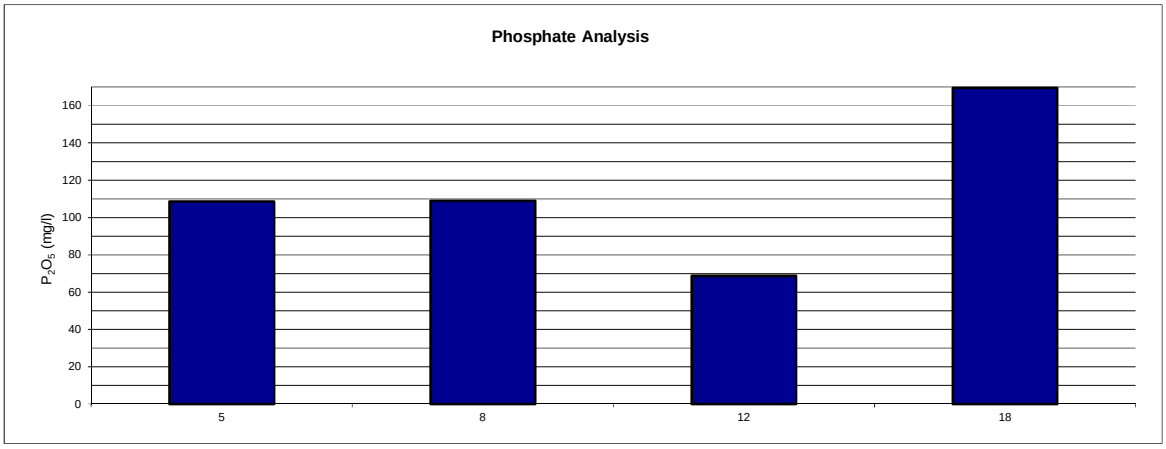
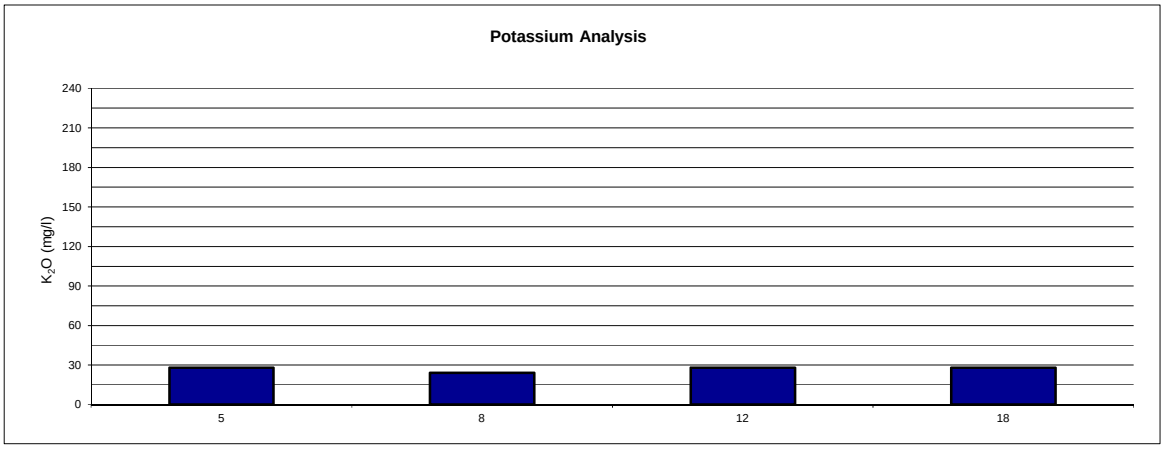
SOIL CHEMICAL ANALYSIS COPENHAGEN GC Date: 18/04/18







THE RESULTS PERTAIN ONLY TO THE SAMPLE(S) SUBMITTED AND TESTED.

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ORGANIC MATTER CONTENT

CLIENT: COPENHAGEN GC

ADDRESS: DYREHAVEN 2,
KGS LYNBY 2800,
DENMARK

DATE RECEIVED: 18/04/18

DATE REPORTED: 26/04/18

RESULTS TO: AJB

TEST RESULTS AUTHORISED BY:
Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION		LOSS ON IGNITION (%)*
A16749/1	5	0-20 mm	5.34
		20-40 mm	3.29
		40-60 mm	3.13
		60-80 mm	3.28
A16749/2	8	0-20 mm	5.30
		20-40 mm	3.54
		40-60 mm	3.75
		60-80 mm	3.92
A16749/3	12	0-20 mm	4.18
		20-40 mm	2.93
		40-60 mm	3.36
		60-80 mm	2.24
A16749/4	18	0-20 mm	3.67
		20-40 mm	2.52
		40-60 mm	2.14
		60-80 mm	2.05

* ASTM F1647-11 Standard Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes (Method A)

ACCREDITED
Testing Certificate 2159 - 01

THE RESULTS PERTAIN ONLY TO THE SAMPLE(S) SUBMITTED AND TESTED