



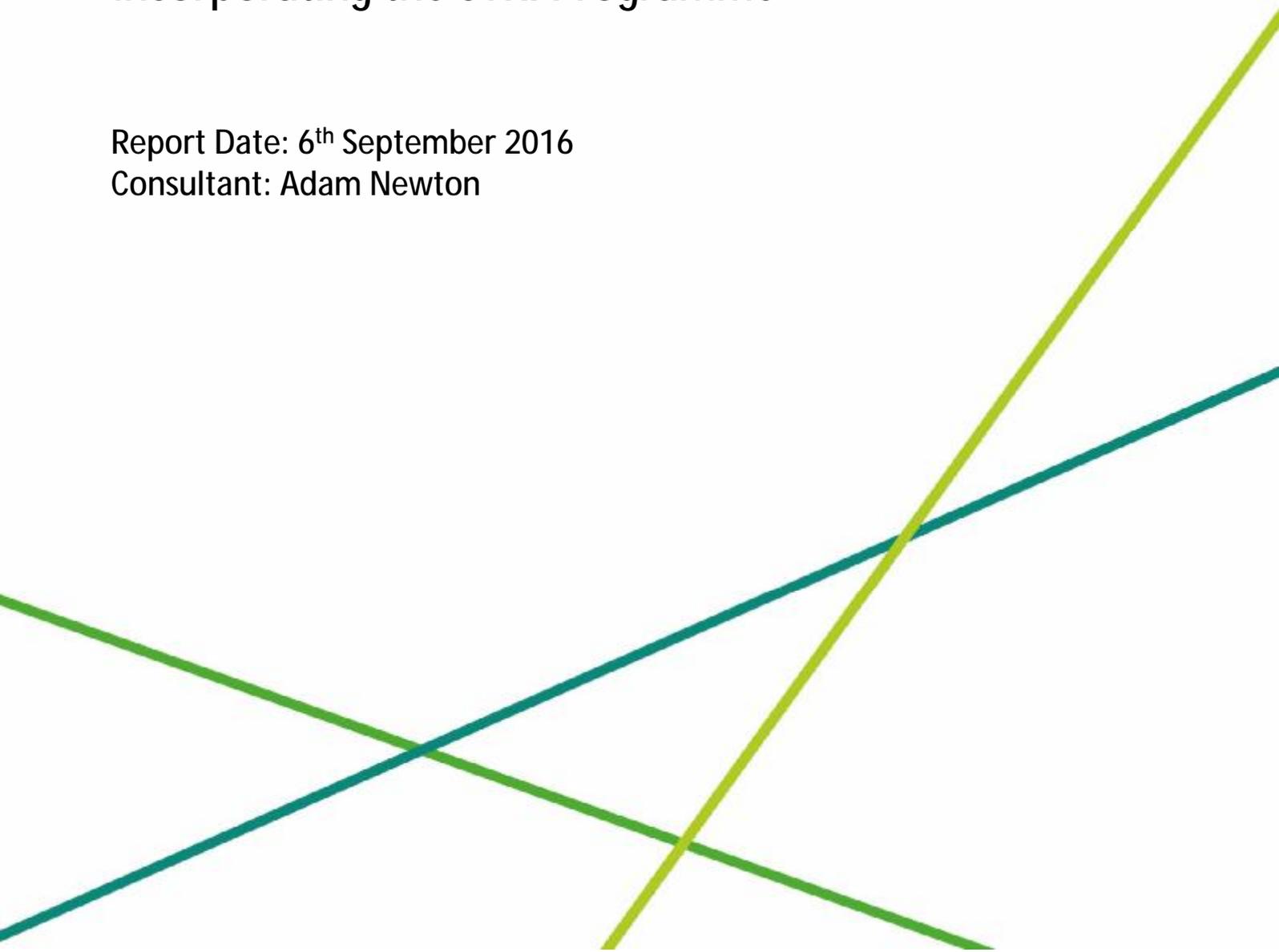
Making great sport happen



# KIBWORTH GOLF CLUB

## Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 6<sup>th</sup> September 2016  
Consultant: Adam Newton



## Kibworth Golf Club

**Date of Visit:** Friday 2<sup>nd</sup> September 2016

**Visit Objective:** To review the agronomic condition of the golf course, collect greens performance data and confirm recommendations for ongoing improvement.

**Present:** Mr Jeremy Woodland – Greens Chairman  
Mr Chris Butler – Head Greenkeeper  
Mr Adam Newton – Turfgrass Agronomist, STRI Ltd

**Weather:** Overcast with showers. Temperatures approximately 18°C.

### Headlines

- Difficult weather conditions have presented a real challenge to golf course preparations this year.
- Greens performance testing results were the best since testing began in 2012; with surface firmness, smoothness, trueness and green speed all being within target ranges.
- Organic matter values remain too high and are compromising year round greens performance.
- Soil compaction beneath the greens is restricting the rate at which water drains and organic matter breaks down. There is a clear need to increase the frequency and depth of aeration inputs.
- Anthracnose disease is prolific on a number of the greens and causing some scarring to the surfaces.
- Tree clearance work around the 7<sup>th</sup> green has greatly improved turf quality and aesthetics.
- The wider areas of the course were well-presented. Clover control is necessary in key areas.

### Key Actions

- Continue with hollow tining, sanding and Graden renovations to reduce organic matter content.
- Consider adjusting the timing of renovations next year to optimise the rate of surface recovery and minimise disruption to the playing surfaces.
- Immediate Air2G2 air injection to relieve soil compaction.
- Increased micro solid tine aeration to the greens at varying depths throughout the year.
- Strong consideration should be given to the purchase of a Procore to facilitate increased aeration.
- Hollow tining and sanding renovation to the collars and approaches to reduce organic matter.
- Clover control on the fairways and semi-rough next year.
- Ongoing tree work to improve the growing environment around enclosed greens (e.g. 10<sup>th</sup>).

### Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	41.3% (range 40.5 – 41.7%)	15-30%
Hardness (Gravities)	94 Gravities (range 88 – 103g)	85-110 g
Smoothness (mm/m)	22 mm/m	<25 mm/m
Trueness (mm/m)	9 mm/m	<10 mm/m
Green Speed	8 ft 9 in	8.5-10.5 ft
Organic Matter 0-20 mm (%)	10.8%	4-6%
Organic Matter 20-40 mm (%)	9%	<4%
Soil pH	5.6	5.0-6.0
Phosphate (P <sub>2</sub> O <sub>5</sub> )	31 mg/l	>10 (mg/l)
Potassium (K <sub>2</sub> O)	78 mg/l	>30 mg/l

Key: In Target Marginal Variance Out of Target

## Photo Observations and Comments



Figure 1: Weather conditions over the last year have been a real challenge and caused difficulties with course preparations and agronomic improvement on many courses across the UK.



Figure 2: Following a slow start to the season, the greens are reported to have improved notably over recent weeks. Ball roll performance was very good on the morning of the visit (see data results in the appendix section).



Figure 3: Anthracnose was apparent on many of the greens, with significant scarring taking place on smaller surfaces (e.g. 2<sup>nd</sup>) and damp, enclosed greens such as the 10<sup>th</sup>.



Figure 4: Localised dry patch has impacted the slope at the front of the 6<sup>th</sup> green during drier spells of weather and will need reurfing this autumn.



Figure 5: Reducing organic matter beneath the greens remains a priority. This will make the surfaces less susceptible to diseases and disorders (such as anthracnose) and will also help deliver improved year-round performance. The picture above highlights the progress being made through Graden sand injection in the upper soil profile.



Figure 6: The structure of the soils beneath the greens was tight and compact. The current level of aeration input to the greens is insufficient due to a lack of suitable aeration equipment.

## Photo Observations and Comments (continued)



Figure 7: The soil profile beneath the 7<sup>th</sup> green demonstrates the point perfectly. We can see where the bulk of aeration is applied through the upper 2 - 3 inches (see yellow arrow) but where aeration is missed at greater depths, the soil profile becomes tight and anaerobic black layer occurs (blue arrow).



Figure 8: The collars and approaches were generally in good shape and are seeing an improvement in response to increased renovation work. The collar to the left of the 15<sup>th</sup> is currently suffering from dry patch activity and will need an application of wetting agent.



Figure 9: The presentation of the wider areas of the golf course was excellent, with good definition being achieved. The fairways in particular were in fine shape and showing a strong, consistent grass cover.



Figure 10: The main blemish to the fairways and semi-rough was that of clover populations, which were seen in abundance. We discussed the potential for targeting these with a later application of selective herbicide next year.



Figure 11: The tree removal work around the 7<sup>th</sup> green has been extremely impressive and has greatly improved turf conditioning and performance of the green, as well as the overall aesthetics of the hole. Some further work is required around other green complexes – such as the 3<sup>rd</sup>.



Figure 12: The enclosed environment around the 10<sup>th</sup> green compounds its drainage issues – particularly through the winter months. Removal of the 3 silver birch trees behind the green and left hand larch tree would greatly help improve turf quality.

## Recommendations

### Greens

#### Aeration

- Relieving soil compaction through increased aeration would be considered a key priority moving forward. With this in mind, look to carry out air injection to all greens with the Air2G2 unit as soon as possible. This process will cause very little disruption to the surfaces but will do a great job at blasting and shattering the lower soil profiles.
- Ideally this should be repeated again in early spring next year.
- Increasing the level of aeration to the greens moving forward is of paramount importance if we are to make real progress with surface performance and organic matter reduction. Currently, the greens are aerated as and when possible through the year with a tractor mounted drum spiker. This only targets the upper 2 – 3 inches at best and covers a relatively small surface area.
- Applying a greater level of micro solid tine aeration to varying depths of 2 – 6 inches would be highly recommended, however investment in a suitable aeration unit would be needed to make this possible. A unit such as the pedestrian Toro Procore would be ideal, as this is a pedestrian unit and so would negate the need to take a heavy tractor on the greens – therefore allowing for an increase in aeration throughout the year. These units are extremely versatile and create very little disruption to ball roll qualities (especially when using needle tines 6 – 8mm).
- Ideally we should be looking to micro solid tine the greens on a monthly basis throughout the year (if ground conditions are suitable).
- Continue with plans to verti-drain the greens in late October/early November to target deep seated compaction. Look to apply this once the surfaces have fully healed from the renovation work but ensure that surface conditions are appropriate i.e. not too soft or saturated.

#### Surface Refinement

- Lift the height of cut on the greens to 4mm over the coming weeks. Look to implement this in 0.25mm increments to ensure that ball roll qualities remain optimum for the upcoming Club competitions.
- Continue to hand mow the greens when required through the winter and maintain cutting heights at 5 – 5.5mm. this should be regularly checked using a cutting height prism as surface softening can lead to greens being cut shorter than their originally bench set height.
- Looking to next season, I would much prefer to see the greens being maintained at a cutting height of 3.5 – 3.75mm (rather than 3mm) as this will place much less stress on the sward and reduce the likelihood of disease occurrence.

#### Organic Matter Reduction

- Reducing organic matter content beneath the greens remains the key agronomic goal to help deliver improved year round performance and agronomic conditioning. The current values are too high throughout the top 80mm which is leaving the surfaces susceptible to excess softening when wet, as well as providing an ideal environment for Turfgrass disease development.
- Continue with greens renovations as planned towards the end of September, with hollow tining being implemented first using 12mm diameter tines (at 50x50mm spacing) and targeting a depth of 100mm. the tine holes should then be fully-filled with sand, before Graden sand injection work being carried out over the top. Look to Graden to a depth of 22 – 25mm only.

- Ensure that a preventative fungicide is applied 3 – 5 days prior to renovations to protect the surfaces through a time of high disturbance. A follow-up treatment may be required 3 – 4 weeks later using a product such as Instrata, to provide further protection from disease.
- Some additional light sand applications may be required in the subsequent weeks after the renovation work to smooth-out surfaces levels. Ensure that these applications are light and do not smother the surface as this will encourage disease.
- Ongoing sand topdressing in between renovations is essential to dilute organic matter as it accumulates. With this in mind, our aim should be to slightly increase sand inputs to a minimum of 120 tonnes of sand/ha per annum.
- Continue with plans to apply some light winter dressing if the opportunity arises.
- We discussed the timing of greens renovation work next year and agreed that spring treatments are often very difficult as surface recovery can be very slow in the event of a cold, dry spring. This is especially frustrating for golfers if the winter has been poor. Presently, the greens are fully renovated twice per year in spring and early autumn which causes two periods of notable surface disruption in the golfing calendar.
- Our ideal time to renovate the greens from an agronomic/greenkeeping point of view is August/early September as we will gain a much faster rate of surface recovery due to more ideal and consistent soil temperatures. Many Clubs are now opting for this window and allowing for a greens maintenance week in the fixture diary at this time of year. I would highly suggest that Kibworth consider doing the same next year and carry out one full renovation in August, as opposed to two separate renovations in spring and autumn. A simple solid tining and sand topdressing treatment can be applied in spring (causing minimal disruption), followed by a main hollow tining and Graden sand injection renovation in August.

## Nutrition

- Soil chemical analysis results were generally very pleasing. Soil pH has seen a slight increase but values remain ideal and very consistent between the greens.
- Phosphate levels were satisfactory on all 3 indicator greens; however values were notably lower on the 7<sup>th</sup>. There is no need to supplement phosphate for at least a further year.
- Potassium levels were also adequate and in no need of supplementation in the near future.
- The fertiliser programme as a whole is well balanced and I see no need to make any significant adjustment. Our aim should be to closely monitor nitrogen inputs and aim to keep yearly totals at 85 – 100kg/ha.
- Continue as planned with the 8:0:6 granular feed over the coming weeks to strengthen the surfaces leading into autumn and promote recovery following the renovation work.
- Look to apply occasional iron sulphate and/or magnesium sulphate to the greens through the autumn/winter to harden the sward against disease.

## Green Collars, Surrounds and Approaches

- Apply hollow tining and sand backfilling to all approaches and collars in early autumn to reduce organic matter levels at the turfbase.
- These areas should also be verti-drained in the autumn when the operation is applied to the greens.
- Use of the Air2G2 air injection unit in these areas would also be beneficial if time and resources allow.

## Fairways

- The fairways were in good shape and certainly the programme of Primo-Maxx application through the summer appears to be doing a good job.
- The main blemish of that on the fairways is that of high clover populations. The fairways were sprayed with a selective herbicide in May to control broadleaf weeds. This did a good job but with clover not generally beginning its growing cycle until later in the season, the application did little to control clover. Ideally next year, a second selective herbicide treatment should be applied to all fairways and semi rough in mid/late summer to control clover. If budgets do not allow for a second application, then look to cease the first application in May (for broadleaf weeds) and concentrate on clover control later in the summer.

## Tree Removal

- Continue the excellent programme of tree removal to improve the environment around greens which are enclosed with dense tree populations. During the visit, we highlighted that the 10<sup>th</sup> green would benefit significantly from removal of the 3 silver birch trees behind the green, along with removal of the larch tree to the left hand side of the woodland. This would increase morning sunlight to the putting surface and encourage better drying through the winter. During this work, it would also be advised that scrub populations at the base of the trees are cleared out to improve presentation.
- Removal of some of the cherry trees to the right of the 10<sup>th</sup> green would also be advised to help break-up the line of trees and create more of a natural appearance to this area.
- Continue with plans to thin out a few more of the silver birches to the back-right of the 7<sup>th</sup> green and also consider further thinning to the back right of the 3<sup>rd</sup> to increase airflow.

## Signed

A handwritten signature in black ink that reads "A R Newton". The signature is written in a cursive style with a large, looped initial "A" and "R".

Adam Newton BSc (Hons), MBPR, FQA  
Official Agronomist to the R&A Championship Committee

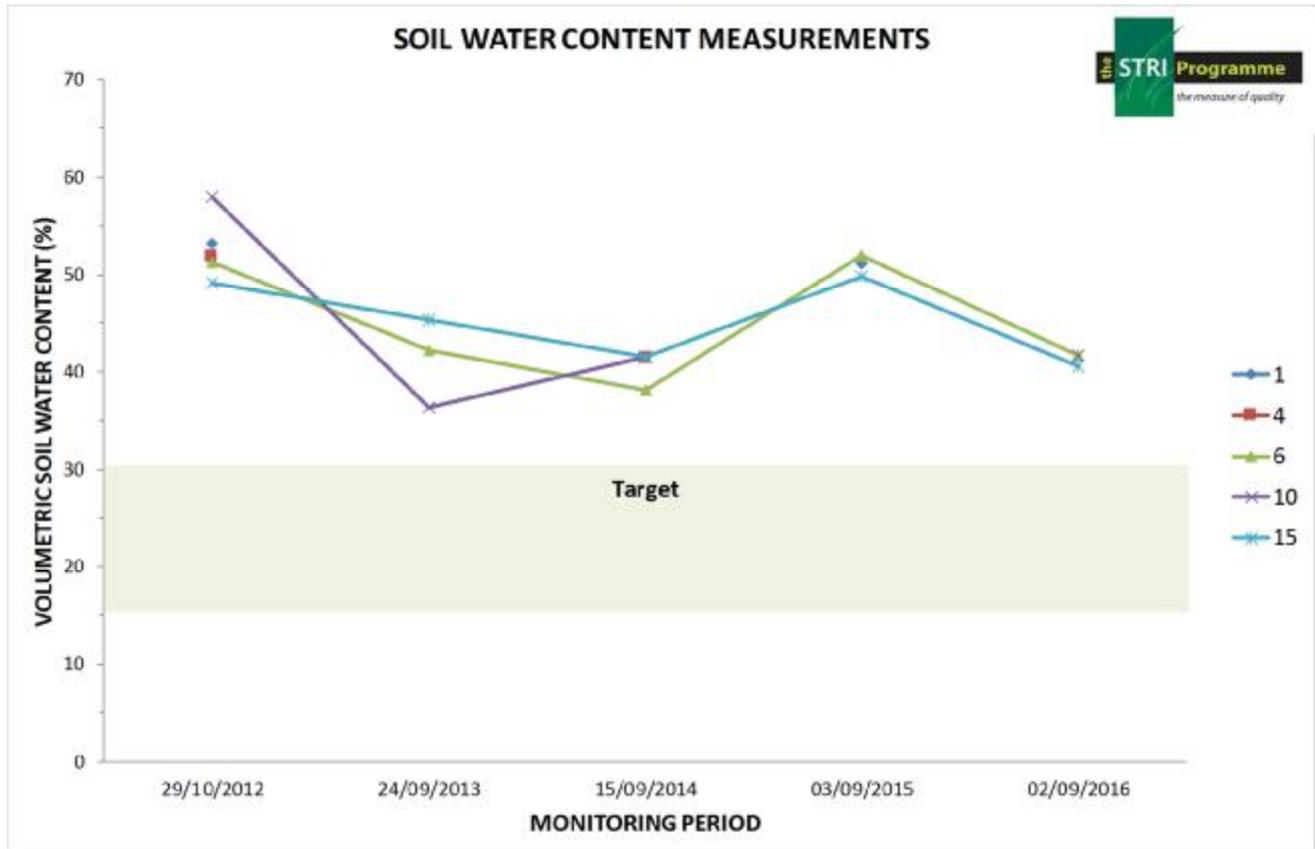
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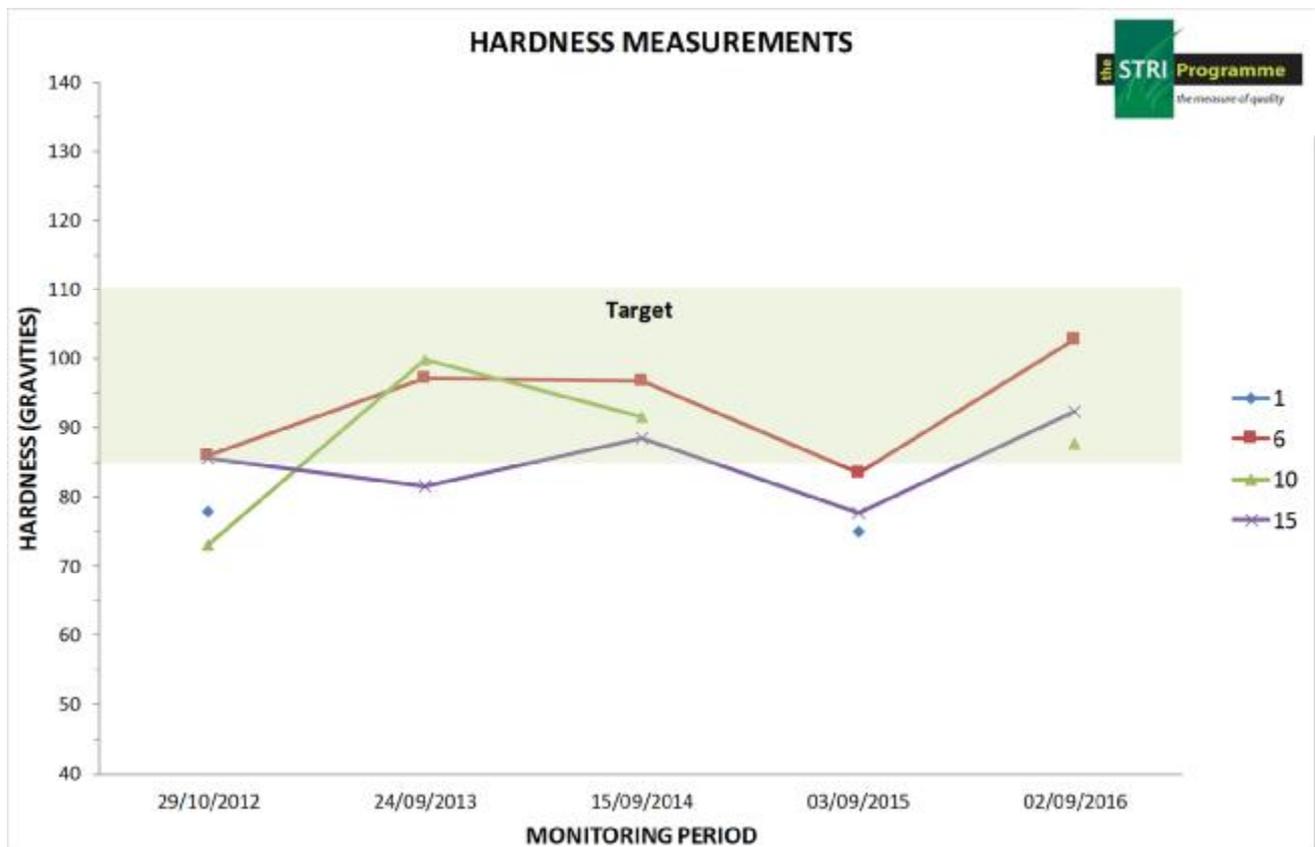
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# Objective Data

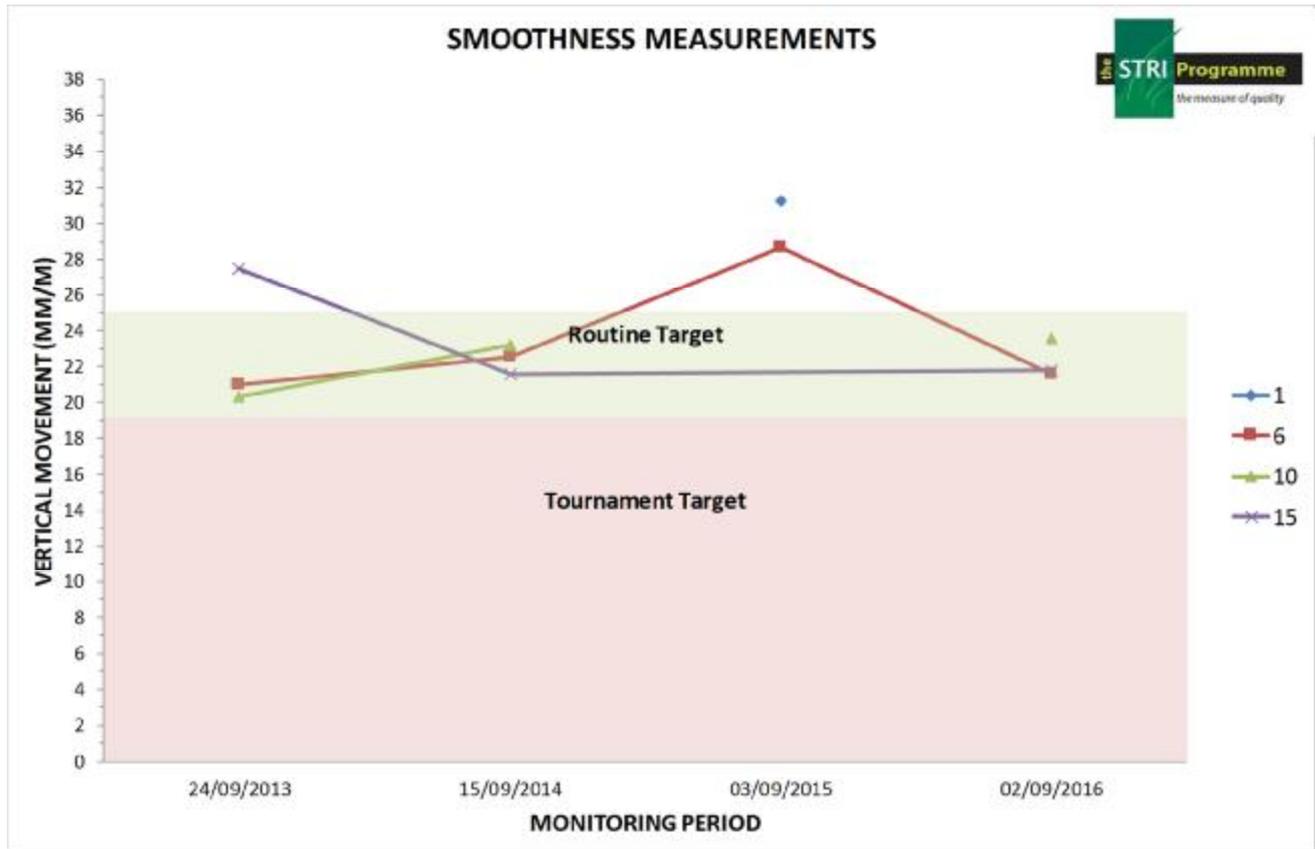


Objective Data Graph 1: Soil moisture values were high following recent heavy rainfall. Upon inspection of the soil profiles, we could see that a combination of excess organic matter at the turfbase and compacting underlying soils are restricting the rate at which the greens drain.

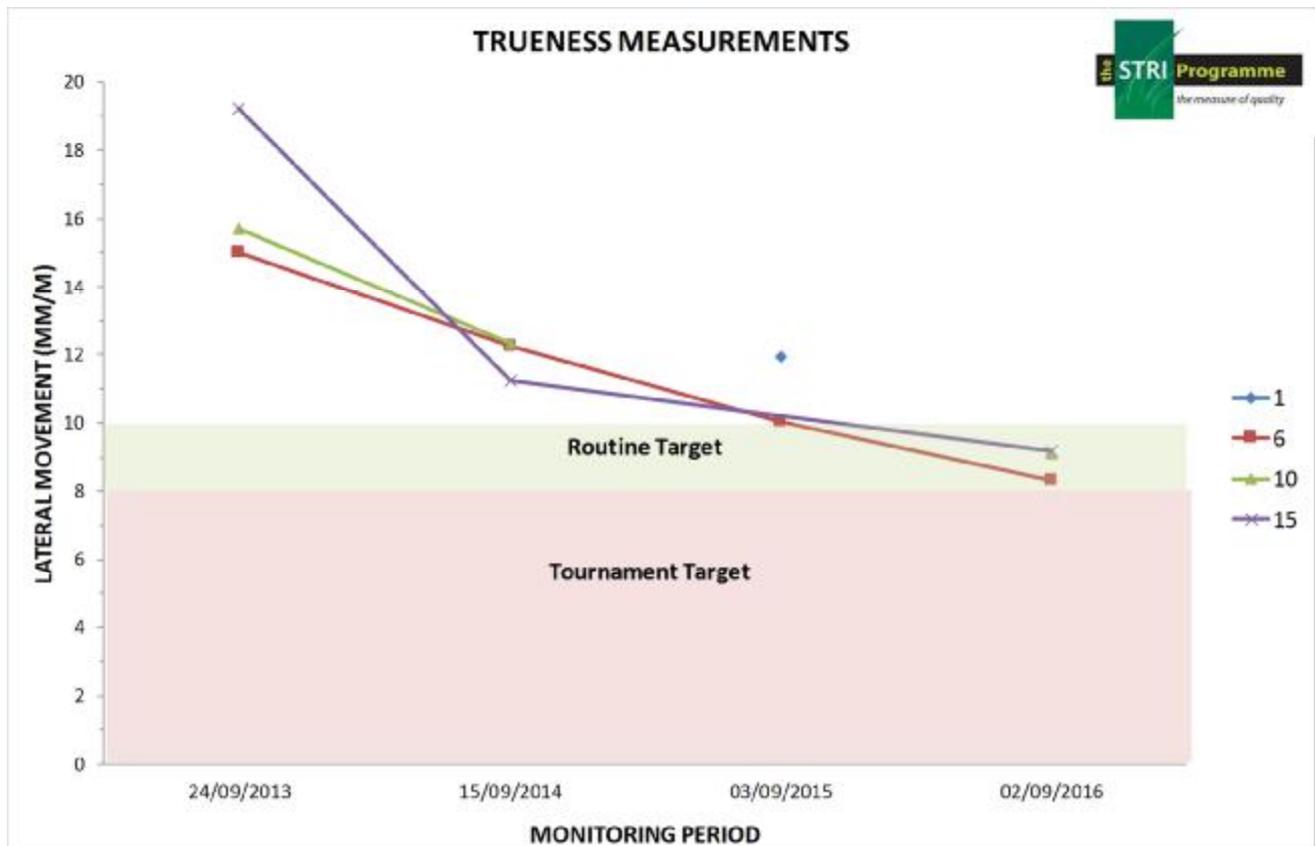


Objective Data Graph 2: Despite such high moisture values, average firmness was the best it's been since testing began, with all 3 indicator greens within target ranges. This highlights the positive improvement made to the condition of the upper soil profiles over recent years.

## Objective Data (continued)



Objective Data Graph 3: The smoothness of ball roll was excellent, with all greens in target range and a very good consistency from green to green.



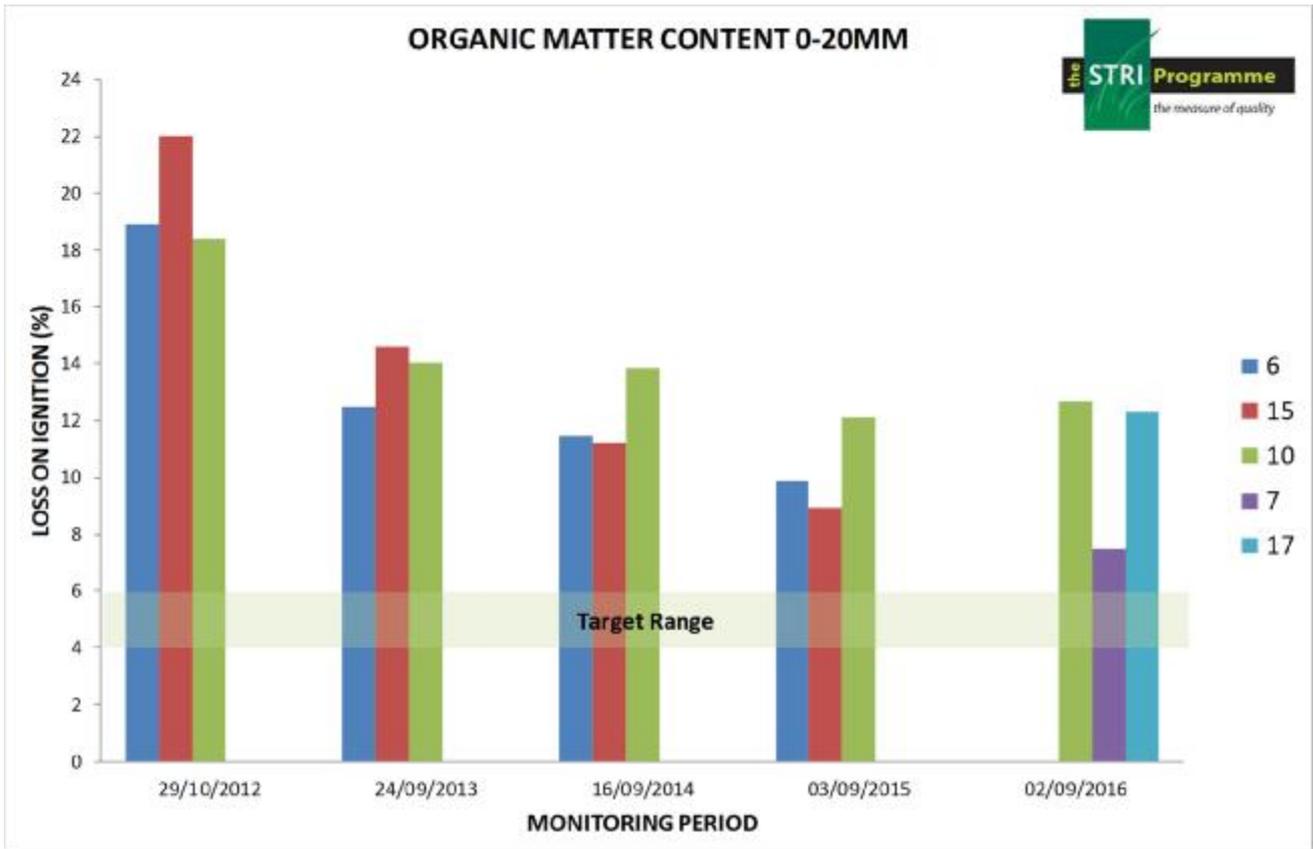
Objective Data Graph 4: Trueness values were also very good and the best that they have been during testing. There has been a positive improvement in trueness each year since 2013.

# Objective Data (continued)

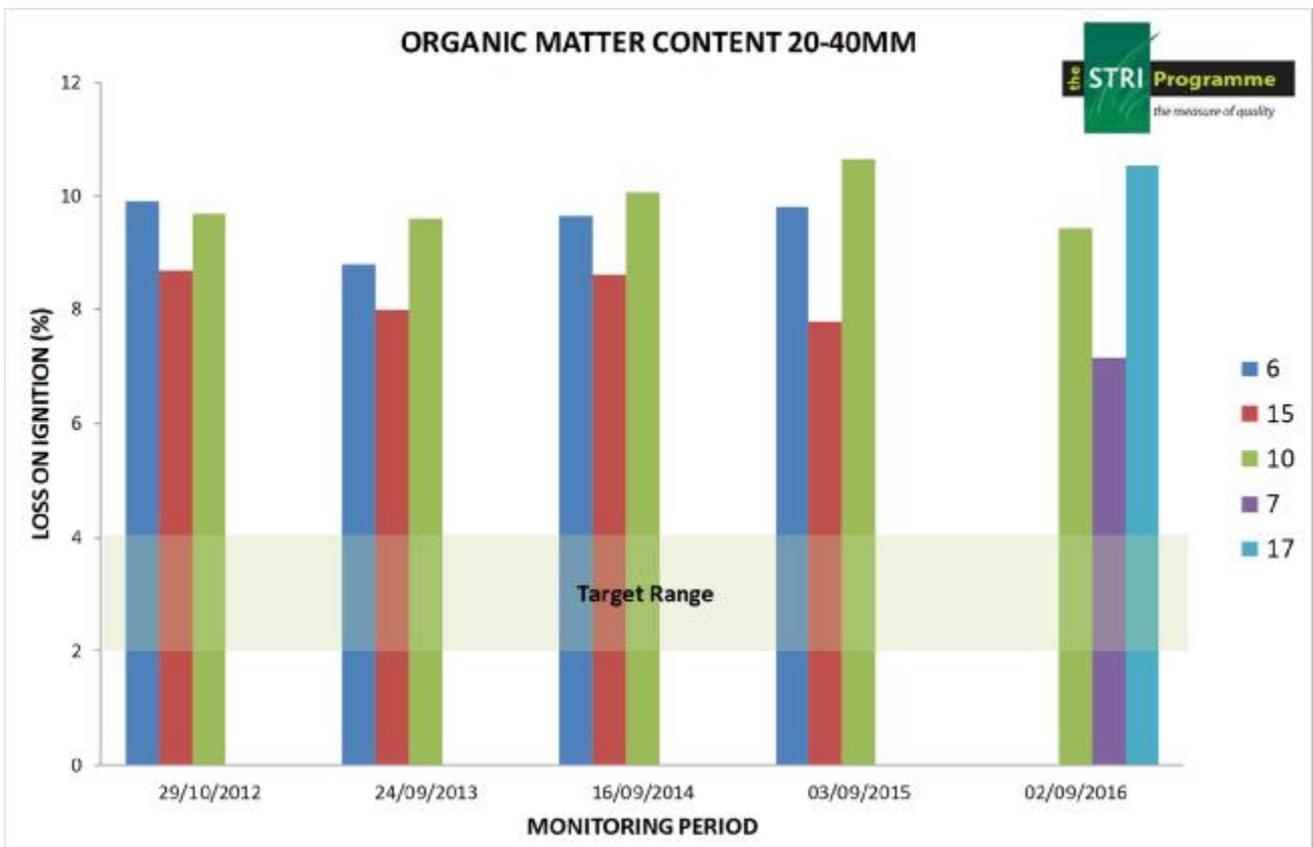


Objective Data Graph 5: The surfaces were well-paced, with green speed averaging at 8ft 9in. This is an ideal pace for routine play and will provide an enjoyable challenge for golfers of all abilities. Again, this is the first time that all 3 indicator greens are inside target ranges for green speed.

# Soils Laboratory Data

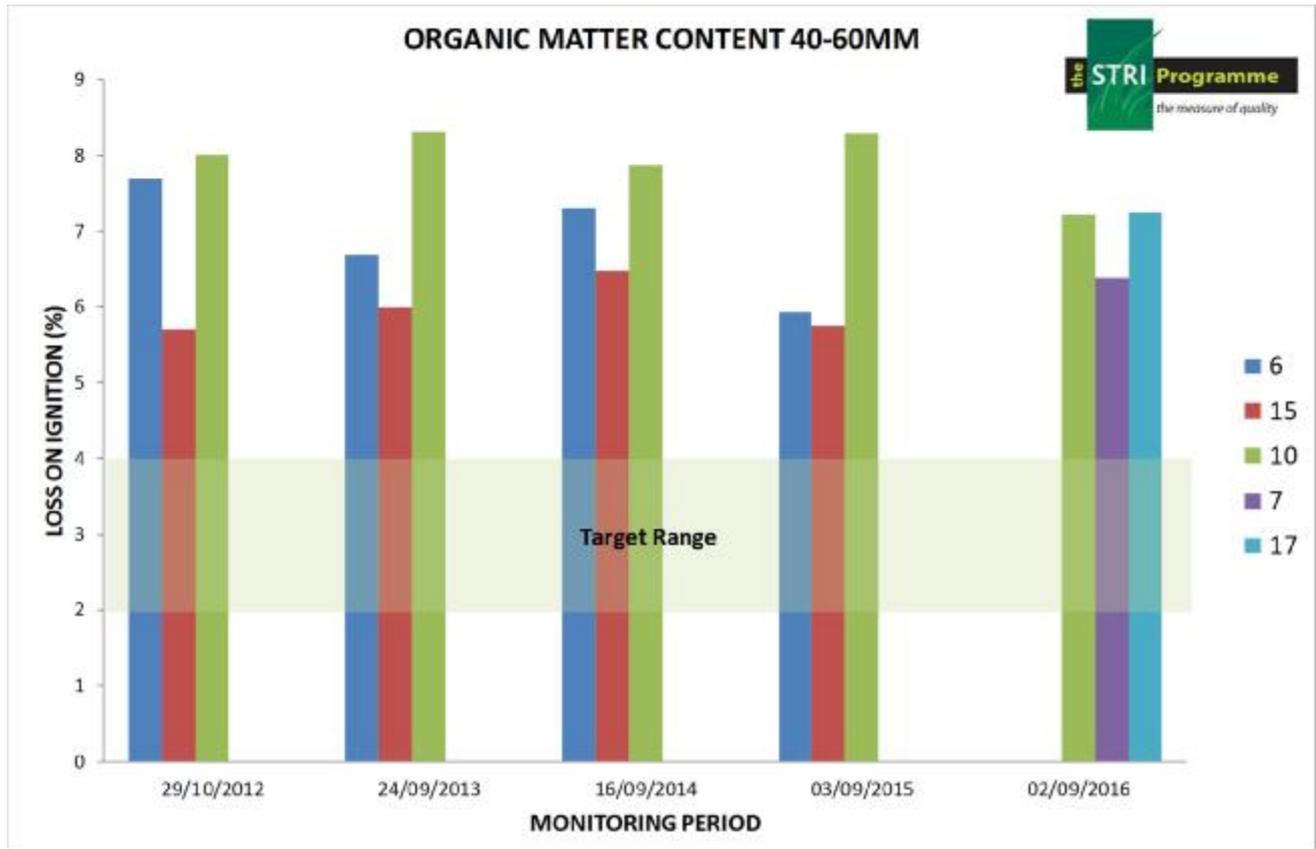


Soils Laboratory Graph 1: Organic matter content in the upper 20mm has remained relatively stable over the last year, with values averaging at 10.8%. These values are still much higher than target ranges and are holding back the year round performance of the surfaces. Reducing organic matter remains one of the key agronomic priorities.

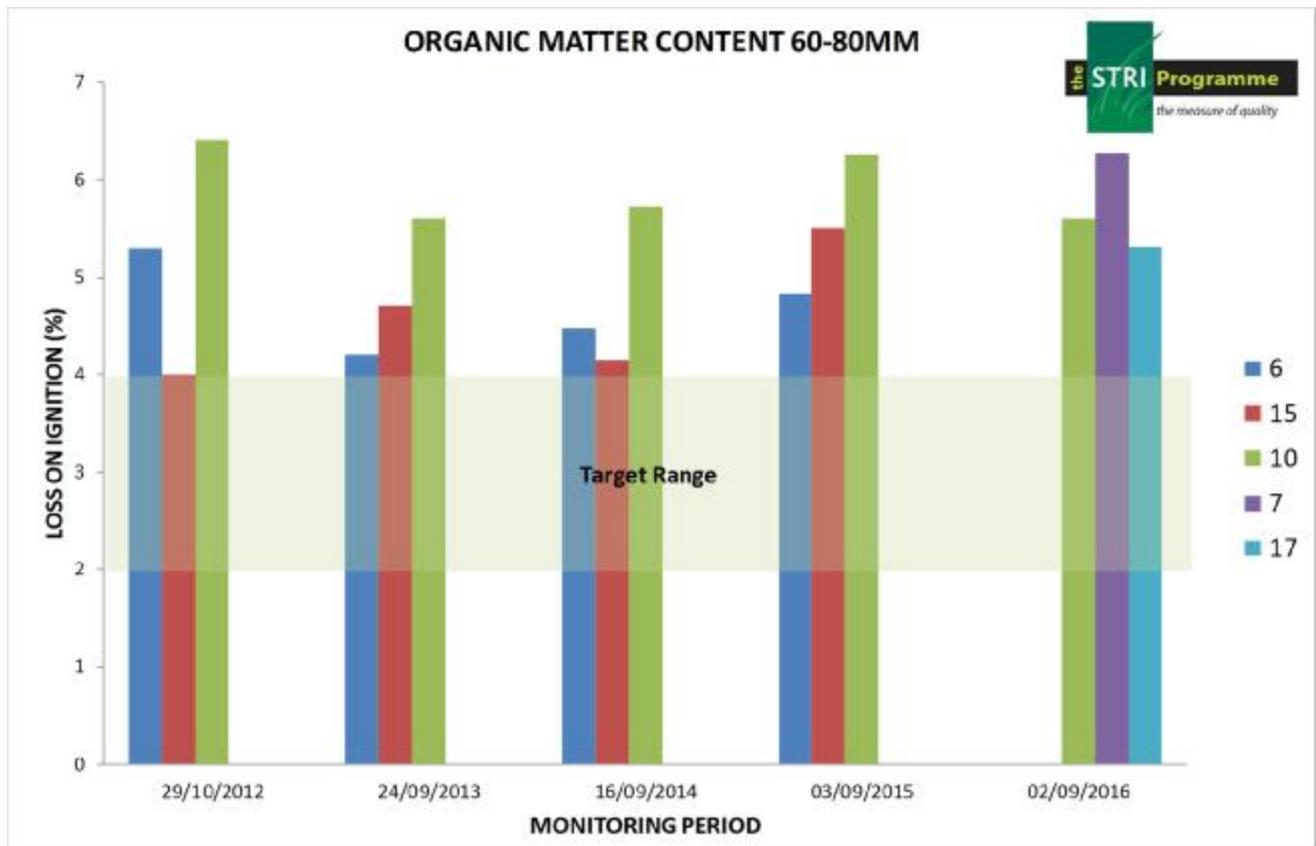


Soils Laboratory Graph 2: Values at 20 – 40mm depth have seen a slight reduction, however still remain far too high.

# Soils Laboratory Data (continued)



Soils Laboratory Graph 3: Values on the 10<sup>th</sup> green have seen a real reduction over the last year but again are still much higher than ideal.



Soils Laboratory Graph 4: Values are closer to target ranges at 60 – 80mm depth but still require further reduction.

## ORGANIC MATTER CONTENT

CLIENT: KIBWORTH GC  
ADDRESS: WEIR ROAD,  
KIBWORTH BEAUCHAMP,  
LEICESTERSHIRE, LE8 0LP

DATE RECEIVED: 12/08/16  
DATE REPORTED: 25/08/16  
RESULTS TO: ARN

TEST RESULTS AUTHORISED BY:  
Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION	LOSS ON IGNITION (%)*
A15124/1	7 0-20 mm	7.5
	20-40 mm	7.1
	40-60 mm	6.4
	60-80 mm	6.6
A15124/2	10 0-20 mm	12.7
	20-40 mm	9.4
	40-60 mm	7.2
	60-80 mm	5.6
A15124/3	17 0-20 mm	12.3
	20-40 mm	10.5
	40-60 mm	7.2
	60-80 mm	5.3

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



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

Testing Certificate 2159 - 01



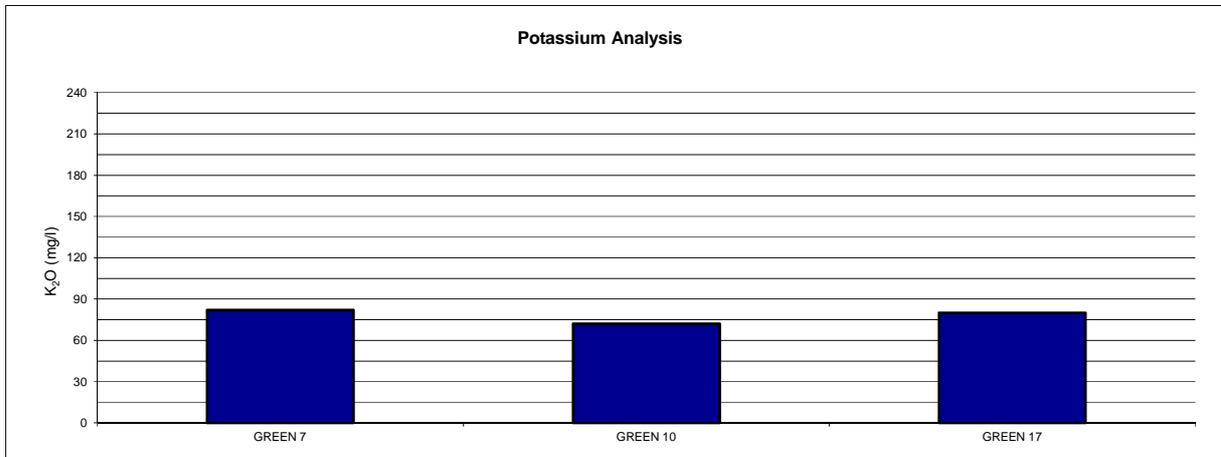
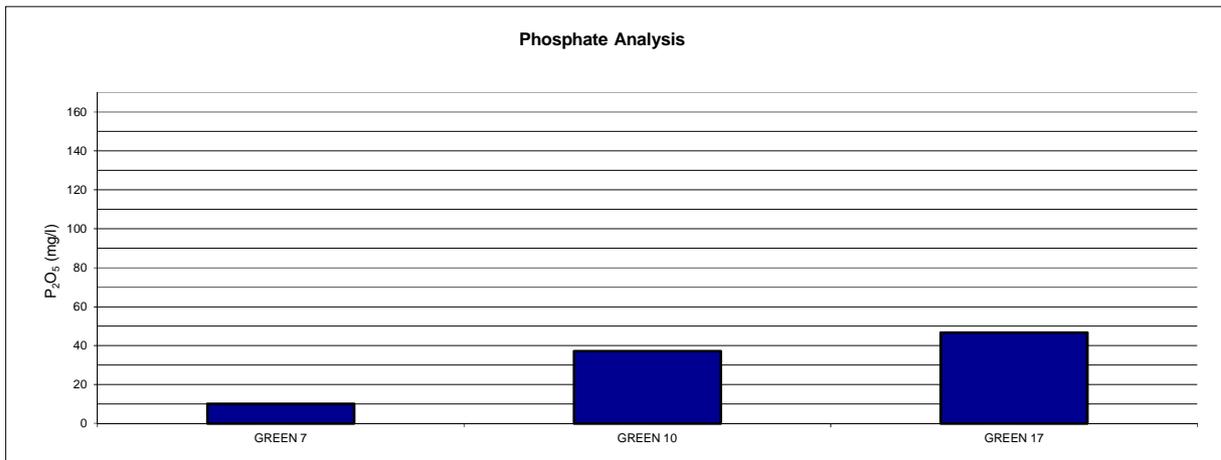
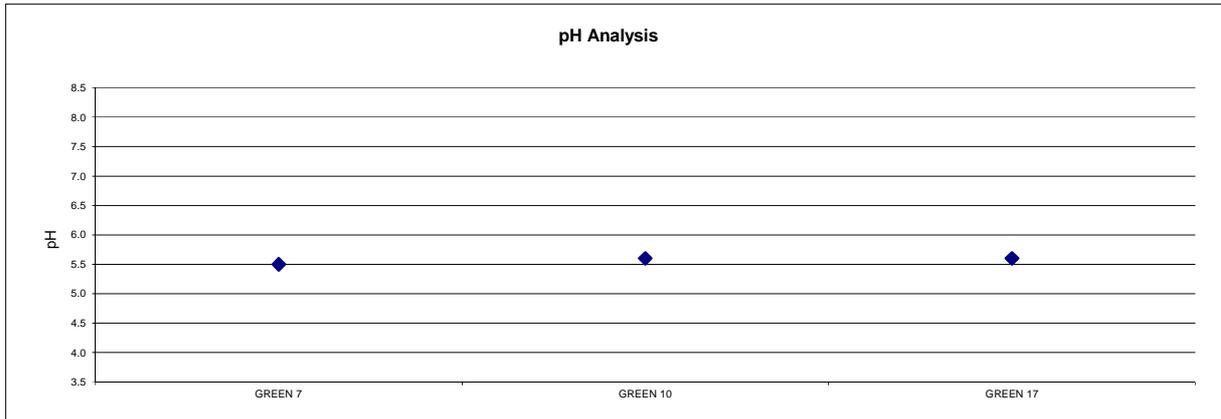
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## SOIL CHEMICAL ANALYSIS

## KIBWORTH GC

Date: 12/08/16



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