

The logo for STRI (Scottish Turf Research Institute) features the letters 'STRI' in white, bold, sans-serif font. The text is set against a dark green rectangular background that has a subtle, stylized pattern of grass blades or turf.

Kirkhill Golf Club

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: Friday 19th August 2016

Consultant: Richard Windows

Kirkhill Golf Club

Date of Visit: Friday 19th August 2016

Visit Objective: To review the annual condition of the course, take objective measurements of green performance and confirm ongoing maintenance requirements.

Present: Mr Scott McCittrick – Course Manager
Mr Richard Windows – STRI Ltd

Weather: Overcast, cool and breezy

Headlines

- The course has performed well this season with excellent standards of presentation.
- Superb level of maintenance achieved due to excellent management and commitment of Greenstaff.
- Staff shortages have made it a difficult season. Ideal levels of staff are considered to be six.
- While presentation has been excellent, reduced staff levels have meant certain key aspects of maintenance have been compromised this season, e.g. greens top dressing and divot patching.
- Ball roll qualities were superb to the greens and some of best measured this season.
- Organic matter levels at 0-20 mm have increased from 7.5% in 2014 to 9.0% in 2016.
- Organic matter levels at 20-40 mm and below show a positive trend of reduction and are in target.
- Performed well in wet winter due to pipe drainage and lowering organic matter below 20 mm.
- Primo working excellently on semi-rough and allowing single cut per week.

Key Actions

- Additional organic matter reduction should be focussed into the top 20 mm of the soil profile.
- Aim to increase sand top dressing and double up autumn Graden intensity in mid-September.
- Selected deep aeration and sand funnelling to BL2, B5 and whole of 15.
- Osprey wetting agent to greens should be continued.
- Preventative fungicide programme is working and keeping greens scar free.
- Sustain programme of tee marker movement to concentrate play before moving markers.
- Use of Primo growth regulator onto semi rough is maintaining presentation with one cut a week.
- Implement scarification to fairways and approaches using the new Terra-Rake.
- Drainage into fairways with initial priority to the 17th fairway.

Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	33.1% (range 31-35%)	15-30%
Hardness (Gravities)	104 Gravities (range 98-109)	85-110 g
Smoothness (mm/m)	13.8 mm/m	<25 mm/m
Trueness (mm/m)	3.6 mm/m	<8 mm/m
Green Speed	10 ft 1 in	9-10 ft 6 in
Organic Matter 0-20 mm (%)	9.0%	4-6%
Organic Matter 20-40 mm (%)	4.0%	<4%
Soil pH	5.2	5.0-6.0
Phosphate (P ₂ O ₅)	16 mg/l	>10 (mg/l)
Potassium (K ₂ O)	91 mg/l	>30 mg/l

Key: In Target Marginal Variance Out of Target

Photo Observations and Comments



Figure 1: Presentational standards are of their usual excellent standard. Achievement of these standards are especially good considering the relatively low number of greenstaff.



Figure 2: The performance of the greens was superb during the visit and smoothness and trueness was particularly good following a cut and roll on the morning of measurements.



Figure 3: Sward density, health and turf texture was excellent and very consistent between greens. A minimalist and sustainable programme is delivering high performance on a consistent basis throughout the season and longer in the year.



Figure 4: 3G intensive pipe drainage (1 metre intervals) combined with deep aeration and sand funnelling has significantly improved the year round performance of this green.



Figure 5: Par 3 tees have improved following tetraploid ryegrass seeding and more regimented tee marker movement and therefore healthier and better grassed as result.



Figure 6: The use of Primo-Maxx growth regulator in the cut rough is maintaining excellent presentation with only one cut per week.

Recommendations

Greens

- Reducing organic matter levels at 0-20 mm is the key area for attention on the greens. The following methods were discussed to achieve this objective:
 - Intensify Graden sand injection operation in mid-September to a double pass with the second at a slight angle to the first.
 - Implement solid tining and sand brushing during February & March to ensure heavier applications of sand can be absorbed into the upper soil profile with minimal impact on mowing and play.
 - Aim to achieve light surface dressings through the season at the current rate. With the above amendments, the level of organic matter should start to show a trend of reduction.
- Nutrient inputs are minimal and work well using a combination of granular feeds and straight forms of fertiliser applied in foliar form supplemented with Molturf and seaweed as required.
- The refinement programme is working excellently at delivering consistent and high quality ball roll for routine play.
- Preventative fungicide inputs are keeping the greens scar free and should be sustained along with the use of phosphite.
- Routine aeration inputs are working well and should be sustained.

Approaches & Fairways

- Now the drainage performance of greens are generally so good extending drainage improvement works into the approaches and fairways is now considered the next priority.
- The initial phase of work should involve scarification using the new Terra-Rake. This unit is quick and efficient and will allow multiple passes to be achieved.
- In addition to scarification, pipe drainage should be installed to the 17th fairway as the first drainage project to be completed.

Tees

- The tees are significantly improved from the last visit due to better movement of markers and the use of winter mats on selected holes and divot patching with tetraploid ryegrass.

Rough

- The use of Primo-Maxx growth regulator is doing an excellent job and should be sustained.

Tree Removal

- Remove trees to the left of the 15th medal tee and also in the tee shot carry to open up the sight line to the fairway.



Signed

A handwritten signature in black ink that reads 'Richard Windows'.

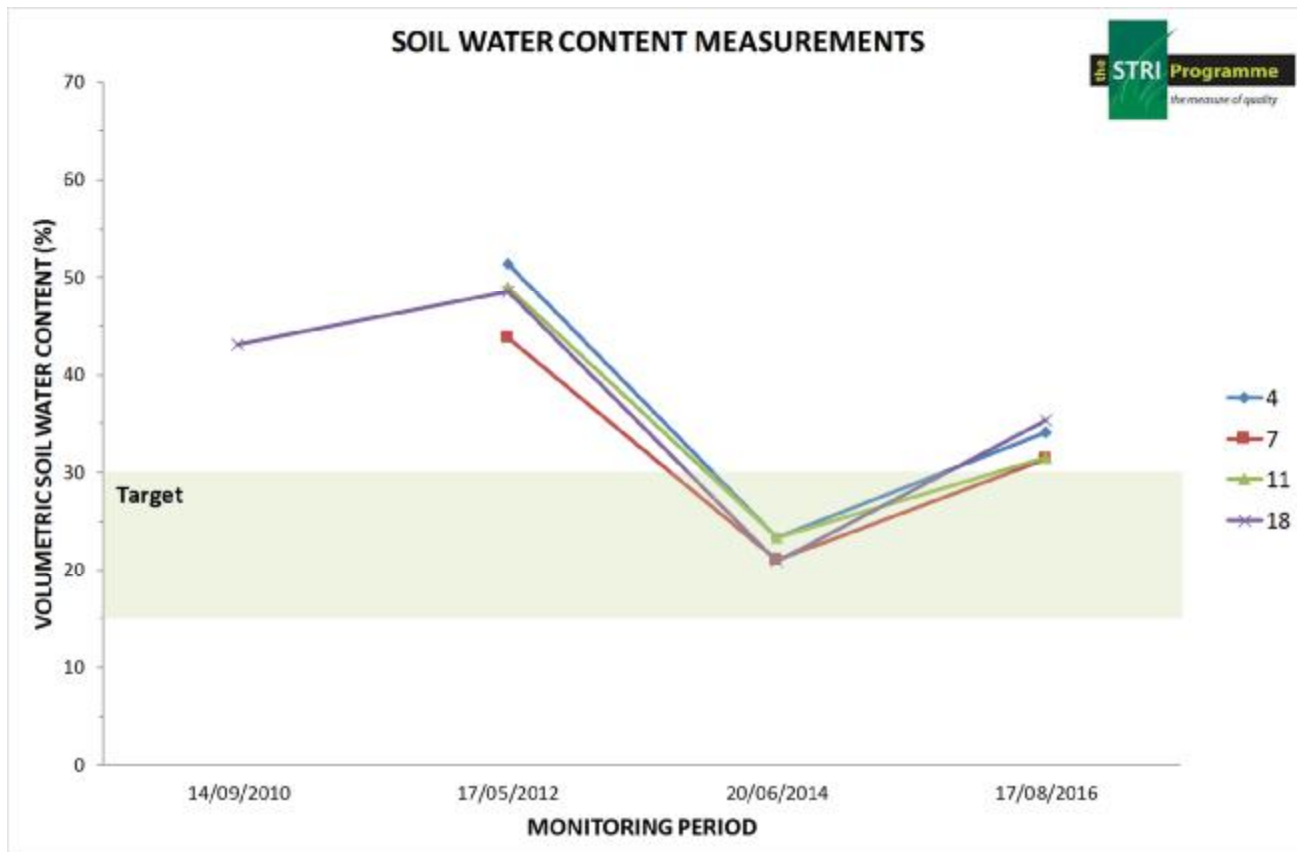
Richard Windows
Agronomy Service Manager
Official Agronomist to the R&A Championship Committee

E-mail: Richard.windows@stri.co.uk

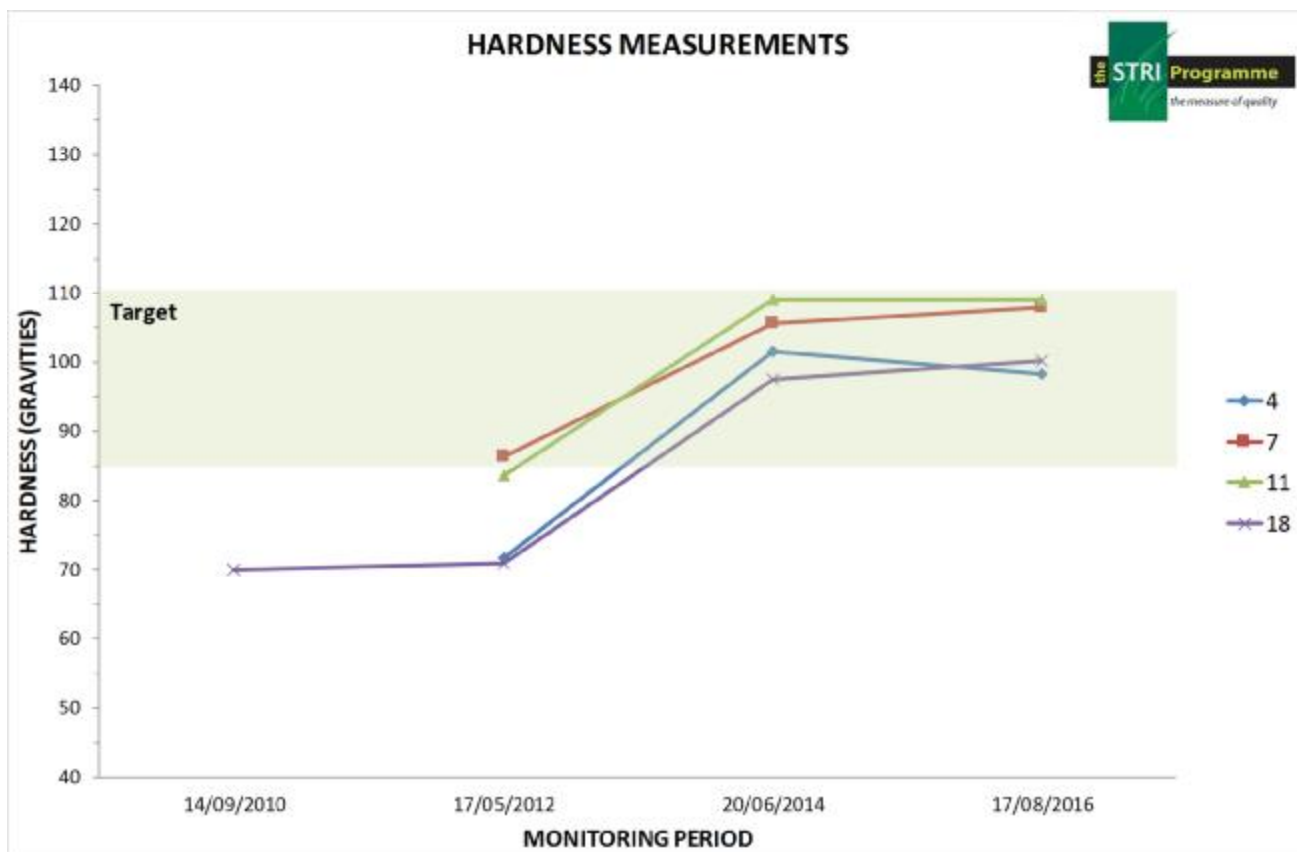
Mobile: 07968 263204

STRI is completely independent and has no alliances to commercial products, services or contractors. This ensures that our design, project management and advisory services provide the best solutions for each individual client.

Objective Data

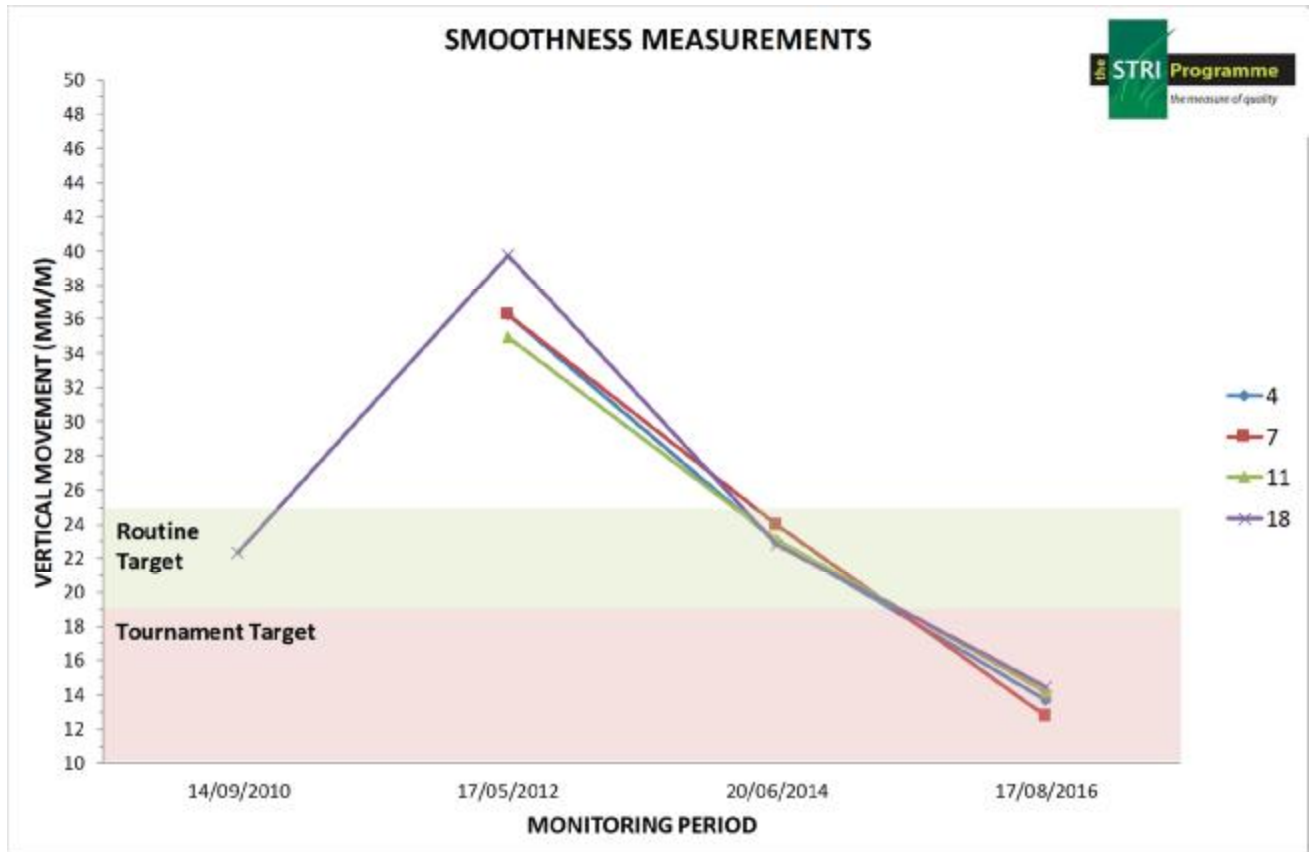


Objective Data Graph 1: Average soil moisture values were 33.1% and consistent between each green but just out of target. As you will see below, the higher than target moisture values are not negatively affecting surface firmness and are therefore not a concern.

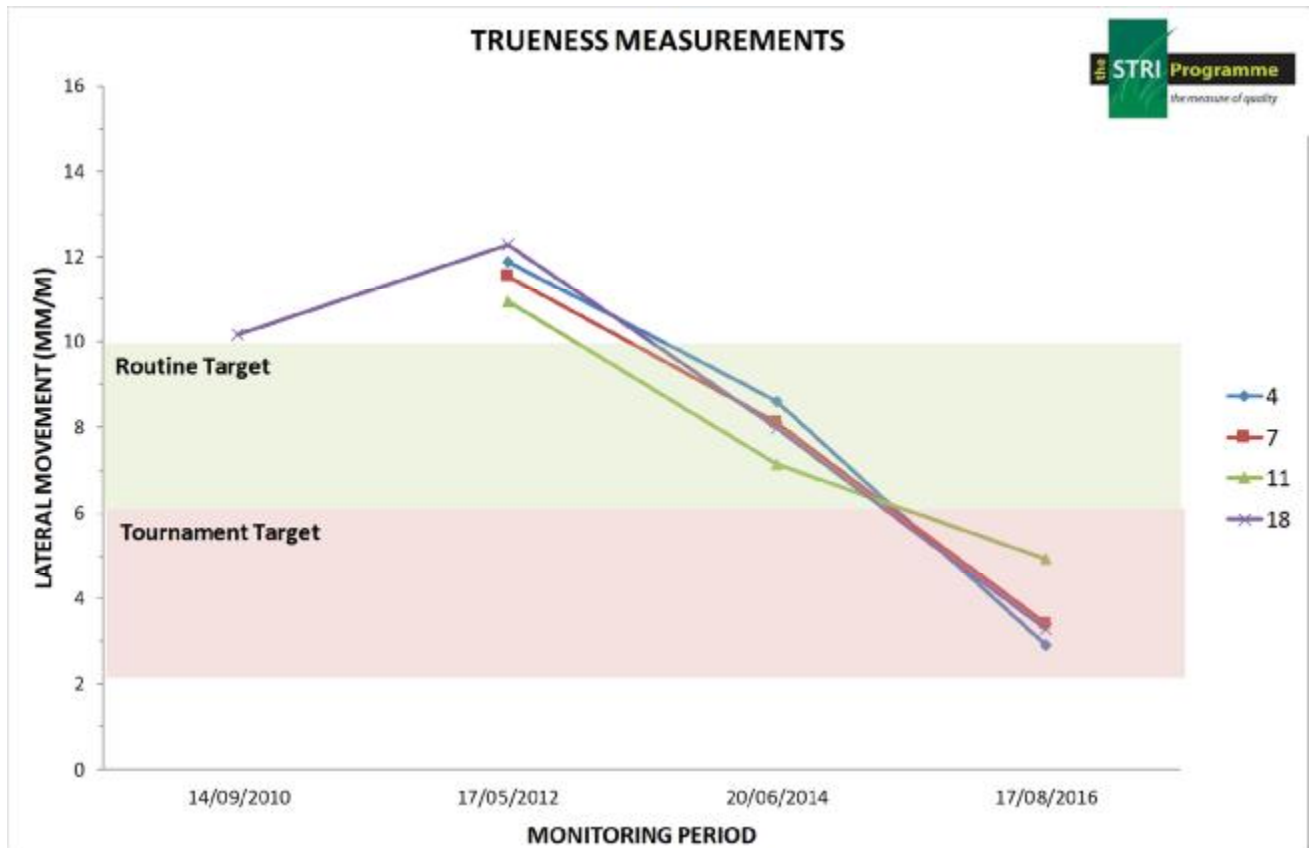


Objective Data Graph 2: Average firmness values were 104 gravities with all greens towards the top of the target and good consistency between greens. It was pleasing to see firmness values were consistent with last year despite higher soil moisture 33% this year compared to 23% in 2014.

Objective Data (continued)



Objective Data Graph 3: Smoothness values were exceptionally good and some of the best values measured this season on parkland greens. The greens were pure following a cut and roll prior to the measurements and really do illustrate how good the greens are on a routine basis at Kirkhill.



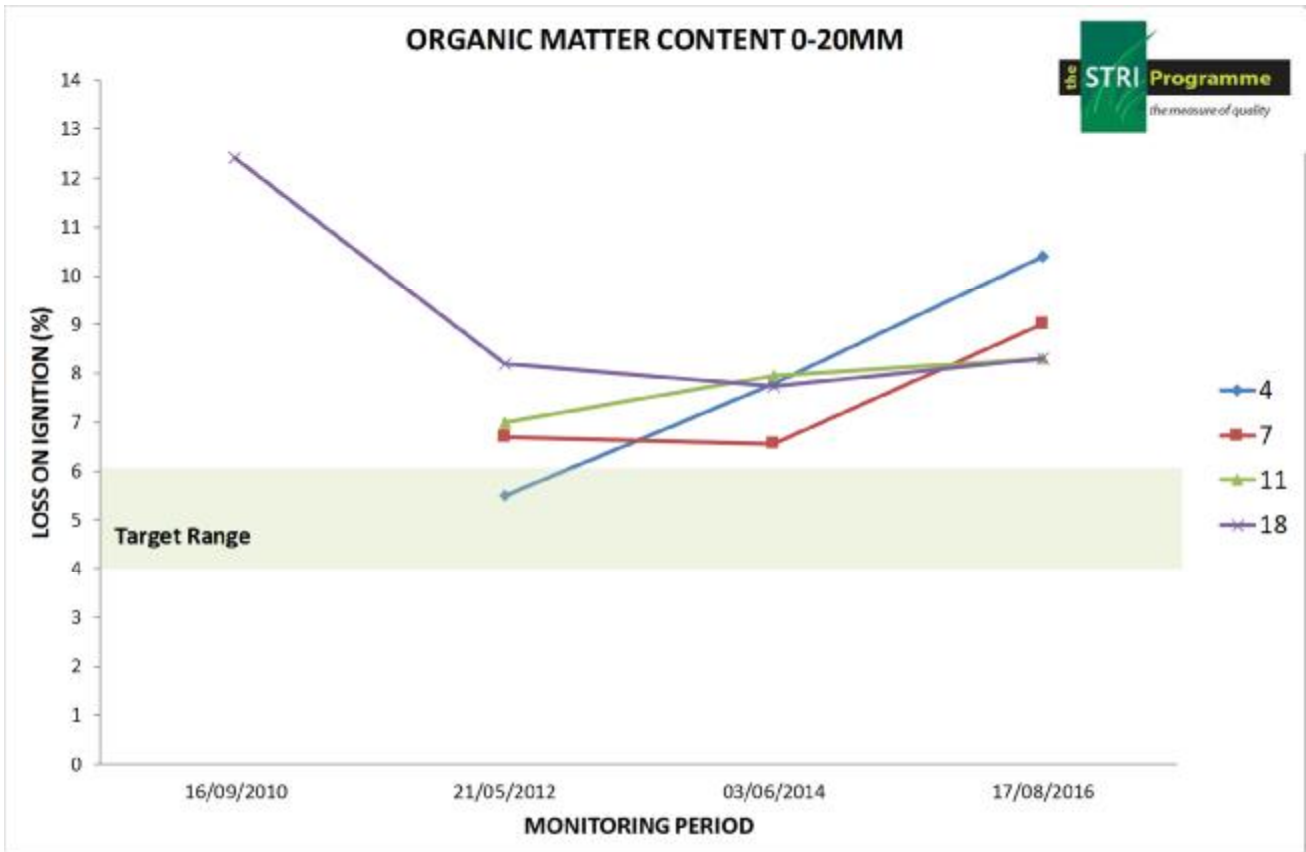
Objective Data Graph 4: Like with smoothness, trueness values were similarly exceptional.

Objective Data (continued)

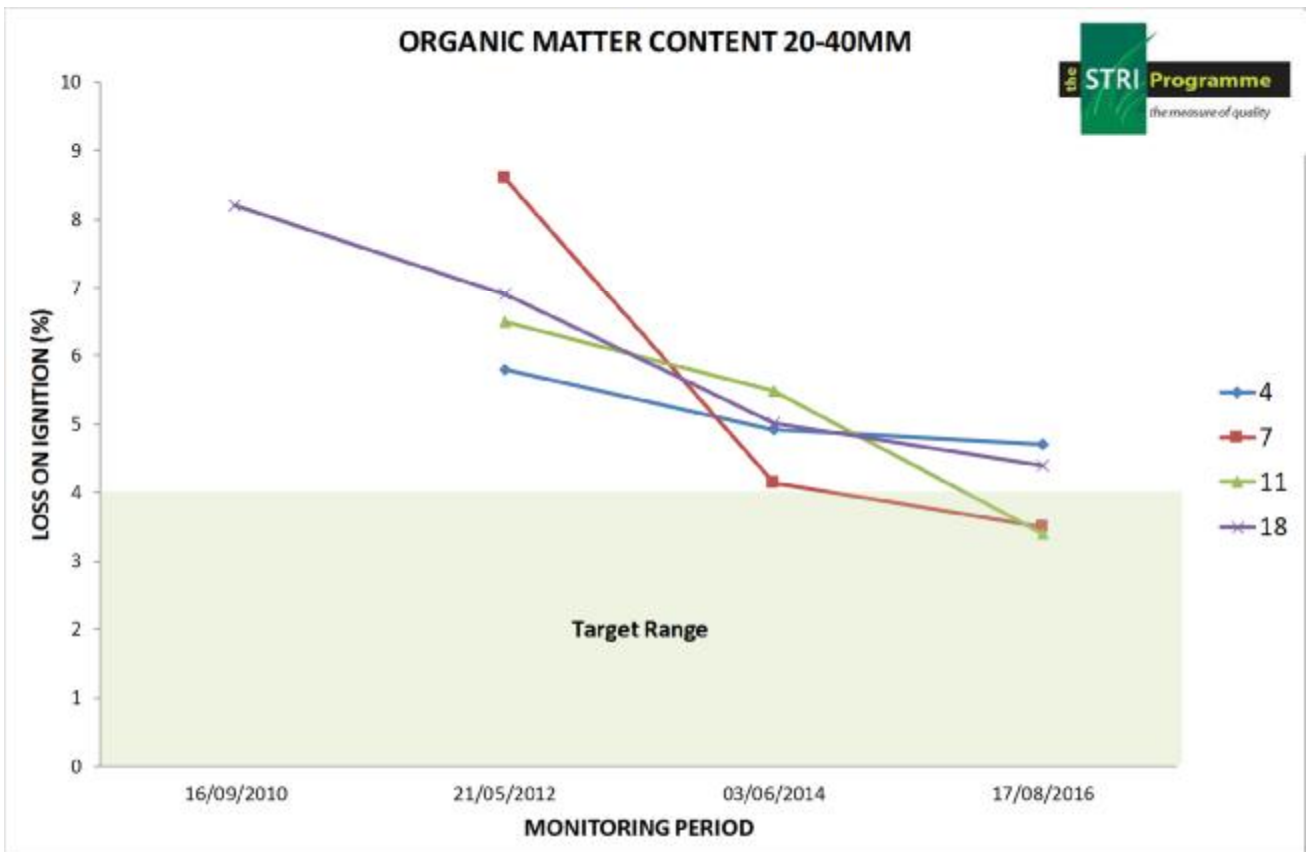


Objective Data Graph 5: Average green speed was 10 ft 1 in and speed was holding well throughout the morning illustrating the greens retain their pace well following morning maintenance.

Soils Laboratory Data

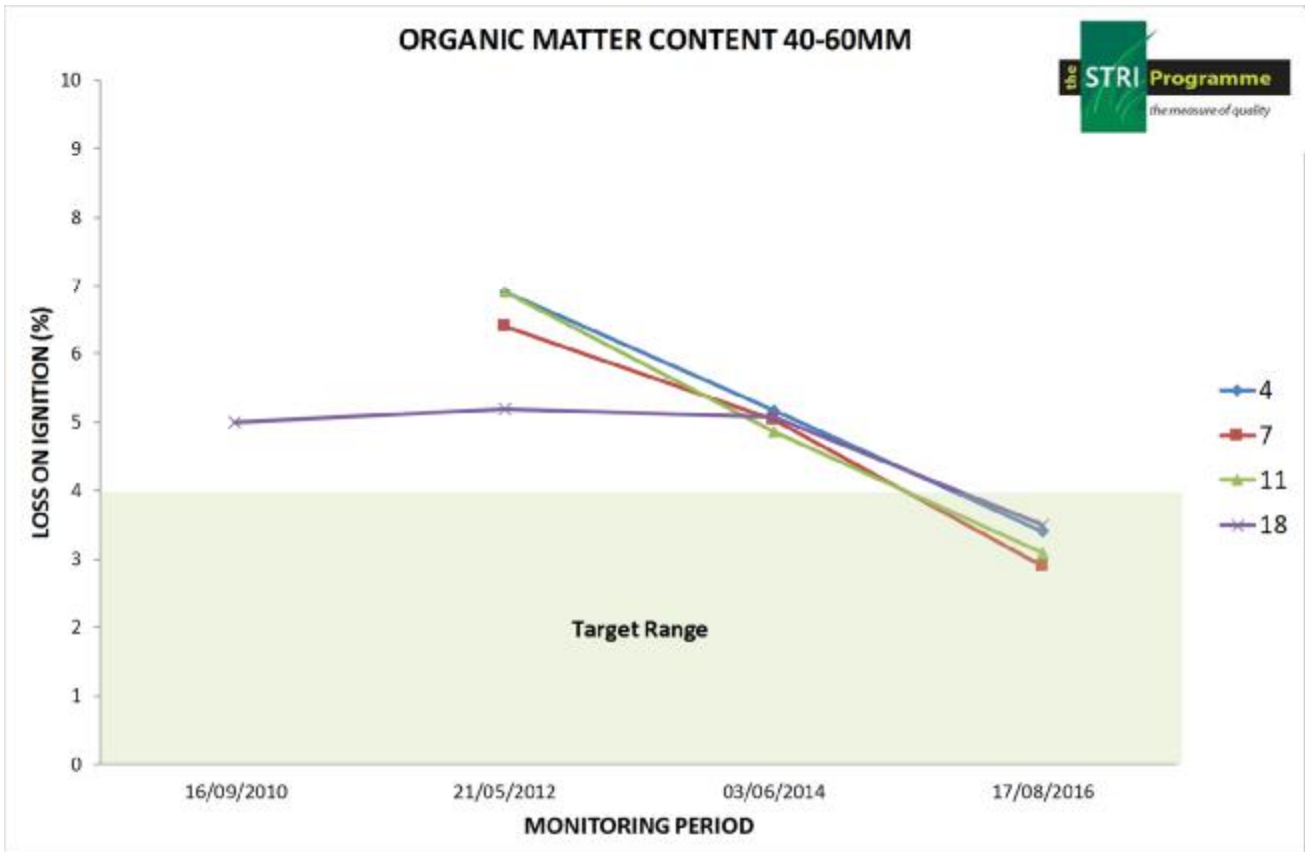


Soils Laboratory Graph 1: Values at 0-20 mm have increased from 6.8% in 2012, 7.5% in 2014 to 9.0% in 2016. 4G has shown a particular increase. Additional work should be focussed into the top 20 mm in order to reduce values towards target.

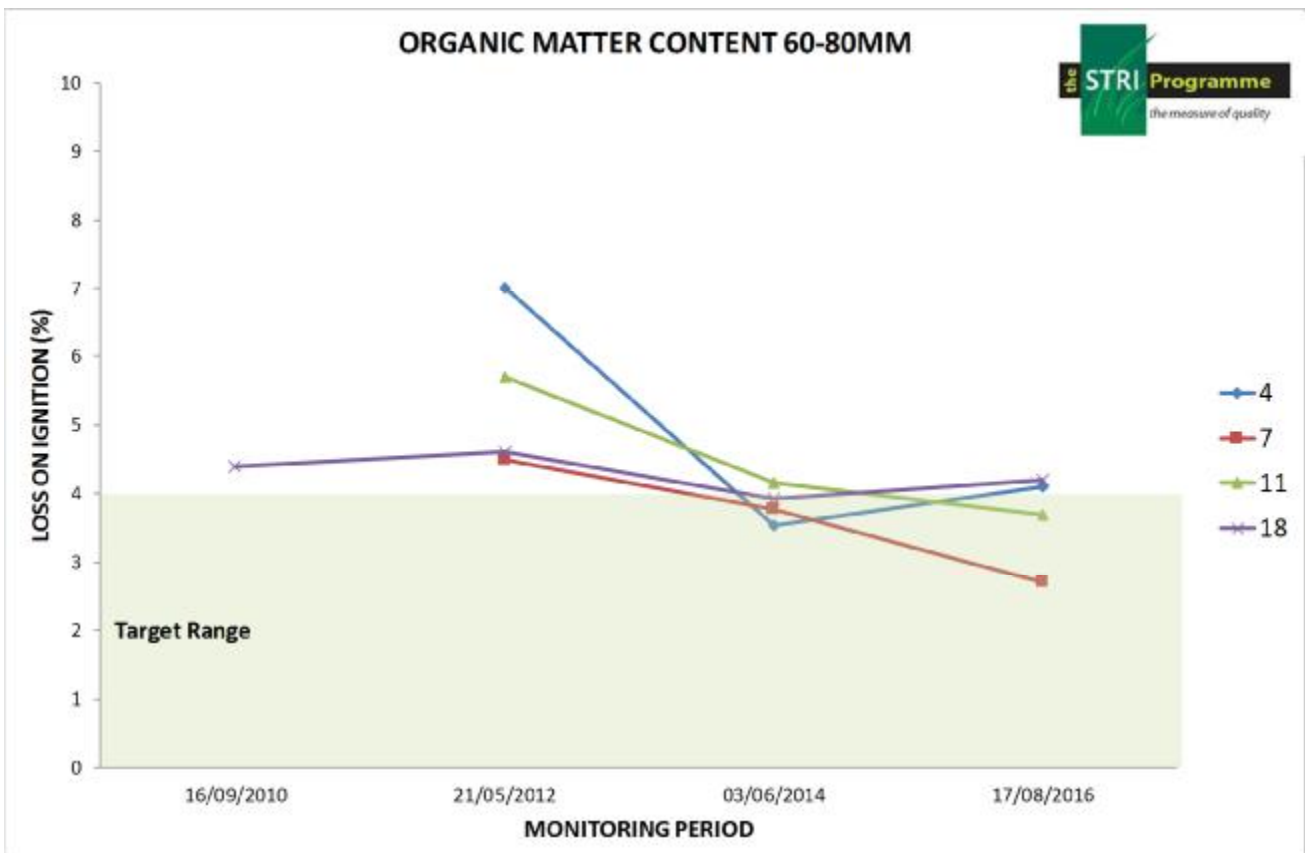


Soils Laboratory Graph 2: Values at 20-40 mm show a positive trend of reduction from 6.9% in 2012, 4.9% in 2014 and 4% in 2016. Average values are now in target but sustaining the current programme will bring 4G & 18G into target over the next couple of years.

Soils Laboratory Data (continued)

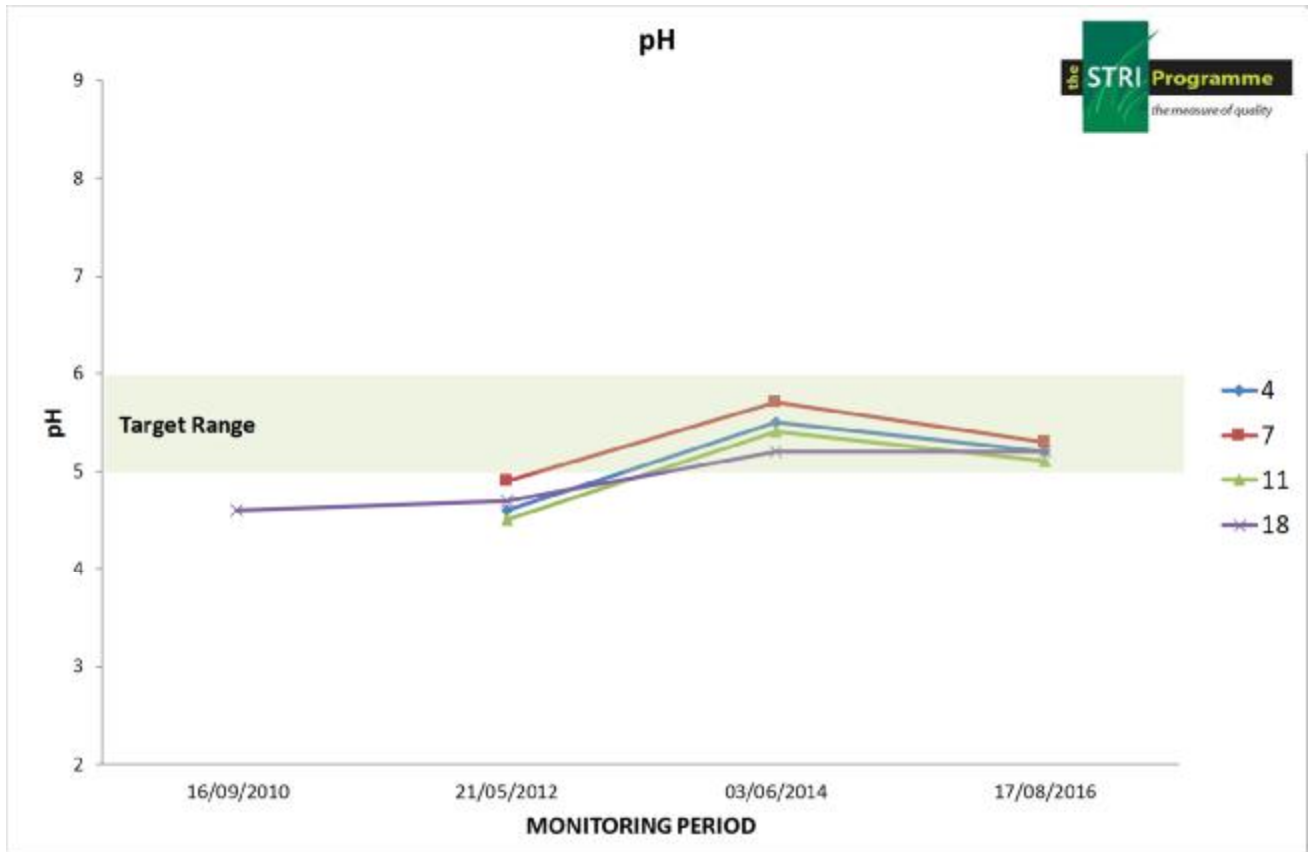


Soils Laboratory Graph 3: Values at 40-60 mm show a positive trend of reduction and values are now in target.



Soils Laboratory Graph 4: A similar positive trend of reduction has been noted at 60-80 mm depth.

Soils Laboratory Data (continued)



Soils Laboratory Graph 5: Soil pH has stabilised at an average of 5.2.