



GLASGOW GOLF CLUB – GAILES LINKS

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 3rd July
Consultant: Jay Dobson

CONFIDENTIAL

Date of Visit: 24th June 2014

Visit Objective: To carry out an inspection of the golf course ahead of Final Qualifying and take data from the six indicator greens

Present: Mr Jim Brown – Greens Convenor
Mr Alistair Gracie – Committee
Mr Brian Dickson – Course Manager
Mr Jay Dobson – Turfgrass Agronomist – STRI Ltd

Weather: Wet and mild

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Executive Summary

- As we have already carried out two inspections for The R&A and the Club, we have already dealt with all of the priorities ahead of Final Qualifying. This visit primarily takes data from the six indicator greens to allow us to tailor final parts of the programme in the work up to Final Qualifying.
- The course looked in excellent condition and as noted Brian and the greenkeeping team have completed the majority of the requirements in good time ahead of Final Qualifying. This primarily means that now there is just some “polishing” required on the play surfaces and the course generally.
- We had some further discussions on preparations, all of which are well progressed.
- We looked at playing qualities on greens and also on approaches mainly to affirm consistency and authentic ball/turf interaction.
- We further discussed maintenance protocols post Final Qualifying and in particular organic matter control and removal and the timing of these works. This was thought best to focus around coring in autumn with further work to Graden and core in spring 2015.
- We had some further discussions on testing the greens which are currently not in the data set. This would be 13 greens including the practice putting green allowing for the usual collection of organic matter samples as well as moisture, firmness, smoothness, trueness and pace. This would be a worthwhile option giving you a better understanding of how the greens perform globally in comparison to those we currently test.

Key Observations

Greens



Density, uniformity



Poa seed heads 13th

- Since our last inspection in early June, the meadow grass seed heading issue has reduced somewhat and the surfaces are settling nicely. Density and uniformity was excellent at the 3.5mm height of cut.
- The blend as we have noted before is good on the greens and now that the seed heading issue is beginning to reduce and diminish, there is a pleasing amount of bent grass blended through the surfaces giving good aesthetics and playing quality.
- Surfaces were beginning to produce a nice “dappled” appearance in reaction to previous warmer and drier conditions. This gives the greens a nice links appearance and condition.
- Notably the greens have retained firmness despite the rainfall prior to and during inspection and playing qualities appeared similar over those greens tested.



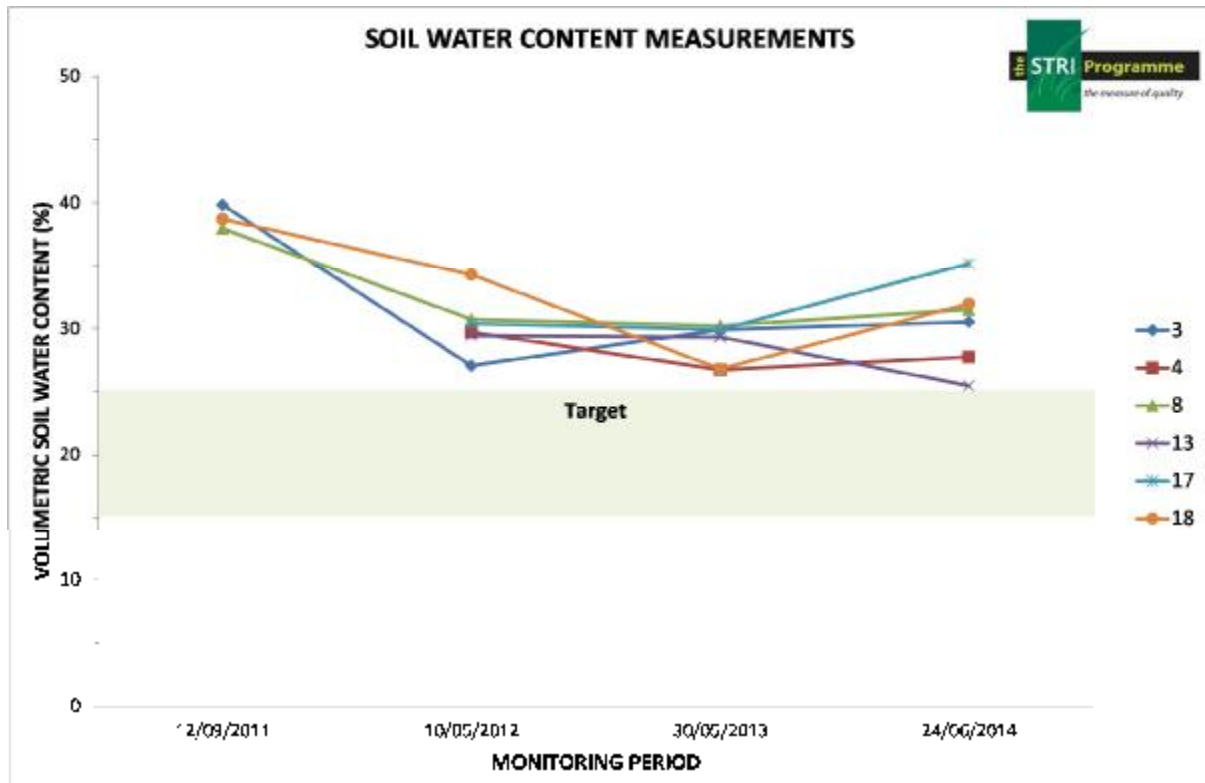
Approaches

- The approaches were all uniform and again showed similar qualities to the greens. Good density and uniformity, optimal refinement and authentic links playing quality being to the fore.
- Surfaces generally from tees through fairways, approaches, surrounds, roll offs and the greens themselves were all consistent and of a high quality.

Performance Data

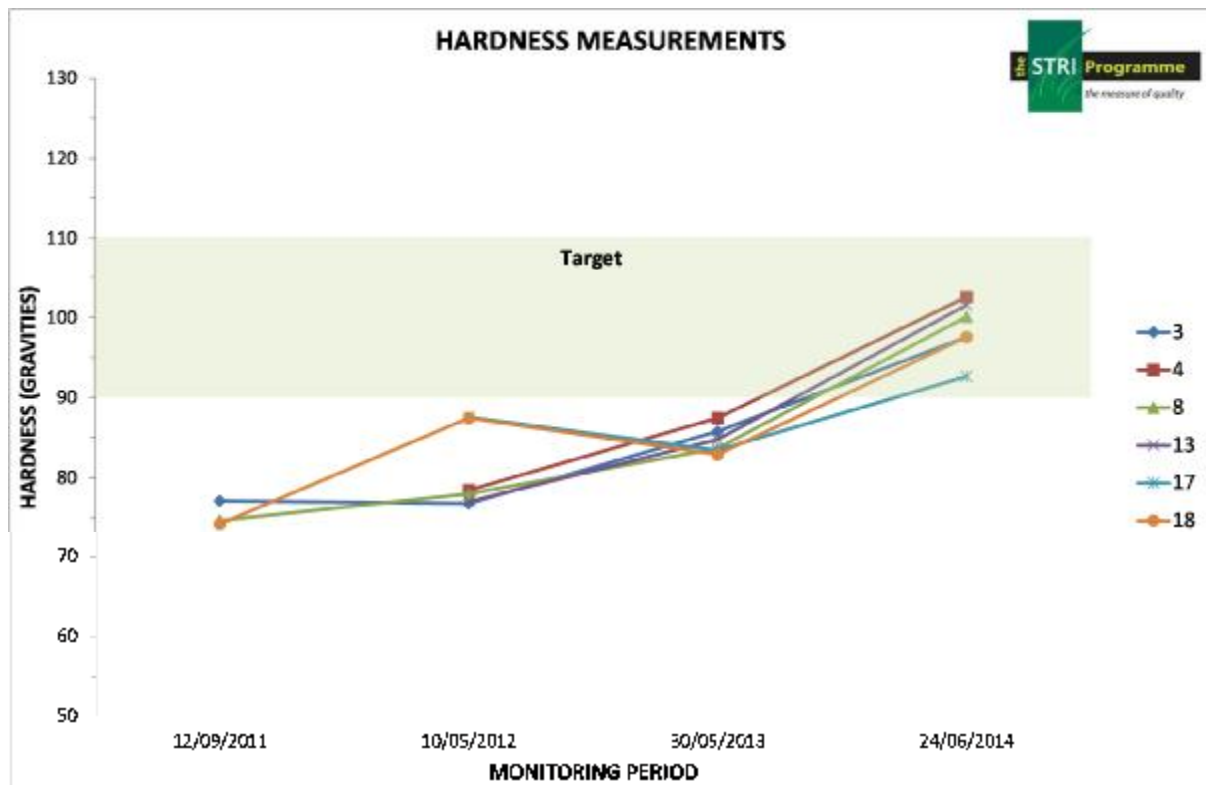
Performance Measurement Results							
Green No.	Speed (distance)	Smoothness (mm/m)	Trueness (mm/m)	Firmness Mean (gravities)	Firmness SEM (±)	Moisture Content (%)	Moisture Content SEM (±)
3	8 ft 11 in	21.5	8.1	98	2	30.5	1.8
4	9 ft 0 in	22.3	8.9	103	4	27.7	2.6
8	9 ft 3 in	22.3	8.8	100	4	31.5	2.5
13	9 ft 3 in	22.2	9.8	102	2	25.5	1.2
17	9 ft 4 in	20.8	9.4	93	2	35.1	1.5
18	8 ft 9 in	23.4	8.6	98	1	31.9	1.3

Soil Moisture Content



- Given that the greens had received irrigation (1.5mm) the night before testing and that we had persistent rainfall before and during assessment, the surfaces performed well. While moisture was outside target on all of the six indicator greens, there was a reasonably good level of consistency between the 3rd, 4th, 8th & 18th all sitting between 27 & 31% vwc. The driest green was the 13th at 25% and the wettest the 17th at 35%.
- Given the conditions, these are a good set of results and knowing from previous testing that the greens are inclined to dry down in a similar fashion, we would expect the 17th to get closer to target over the next few days in tandem with the others around the course.
- There was some variability in moisture and firmness on both the 4th & 8th greens, this replicated in the firmness values. The 4th for instance showing a low of 14.3% on the left hand side front corner and a high of 40.9% on the left hand side centre. However, all of the other assessments of soil moisture showed a pleasing level of consistency throughout.

Surface Firmness/Hardness



- As we have discussed previously, the most important concept with regard to moisture and firmness is that despite moisture going up as it will do in response to rainfall and irrigation, firmness should always stay in target. This is what we found at inspection. All of the six indicator greens are comfortably into target despite irrigation and rainfall and with a pleasing upward trend in values.
- The firmest green was the 4th at 102 gravities with the 17th (also the wettest) at 92 gravities.
- Outside of this, a good level of consistency was found and given the weather forecast prior to Final Qualifying, these should dry down and firm up even further in response to this.
- The 4th & 8th again showed some variability in firmness (likewise moisture), the 4th having 131 gravities on the left hand side and a low of 87 gravities in the left hand side centre, both correlating with the higher moisture values here. The 8th similarly showed a high of 125 gravities on the centre of the green with a low of 85 gravities towards the left hand side rear.
- Having noted the above, clearly the rear of greens are softer than the fronts and centres and particularly so if there is no walk on or walk off area. This would be an area to look to manage with some extra rolling on those greens where firmness values are slightly lower than optimal.

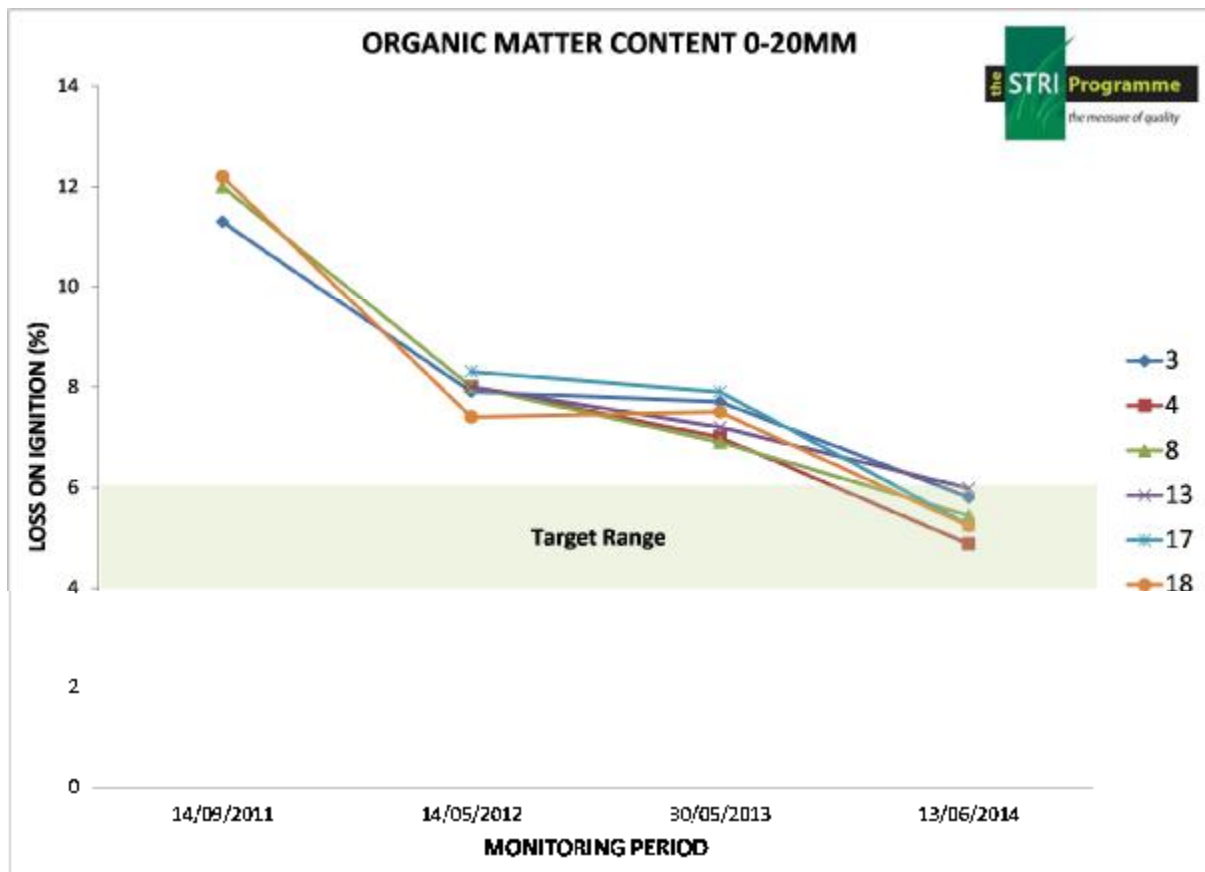
Organic Matter Content

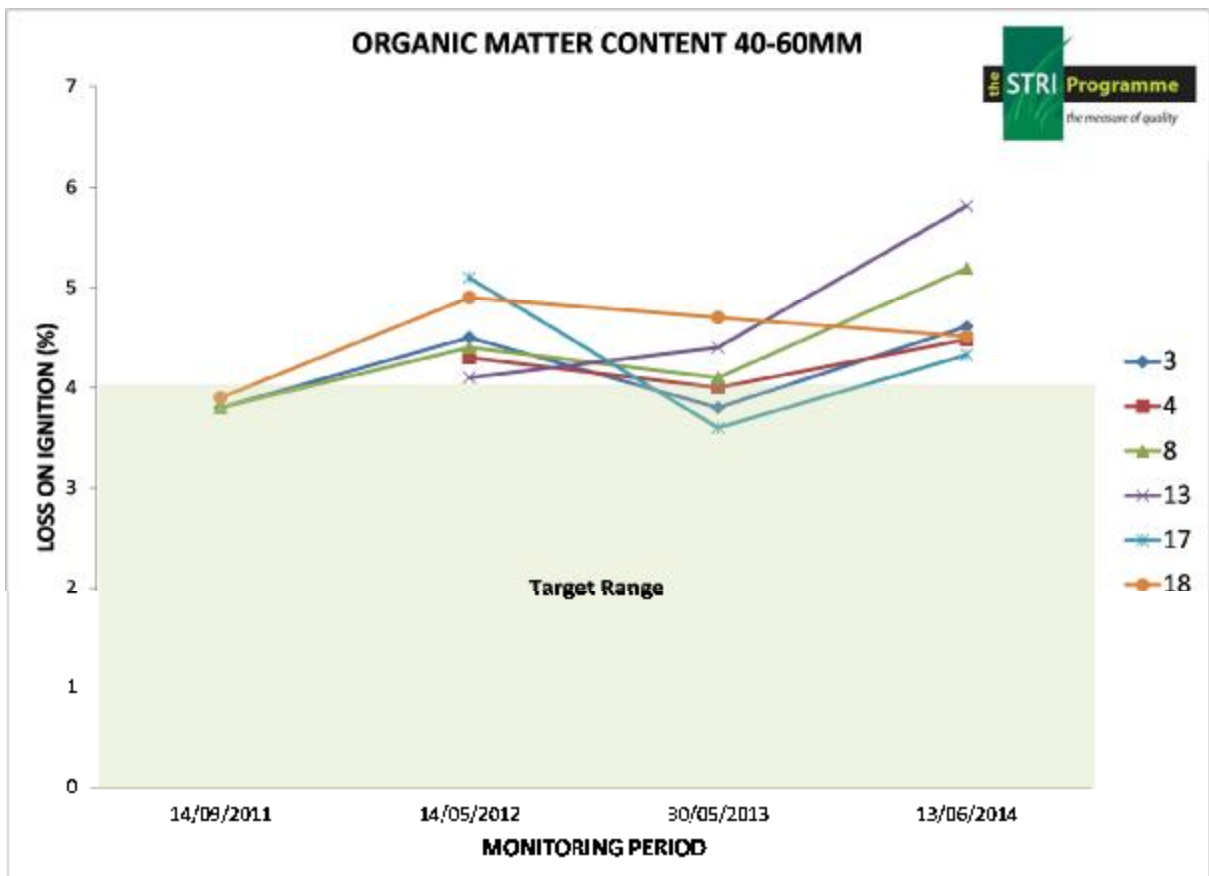
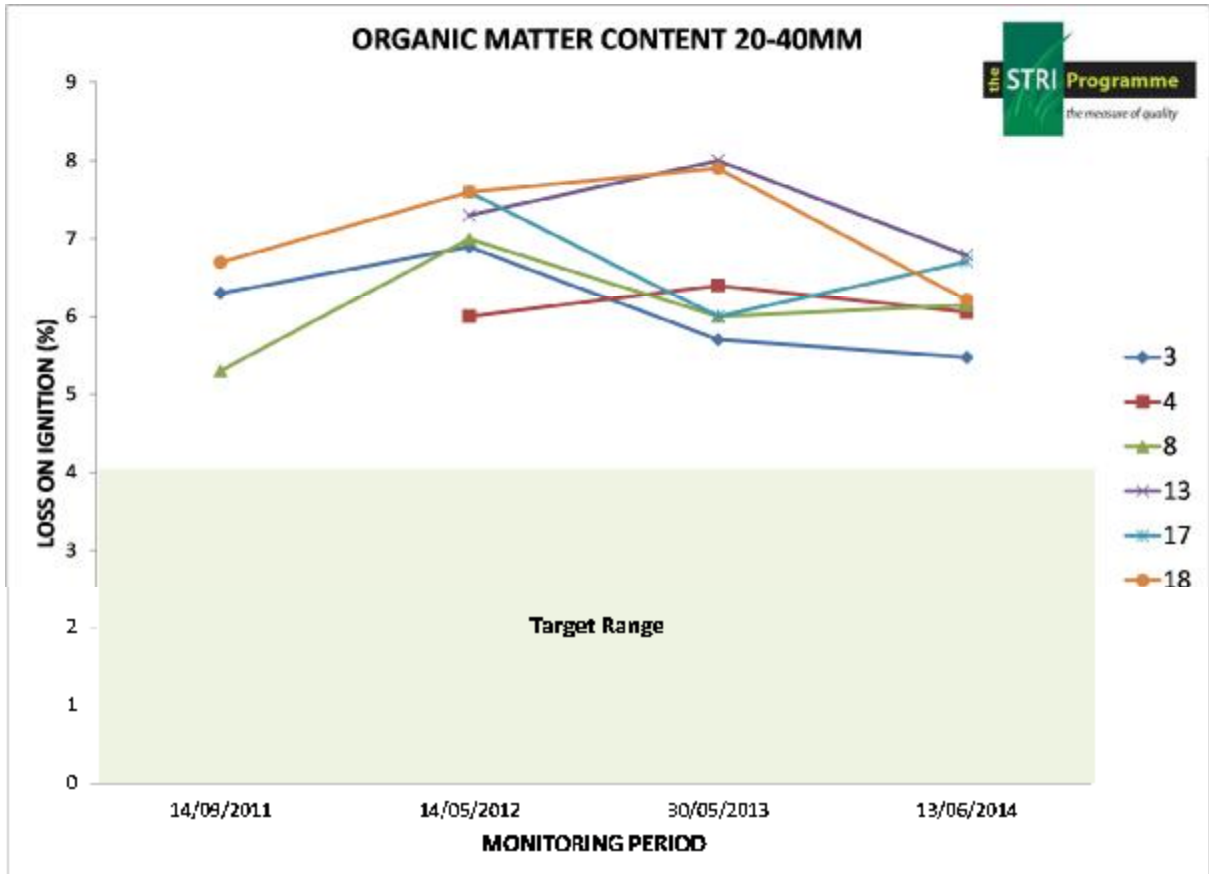
Samples were taken and submitted to our laboratory to assess the organic matter content of the upper soil profile beneath the selected greens. Organic matter content is important because high levels can adversely affect playing quality (soft surfaces) and also increase the risk of potentially damaging conditions such as disease and dry patch developing. Our target range for organic matter

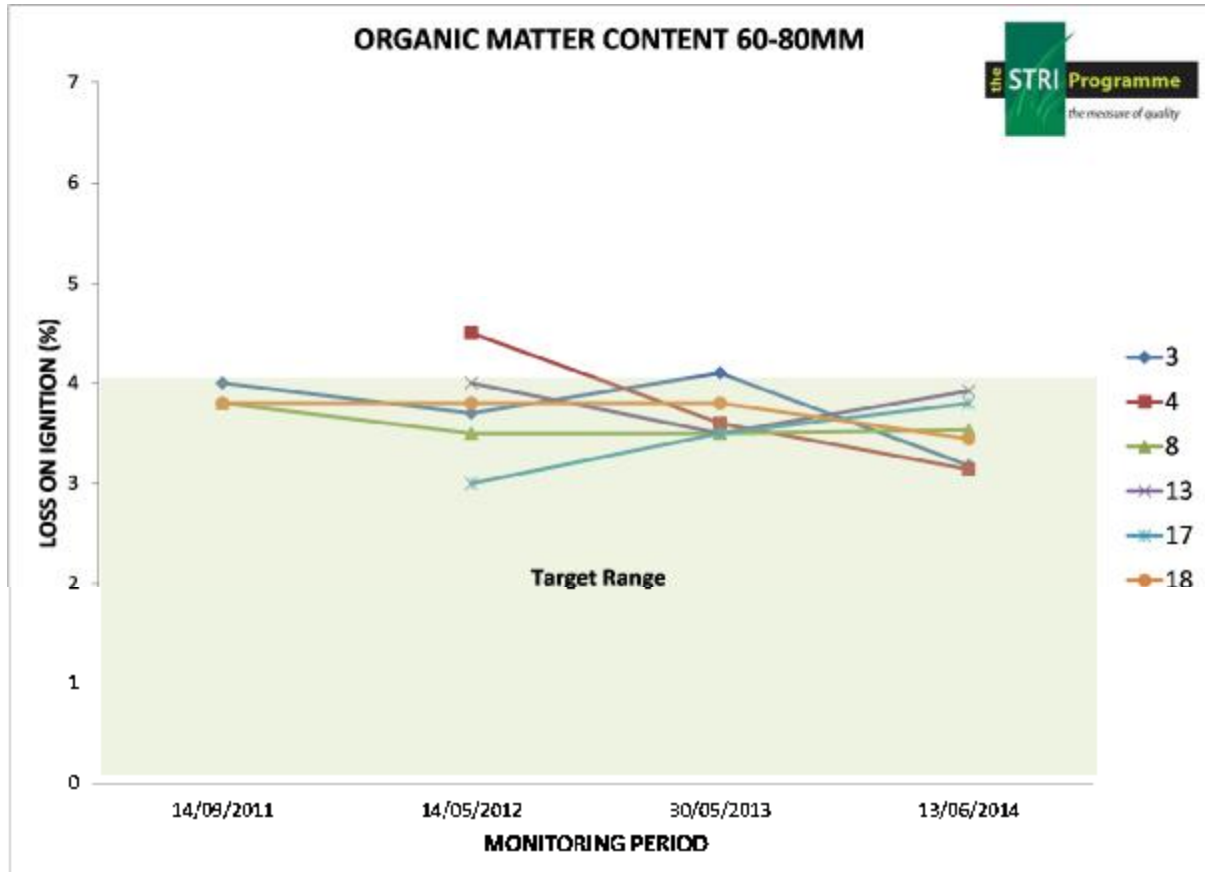
content is 4 – 6 % in the top 20 mm moving down to < 4 % lower down. An accurate measure of the organic matter content helps us determine the intensity of work required to hit our target levels.

The results of the organic matter content testing are contained in the table below.

Organic Matter Content						
Loss on Ignition (%)						
	Green 3	Green 4	Green 8	Green 13	Green 17	Green 18
0-20 mm	5.8	4.9	5.5	6.0	5.3	5.2
20-40 mm	5.5	6.1	6.1	6.8	6.7	6.2
40-60 mm	4.6	4.5	5.2	5.8	4.3	4.5
60-80 mm	3.2	3.1	3.5	3.9	3.8	3.4







- The organic matter results are pleasing and show the influence of the top dressing and work that has been carried out to the greens. Reductions are noted in the top 20mm of all six indicator greens, the 3rd reducing from 7.7 to 5.8%, the 4th from 7-4.9%, the 8th from 6.9-5.5%, the 13th from 7.2-6%, the 17th from 7.9-5.3% and the 18th from 7.5-5.2%.
- These figures are excellent and are reflected in the improved firmness on the greens.
- However, as discussed, the top dressing has moved some of the organic matter originally in the top 20mm further down the profile and this is reflected in testing at 20-40mm and at 40-60mm.
- At 20-40mm, all six greens trend outside target. Although this was the case in the past, there have however been reductions notably on the 13th & 18th and to a lesser extent on the 4th & 3rd.
- At 40-60mm depth, there have been some increases as this area would have previously been in the 20-40mm increment. However, the 3rd, 4th, 17th & 18th are only just outside target only the 8th & 13th having rather too much.
- The organic matter below 60mm is in target and really creates no significant issues. However, the increment between 20 & 60mm is where moisture is where moisture is still being retained and this is reflected in moisture values at testing. Further works to manage organic matter in the top 20mm of the profile as well as to 60mm depth e.g. coring will be required going forward.

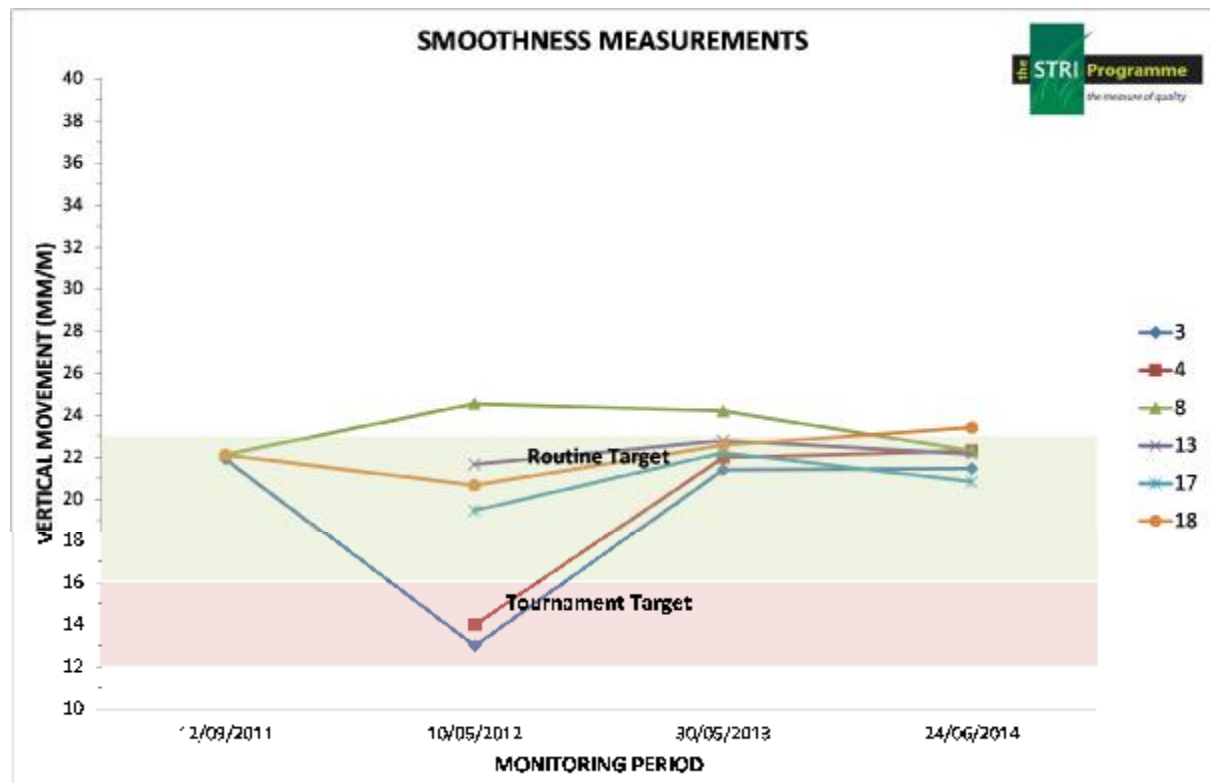
Soil Chemical Analysis

Samples were taken from each green for routine chemical analysis of soil pH, phosphate (P₂O₅) and potassium (K₂O). The results of the testing are outlined in the table below.

Soil Chemical Analysis			
	pH	P ₂ O ₅ (mg/l)	K ₂ O (mg/l)
3	4.3	12	55
4	4.4	11	41
8	4.2	13	154
13	4.4	12	99
17	4.2	10	55
18	4.2	20	41

- Soil chemistry really only throws up the issue with pH having dropped to the low 4's. While this requires no specific intervention currently, a close watch should be kept on this as further reductions would inhibit nutritional pick up on the greens.
- All other values are satisfactory.

Smoothness

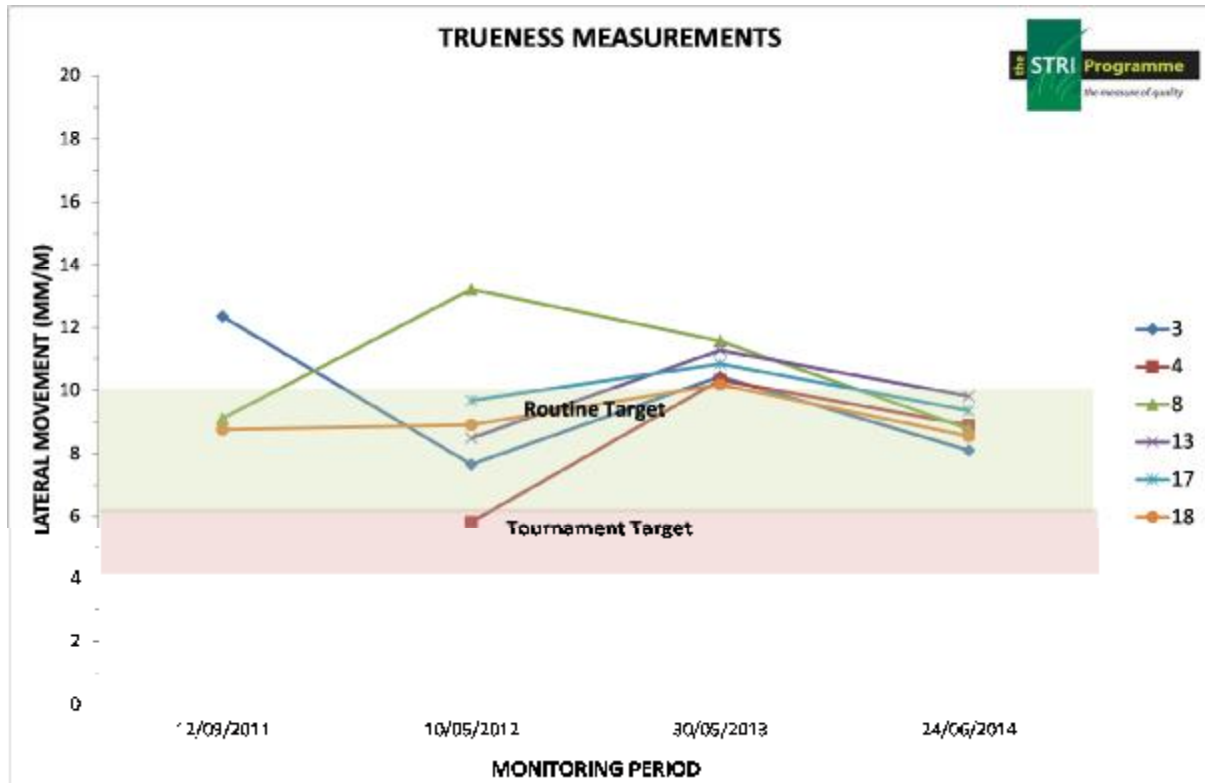


- The smoothness assessment carried out using the Trueness Meter showed a good and consistent set of results, all greens trending into the upper parts of routine target despite the

presence still of some of the seed head issues although this had been dealt with relatively well by some light verticutting prior to inspection.

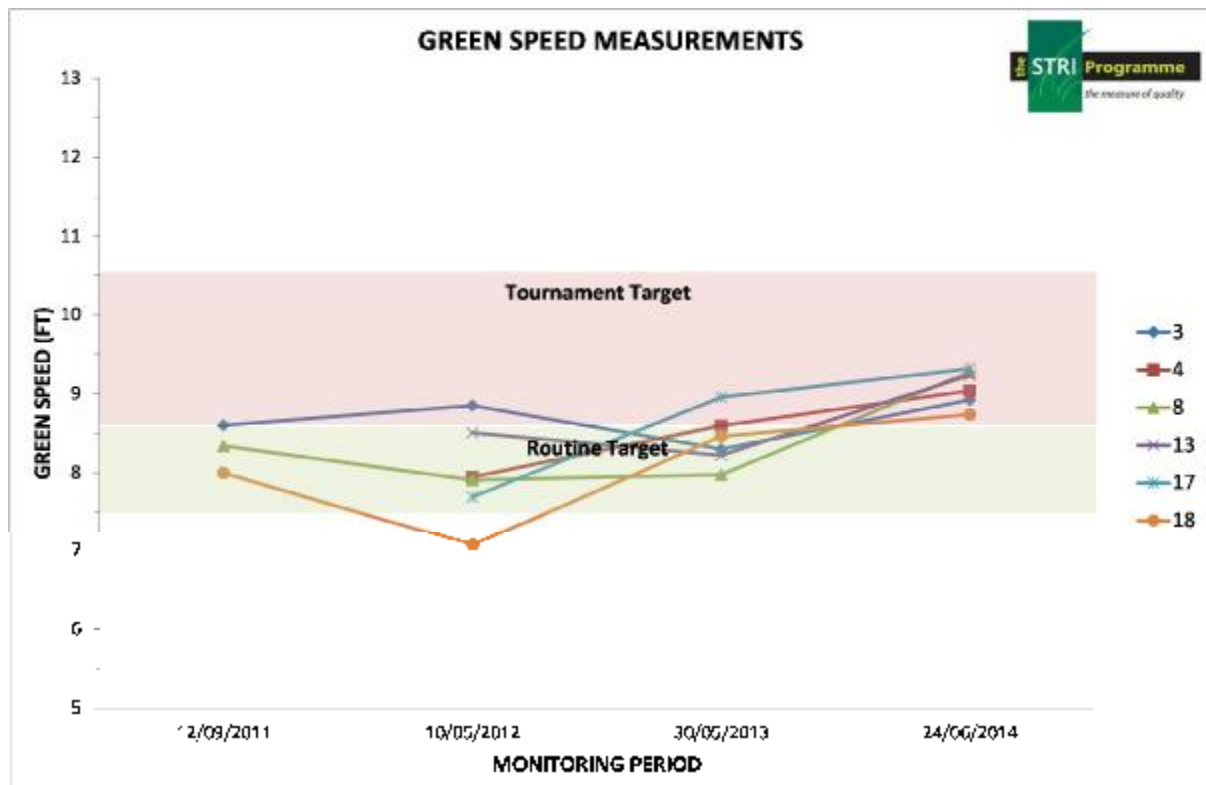
- No issues were noted with a good and consistent set of figures in the low 20mm/m on all greens. The 18th was slightly higher than this as it hadn't been rolled prior to testing, but this still showed reasonably good refinement.

Trueness



- Trueness was excellent and comfortably into the upper parts of routine target. Again the significant level of consistency was noted between all of the greens, important ahead of major competitions.
- Trueness values were noted as being proved up and down the line rolling or mowing as is always the case, however values around 8 or 9mm/m were found on all of the greens and can be trended downwards significantly over the next few days prior to Final Qualifying.

Green Speed



- As a reflection of smoothness and trueness, green speed was excellent with all six greens being consistently in the lower parts of tournament target.
- The trend is currently upwards and should allow Brian and the team to produce smooth, true and pacey surfaces for Final Qualifying. The final polishing in the run up to this including hand cut and roll and triple cut later in the day, should allow you to produce pace comfortably on these surfaces and in tandem with good and consistent ball roll qualities.

Summary

- Testing of the greens showed a pleasing set of improvements and some nice trends for both agronomic and playing qualities.
- Moisture had risen slightly as would be expected given irrigation return and rainfall, however despite this firmness had improved and trended nicely into target giving good and authentic links ball/turf interaction.
- Ball roll qualities including smoothness and trueness were also excellent, comfortably into routine target and trending nicely towards tournament target.
- This was reflected in green speed which was consistent with only 5in difference in pace between the fastest and slowest green and a good level of consistency off both of the Stimpmeter assessments on each green.
- In short, pace can be comfortably increased and managed at the required level given these current excellent results.

Key Recommendations

Greens

- There were no issues to report with the greens, most of our discussions at our two previous visits have dealt with these. We discussed the protocols into Final Qualifying and this we feel would be perfectly comfortable with a single hand cut and roll in the morning followed by a triple cut later in the day. This should produce the level of playing quality and pace that you require for Final Qualifying. However, given the consistency of the greens, we feel there will be no issues whatsoever with regard to playing quality going forward.



Roll off rear right hand side 18th

- As to the greens complexes generally, these are “polished” and “tight”. There is excellent definition, playing quality and consistency through all of the green sites.



Fairways & Approaches

- Similarly to the green complexes, fairways and approaches were also excellent with a fine tight sward, good refinement and good consistency.
- We took some firmness assessment of the 3rd approach which showed a mean of 120 gravities over the six assessment points. This would indicate consistency of firmness with the approaches and the greens themselves.
- Post Final Qualifying into autumn and spring 2014/2015, our discussions were to look at coring in October and to further core and Graden in spring 2015.
- Options are to further assess the remaining greens that are currently not tested some time in spring/summer 2015.
- Other works planned post Final Qualifying are removal of the gorse to the right hand side of the 4th which is now encroaching on the semi-rough and towards the fairway. This has been in the plan for some time and will make a significant difference to this area.



Sandhill rear 4th

- As per discussions, this should settle nicely now and there is certainly a better level of uniformity towards the bottom of the sandhill and towards the rear of the green. Our recommendations would be to refine the top of the sandhill and surrounds in September. There is a fair amount of rank growth and grass in these areas and the target would be to remove this, carrying out a graminicide (Rescue) programme at that time. This would allow us to produce a predominance of the finer species which would tie in with the mounds to the right hand side of the green site which contain a higher proportion of fescue and the finer grasses.
- We discussed the costs for testing the outlying greens on the golf course. This has been passed to the Course Manager in a separate email and will allow you to make decisions on this going forward.

Signed

A handwritten signature in black ink that reads "Jay S. Dobson". The signature is written in a cursive style with a large initial 'J'.

Jay S Dobson
Turfgrass Agronomist (Scotland), STRI Ltd

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The STRI Programme provides golf courses with measurements and data that help to monitor and assess golf course performance. The R&A has recently developed CourseTracker (www.coursetracker.org), a free, online business management tool for golf courses, to record, review and analyse golf club performance across many areas of your business, including the golf course. STRI believes The R&A CourseTracker combined with the STRI Programme provides the tools you need to objectively monitor and assess your golf course performance.