

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

Monifieth Golf Links Committee

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 6th September 2016
Consultant: Ian Craig



Monifieth Golf Links Committee

Date of Visit: 6th September 2016

Visit Objective: to review the prevailing condition of the course, take further objective measurements from the indicator greens and confirm ongoing maintenance requirements.

Present: Mr David Moncur – Greens Convenor
Mr Scott Rennie – Course Manager
Mr Ian Craig – STRI Ltd

Weather: 21°C & overcast

Headlines

- The golf course is in superb condition with extremely positive feedback from members and guests alike.
- Good, authentic links characteristics were observed throughout the course.
- Green performance was excellent, with tournament target achieved for ball roll qualities despite the recent overseeding works.
- Organic matter remains broadly within target range in response to aeration work, sand topdressing and good sensible and sustainable inputs.
- The majority of the sand is locally sourced and applied to the greens in the early part of the season, delivering superb consistency of performance throughout the year.

Key Actions

- Autumn, granular fertiliser application to be made ahead of aeration and over seeding work.
- End of season renovation work to focus on solid tine aeration, 'pot seeding' of fescue and browntop bent and sand topdressing.
- Sand topdressing to continue when possible, throughout the winter months.
- Additional sand topdressing to be applied to the 6th green to dry the surface and increase firmness.
- Fescue overseeding to be carried out twice during the playing season.
- Surface disturbance to be minimised in order to favour the development of the finer grasses within the sward.

Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	21% (range 17-27%)	15-30%
Hardness (Gravities)	116 Gravities (range 105-129)	100-130 g
Smoothness (mm/m)	17.8 mm/m	<25 mm/m
Trueness (mm/m)	4.8 mm/m	<8 mm/m
Green Speed	9 ft 3 in	9-10 ft
Organic Matter 0-20 mm (%)	7.0%	4-6%
Organic Matter 20-40 mm (%)	3.3%	<4%
Soil pH	6	5.0-6.0
Phosphate (P ₂ O ₅)	29.5 mg/l	>10 (mg/l)
Potassium (K ₂ O)	45.5 mg/l	>30 mg/l

Key: In Target Marginal Variance Out of Target

Photo Observations and Comments



Figure 1: The general condition of the greens was superb demonstrating a good consistent blend dominated by browntop bent with supporting populations of annual meadowgrass and fine fescue.



Figure 2: Fescue overseeding was carried out to the greens in order to continue the development of a more favourable botanical blend.



Figure 3: Populations of Pearlwort have been increasing in recent years. These appear to have been successfully controlled through accurate use of selective herbicides.



Figure 4: The overseeding lines were having minimal impact of the putting surface following 2 days of mowing and rolling directly following the operation.



Figure 5: Dollar Spot was noted to a number of surrounds. This disease is an indication of insufficient nutrition coupled with high levels of humidity and surface moisture (i.e. heavy dews)



Figure 6: The 4th apron is subject to significant levels of foot traffic. Populations of coarse textured ryegrass is high to this particular area.

Photo Observations and Comments (continued)



Figure 7: The prevailing weather conditions have given rise to very good, authentic links conditions, conducive to the traditional running game.



Figure 8: The removal of much of the gorse surrounding the 12th hole has resulted in the natural regeneration of heather populations throughout the rough.



Figure 9: The fescue turf remains overly dense for the time being and will require continued treatment with the Amazone in order to reduce biomass and deliver a more suitable texture allowing it to be left unmown.



Figure 10: The low lying 6th hole continues to respond well to additional aeration and sand topdressing work, aimed at improving the texture of the underlying soil and reducing the water retentive nature of this section.



Figure 11: Heavy downpours and high volumes of water are resulting in erosion of the burn bank at the 11th hole. Work will commence in the winter to shore up this potential problem



Figure 12: Re-shaping of the burn banks have been proposed with a view to making the area accessible to a mower, thereby reducing the number of man hours used to maintain it at semi rough height.

Recommendations

Greens

- Nitrogen inputs have been reduced to around 30kg/ha/annum. This is helping to favour the development of the finer grasses, keeping the annual meadowgrass lean and thereby delivering excellent putting qualities whilst facilitating the blending process to a fine grass dominant sward. This approach should be sustained and any additional nitrogen inputs required should be made in the form of ammonium sulphate, thereby favouring the browntop bent component of the sward.
- Phosphate levels within the soil are adequate and no further inputs will be required for the time being.
- Potassium levels are also satisfactory and inputs should be sustained at their current level.
- Soil pH is at the higher end of target range and the use of acidifying fertilisers such as ammonium sulphate would be recommended to favour the development of the finer grasses.
- With organic matter now down to manageable levels within the upper soil profile, the fescue overseeding should continue with a minimum of two operations throughout the growing season.
- Browntop bent overseeding can also continue in conjunction with aeration and sand topdressing.
- With the establishment of fescue and browntop bent to the greens now becoming a high priority, it is important that disturbance to the surface is minimised. End of season renovations should focus on solid tine aeration, overseeding and sand topdressing.
- Sand topdressing totals are around the 150 tonnes/ha/annum mark and should be sustained at this level. The sand is generally applied following aeration work with routine dustings through the early season. Topdressing should be sustained throughout the winter where possible in order to retain firmness and ball roll qualities.
- Bespoke treatments should be afforded to certain greens and sections of green in order to deliver greater consistency. The 4th green is generally the firmest green on the course as a result of concentrated foot traffic to the front and right of the green. Additional solid tine aeration to these sections of the green should help to relieve some of the tension and deliver more consistent firmness and ball release in line with the rest of the course.
- The 6th green is historically more moisture retentive and softer and would benefit from additional sand inputs and occasional rolling in order to increase firmness.
- Light verti cutting can be carried out during the early part of the season in order to develop texture however this should be minimised during the main season once a suitable sward texture has been achieved, in order to favour the development of the finer grasses and reduce the disturbance to the surface.

Rough Grassland

- The rough grasslands are generally in fine condition with a well established and textured sward delivering a fair challenge to the errant golf shot. The removal of much of the gorse throughout the course has been a very positive move by the Club and has resulted in the natural regeneration of a number of stands of heather. The fescue turf on the 12th hole remains a little dense to be maintained at rough height and will require additional cutting, clipping collection and scarification with the Amazone. Once a suitable texture has been developed, this turf should be grown in as rough and the disturbance should then be minimised in order to allow the further development of heather, surrounding and framing this hole.

Moisture management

- The current wetting agent programme appears to be working very well in retaining suitable soil moisture levels, delivering firm greens without compromising the health of the turf. We would support the proposed purchase of a moisture meter which would allow the greenstaff more accurate monitoring and control of soil moisture, thereby facilitating a greater level of consistency throughout the greens.

Burn Bank

- The burn bank at the 11th & 6th holes is currently problematic in terms of maintenance, this area of the course is often in play for errant tee shots and must be managed using strimmers and clippings are manually collected. This is a large drain on man hours and we would support the proposed changes to the severity of slope in order to facilitate regular mowing with the ride on rough mower.

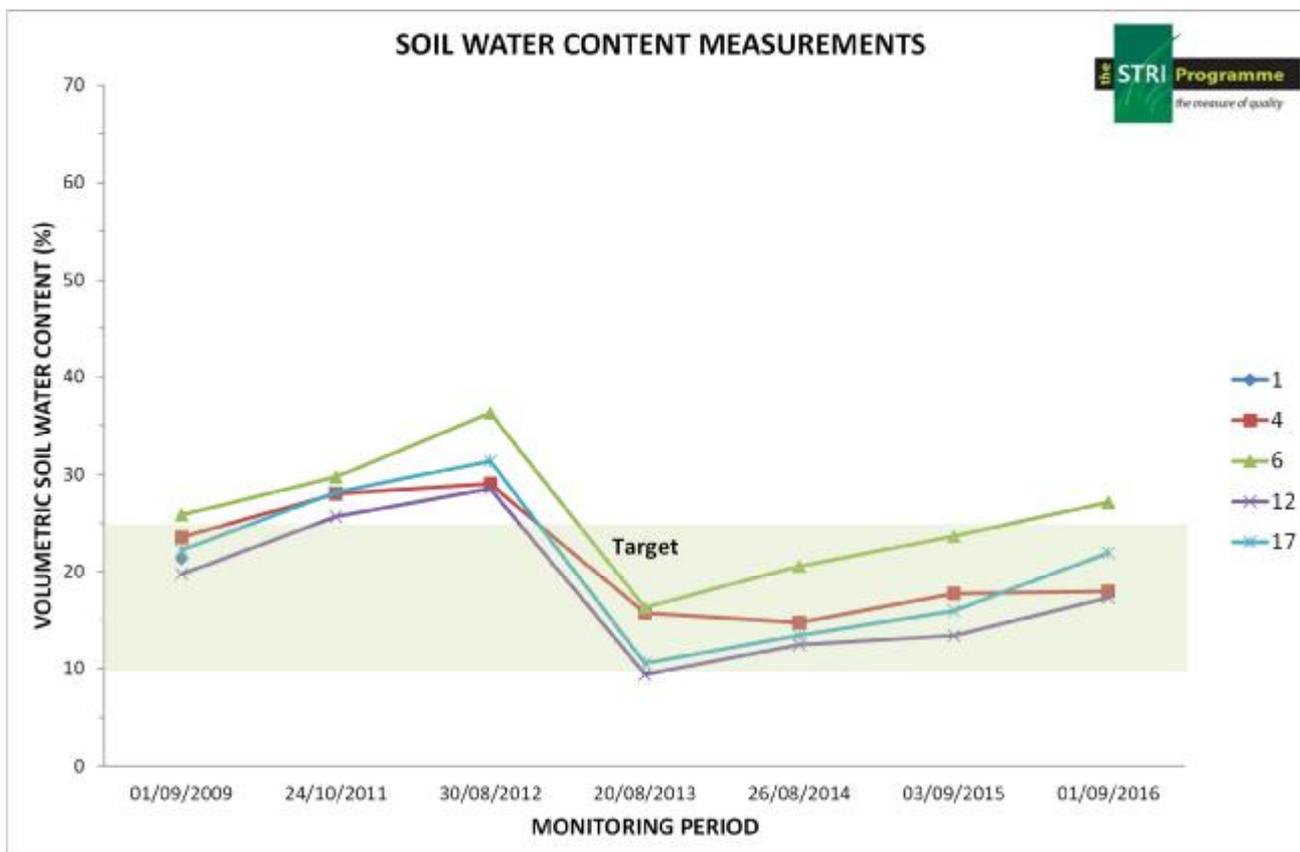
Signed

A handwritten signature in black ink, appearing to read 'Ian W Craig'.

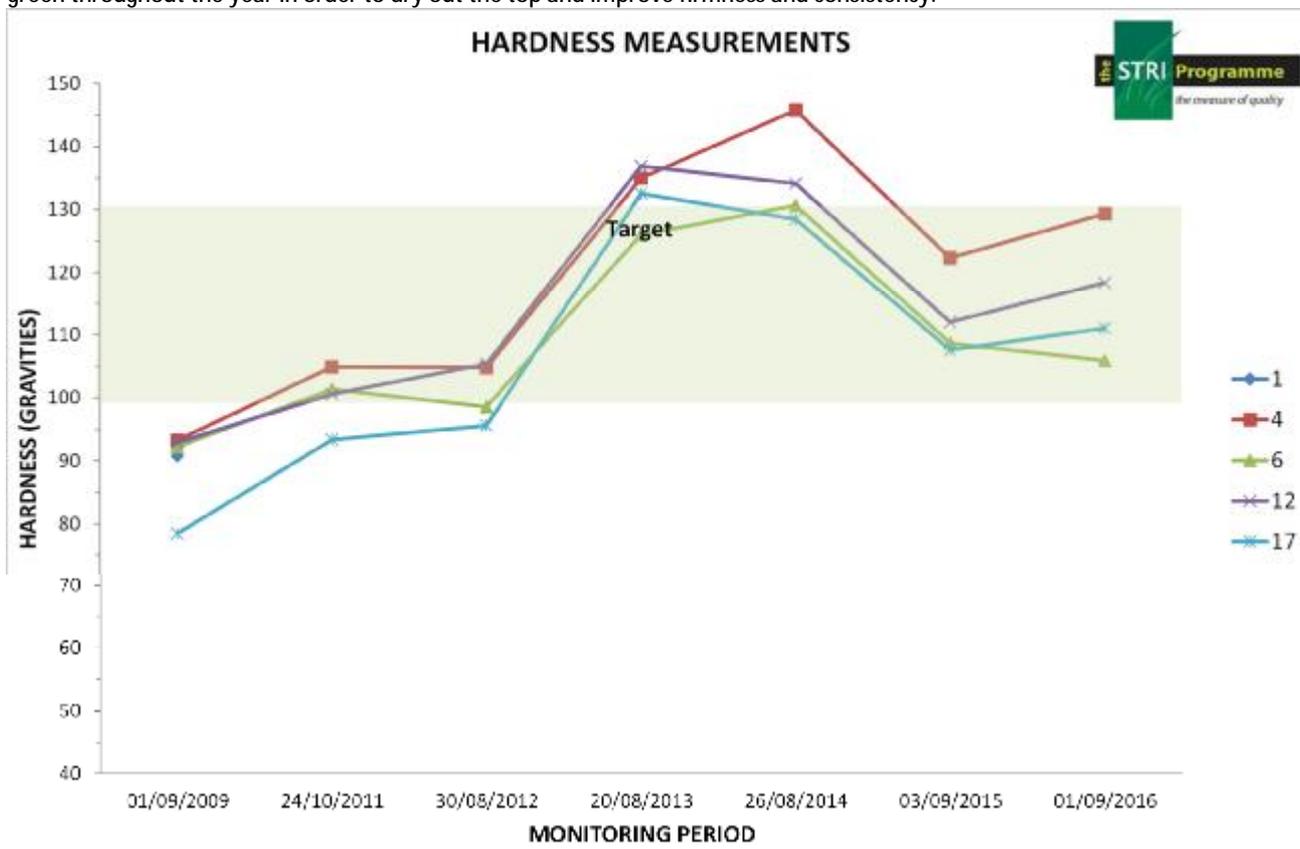
Ian W Craig BSc (Hons), MBPR
Turfgrass Agronomist, STRI Ltd

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

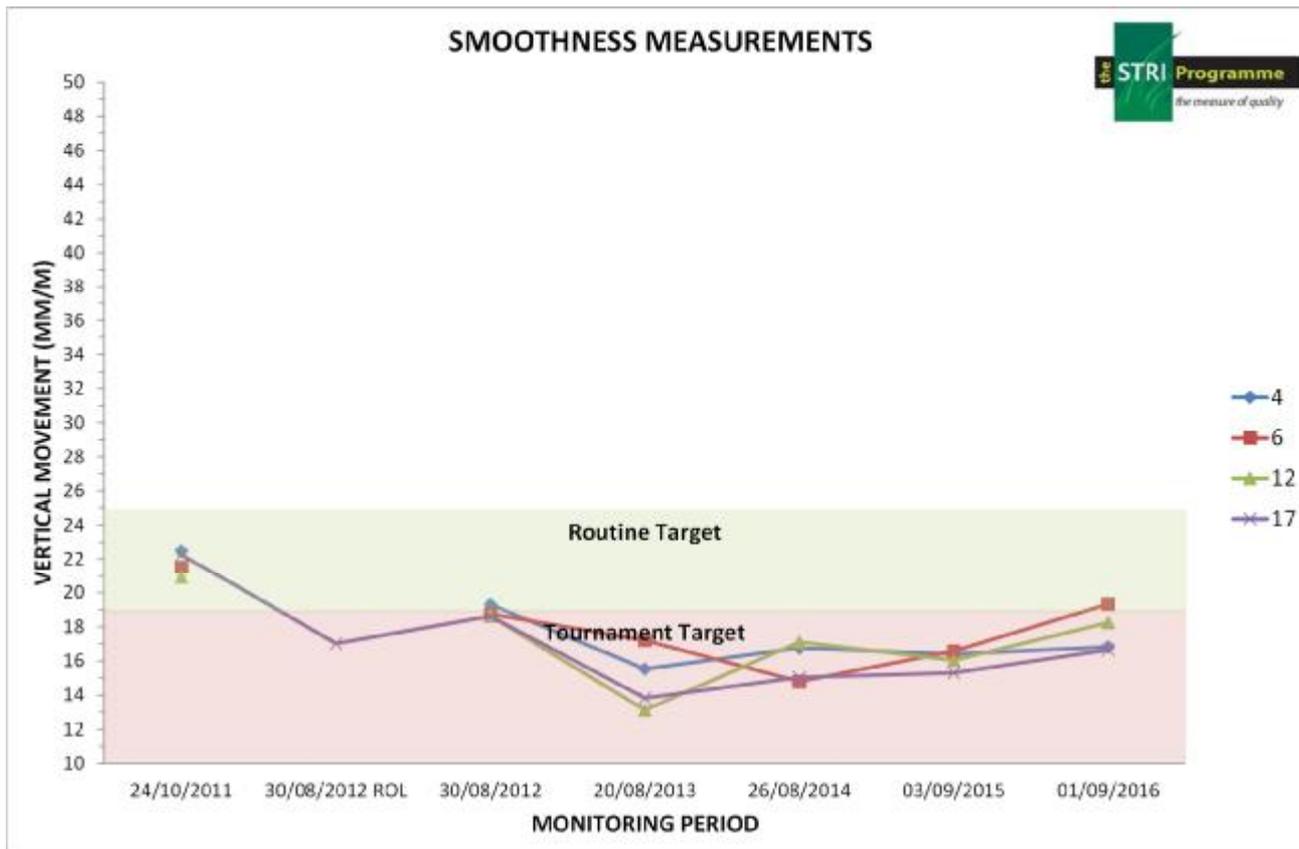


Objective Data Graph 1: Soil moisture content was generally within target range for the four indicator greens with the 6th holding more moisture due to its low lying topography and richer underlying soil. Additional sand topdressing should be applied to this green throughout the year in order to dry out the top and improve firmness and consistency.

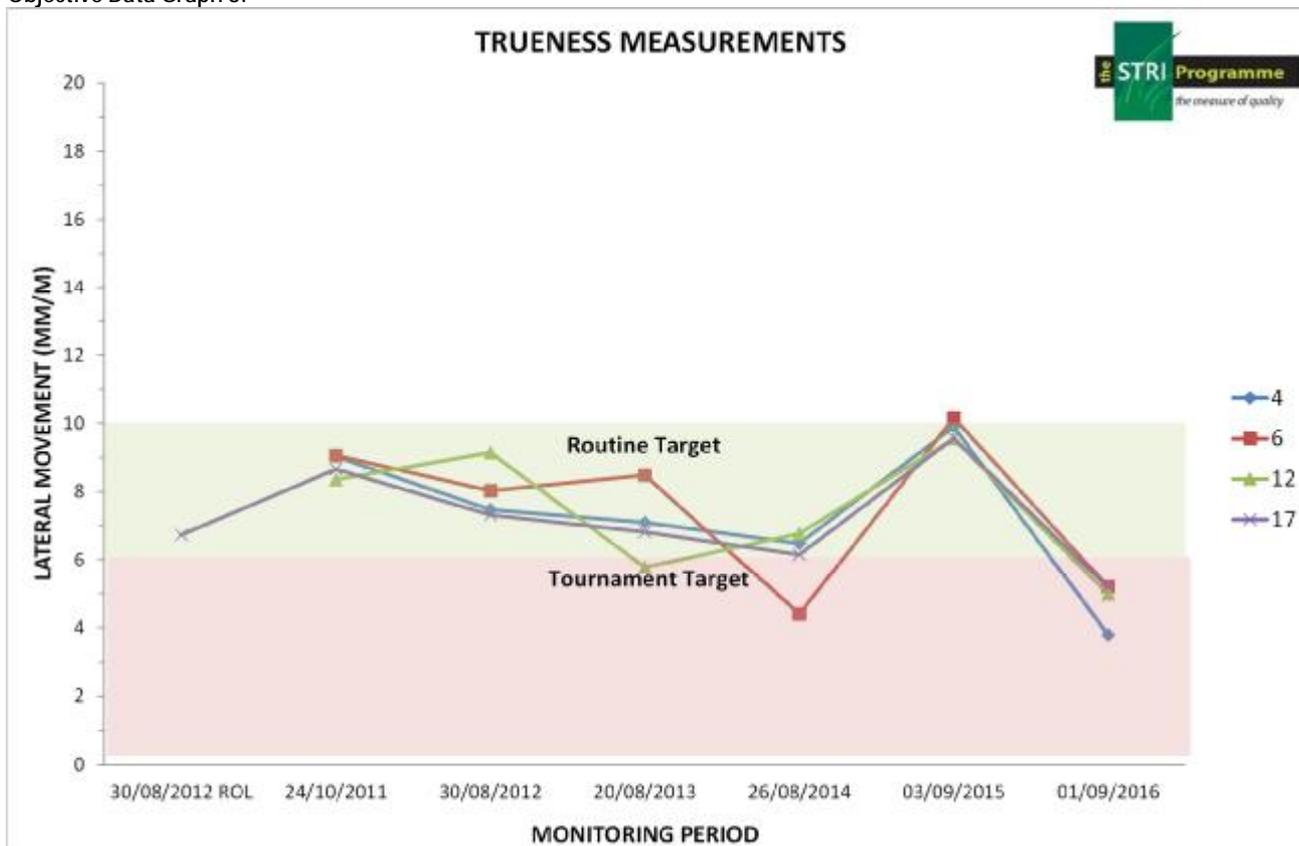


Objective Data Graph 2: Surface firmness was very good if a little inconsistent. Increased sand inputs should help to firm up the 6th green and some additional solid tine aeration to the 4th green will alleviate some of the tension and reduce the likelihood of this green becoming overly hard and unreceptive to well struck shots.

Objective Data (continued)

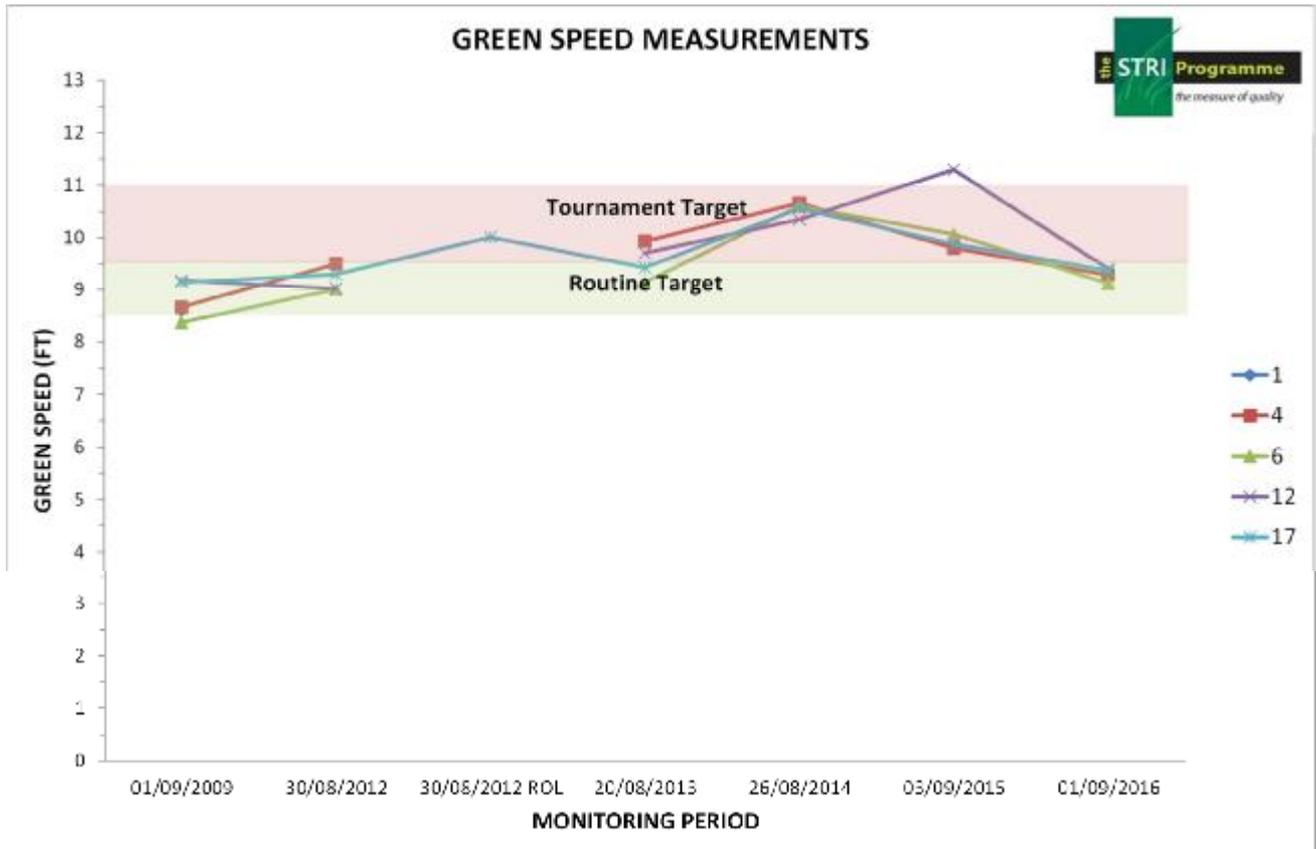


Objective Data Graph 3:



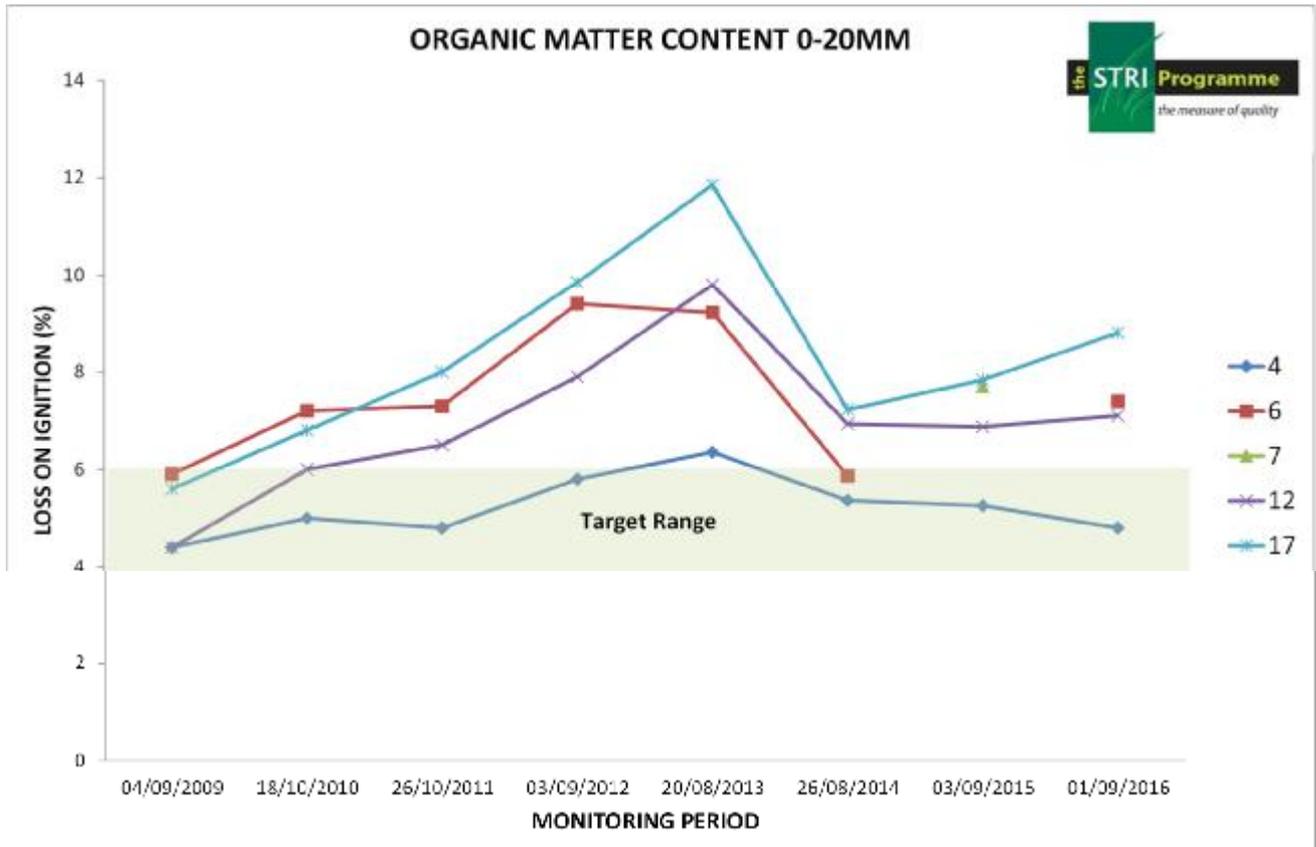
Objective Data Graph 4: Ball roll qualities were superb, with smoothness and trueness recorded within tournament target despite the recent overseeding operation. The 17th green was tested prior to overseeding and the others following, despite this, no significant difference in ball roll was noted.

Objective Data (continued)

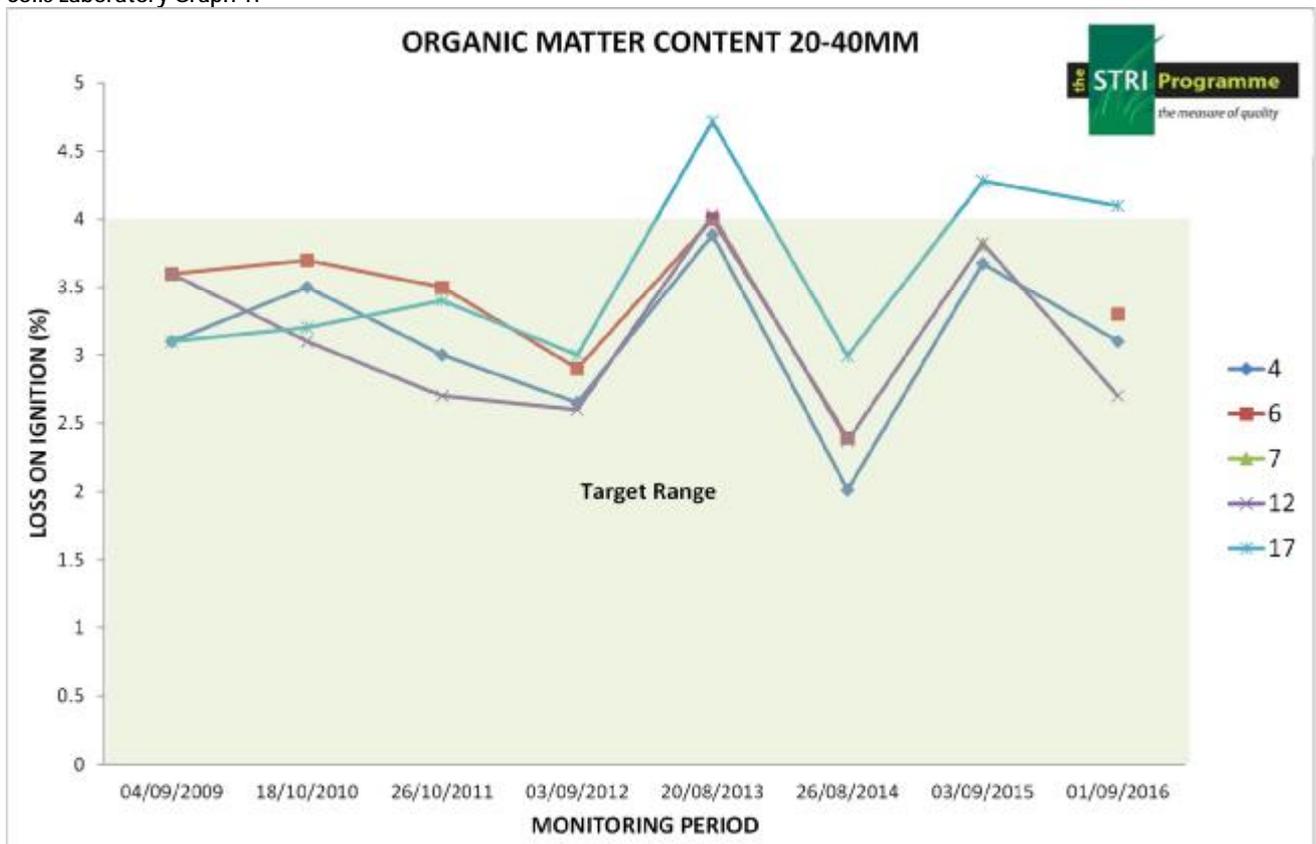


Objective Data Graph 5: Green speeds were comfortably within the challenging routine target range and consistency from green to green was superb.

Soils Laboratory Data



Soils Laboratory Graph 1:



Soils Laboratory Graph 2: Organic matter within the upper soil profile remains at a manageable level and should be controlled with routine sand topdressing and solid tine aeration, provided nutritional inputs are maintained at a sensible and sustainable level.

ORGANIC MATTER CONTENT

CLIENT: MONIFIETH GOLF LINKS COMMITTEE DATE RECEIVED: 01/08/16
ADDRESS: MEDAL STARTERS BOX, DATE REPORTED: 17/08/16
PRINCES STREET, MONIFIETH,
ANGUS, DD5 4AW RESULTS TO: IWC

TEST RESULTS AUTHORISED BY:

Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION	LOSS ON IGNITION (%) [*]
A15090/1	4 0-20 mm	4.8
	20-40 mm	3.1
	40-60 mm	2.9
	60-80 mm	2.5
A15090/2	6 0-20 mm	7.4
	20-40 mm	3.3
	40-60 mm	2.9
	60-80 mm	2.7
A15090/3	12 0-20 mm	7.1
	20-40 mm	2.7
	40-60 mm	2.5
	60-80 mm	2.5
A15090/4	17 0-20 mm	8.8
	20-40 mm	4.1
	40-60 mm	3.2
	60-80 mm	3.1

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



Testing Certificate 2159 - 01

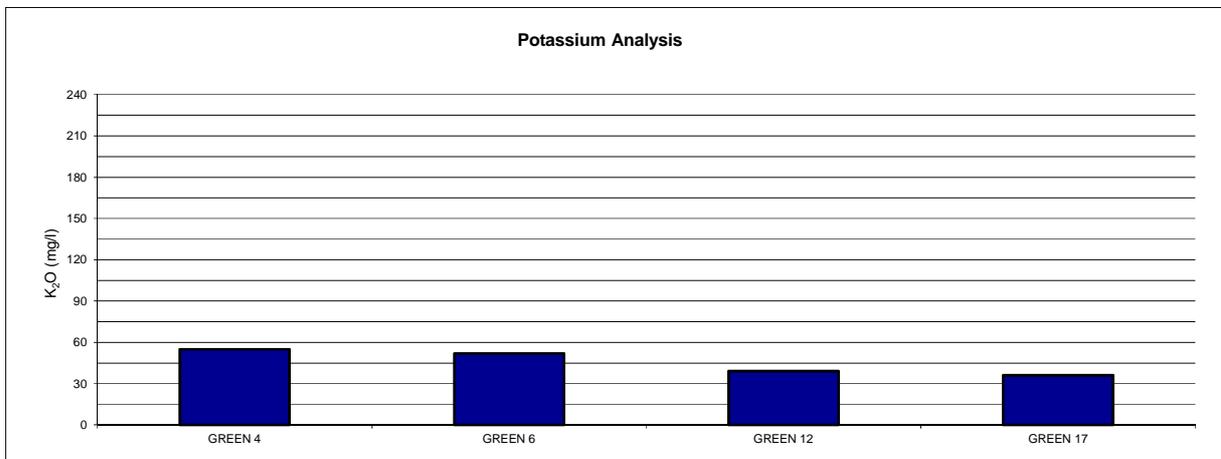
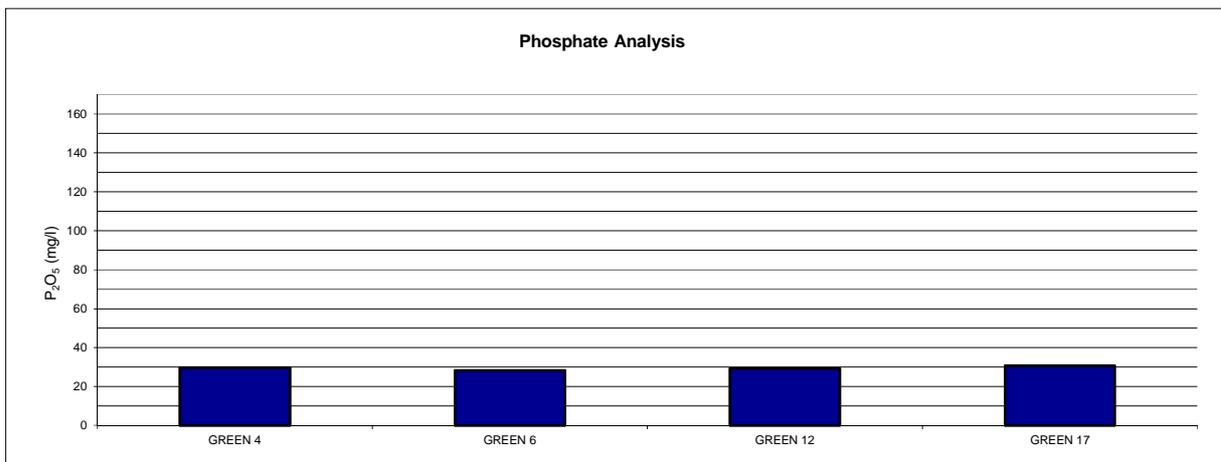
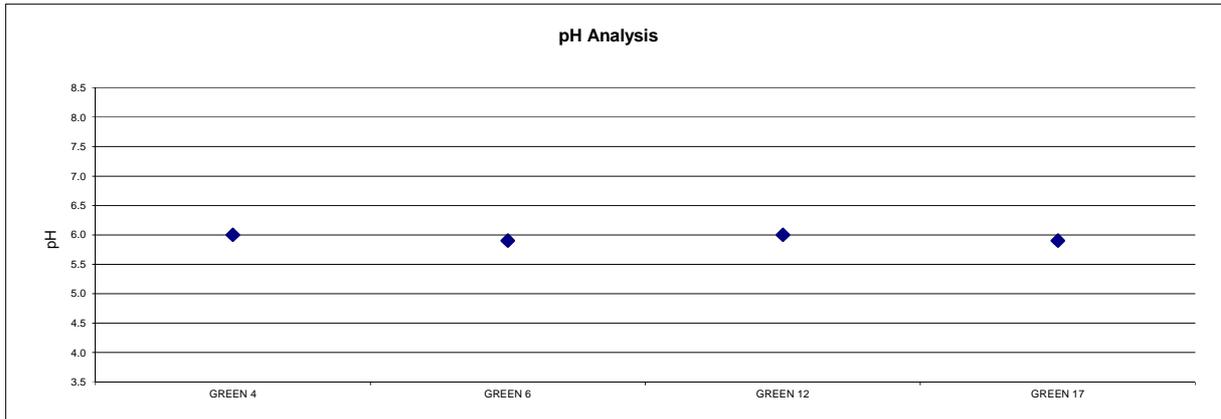
THE RESULTS PERTAIN ONLY TO THE SAMPLE(S) SUBMITTED AND TESTED

STRI

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SOIL CHEMICAL ANALYSIS MONIFIETH GOLF LINKS COMMITTEE

Date: 01/08/16



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