



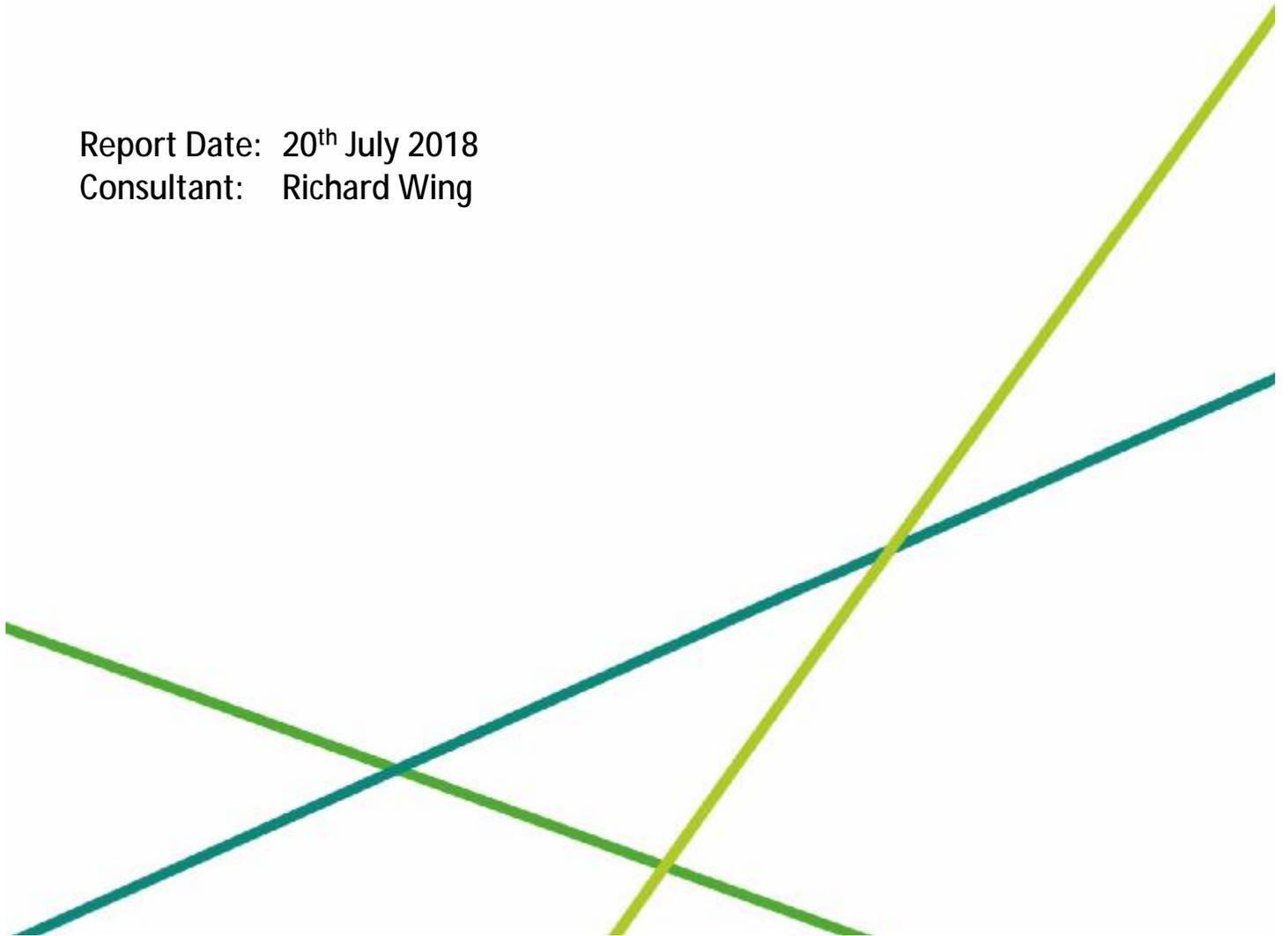
Making great sport happen



# ELGIN GOLF CLUB

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

Report Date: 20<sup>th</sup> July 2018  
Consultant: Richard Wing



Date of Visit:	Monday 11 <sup>th</sup> June 2018
Visit Objective:	To review the prevailing condition on the golf course, take objective measurements of the selected indicator greens and confirm ongoing maintenance practices.
Present:	Mr Ian Hamilton – Committee Member Ms Barbara Anne Rumbles – Secretary Mr Kevin McGraph – Head Greenkeeper Mr David Rumbles – Deputy Head Greenkeeper Mr Michael Patterson – Greenkeeper Mr Mark Ross – Greenkeeper Mr Kian Taylor – Greenkeeper Mr Richard Wing – STRI Ltd
Weather:	Overcast, 20°C

### Headlines

- The course was in good condition considering the set of extremely challenging circumstances of the past 9-months.
- Many greens remained frozen for prolonged periods through the winter with thick layers of ice formulating in low-lying pockets of the greens. Consequently, turf health and density are reduced.
- Irrigation issues are reducing the ability to efficiently apply water to major playing surfaces.
- Dry patch has occurred in areas of the greens and to all tees.
- Green speeds were below the routine target range due to the growth flushes caused by granular fertiliser applications.
- Organic matter remains excessive in the top 60mm of the greens soil profiles.
- The course lacks visual definition off the tees due to the lack of rough grassland areas to create frames to the holes.

### Key Actions

- Intensify spring refinement through verti-cutting to improve the ball roll performance of the greens.
- Apply remedial wetting agent to the greens and tees prior to rainfall to reduce the hydrophobicity of the soil.
- Change the nutrient strategy to focus on regular liquid spoon feeding to provide a more consistent growth pattern.
- Carry out a hollow-coring operation in the autumn to physically remove the accumulation of organic matter in the profile. Ideally combine with a Graden sand-injection.
- Apply 120 tonnes/ha per annum of sand top-dressing to dilute the accumulation of organic matter at the top of the profile.
- Change the cutting patterns of the roughs on the carries to improve the visual definition of the holes.
- Implement a rough management plan to improve the quality of the golfing roughs.



## Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	25.8% (range 23.8-29.7%)	15-30%
Hardness (Gravities)	111 Gravities (range 107-117g)	90-120g
Smoothness (mm/m)	26.1 mm/m	<25 mm/m
Trueness (mm/m)	9.5 mm/m	<10 mm/m
Green Speed	7 ft 10 in	8.5-10 ft
Organic Matter 0-20 mm (%)	12.7%	4-6%
Organic Matter 20-40 mm (%)	6.3%	<4%
Soil pH	4.7	5.0-6.0
Phosphate (P <sub>2</sub> O <sub>5</sub> )	46 mg/l	>10 (mg/l)
Potassium (K <sub>2</sub> O)	76 mg/l	>30 mg/l

Key:      In Target      Marginal Variance      Out of Target

## Photo Observations and Comments



Figure 1: The greens general display a dense sward. The greens speed was slower than ideal for routine play. This was caused by a flush in growth following applications of granular fertiliser.



Figure 2: The sward composition of the greens is a blend of bent grass and annual meadowgrass. The sward lacked refinement, to improve the performance qualities of the putting surfaces.



Figure 3: Sporadic, isolated patches of coarser Yorkshire Fog species remain in the turf sward.



Figure 4: The soil profiles a good amelioration of sand through the profile. The accumulation of organic matter in the top 60mm remains excessive. Also, note the root break at 50-60mm depth highlighting the lack of root development through the tough conditions of the winter.



Figure 5: High spots on the greens are beginning to dry causing a reduction in turf vigour. The wet and cold conditions of the winter have reduced root growth, increasing the susceptibility of these areas to drying. A simple droplet test was carried out on the soil profile to highlight the hydrophobicity.



Figure 6: Areas of turf have thinned through the winter following prolonged periods of frozen ground and ice accumulation.

## Photo Observations and Comments (continued)



Figure 7: The ingress of cushion moss has occurred where the sward has thinned through the winter.



Figure 8: The limited amounts of irrigation available has resulted in insufficient applications to the tees. The soil has now become hydrophobic and the onset of dry patch has occurred.



Figure 9: Despite the dry conditions the fairways give excellent support to the golf ball with a dense sward of fine grasses on a firm surface.



Figure 10: The definition of the golf course is somewhat reduced by the excessive mowing of rough grasslands in particular on the carries from tee to fairway. This is also using valuable man hours to manage these areas.

## Recommendations

### Greens

- Apply a remedial wetting agent (e.g. Aquatrols Aquaduct) to reduce the hydrophobicity of the soils in the dry spots. Ideally apply the product prior to heavy rainfall to help penetrate the soil. This should be followed by an application of a wetting agent (e.g. Osprey) to control the soil moistures in the profile.
- Monthly applications of wetting agents should commence in early spring (March - April) before the weather conditions become dry. These should continue through the season until mid-summer (late July - August).
- Any areas that have lost turf vigour should be hand-seeded using a browntop bent seed.
- Increase routine refinement through regular verti-cutting in the spring to improve ball roll when growth is differential.
- Organic matter control - As previously advised, the high organic matter levels in the greens soil profile require remedial work to reduce figures down to the ideal levels. Carry out a hollow coring operation in the autumn with a 12mm tine to a depth of 50-60mm. The cores should then be cleared from the greens and followed by a heavy top-dressing to fill the holes to the surface. A follow-up application of sand top-dressing may be required to re-level the surface following rainfall or irrigation inputs.
- For a faster reduction combine the hollow coring with a Graden sand injection process. Ideally this will be carried out in August to facilitate faster recovery as weather conditions will be more favourable. This is a perfect opportunity to include an overseeding with 100% browntop bent at the same time to further speed up recovery.
- Sand top-dressing inputs must achieve a minimum target of 120 tonnes/ha per annum. This should be achieved through a combination of regular light dressings, with heavier dressing at the time of renovations.
- To encourage deeper rooting following a wet and cold winter where root development was compromised, carry out a solid tine operation every 3-4 week with a 6-8mm tine to 80mm depth to create air space to encourage root development. Combine the operation with an application of sand top-dressing, brush and roll to return the surface back to an acceptable standard
- Carry out 2-3 Air2G2 operations annually to provide the deep aeration the soil profiles require. The process of fracturing and fissuring the soil through air injection at 7 or 11 inches depth will improve the movement of moisture through the profile.
- Nutrition - A change should be made to the fertiliser inputs to provide more control over growth rates and reduce the risk of growth flushes that compromise the playing qualities of the greens.
- The annual total of nitrogen input must be reduced, aim to apply 80-90 kg/ha N. This could fluctuate dependent on weather conditions and growth potential.
- To provide the consistent control of nutrition input in the future, apply an early season ammonium sulphate-based lawn sand at 35g/m<sup>2</sup>. A lawn sand product will also help control the moss ingress. Follow this application with regular liquid spoon feeding through the growing season with homemade straight mixes containing ammonium sulphate & urea mixed with iron & magnesium sulphate when required.
  - Through the growing season mix:
    - § 5-6 kg ammonium sulphate.
    - § 5-6 kg soluble urea.
    - § Dissolve and apply in 400-500 l/ha of water.
    - § Apply mix as and when required, fluctuating from every 2-4 weeks dependent on growth and weather conditions.

- Utilise liquid straight nutrition of ammonium sulphate (5 kg/ha) and iron sulphate (10 kg/ha) right through the winter period to maintain turf sward density to reduce the ingress of moss. Occasionally add some magnesium sulphate (5 kg/ha) into the mix to provide a colour and sward health response.
- The use of acidifying fertiliser will favour the finer bent grasses in the sward.
- To help control the moss in the turf apply Mogaton to the affected areas. Mix in the product at 1.5 g/L of water (15 kg/ha) and apply by knapsack on the infested areas at 1 L/m<sup>2</sup> (10,000 l/ha).
- Follow the application with a scarification operation to physically remove the moss for the sward.
- If moss still persists then plugging the affected turf will be the most effective control method.
- Long-term, maintain good turf vigour through the winter is key to reducing the available space for moss ingress in the greens.

### Tees

- As the dry conditions continue limit the stress on the tees as much as possible by raising the height of cut and reducing the frequency of mowing to only when required.
- Prior to the next forecast heavy rainfall apply a remedial wetting agent (e.g. Aquatrols Aquaduct) to reduce the hydrophobicity of the soil and help re-wet the profiles.
- An application of a controlled release granular fertiliser is required to accelerate the recovery of any turf cover lost during the extremely dry conditions.

### Rough Grasslands

- To improve the aesthetic appearance of the course changes to the mowing patterns of the roughs is required. Currently regular mowing of vast expanses of grassland in the carries reduces the definition of the holes.
- To create a visual frame for the hole, increase the amount of uncut rough grassland right and left of the carries to create more defined playing lines.
- It is key that a long-term rough management plan be implemented to improve the playability of the roughs in-line with the aesthetic appearance.
- Implement an annual cutting and collecting operation by cutting the rough to 2-inch, ideally with a flail mower, and removing the clippings. Removing the clippings reduces the nutrient that is replenished in the soil.
- The location and arid nature of Elgin Golf Club is ideal for promoting the finer grasses that are revered for golfing roughs. This is highlighted by the abundance of finer grasses in the fairways. A robust rough grassland management plan in these conditions will see a change in the nature of the roughs relatively quickly.
- Introducing more rough grasslands will also save on valuable man hours spent mowing excessive amounts of short cut rough on a regular basis.
- The introduction of the rough grasslands will also improve the ecological value of the golf course by creating habitats for a diverse range of flora and fauna.

### Tree Removal

- Further tree and whim removal are to continue around the golf course and should be focused on areas that will improve the agronomic areas of the turf.

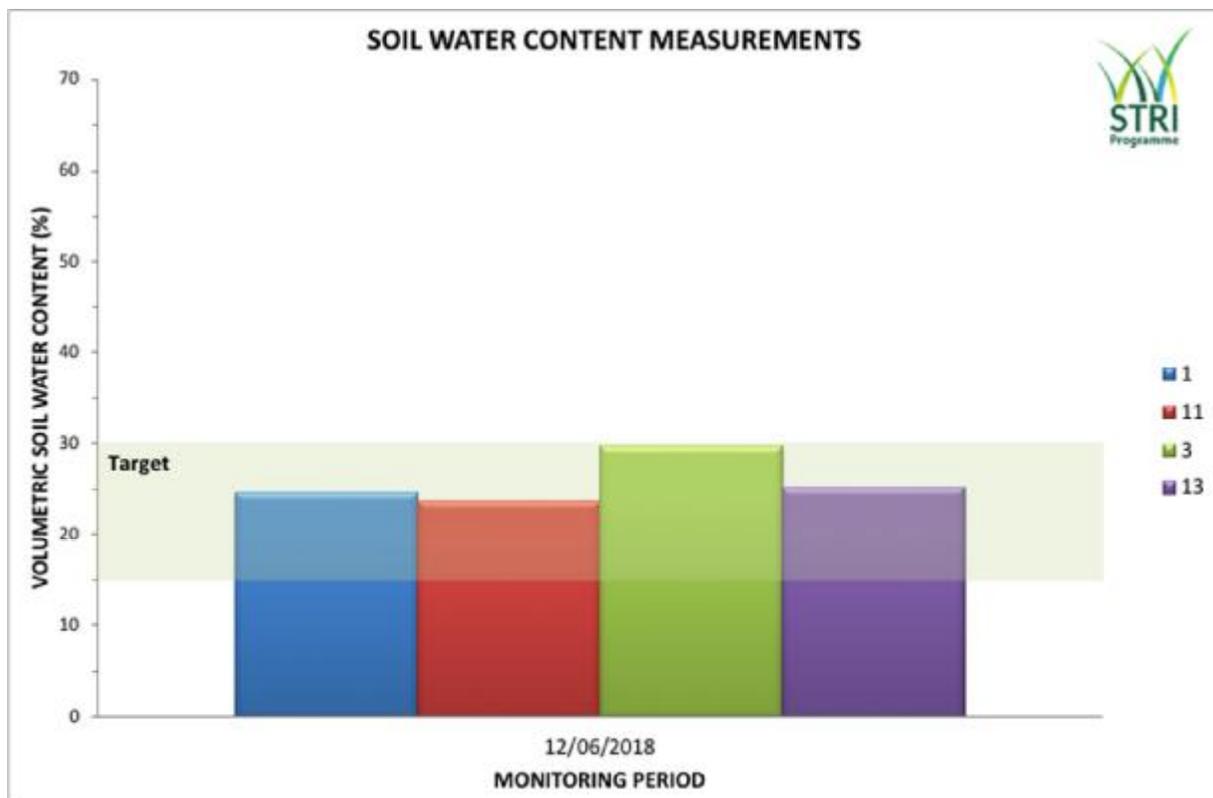


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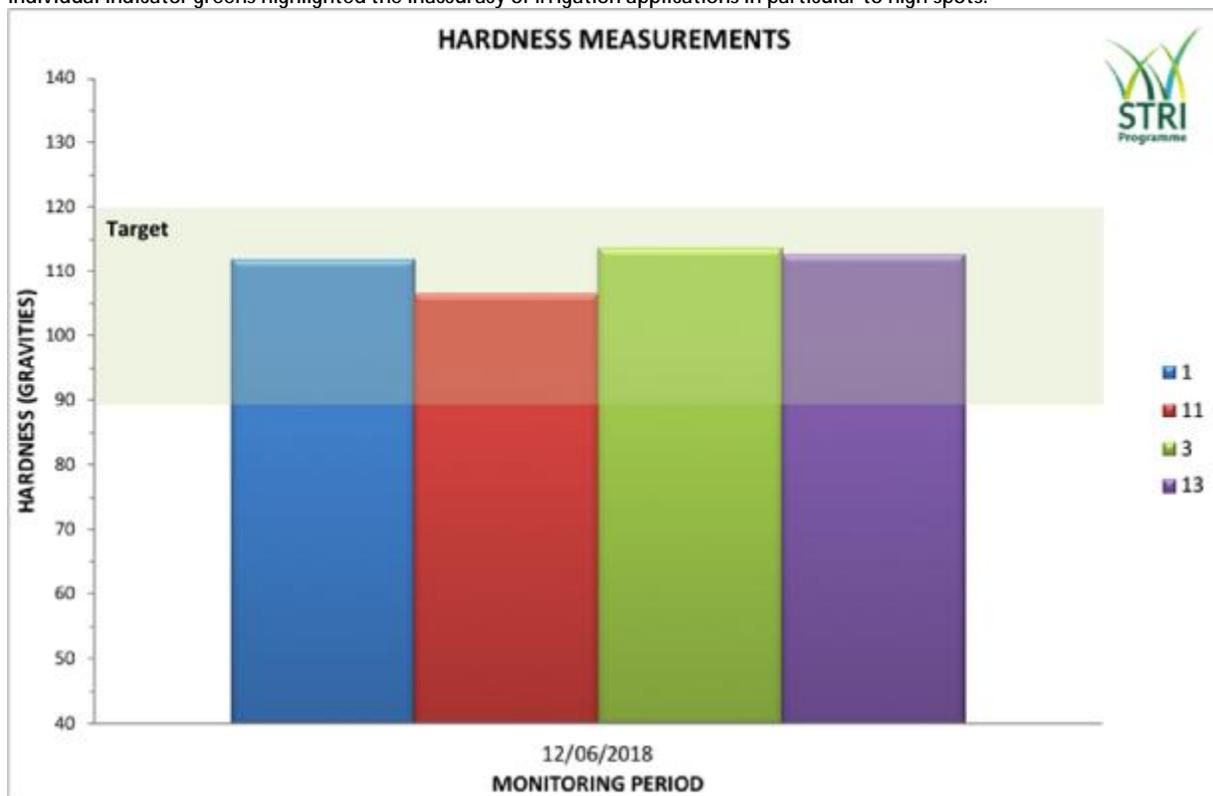
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# Objective Data

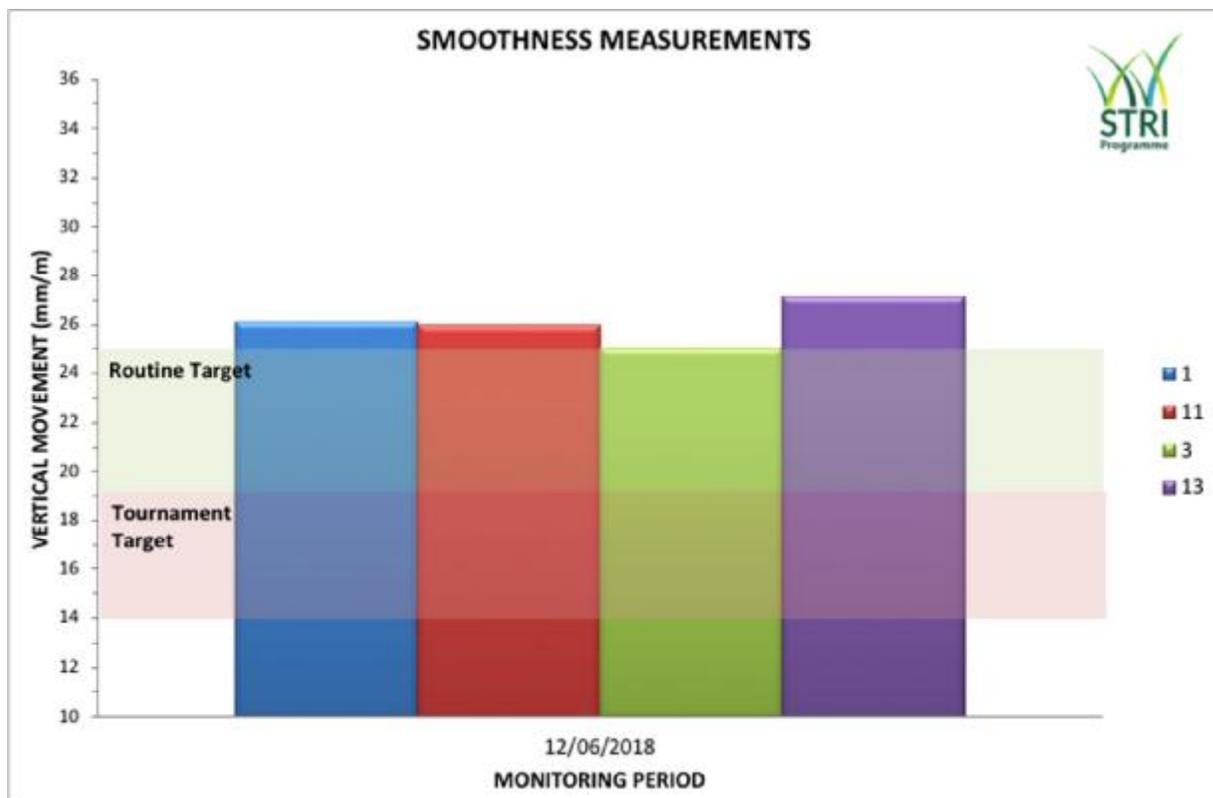


Objective Data Graph 1: The average moisture content was in target at 25.8% and in target range. However, variance across the individual indicator greens highlighted the inaccuracy of irrigation applications in particular to high spots.

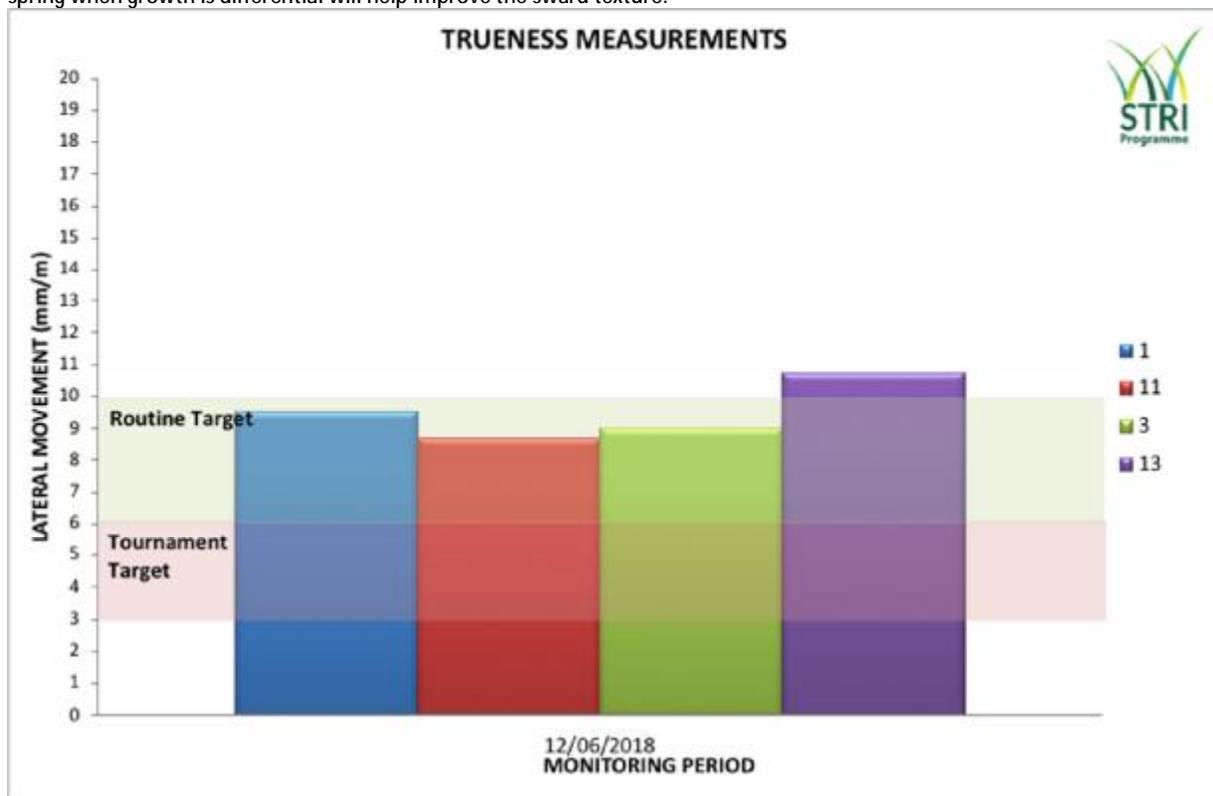


Objective Data Graph 2: The firmness readings were all in the target for routine play at an average of 111 Gravities. With firmness's towards the upper end of the target scale a 7-iron will impact, release, check and roll out.

# Objective Data (continued)



Objective Data Graph 3: Smoothness readings were out of target for routine play. Intensifying routine refinement work through the spring when growth is differential will help improve the sward texture.



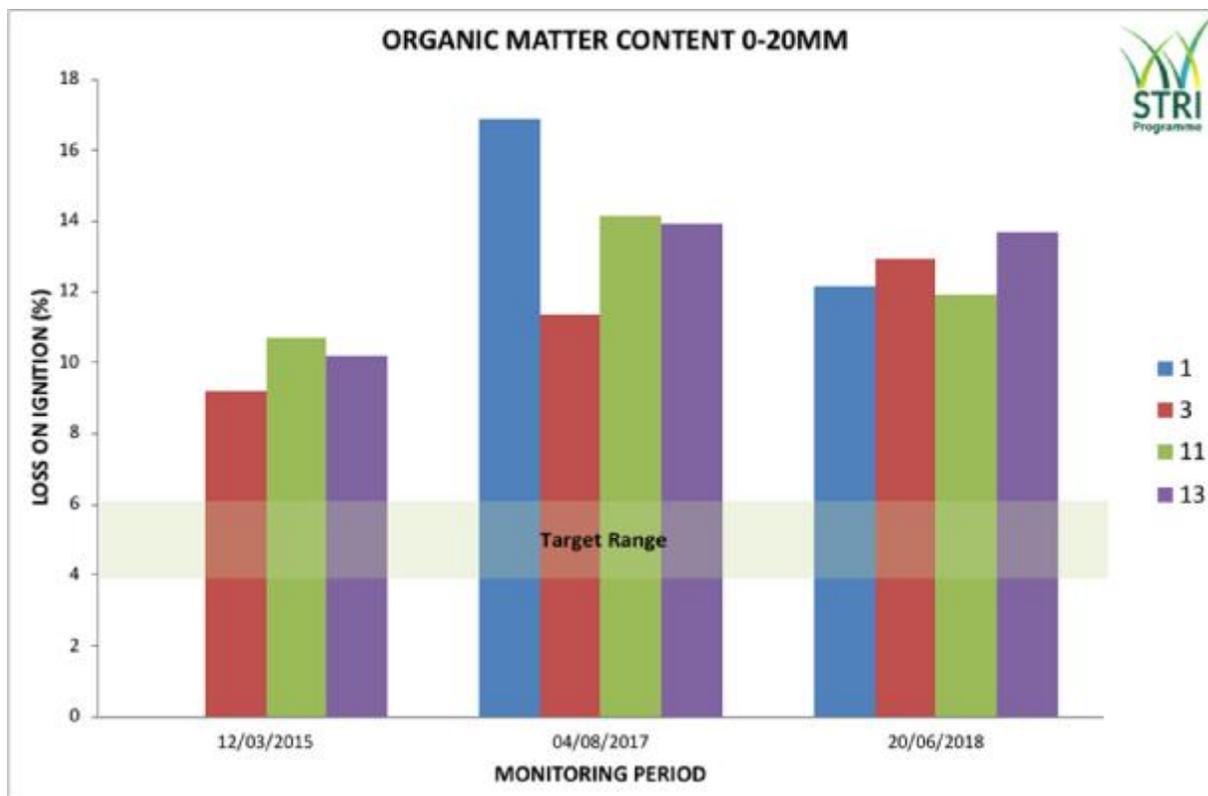
Objective Data Graph 4: Average trueness measurements were in target at 9.5mm/m. This indicates the quality of the blend of grasses through the greens.

# Objective Data (continued)

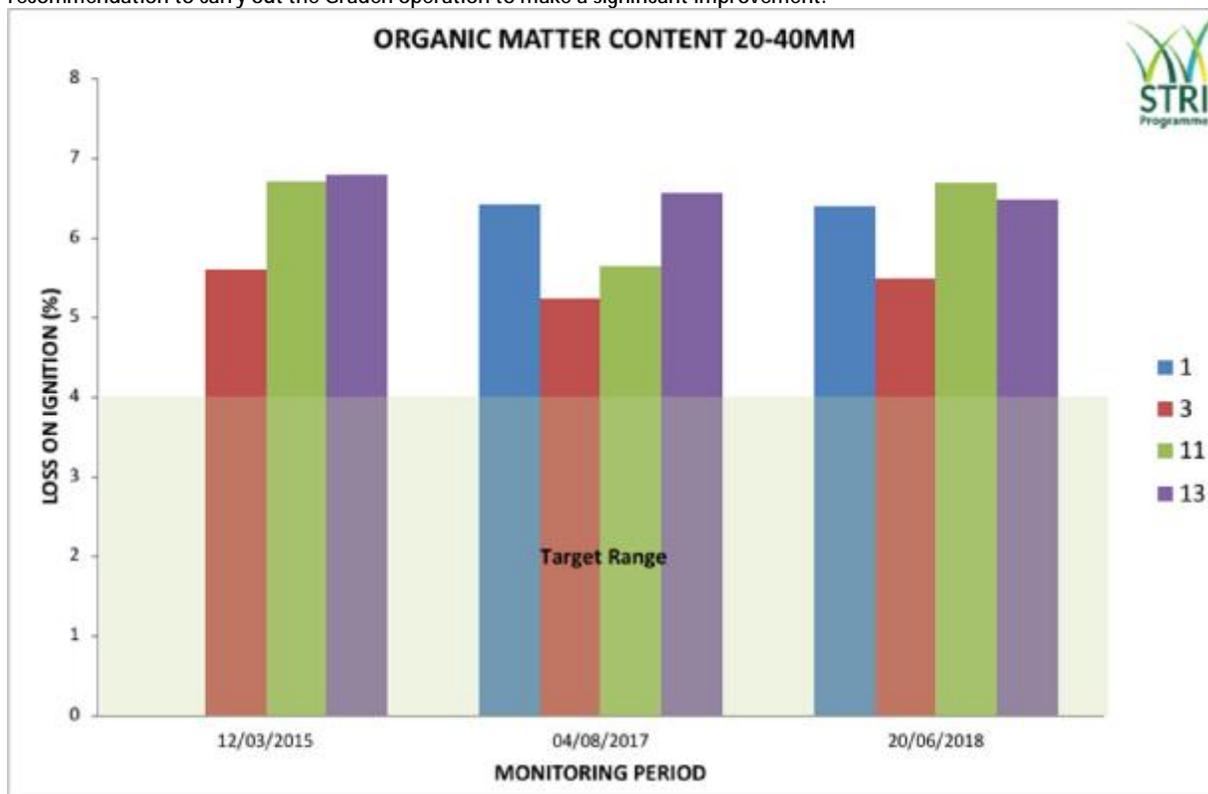


Objective Data Graph 5: Average green speed was 7ft 10in and considerably slower than the acceptable standard for routine play.

# Soils Laboratory Data

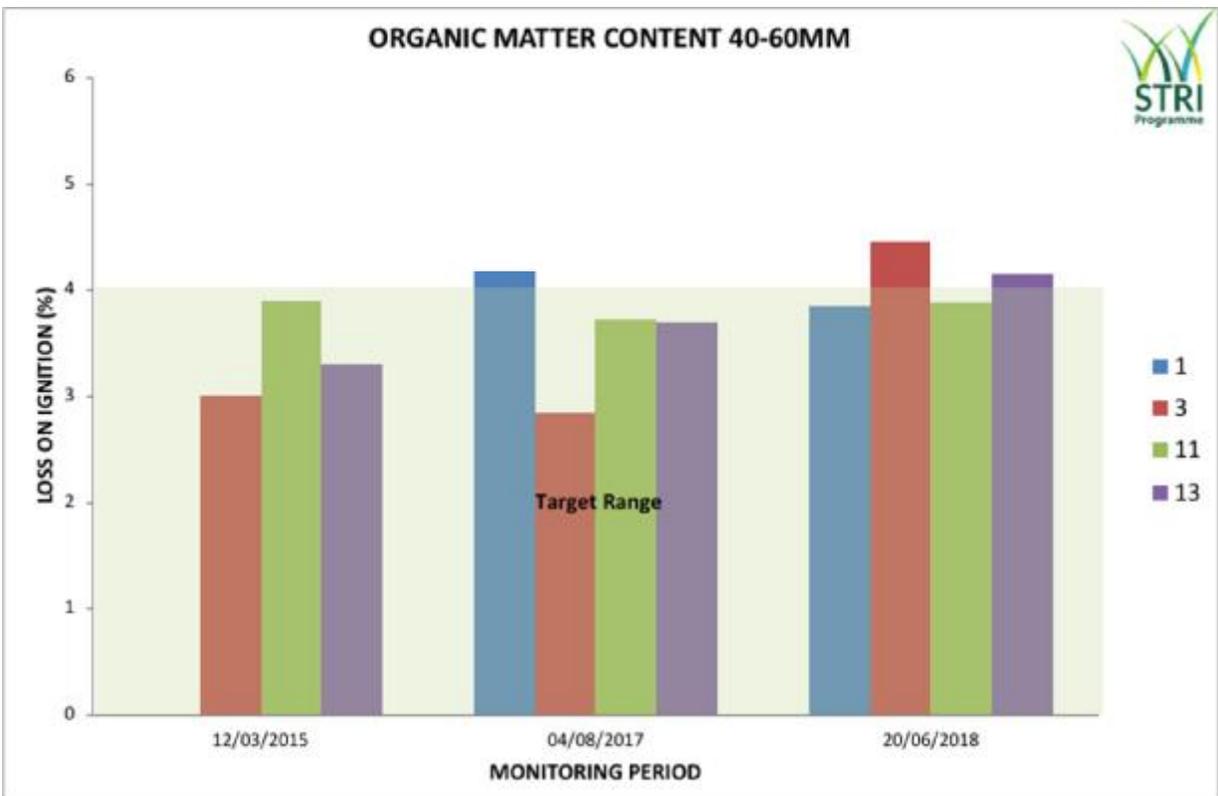


Soils Laboratory Graph 1: At an average of 12.7%, the organic matter accumulation at 0-20mm remains excessive. This supports the recommendation to carry out the Graden operation to make a significant improvement.



Soils Laboratory Graph 2: The organic matter content at 20-40mm remains higher than the ideal at 6.3% supporting the recommendation to combine the Graden operation with a hollow coring to 50-60mm depth.

# Soils Laboratory Data (continued)



Soils Laboratory Graph 3: The organic matter content at 40-60mm in the profile has seen a slight increase to an average of 4.1%. The increase of sand top-dressing will see this slightly increase but with hollow-coring to a depth of 60mm and incorporating top dressing to this depth should see the figures reduce.



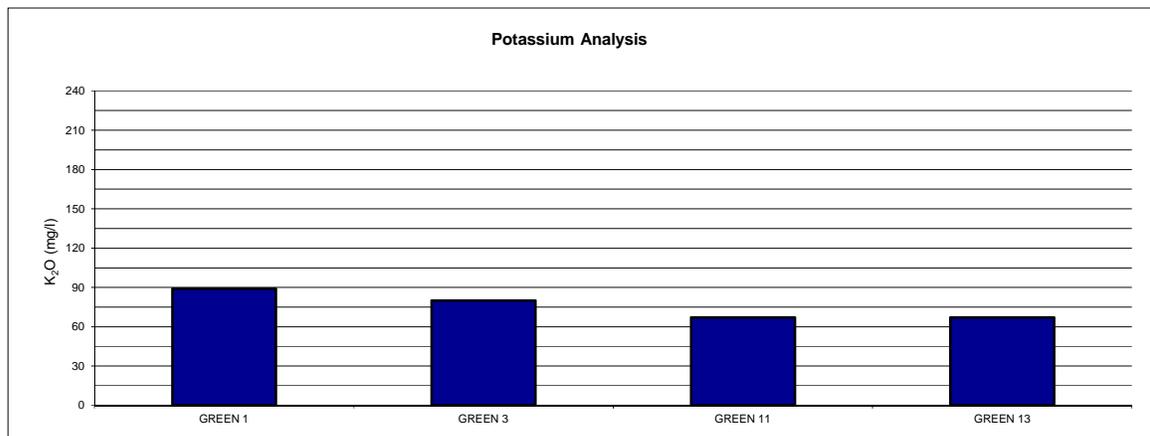
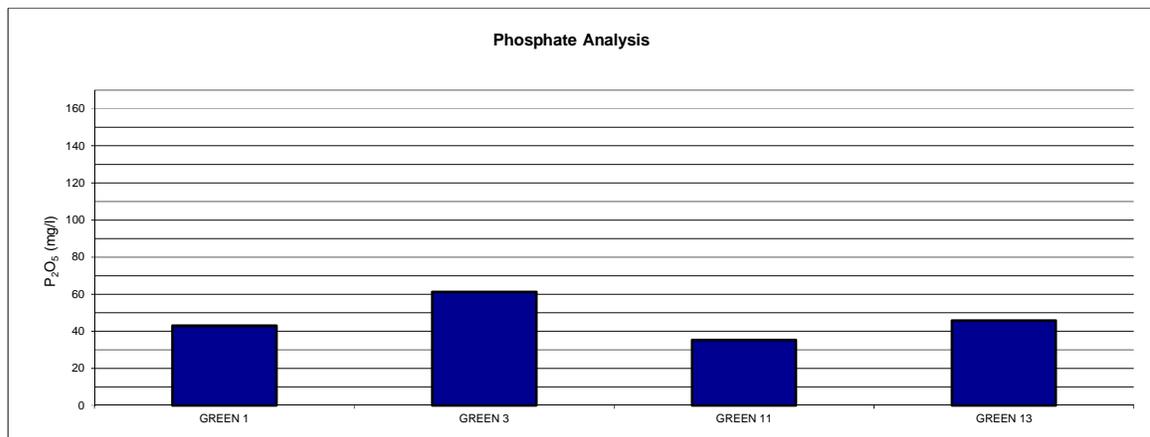
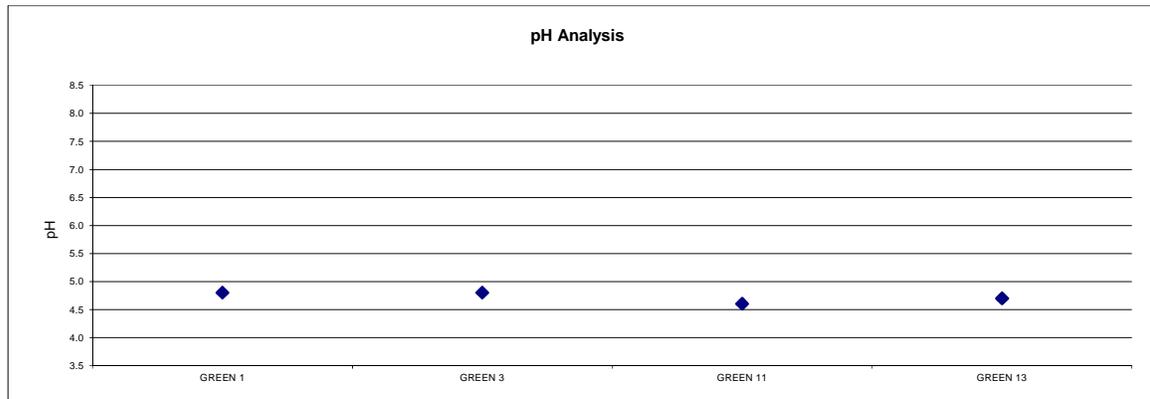
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## SOIL CHEMICAL ANALYSIS

## ELGIN GC

Date: 14/06/18



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

## ORGANIC MATTER CONTENT

CLIENT: ELGIN GC  
ADDRESS: HARDHILLOCK,  
BIRNIE ROAD, ELGIN,  
MORAY, IV30 8SX

DATE RECEIVED: 14/06/18  
DATE REPORTED: 20/06/18  
RESULTS TO: RAW

TEST RESULTS AUTHORISED BY:  
Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION	LOSS ON IGNITION (%)*
A16957/1	1 0-20 mm	12.13
	20-40 mm	6.40
	40-60 mm	3.85
	60-80 mm	3.77
A16957/2	3 0-20 mm	12.96
	20-40 mm	5.47
	40-60 mm	4.46
	60-80 mm	3.64
A16957/3	11 0-20 mm	11.93
	20-40 mm	6.69
	40-60 mm	3.88
	60-80 mm	3.33
A16957/4	13 0-20 mm	13.71
	20-40 mm	6.49
	40-60 mm	4.14
	60-80 mm	4.47

\* 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