Making great sport happen

Fortrose & Rosemarkie Golf Club

Advisory Report on the Golf Course

Report Date: 7th June 2017
Consultant: Richard Windows

Fortrose & Rosemarkie Golf Club

Date of Visit:	Thursday 8th June 2017
Visit Objective:	To review the condition of the course, take objective measurements of green performance and confirm ongoing maintenance requirements.
Present:	Mr Mike MacDonald – Club Manger Mr George Patterson – Course Manager Mr Richard Wing – STRI Ltd Mr Richard Windows – STRI Ltd
Weather:	30 mm rain on the day before the visit but dry and breezy with sunny spells.

Headlines

- Fortrose & Rosemarkie is an excellently conditioned course on a wonderful piece of land – a true gem.
- The fescue overseeding programme has delivered limited success with only small traces within greens.
- A programme of bent seeding should replace the fescue seeding programme.
- Leatherjacket damage has been a problem to greens, most notably 12G.
- Grass cover has been fully restored to fairways following the drought damage in 2013.
- Currently reviewing staffing and machinery requirements although additional seasonal appointed.
- Pathways are in poor condition and require improvement to enhance course presentation.
- Gorse removal is an important objective to improve the quality and diversity of landscape.
- Irrigation system is old (1981) and is something that will require upgrade within 10 years.

Key Actions

- Increase sand top dressing inputs to greens and approaches with an annual rate of 100 t/ha.
- Implement monthly bent seeding during July, August and early September rather than fescue.
- Carry out micro hollow coring during August combined with bent seeding.
- Implement 2-3 12 mm Verti-drain operations and 4-6 slitting operations before Christmas.
- Use soluble straights to provide careful control of nutrient inputs to the greens.
- Extend more refinement and routine maintenance into the green approaches.
- Apply wetting agent (Revolution) to the fairways four times during October to April.
- Increase nutrient inputs and achieve annual renovation to the tees.
- Manage the rough grassland involving cutting, clipping collection and raking in the early autumn.
- Additional sprayer, a greens Verti-drain and potential for a seeding unit are main items of machinery.
- Commence a programme of gorse management.

Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	33.7% (range 31-36%)	10-25%
Hardness (Gravities)	101 Gravities (range 99-105g)	100-140 g
Smoothness (mm/m)	21.71 mm/m	<25 mm/m
Trueness (mm/m)	5.1 mm/m	<8 mm/m
Green Speed	9 ft 2 in	9 ft 0 in - 9 ft 6 in
Organic Matter 0-20 mm (%)	8.1%	4-6%
Organic Matter 20-40 mm (%)	4.8%	<4%
Soil pH	5.2	5.0-6.0
Phosphate (P_2O_5)	14 mg/l	>10 (mg/l)
Potassium (K_2O)	41 mg/l	>30 mg/l

Key: In Target | Marginal Variance | Out of Target

Figure 1: The golf course is generally in excellent condition given the staffing and resources available. Authentic links conditions are presented to all surfaces.

Figure 2: The greens were firm despite 30 mm rainfall the day before the visit. Grass cover, sward texture and ball roll qualities were good.

Figure 3: The sward blend to the greens varied from browntop bent dominant turf (60% to better greens, e.g. 1 & 2) and meadow-grass dominant turf (70% to weaker greens, e.g. 13 & 16). The aim is to increase bent populations further.

Figure 4: There are traces of fescue in the swards but this is limited to drier slopes. At this stage, the strategy of fescue overseeding should be replaced with browntop bent. Once bent is dominant, a return to fescue seeding can commence.

Figure 5: The soil profiles are generally in good order although the richer fine textured soil at depth (red arrow) was tight and rather compact with evidence of an iron pan in wetter areas, which does restrict drainage. Increased deep aeration is needed.

Figure 6: The upper soil profile supports good quantities of sand but organic matter is a little high (8% at 0-20 mm) illustrating the need to increase sand top dressing but more drastic treatment such as routine hollow coring or sand injection scarification is not needed.

Figure 7: Leatherjacket activity is noted to certain greens and the worst damage was present to the right of 12. In some areas, the grub activity did compromise the early season performance of the greens.

Figure 8: Populations of moss was present to parts of greens following Rescue graminicide treatment.

Figure 9: The green approaches were well grassed but do require additional maintenance input in the form of feeding, sanding, wetting agent and routine refinement to ensure they become extensions of the greens.

Figure 10: The fairways were offering tight and crisp lies. Those to 1-4 & 12 which have been treated with Fifty90 wetting agent supported stronger grass cover and better consistency between slopes and swales.

Figure 11: The tees were in decent order but require greater nutrient input and a solid programme of annual renovation involving aeration, top dressing and seeding.

Figure 12: The process of cutting, clipping collection and scarification should commence to the rough during the early to mid-autumn to provide thinner and wispier textured swards.

Figure 13: Gorse removal is an important objective to many areas of the course. The plan should be to open green complexes, e.g. 17 by pushing the gorse back from the putting surfaces and created more wispy grassland.

Figure 8: The areas of gorse running along fairways are dominant (e.g. left of 3) and should be broken up with some being allowed to regenerate to create small copses while larger areas should be removed to create open sand scrapes.

Figure 9: Unfortunately, where gorse was removed last year has been replaced with imported fescue and rich soil. The result is dense patches of unnatural grassland which is thick and dense. These should be removed.

Figure 10: Areas of excellent species rich grassland are evident throughout the course and future rough turfing work should use such species rich material from donor areas or by establishing on Turf Nursery.

Figure 11: Pathway areas require improvement in the form of returfing with ryegrass and then a programme of ryegrass seeding, feeding and wetting agent to maintain density and quality.

Recommendations

Greens

- The biggest change in the maintenance should involve an alteration in the overseeding strategy. Despite several years of fescue overseeding, there is little evidence (other than a trace) of fescue within the surfaces. Many of the greens are currently too moisture retentive (due to the rich underlying soil) and support excessively high populations of meadow-grass. Therefore, a better strategy would be to improve the soil profile by more top dressing, carefully manage nutrient inputs to provide leaner turf and implement more bent overseeding to favour the development of this grass within the swards over the next few seasons. The general aim should be to create drier upper soil profiles and leaner, bent dominant swards before shifting the strategy once again towards more fescue. In summary, we will come back to fescue overseeding in the medium term, but the greens are not at that stage yet.
- The bent overseeding should be focussed during periods where soil temperatures are consistently around and above 15°C. So, this means July, August and early September. It is hoped a process of double verticutting and then dimple seeding using the Sisis Variseed will work well. For the August treatment, use the micro coring tines to further prepare the seedbed. Ensure high quality bent seed is used (e.g. Johnsons All Bent or Barenbrug Bar All Bent) and apply at a high seed rate of 10 g/m^2.
- Routine grooming with the units fitted on the triple mowers should continue through the season to refine sward texture. Occasional verticutting should be integrated into the process to regulate sward density and texture. The 'grassier' greens, e.g. 8, 13 & 16, may require additional verticutting to optimise density and ball roll qualities to these surfaces.
- Increasing sand top dressing inputs, using the excellent Hugh King sand, is important. The aim is to apply sand at an annual rate of 100 tonnes per ha as a minimum. Use solid tining in the autumn, winter and early spring to key the material into the upper soil profile and help the turf absorb the sand. Through the spring and summer, regular light dustings of 5-10 tonnes to 18 greens would be ideal and rapidly absorbed into the sward base and therefore offer minimal disruption to golf/mowing. By increasing sanding, the surfaces become firmer and drier in wet weather and create the desirable free draining conditions in which to favour bentgrass and ultimately fine fescue.
- Where organic matter is higher, e.g. 16G, a slightly different approach involving some micro coring or hollow coring would be beneficial to accelerate organic matter reduction.
- The general programme of granular fertilisers in the spring is good and should be sustained. A product such as the Sea Complex 4:3:4 will work well or the Terralift 3:0:6. For feeding through the rest of the year, soluble straights will give the best flexibility and control. In general, ammonium sulphate should be used during cooler conditions (spring and autumn) and urea during warmer conditions. 10 kg/ha of ammonia with some magnesium sulphate, Farmura Porthcawl and compost tea would be a good early and late season mix then changing to a 5 kg/ha ammonia and 5 kg/ha urea mix during the summer months. Green specific inputs can be made with more frequent or double passes to the weaker greens to balance out growth and surface performance.
- Routine aeration practices should involve 2-3 Verti-drain operations using the 12 mm tines fitted to the machine during the October to March period. In addition, implement some slitting (3-6 passes) to the greens during the autumn to Christmas period.
- Continue with the Revolution wetting agent programme.
- Soil pH was on the low side at 5.2 and would benefit from a gentle increase to 5.5 with calcium carbonate applications in the autumn/winter combined with aeration.
- Phosphate and potassium levels are satisfactory indicating a nitrogen only fertiliser programme would be sufficient at least for the next 12 months.

Green Collars, Surrounds, Approaches & Fairways

- Extend sward refinement operations into the approaches to tighten texture and make the surfaces extensions of the greens rather than the fairways.
- Sand top dressing should also be extended into these areas in combination with greens wetting agent.

Tees

- Additional nutrient input should be made into the tees to boost vigour, density and sward recovery. A granular feed in the spring and autumn should be augmented with liquid inputs on a tee specific basis through the season.
- Liquids based on urea would be ideal tank mixed with seaweed, looking to apply 10 kg/ha of nitrogen on each application.
- A good process of renovation involving scarification, hollow coring and fescue seeding would be ideal during September.

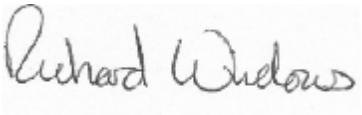
Fairways

- The main issue to the fairways is to extend the fairway wetting agent programme from 1-4 & 12 to all the surfaces. This will improve water penetration and thereby sustaining superior grass cover. It will also help improve consistency of lies to the tops and bottoms of slopes.
- The most cost and time efficient programme, which works well at other links courses, is to apply a product such as Aquatrols Revolution four times but during the autumn to early spring. So, on this basis, make the first application in October and the last of four in March.

Rough

- The major issue to the rough is gorse management and removal. The aim is to break up the large tracts of gorse throughout the course and create smaller 'copses' to break up the landscape and provide valuable shelter and nesting habitat for birds.
- This is a process that should gradually be implemented over the next few years. Where gorse does not require regeneration, the finish should be open sand areas that can naturally regenerate. When doing this, it is essential to remove any traces of topsoil to create a clean sand finish.
- In some of the open sand areas, introduction of 'chunks' of grassland would be useful to break up larger areas of open sand.
- Where imported patches of fescue have been introduced, it will be important to reduce the vigour, density and cutting, collecting or scarification or even better removing these, digging out the imported soil and leaving as a clean sand finish.
- A process of cutting, clipping collection and raking is required into the areas of open grassland. This should be completed during September/October and repeated in February/March (before any birds start nesting).
- Some local use of graminicide may be necessary to remove any patches of coarse Yorkshire fog that is present through areas of the grassland.

Signed



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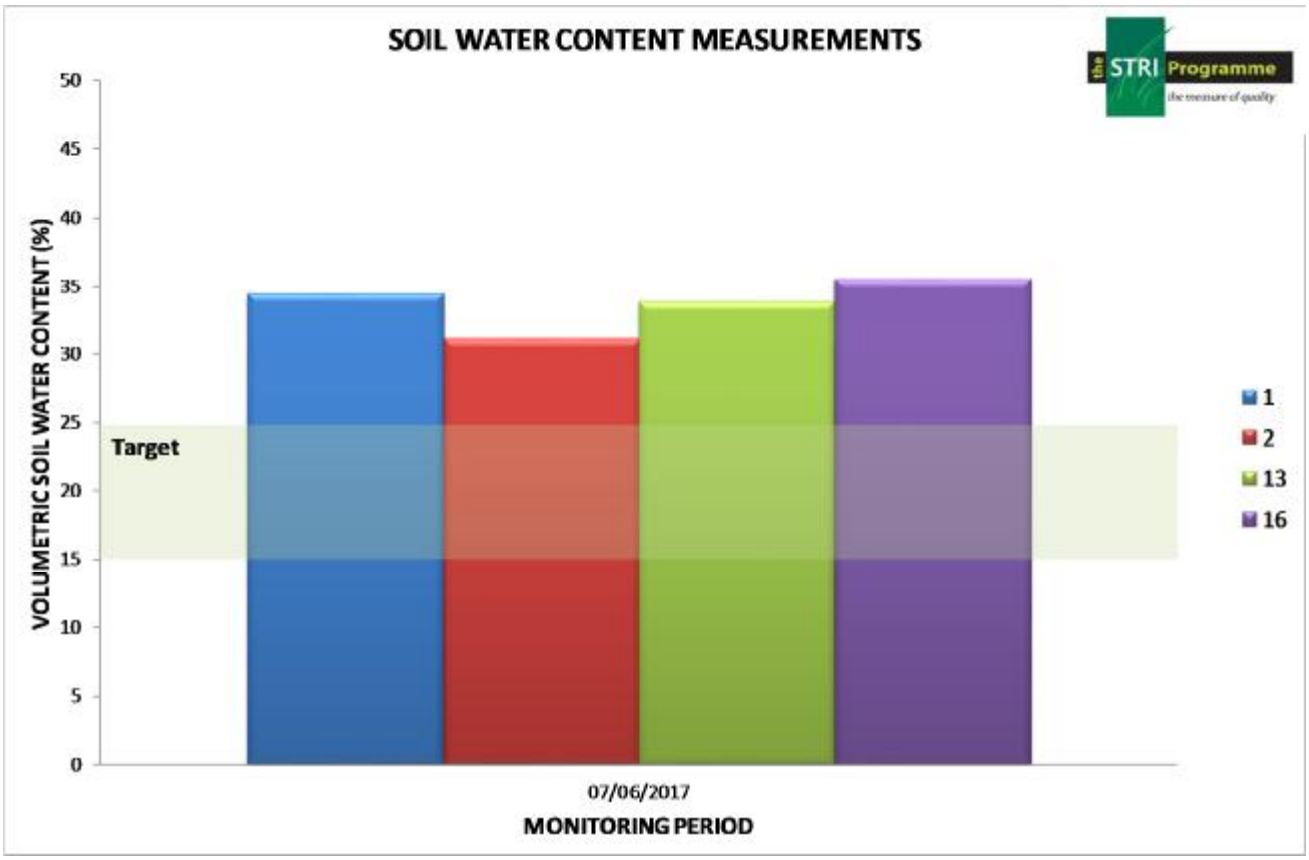
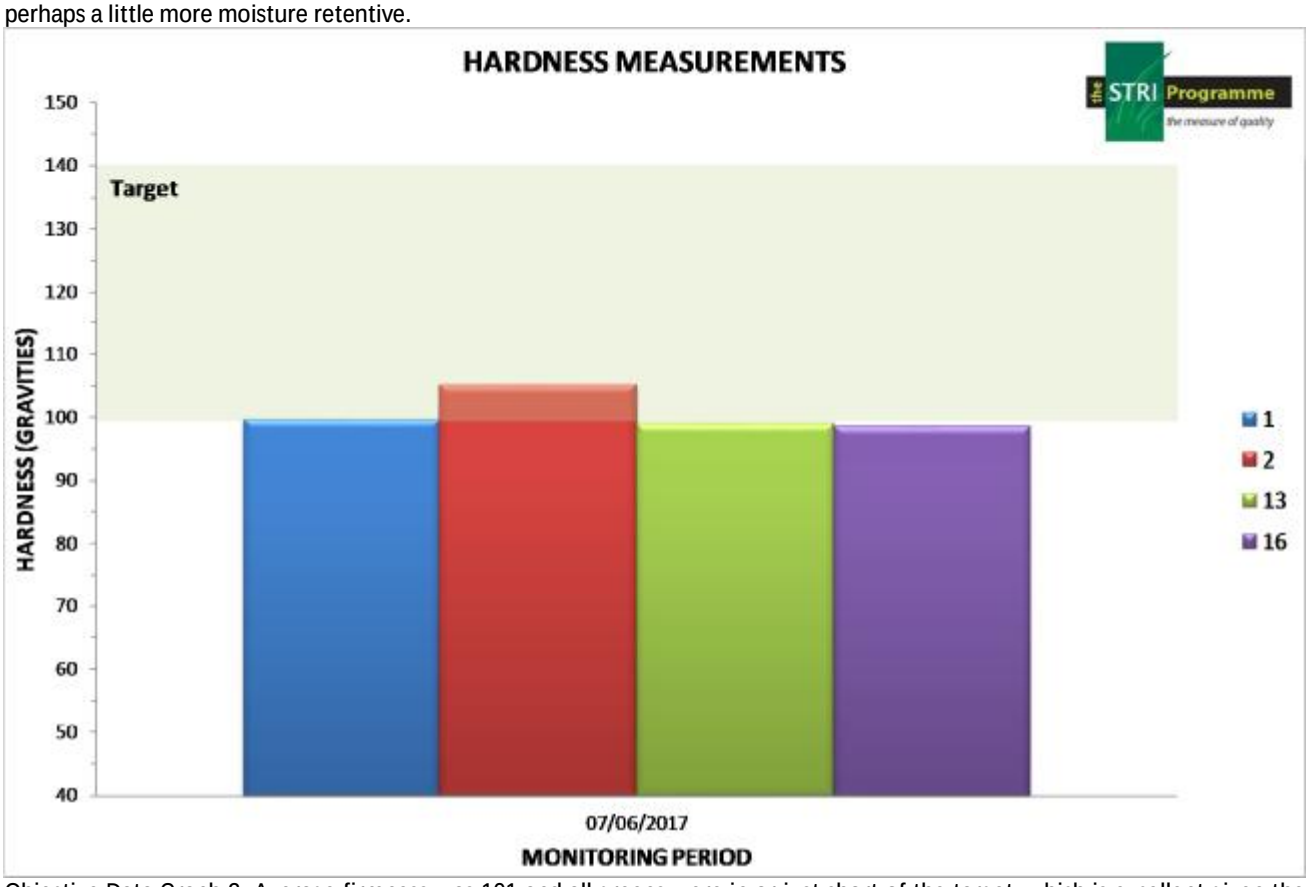
STRI is completely independent and has no alliances to commercial products, services or contractors. This ensures that our design, project management and advisory services provide the best solutions for each individual client.

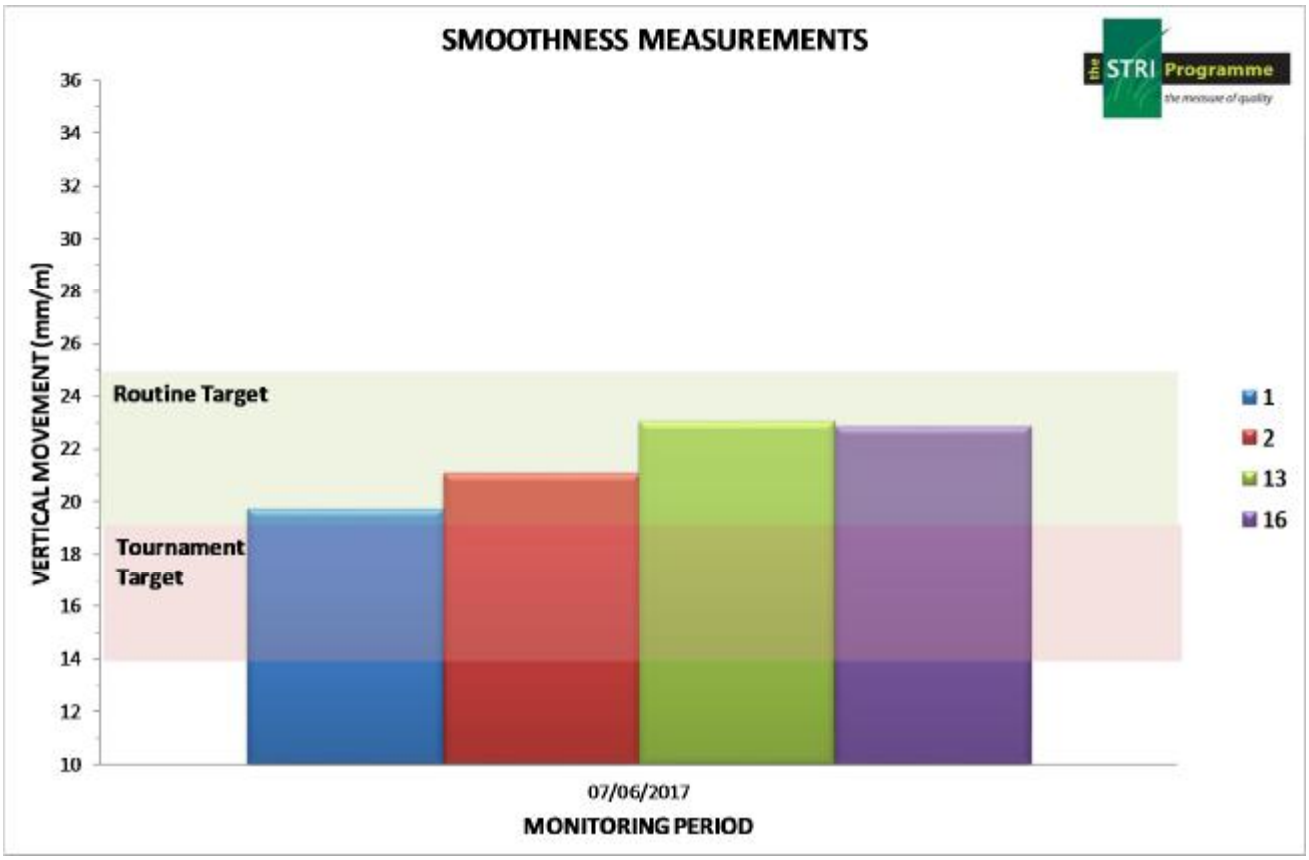
Objective Data



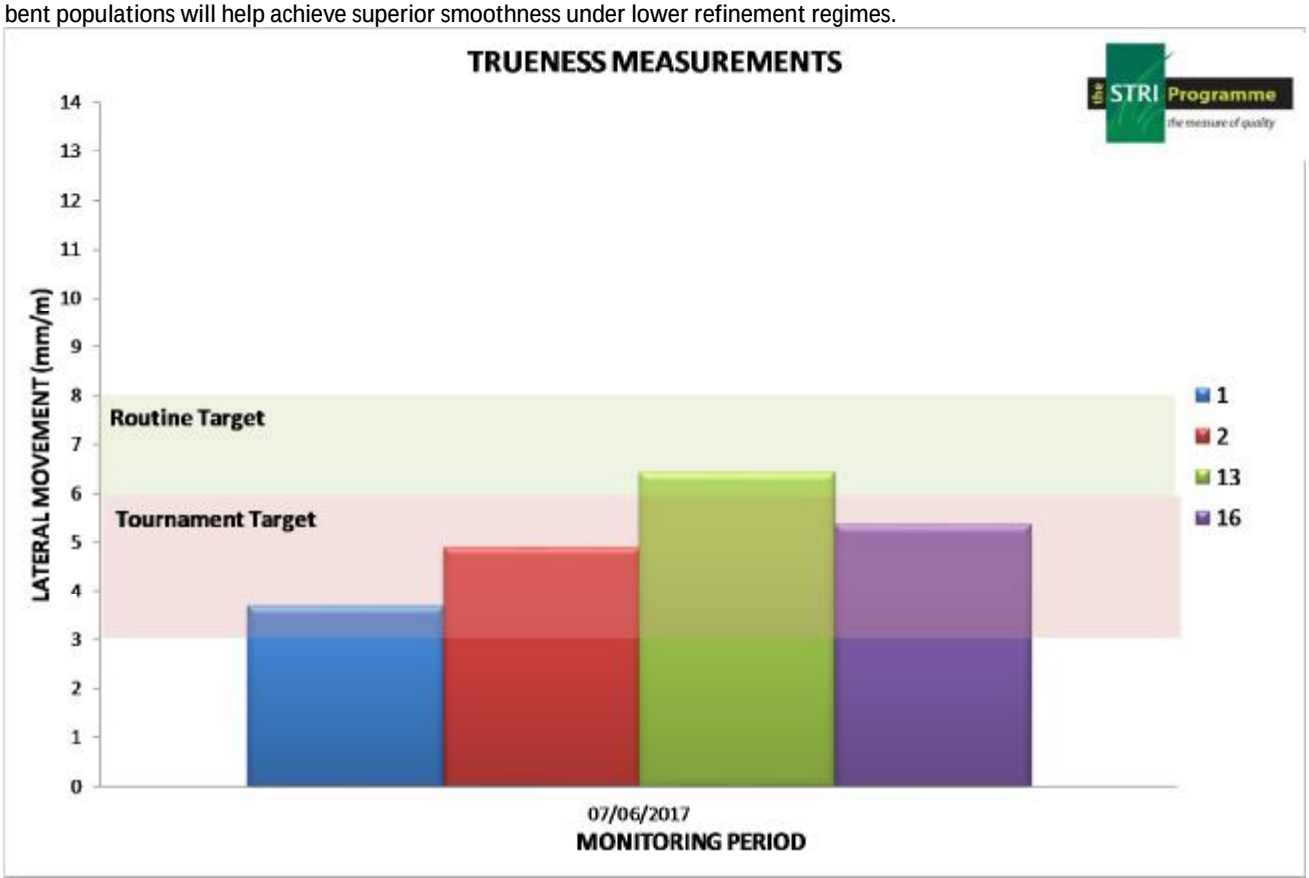
Objective Data Graph 1: Average soil moisture was 33.7% and significantly above target due to 30 mm rainfall earlier in the week. There was good consistency between greens and within each surface illustrating there are no issues with dry or wet spots. 16G was perhaps a little more moisture retentive.



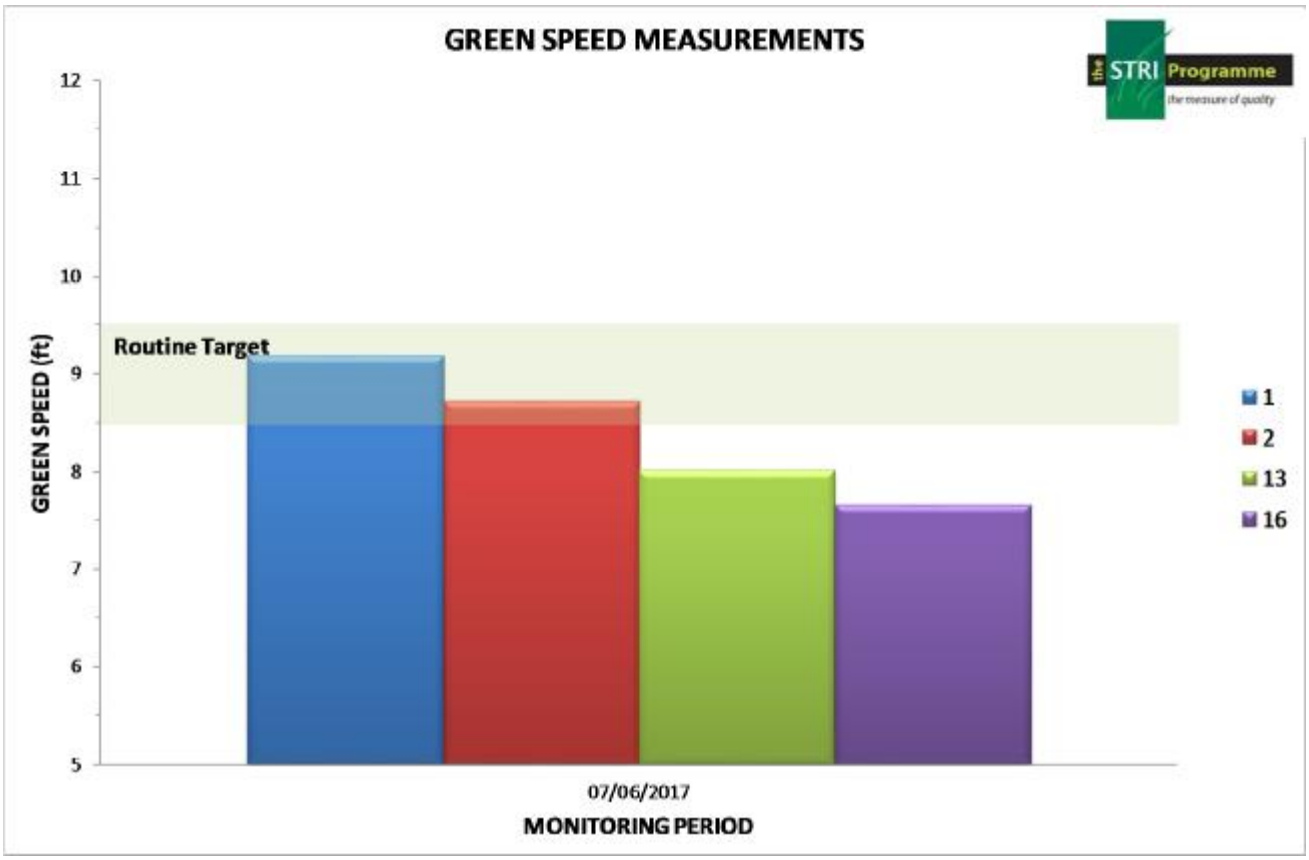
Objective Data Graph 2: Average firmness was 101 and all greens were in or just short of the target, which is excellent given the high level of rainfall and the high soil moisture values. This shows that firmness is holding up well in response to rainfall and there is no need for intensive/aggressive aeration practices.



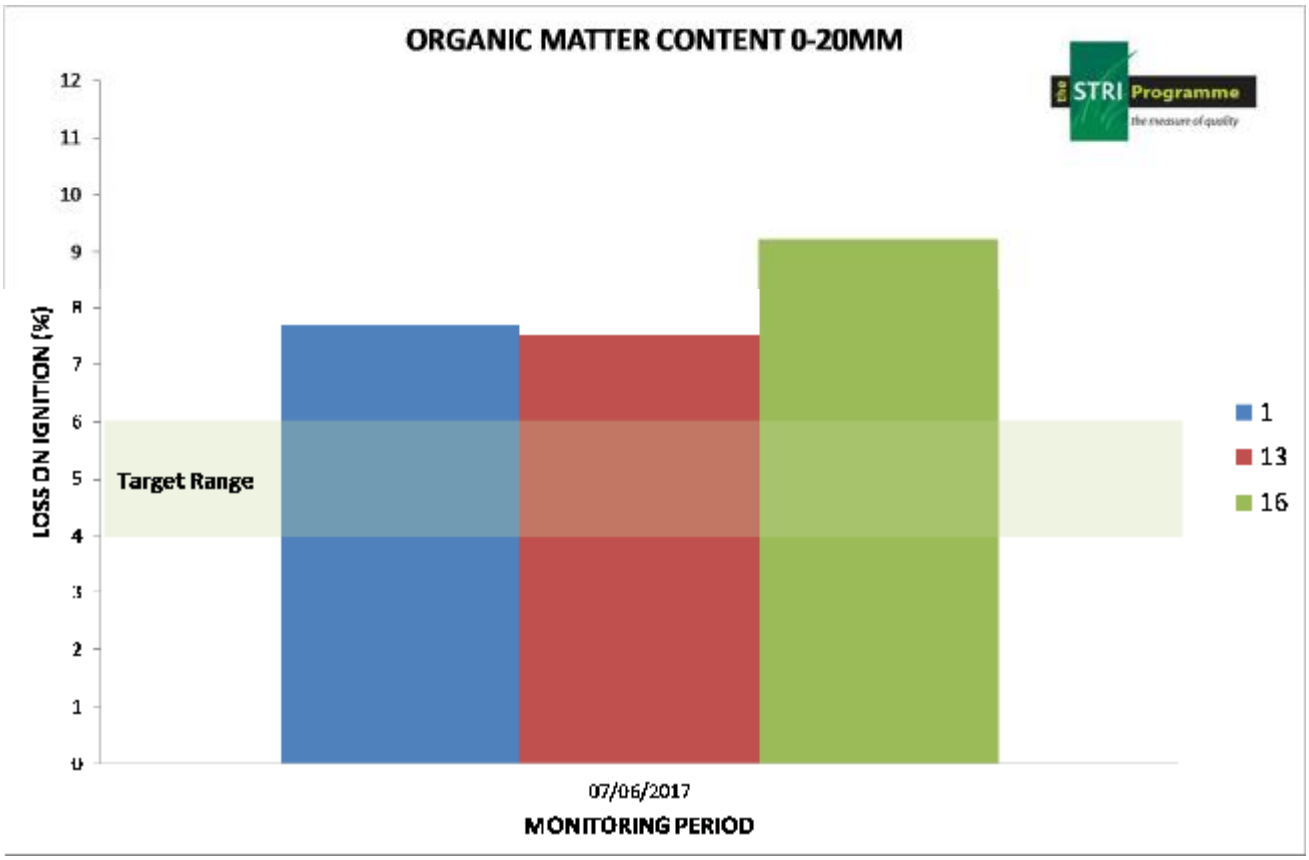
Objective Data Graph 3: Smoothness values were all in the routine target range illustrating a very good level of routine performance. The finer textured surfaces to 1G & 2G were smoother due to the higher populations of bentgrass within these swards. Increasing bent populations will help achieve superior smoothness under lower refinement regimes.



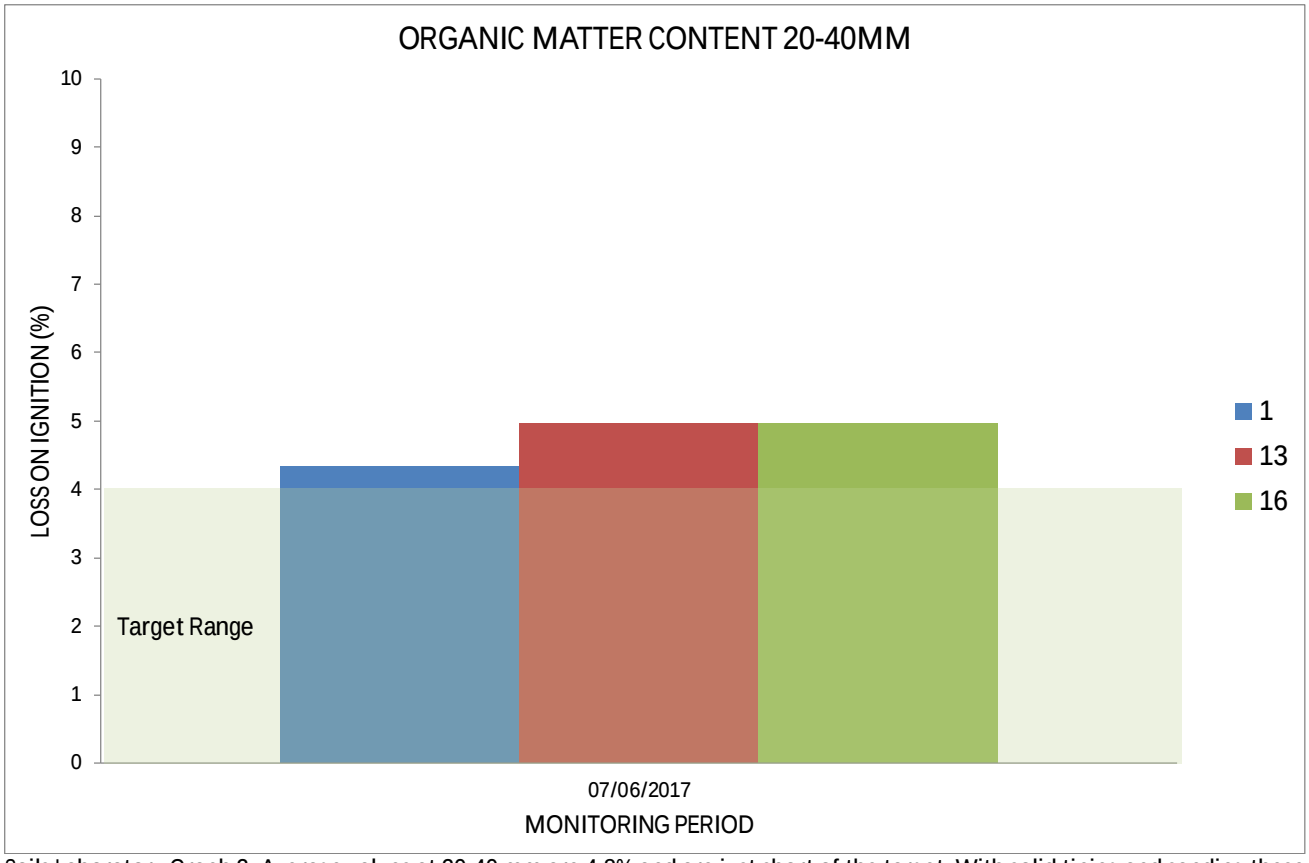
Objective Data Graph 4: Trueness values were very good with all greens in routine target and 1G, 2G & 16G all within the tournament target. 1G & 2G were superior due to the higher populations of bent in the sward.



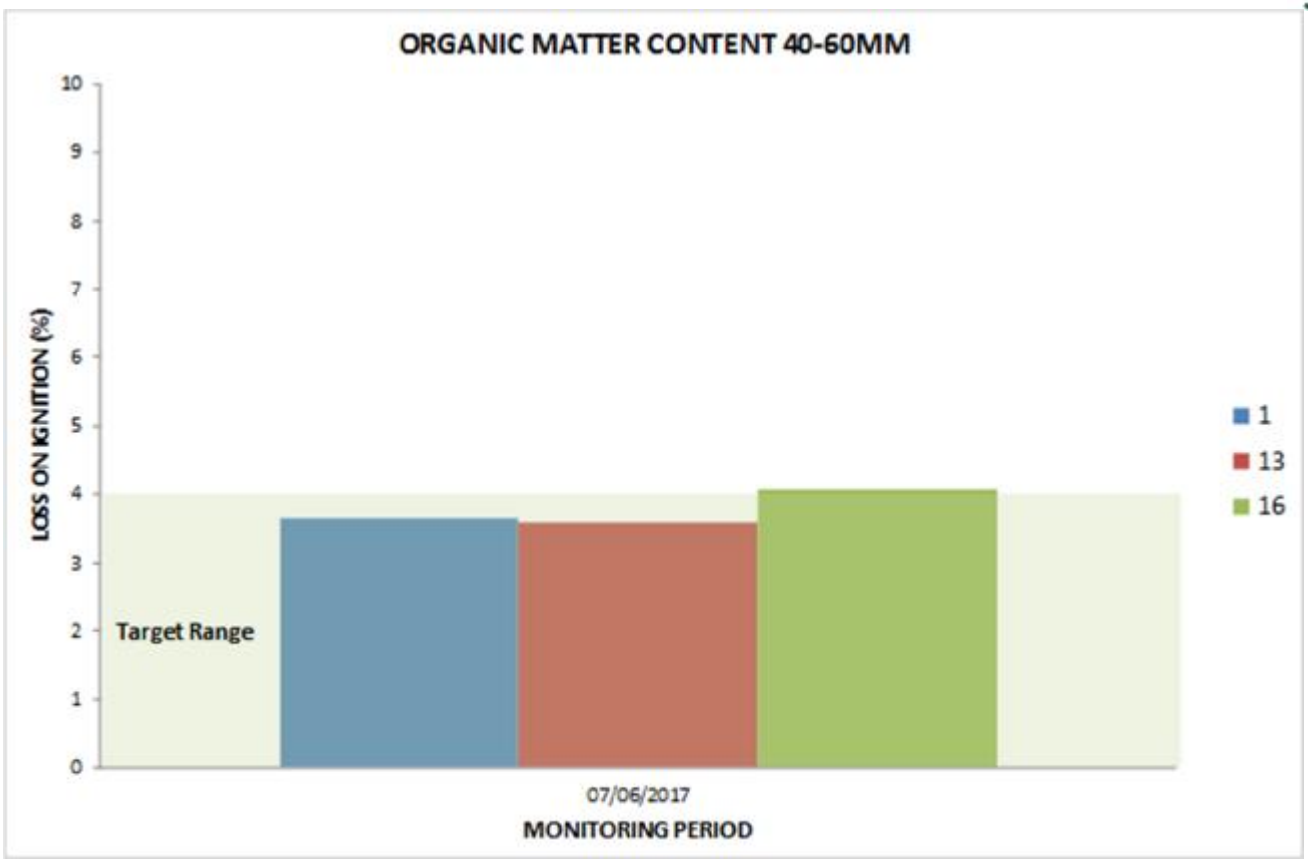
Objective Data Graph 5: The accuracy of the green speed results was significantly compromised due to the windy conditions and should be treated with caution. In windy conditions, the speed values are only ever reduced meaning the results are always slower than what they are. The values obtained from 1G are the most accurate as this was the most sheltered surface. The green speed value of 1G was 9 ft 2 in and this was generally reflective of the other greens on the course.



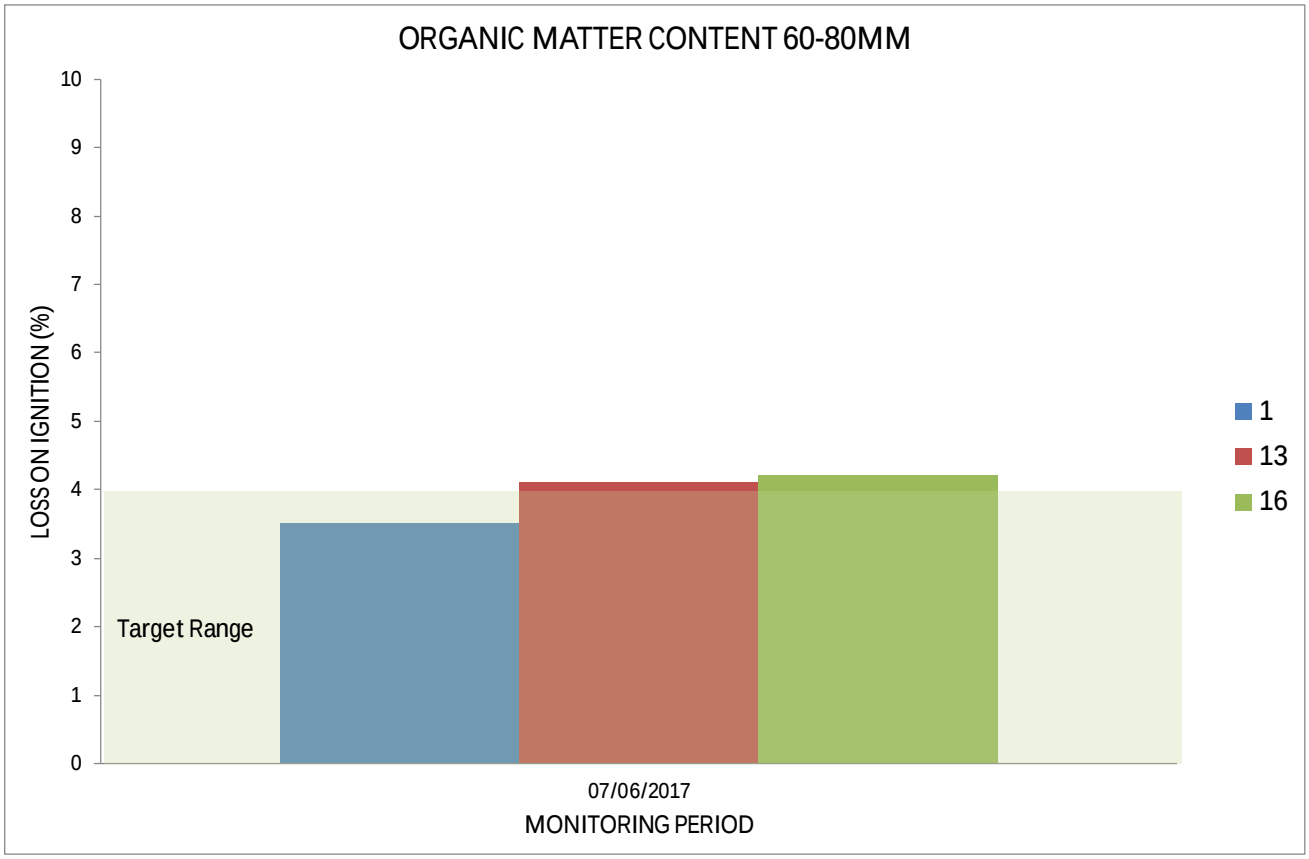
Soils Laboratory Graph 1: Average organic matter is 8.1% and above the target range. The grassier and more moisture retentive 16G is higher at 9.9%. The levels are not sufficiently high to warrant an aggressive reduction programme but rather an increase in solid tining and sand top dressing to dilute accumulations gradually over the next 2-3 years. Some additional work involving hollow coring would be beneficial to 16G.



Soils Laboratory Graph 2: Average values at 20-40 mm are 4.8% and are just short of the target. With solid tining and sanding these values will reduce over the next few years and do not require any direct action.



Soils Laboratory Graph 3: Average organic matter at 40-60 mm is 3.8% and in target illustrating no direct action is required to reduce values further.



Soils Laboratory Graph 4: Average values at 60-80 mm are 3.9% are in target and illustrating no direct action is required to reduce values further.

STRI

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ORGANIC MATTER CONTENT

CLIENT: FORTROSE & ROSEMARKIE GC

ADDRESS: NESS ROAD EAST,
FORTROSE,
ROSS-SHIRE, IV10 8SE

DATE RECEIVED: 12/06/17

DATE REPORTED: 14/06/17

RESULTS TO: RJW

TEST RESULTS AUTHORISED BY:

Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION		LOSS ON IGNITION (%)*
A15986/1	1	0-20 mm	7.71
		20-40 mm	4.35
		40-60 mm	3.64
		60-80 mm	3.51
A15986/2	13	0-20 mm	7.52
		20-40 mm	4.96
		40-60 mm	3.59
		60-80 mm	4.11
A15986/3	16	0-20 mm	9.22
		20-40 mm	4.98
		40-60 mm	4.06
		60-80 mm	4.22

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

ACCREDITED

Testing Certificate 2159 - 01

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

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SOIL CHEMICAL ANALYSIS

CLIENT:

FORTROSE & ROSEMARKIE GC

RESULTS TO: **RJW**

DATE RECEIVED:
12/06/2017

Lab No.	Source	pH	P_2O_5 (mg/l)	K_2O (mg/l)
A15986/1	GREEN 1	5.3	16	36
A15986/2	GREEN 13	5.3	12	39
A15986/3	GREEN 16	5.1	14	48

Mr M A Baines, Soil Laboratory Manager

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

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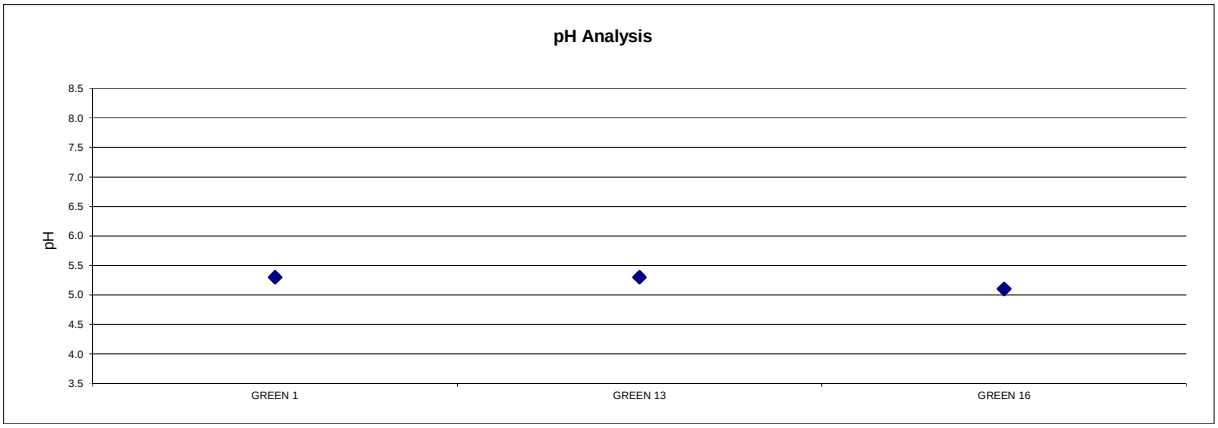
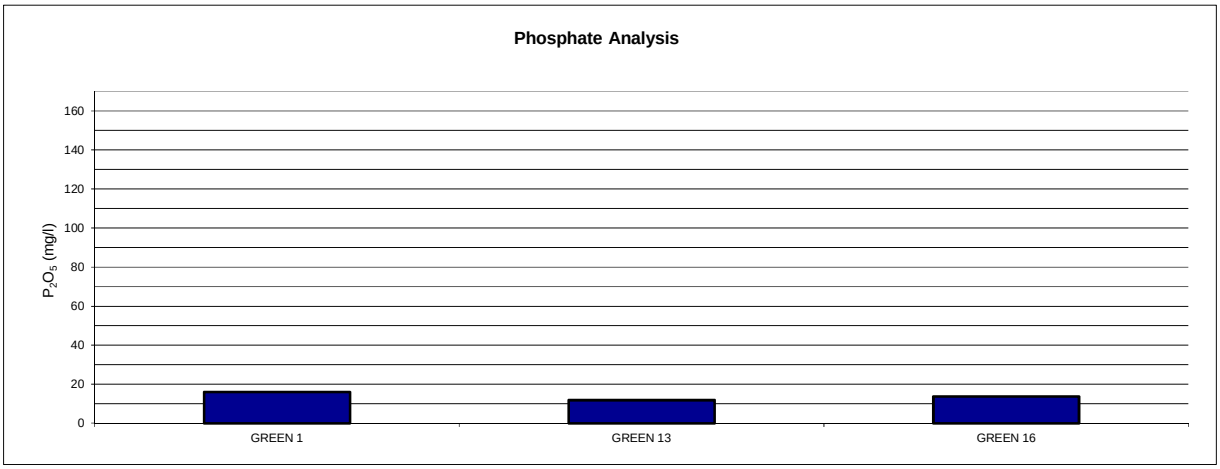
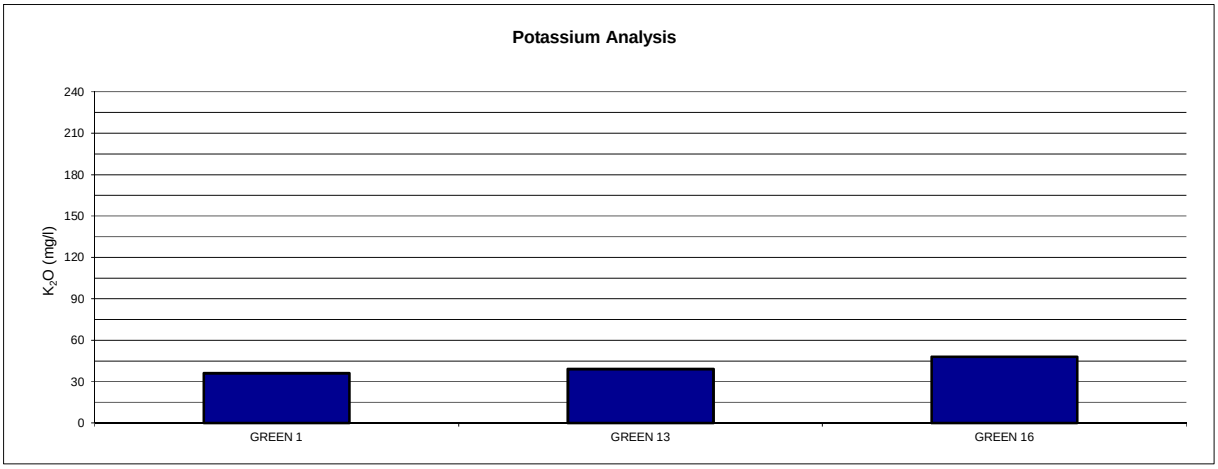
SOIL CHEMICAL ANALYSIS FORTROSE & ROSEMARKIE GC Date: 12/06/17







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