

Rothley Park Golf Club

Report on the golf course incorporating
programme performance testing

Report date: 27th July 2023

Consultant: Michael Boyes

Date of visit: 13th July 2023

Visit objective: To provide an agronomic review of the golf course, collect objective greens performance data and make recommendations for ongoing improvement.

Present: Chris Weir – Course Manager
Michael Boyes – Senior Consultant Agronomist, STRI Group Ltd

Weather: Warm with cloud cover (20°C).

Introduction

Our previous visit was carried out on 12th October 2022.

The document details the following:

- [Executive summary](#)
- [Essential actions](#)
- [Performance data summary table](#)
- [Record of site conditions](#)
- [Recommendations](#)
- [Graphs of performance data and soil results](#)

Executive summary

- It was a pleasure to meet the new Course Manager (Chris Weir) on the day and note that general golf course conditions were very good with objective performance measurements on the greens found to be largely within the projected target ranges.
- Putting surfaces are a little water retentive at present with an average of 36% soil moisture (target 15-30%) and a minor concern regarding the wide variance in individual moisture values (i.e., 27.3-41.3%), leading to a similar discrepancy in surface firmness values (i.e., 87-108g).
- Laboratory analysis has shown that thatch levels are above target range in the top 20mm of the profile, but soil chemistry (soil pH, phosphates and potassium levels) are comfortable.
- Green approaches are neat and tidy but there is substantial differential growth between component grasses which is leading to a slight deterioration in presentation and performance.
- Tees are well-presented and continue to deliver good teeing area and surface levels.
- Fairways appear to have recovered well from the drought pressures of recent summers and are very well-presented at the current 16mm height of cut.
- General overhaul of bunkering across the site has yielded excellent results and a new procedure for routine maintenance is optimising presentation. Some of the previously reported issues with the impact of drought stresses on bunker noses and exposed mounding persists.
- There remains a distinct need for continuing woodland management works across the site in accordance with the 2018 woodland audit, due to expire this year.
- Some targeted irrigation repairs around green side sprinklers were evident on the day. There is a need for the Club to address long term water supply security and storage capabilities on site.
- As identified previously, there is no formal rolling replacement programme for key cutting equipment which could present a considerable challenge to routine operations in the event of a continuing or prolonged breakdown.

Essential actions

- Monitor soil moisture levels across the putting surfaces continually to promote a uniform moisture content to deliver consistency in performance of the putting surfaces across the site.
- Deliver a bespoke programme of aeration, sanding and overseeding on the relatively problematic and sheltered 7th green.
- Schedule suggested renovation works on the greens for the first week of August combining use of the pedestrian Graden scarification unit, extending to the approaches, utilising a 2mm wide blade tested and adjusted for depth to impact the identified thatch layer. Complement the process with deep solid tine aeration (i.e., Verti-Drain) using a 12mm tine to a depth of approximately 120mm for the introduction of between 35 & 45 tonnes of sand top-dressing.
- A more aggressive programme of renovations will be appropriate for the problematic 7th green to affect greater material exchange with thatch removal and replacement with sand top dressing and appropriate localised overseeding using the selected Rigby Taylor R9 seed mix.
- Continue to promote routine star tine aeration on the greens, tees and approaches using the pedestrian Toro Procore 648.
- Once hot and dry oppressive conditions ease, but growth conditions remain strong, undertake a programme of refinement operations on the greens approaches to target procumbent growth, promote an upright growth pattern and incorporate sand top-dressing and seed to deliver a more uniform grass coverage and a smoother transition from fairway to green.
- Consider a marginal increase in the height of cut on fairways to 18mm during oppressive weather conditions in the summer to alleviate the drought stresses on the grass plant.
- Address drought damage on bunker noses and exposed mounding, as previously suggested, by employing localised aeration and the delivery of a granular curative wetting agent (i.e., Aquatrols Aqueduct Flex Granular, or similar).
- Engage a reputable woodland management company to undertake an audit of the site to provide continuity when the 2018 audit expires this year. Promote ongoing works, focused on woodland areas which are having a negative impact on key playing surfaces (i.e., greens & tees), commencing with the partial removal of some poplars at the rear of the 15th green.
- Continue with positive targeted repairs of irrigation around greens complexes to address problematic connections to the pipework and investigate long-term water supply security and the provision for adequate storage on site to service all irrigation requirements.
- Readdress the formulation of a 5-year rolling programme of machinery replacements with the Club's management to ensure ongoing equipment provision and reduce the impact of potential breakdowns and the costly ongoing repairs to ageing equipment.
- Investigate the potential for the recruitment of one further full-time NVQ3 level qualified greenkeeper to supplement the existing numbers and continue to uphold the high standard expected across the site at Rothley Park Golf Club.

Performance data summary table

Greens set up: Cut at 3.0mm

Measurement	Average	Target range
Soil moisture (%)	36% (range 27.3 – 41.3%)	15-30%
Hardness (gravities)	96 g (range 87 – 108 g)	85-120 g
Smoothness (mm/m)	19.6 mm/m	<25 mm/m
Trueness (mm/m)	9.8 mm/m	<10 mm/m
Green speed	9 ft 5 in	9-10 ft
Organic matter 0-20mm (%)	8.0%	3-6%
Organic matter 20-40mm (%)	3.9%	<4%
Soil pH	5.4	5.0-6.0
Phosphate (P ₂ O ₅)	12 mg/l	>10 mg/l
Potassium (K ₂ O)	80 mg/l	>30 mg/l

Key:

In target

Marginal variance

Out of target

Key points from the performance data:

- The greens remain slightly water-retentive for the time of year with an average soil moisture content of 36%, against the suggested target range of between 15-30%. Individual values remain widespread (i.e., 27.3 – 41.3%) which results in a similar variance in the individual hardness values (87-108g), despite the acceptable surface firmness average of 96 gravities.
- Average greens smoothness, trueness and green speed were very good on the day.
- Laboratory results have shown thatch levels are considerably above target range of 3 – 6% at 8% in the top 20mm of the soil profile.
- Soil chemistry shows average soil pH, phosphate and potassium levels are all comfortably within target range.

Record of site conditions



Photo 1: General presentation of the golf course was very good under the stewardship of new Course Manager, Chris Weir.



Photo 2: Soil samples collected on the 14th Green shows improving sand integration in the upper profile, but the persistence of thatch.



Photo 3: The challenging 7th Green, shows the negative influence of organic matter accumulation with signs of anaerobic activity.

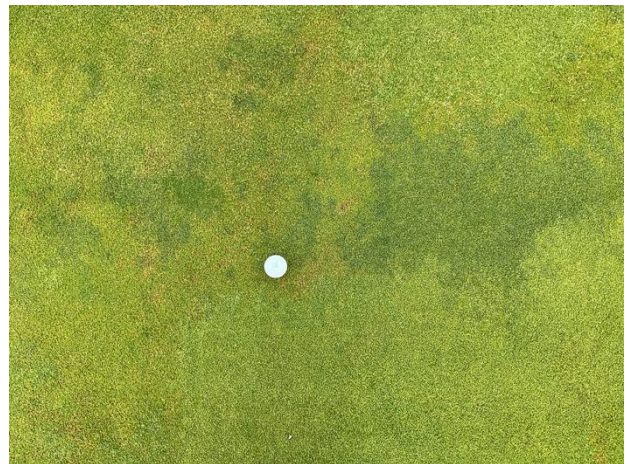


Photo 4: The component grasses on the 14th Green are starkly different in appearance, but not deemed to be having a negative impact on performance.



Photo 5: Algal build-up is apparent in localised areas at the rear of the 7th Green, where thatch levels are elevated, and the surface sits wet occasionally.

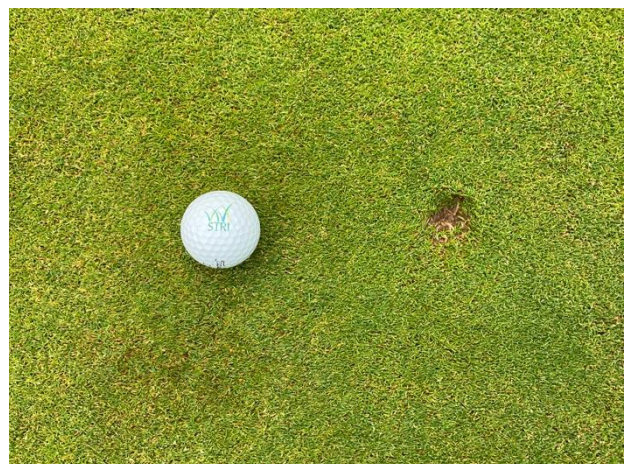


Photo 6: Unfortunately, poorly repaired, or regrettably completely unrepaired pitch marks, represent one of the largest negative impacts on green presentation and performance.

Record of site conditions (continued)



Photo 7: Areas of thinning grass cover are also evident at the rear left-hand side of the sheltered 7th Green.



Photo 8: Surrounding woodland is a key factor in the restricted growing environment at the 7th Green.



Photo 9: The 16th green approach is indicative of these key areas across the site, which are largely neat but need refinement of the grass cover.



Photo 10: The teeing platforms are very well presented and continue to deliver good teeing area and sound levels (see 16th Tee above).



Photo 11: Fairways have recovered very well from the oppressive weather conditions of recent summers.



Photo 12: Selected areas of the green surrounds provide significant scope for development as areas of fine turf run-off.

Record of site conditions (continued)



Photo 13: Some more exposed, or heavily trafficked areas, around the green complexes require localised repairs to improve grass cover.



Photo 14: Recent bunker works have yielded very positive results across the site and remain well-presented and are performing well.



Photo 15: As identified previously, bunker noses and the more exposed mounding has deteriorated under hot and dry conditions.



Photo 16: The large poplars at the rear of the 15th Green are having a significant, negative impact on air circulation and light penetration to the green.



Photo 17: Similarly, willow trees across the site present an ongoing challenge to adjacent surfaces due to dense foliage and expanding root networks.



Photo 18: The sheltered nature of the 8th competition tee, has warranted routine stripping and reurfing of the playing surface.

Record of site conditions (continued)



Photo 19: A reputable, outside irrigation contractor has been engaged to undertake key repairs on the sprinkler network.



Photo 20: Problems have arisen due to the use of inappropriate connections on green side sprinkler pipework, which have subsequently failed.



Photo 21: River abstraction, passed through a filtration system, is key to irrigation water supply at a reported 3000m³ per month.



Photo 22: Switch controls, on the right of the above image, directs water supply from the river abstraction to mains when required.



Photo 23: The newly constructed Chipping Green as an excellent addition to the facilities under the direction on Course Manager, Chris Weir.



Photo 24: Environmental and ecological initiatives, such as the "bug hotel" shown above, are great signs of the Club's commitment to sustainable practices.

Recommendations

Maintenance Team

- It was a pleasure to meet the new Course Manager, Chris Weir, on the day of the visit and hear that the maintenance crew now constitutes 6 full-time members (including two greenkeeper/mechanics) with the additional part-time help provided in collecting balls on the range and cleaning bins around the site.
- As identified before, the addition of one, additional fully qualified (NVQ 3) greenkeeper on a full-time basis would be deemed appropriate to uphold the high standards promoted across the site.

Greens

General Maintenance

- The putting surfaces are generally well-presented and even those that display significant proportions of differing grass types (i.e., 14th green which remain visually very obvious) display very good performance characteristics on the greens.
- Objective performance measurements illustrated an average soil moisture content of 36% (target 15-30%) which highlights the slightly water retentive nature of the greens at present, but it was encouraging to see that the average surface firmness recorded was 96 gravities (target 85-120g).
- As highlighted in previous reports, there is a slight concern at present over the wide variance in individual soil moisture values recorded (i.e., 27.3-41.3%) and the corresponding range between individual surface hardness values (i.e., 87-108g). Naturally, greater consistency is the ultimate aim and therefore continued monitoring of water content across the greens is advantageous to identify differing programmes of aeration which could help deliver this desired parity.
- The greens are currently being cut at 3mm height of cut which delivered the excellent surface performance values recorded on the day. Greens smoothness (19.6mm/m), trueness (9.8mm/m) and green speed averages (9 ft 6 in) were all comfortably within the respective desirable target ranges.
- The well reported challenges regarding the growing environment for the 7th green continues to have an impact the playing surface which bears localised signs of algal build up in the sward and reported issues of disease activity and moss ingress in the most sheltered areas of the green. Inspection of the soil profile highlights an increased level of organic matter accumulation and some signs of anaerobic activity and as previously suggested a bespoke programme of additional aeration, sanding and overseeding in conjunction with more aggressive thatch removal operations will be key to improving the overall performance of the profile and subsequently the putting surface.
- Regretfully on the day, one of the most prevalent incidences with regards to imperfections on the putting surfaces was the ongoing issue with unrepaired, or poorly repaired, pitch marks.

Organic Matter Management

- Laboratory analysis has shown that organic matter accumulation is high in the top 20mm of the soil profile on greens, with an average of 8% identified against a suggested target range of between 3-6%. Organic matter management operations should be targeted at significant material exchange in this zone (i.e., thatch removal for the integration of heavy sand top-dressing).

- Greens renovation week, scheduled for the first week of August 2023, will constitute a pedestrian Graden scarification operation using a 2mm wide blade, appropriately tested for depth to target the problematic zones identified above by the laboratory results. The subsequent delivery of between 35 and 45 tonnes of sand top dressing will be integrated into the profile through the use of a deep solid tine aeration (i.e., Verti-Drain) via outside contractor utilising a 12mm diameter tine to suggested depth of around 120mm. Localised overseeding will be targeted at weaker areas on individual greens as required using the preferred seed mix of choice R9 (Rigby Taylor).
- As indicated above, the unique nature of the 7th green with regards to its growing environment and the impact on thatch accumulation warrants a more aggressive approach to material exchange with the removal of problematic thatch for the introduction of high volumes of sand dressing. To this end, it was suggested that supplementary passes with the Graden scarification unit will be required, and it is likely that this will warrant the application of further, heavy sand top-dressing and a comprehensive overseeding programme.
- Routine and regular use of the TORO Procore 648 pedestrian aeration unit using star tines would be advantageous to improving drainage potential on the putting surfaces, and where appropriate tees and approaches also.
- Soil chemistry analysis has shown that average soil pH, average phosphate and average potassium levels, are all within the projected target ranges, and indication of a well-balanced nutritional programme.

Green Surrounds and Approaches

- Despite being relatively neat and tidy, differential growth between the component grasses within the greens approaches is having a detrimental effect on overall presentation and performance of these key areas. When oppressive weather conditions abate, consider a programme of targeted refinement to alleviate some of the lateral growth and allow the integration of sand top dressing and overseeding to promote a more uniform playing surface.
- Nutritional inputs, targeting greens approaches and the teeing platforms, commenced with an application of Rigby Taylor Convert Gold (15-5-15) in March, a monthly liquid application of Microflow 17-2-5 tank mixed with Primo Maxx growth regulator and Breaker Sport wetting agent monthly between April and August, with a final granular application in September of Convert Gold 16-4-13.

Tees

- Tees continue to deliver good teeing area and sound surface levels and are well-presented at the current 12mm height of cut.

Fairways

- Fairways are very neat and tidy and appear to have recovered extremely well from the oppressive drought pressures of recent summers.
- Current height of cut is around 16mm, and it is suggested that a marginal increase to approximately 18mm may be appropriate if prolonged periods of hot and dry weather persist.
- It was suggested that nutritional inputs are confined to an application of 25:0:0 only when required in conjunction with Primo Maxx plant growth regulator to promote a denser lateral growth pattern, favoured over vertical, leafy growth.
- More uniform presentation of fairways is apparent in comparison to previous years when the typical ridge and furrow topography in places caused extremes of droughting pressures on the raised areas.

Roughs

- Semi-rough is currently maintained at a 22mm height of cut using the John Deere Fairway mower and the longer managed roughs cut routinely at a 50mm height of cut. Both areas are presented well and performing as expected.

Bunkers

- The general overhaul of the sand hazards across the site has delivered good results and a new process with routine maintenance has optimised the presentation and performance of the bunkers across Rothley Park.
- A regime of a “full hand rake” on Monday from the back of the bunker, and the rolling of the faces on a Friday using a squeegee, has helped to optimise presentation and performances of the bunkers consistently.
- Some well-discussed issues remain with regards to the more exposed bunker noses and raised areas of the surrounds which have been negatively impacted by hot and dry weather conditions, and as previously suggested, the aeration of the affected areas for the introduction of a curative granular wetting agent would be appropriate to help restore full grass cover.

Woodland Management

- It was reported that the historic woodland audit (2018) has been largely acted upon with regards to the high priority number 1 & 2 jobs prioritising operations, with natural progression to 3 & 4 jobs, before the report is due to expire this year. Appreciating the necessity for ongoing woodland management works, the Club proposes to engage an expert to undertake a new audit for the next 5-year period and it is essential to use the audit immediately as a working document to undertake the required works in a compartmental basis year-on-year, without fail.
- On the day the regularly discussed issues regarding the woodland around the 7th green were once again addressed with the suggestion, where possible, to remove underlying growth, and certain specimens to open pockets of light and air through to the struggling putting surface.
- In particular, the negative influence of the willow trees around the site was discussed generally and more specifically the dense poplars at the rear of the 15th green having a significant negative impact on light penetration and air circulation to the adjacent green. It is suggested that an outside specialist contractor be engaged to physically remove a large number of the trees to improve the growing environment.

Irrigation & Water Security

- Some targeted irrigation upgrades were being carried out on the day of the visit, via outside contractor, around green side irrigation provision in order to tackle some of the issues faced with failures in the pipework thought to be as a result of the wrong fittings being used.
- With river abstraction being reportedly 3000m³ per month, there appears to be an adequate supply to service irrigation requirements, but it should be noted that if the pressure drops significantly in the village than the abstraction licence is restricted. With an inevitable switch to mains water supply in the event of this scenario, the limitations of the onsite storage capacity are highlighted. Reportedly, current storage tanks hold a total of 90 cubic metres and the optimum requirement is for some 300m³ of storage capacity to optimise water security when river abstraction is unimpeded and thereby negate the necessity to look towards mains water supply to supplement the system.

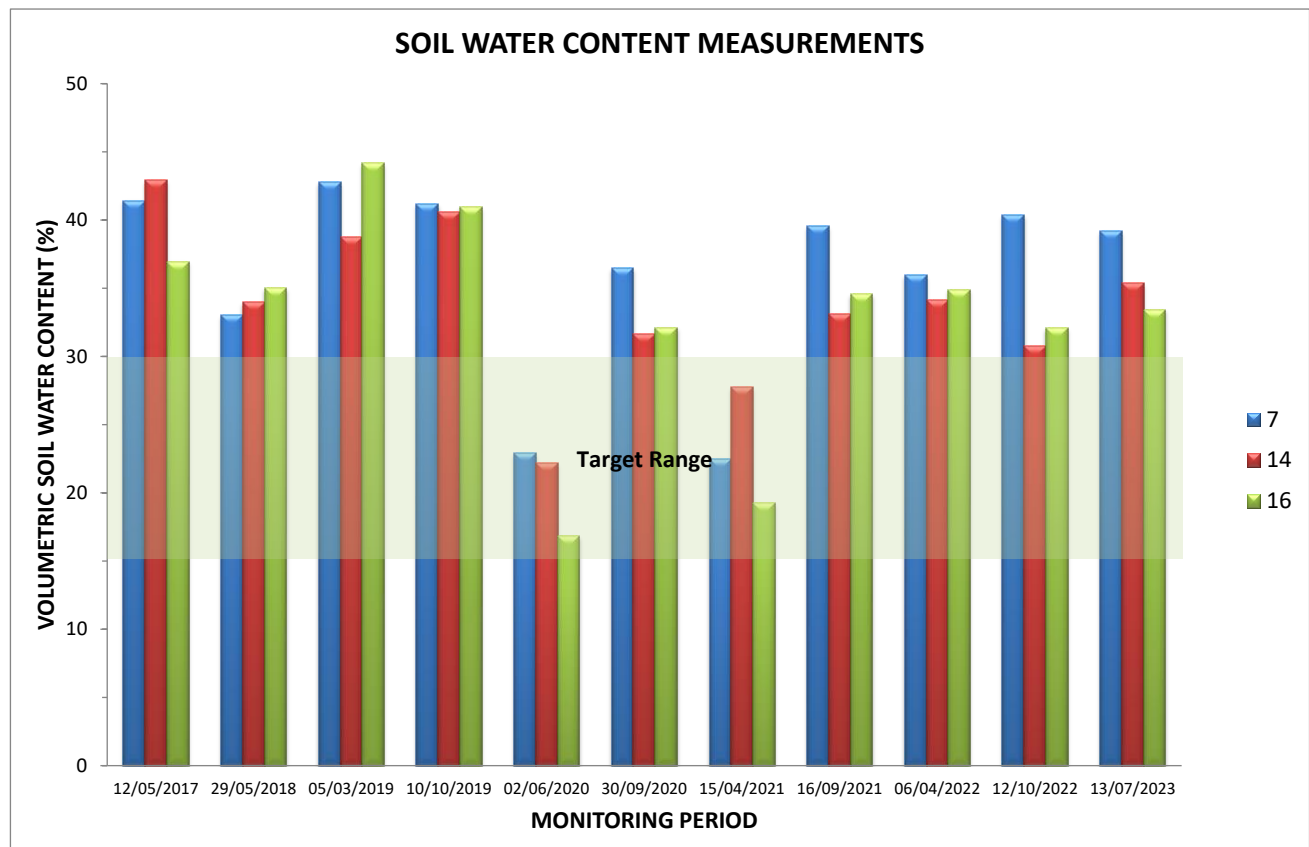
Plant & equipment

- There remains a distinct requirement for a formalised 5-year programme of rolling replacement for key pieces of maintenance equipment, as highlighted in the last report.
- The procurement of an electric TORO Triplex mower is pivotal to the process in allowing the current ageing greens mower to effectively be relegated to use as one of two, tees and approach mower which also allows the oldest of the existing tee/approach mowers to also be relegated and broken for spares. The acquisition of a modern electric unit, with all the associated grooming/brush attachments, inevitably provides some security around operations whilst also ticking the box with regards to the Club's environmental and ecological stewardship.
- In the event that the situation remains unchanged, there is always the chance of a significant breakdown in the equipment which will cause the operation to revert to the use of hand mowers in order to maintain greens/tees and all the implications that delivers with regards to the significant impact on available labour to carry out the other key operations across the site.
- The trade-off between continually repairing failing units versus the acquisition of newer equipment in a rolling replacement programme is highlighted by recent events with regards to the John Deere control box for the Triplex mower with the only spares available being a different configuration due to the ageing nature of the units under repair. In this scenario, ongoing running repairs become very expensive and not cost-effective when compared to a permanent replacement.

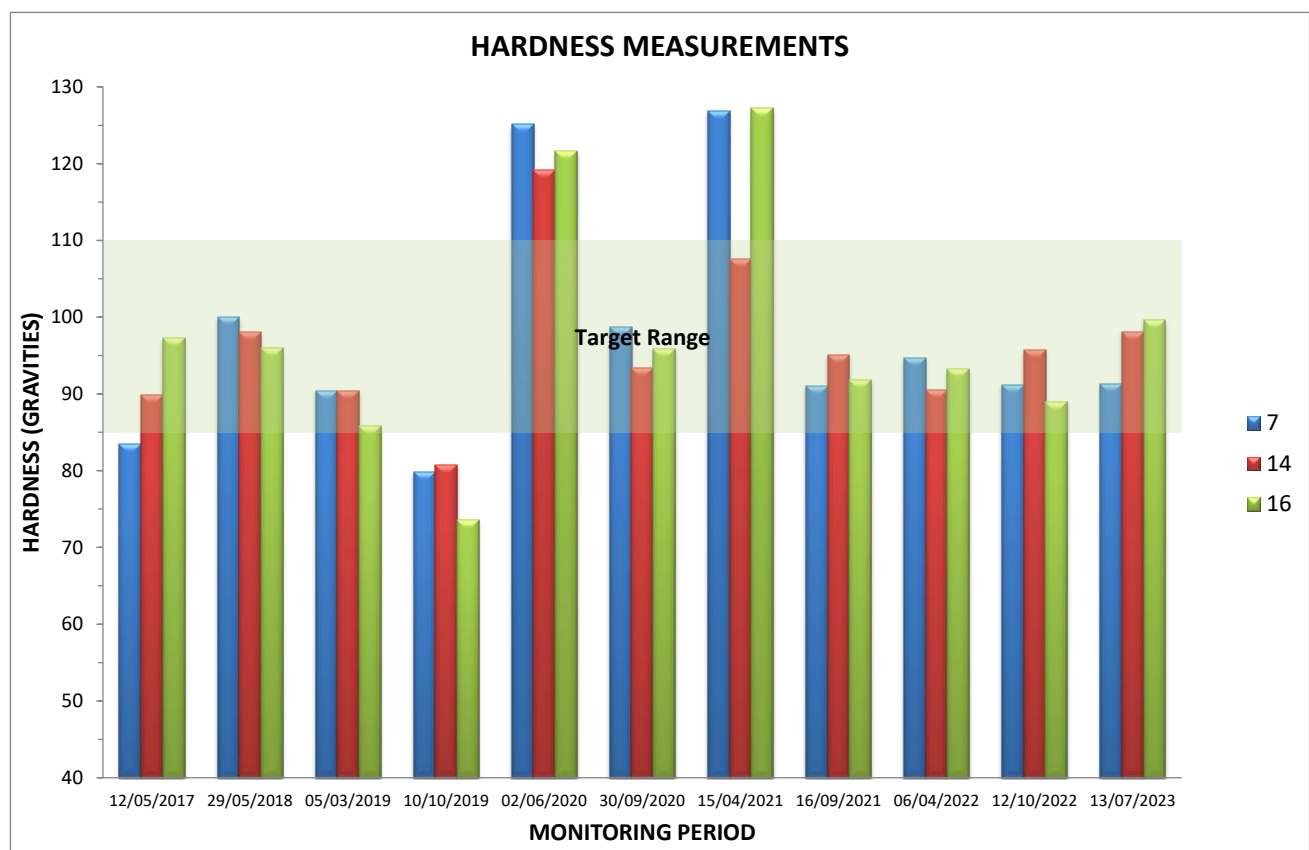
Long-term strategy

- The main objective of the new Course Manager (Chris Weir) is to continually raise the profile of the Club through the continuing development of the playing surfaces across the site which will inevitably depend on the level of staffing, appropriate skill set within the team and the timely provision of reliable, key plant and equipment.
- The appointment of a specialist to undertake a new woodland management audit will be pivotal to operations across the site for the next 5 years, particularly with regards to areas of expanding woodland which are having a negative impact on key playing areas (i.e., greens and tees).
- Consideration must be given to overall water supply security and storage on site to optimise the typical enhancement to the irrigation system viewed on the day to ensure that as oppressive and hot, dry conditions return on an annual basis the Club is best positioned to optimise the gathering and storage of what is becoming an ever-limited resource.
- It was very encouraging to see some of the positive impacts already in place under the supervision of Chris (Course Manager) which include the construction of the new practice Chipping Green at the end of driving range with provision being made for the installation of a bunker in due course to enhance the facilities across the site.
- It is also very rewarding to see environmental initiative such as "bug hotels" employed on the course to highlight the Club's importance placed on sound environmental stewardship of the site.

Graphs of performance data

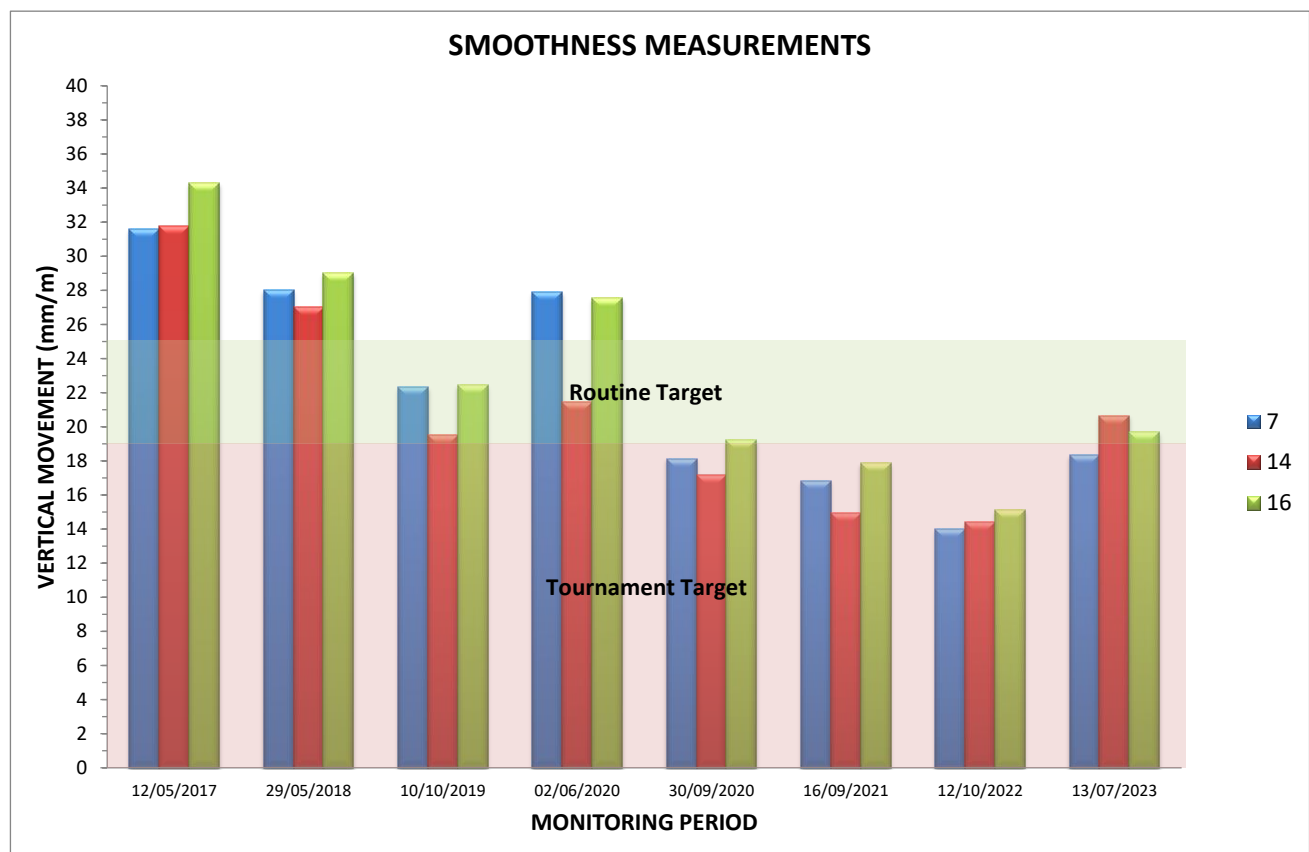


Graph 1

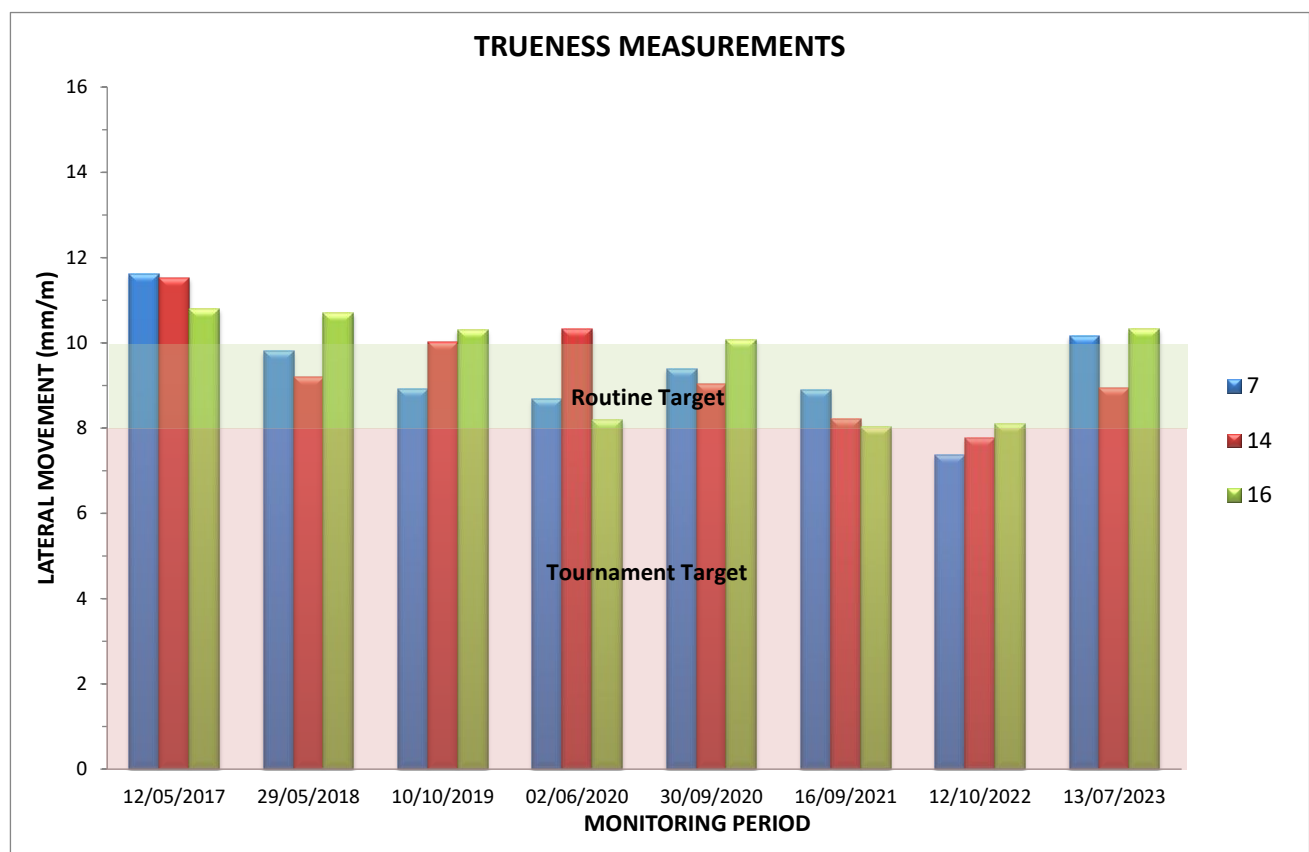


Graph 2

Performance Data (continued)

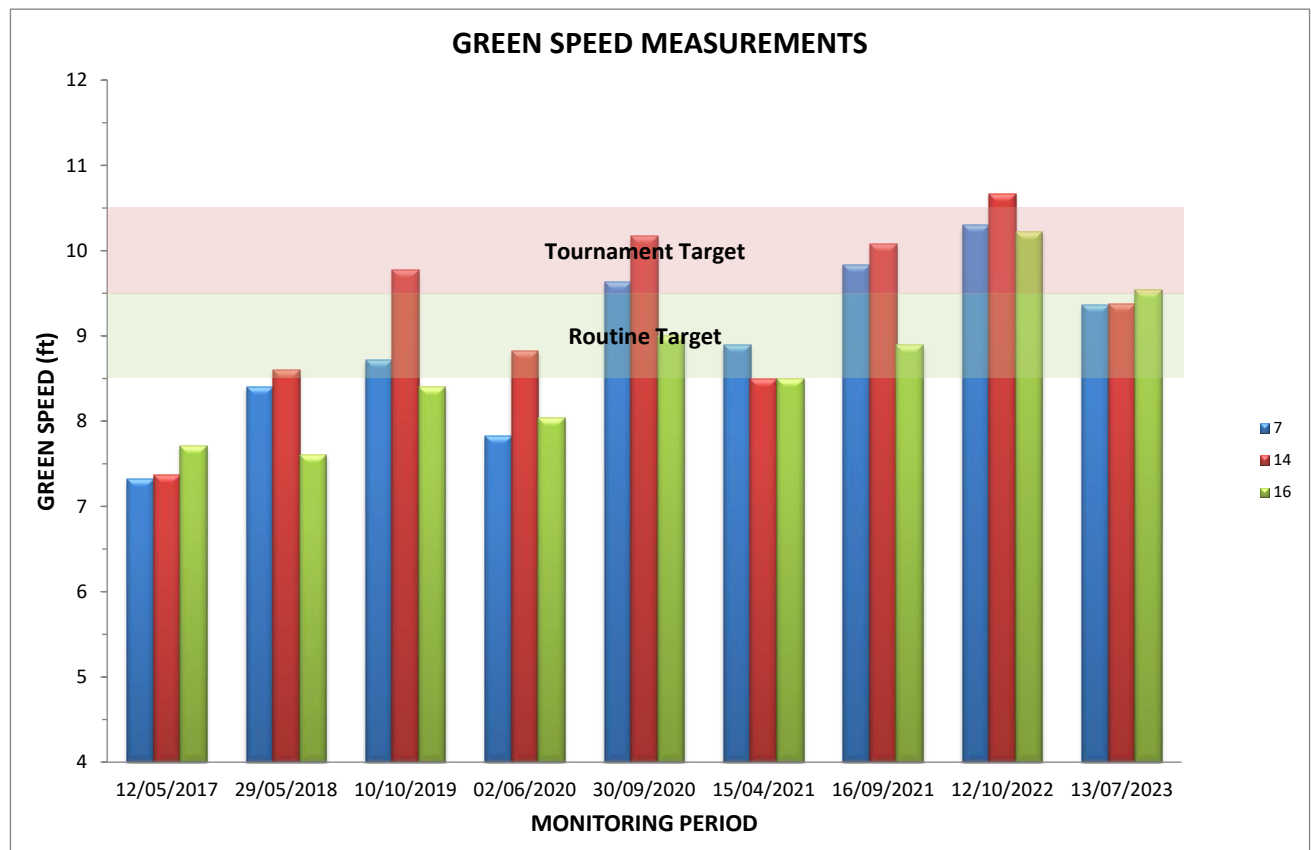


Graph 3



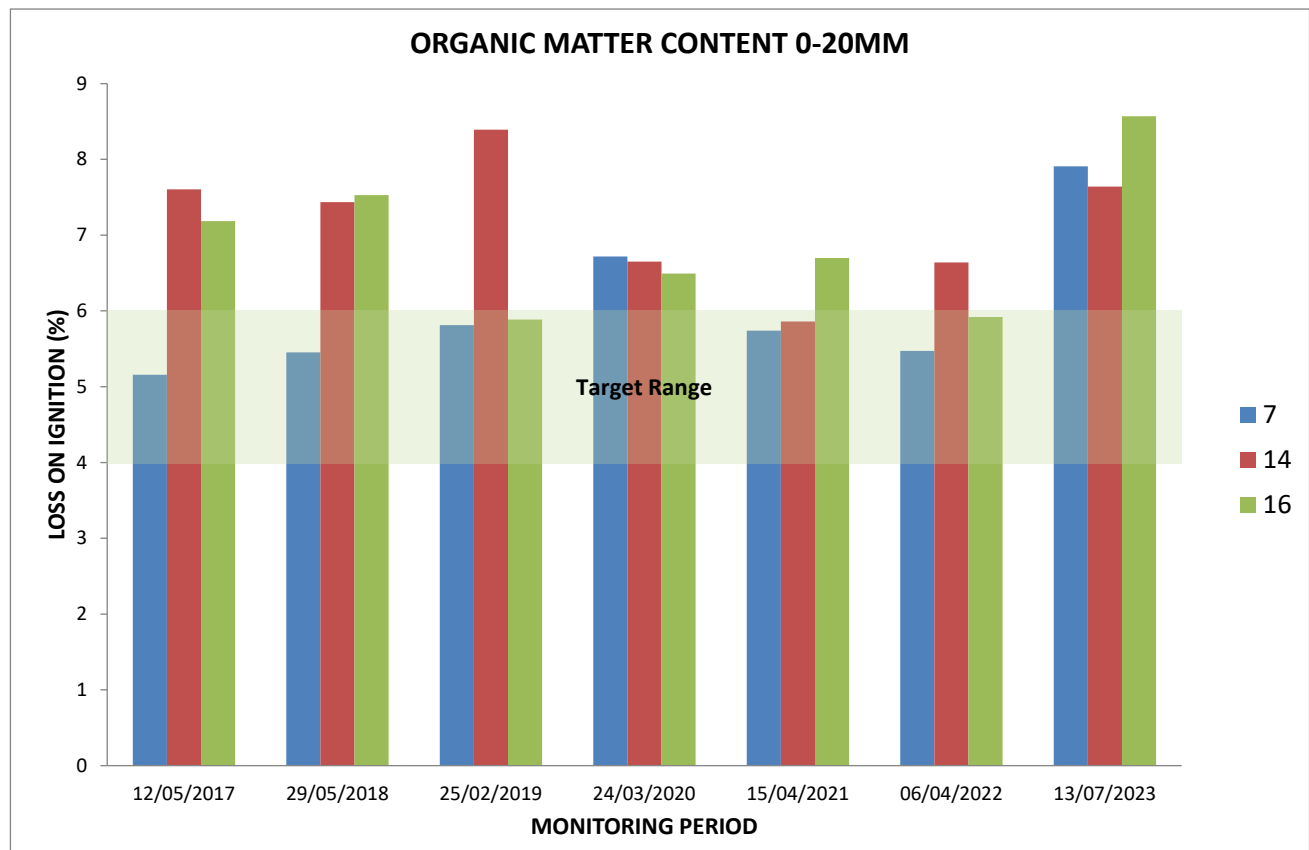
Graph 4

Performance Data (continued)

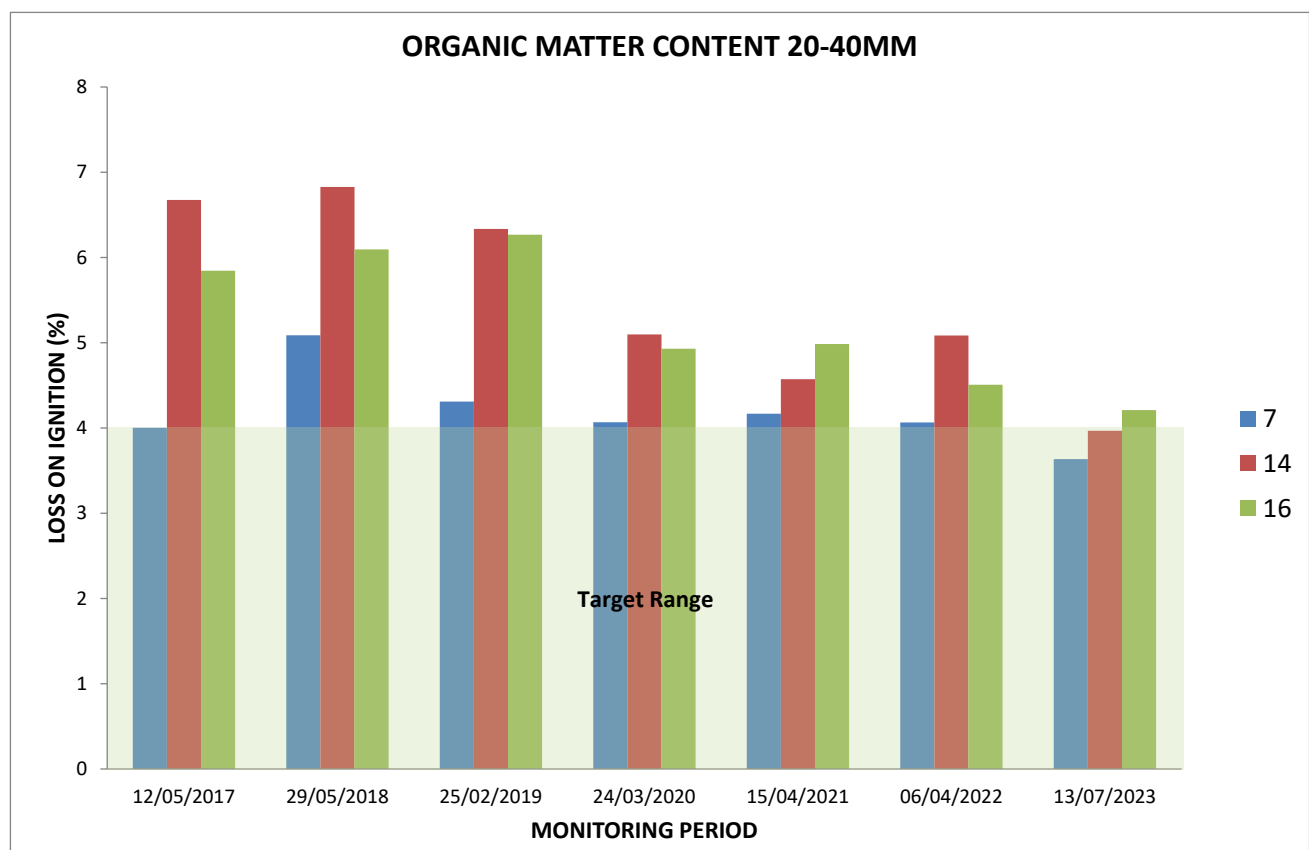


Graph 5

Soil Results

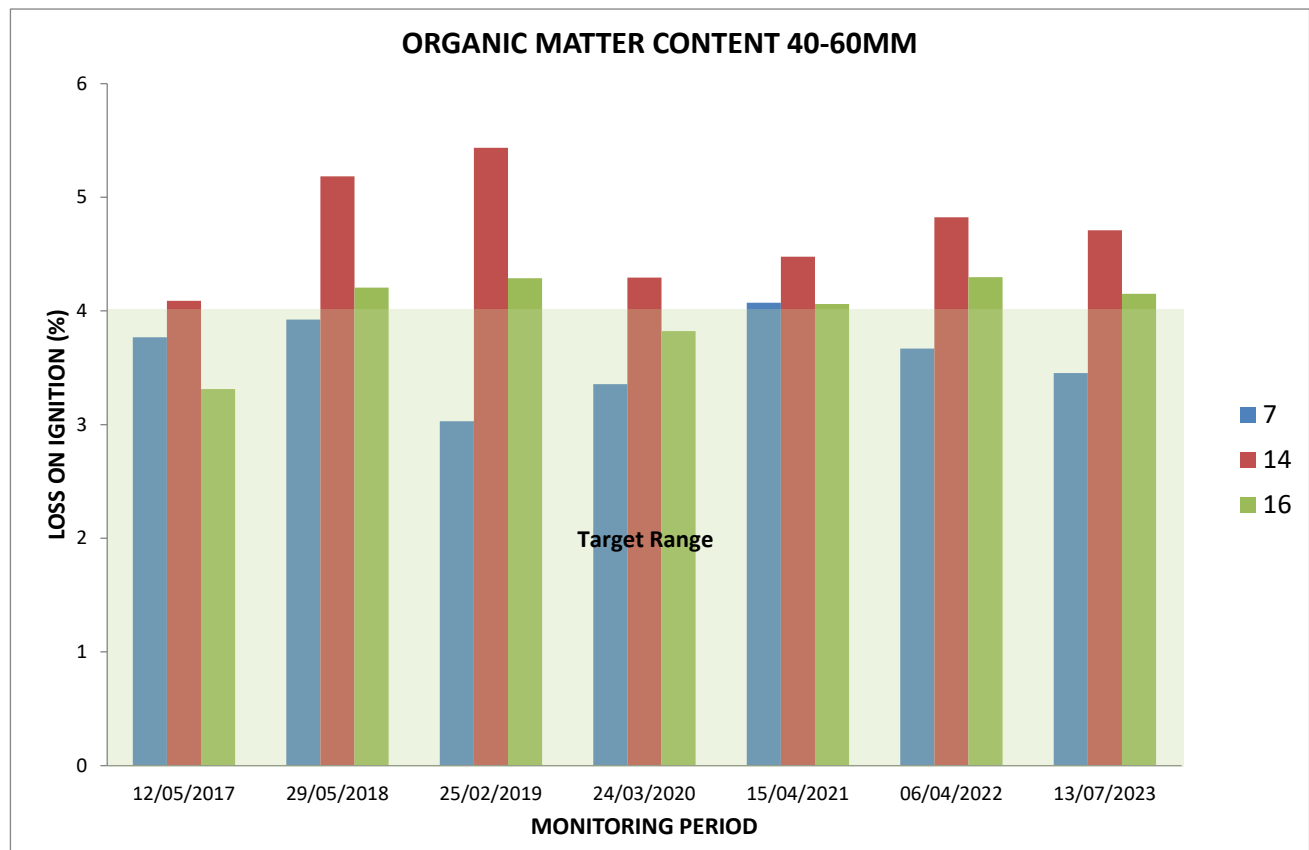


Graph 6

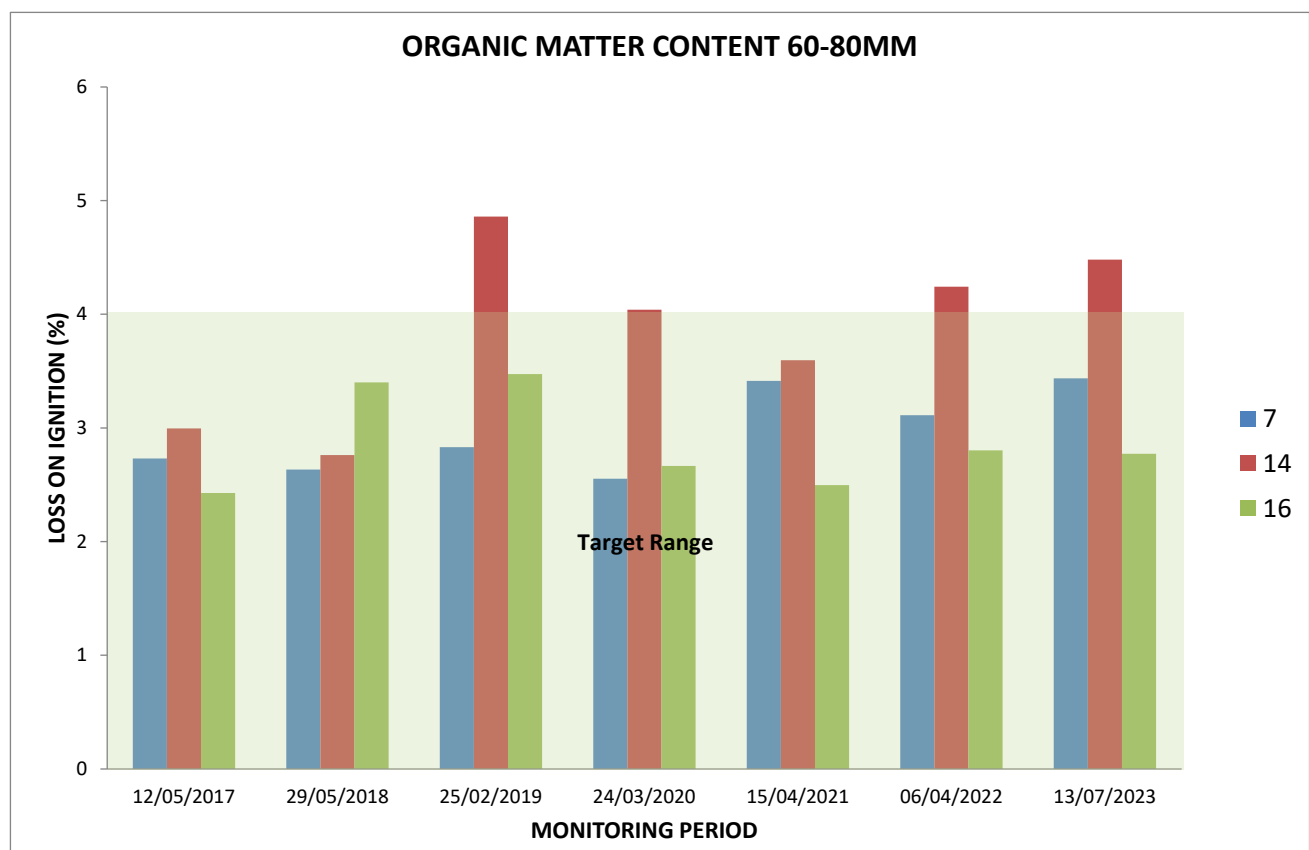


Graph 7

Soils Results (continued)



Graph 8



Graph 9

Signed

A handwritten signature in black ink, appearing to be "m. boyes".

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ORGANIC MATTER CONTENT

CLIENT:	ROTHLEY PARK GC	DATE RECEIVED:	17/07/23
ADDRESS:	WESTFIELD LANE ROTHLEY RUTLAND LE7 7LH	DATE REPORTED:	25/07/23
		RESULTS TO:	MEB
		TEST RESULTS AUTHORISED BY:	
CONDITION OF SAMPLE UPON ARRIVAL:	MOIST	Michael Baines, Laboratory Manager	

SAMPLE NO	DESCRIPTION		LOSS ON IGNITION (%)†
A20300/1	7	0-20 mm	7.91
		20-40 mm	3.64
		40-60 mm	3.45
		60-80 mm	3.44
A20300/2	14	0-20 mm	7.64
		20-40 mm	3.97
		40-60 mm	4.71
		60-80 mm	4.48
A20300/3	16	0-20 mm	8.57
		20-40 mm	4.21
		40-60 mm	4.15
		60-80 mm	2.77

† ASTM F1647-11 (2018) Standard Test Methods for Organic Matter Contents of Athletic Field Rootzone Mixes (Method A)



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

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