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Blankney Golf Club

Report on the Golf Course Incorporating Programme Performance Testing

Report date: 22 May 2023

Consultant: Ben Morgan

Date of visit:	19 May 2023
Visit objective:	To assess course health and conduct performance quality testing
Present:	Mr John Hart – Head Greenkeeper Mr Alec Bradley – General Manager Ben Morgan – STRI Group Ltd
Weather:	The weather was overcast with light rain and an average temperature of 16°C.

Introduction

The document details the following:

Executive summary

- Chafer grubs have caused widespread damage to large areas of turf last year.
- The overseeding of the damaged areas worked well with strong germination.
- The greens were in good condition with a healthy population of bent grasses.
- The soil moisture was good and within range and should be maintained at around 15-25%.
- The firmness was just within range. The aim should be to hit around 110g's in summer.
- The smoothness readings were slightly above recommended ranges of 18-25mm.
- The trueness readings were well within range and should be maintained at <10mm.
- The speed was lower than recommended range and aims should be to maintain 9-10ft.
- There was no disease seen on the greens during the visit.
- The rooting and soil health observed was good with a healthy rootzone.
- Isolated areas of the greens were starting to dry out and were due to be irrigated.
- The two driest sand greens were vulnerable to drought and require additional wetting agents.
- Moss and annual meadow grass has colonised any bare areas caused by the drought.
- The team have started applying wetting agents to the greens in anticipation of summer.
- The Club implemented a portable mat policy to protect the fairways in winter.
- The Club has been managing the trees to increase air and light to the greens.
- The collars and approaches were looking dense with a tight sward.
- The tees had full coverage with no signs of winter traffic damage.

Essential actions

- Apply Acelepryn (*Chlorantraniliprole*) for the control of chafer grubs.
- Overseed any remaining chafer grub damaged areas with a fine ryegrass Mix.
- Consider the purchase of a moisture meter for the Team.
- Monitor the soil moisture levels on the greens closely and irrigate as required.
- Maintain a soil moisture of 15-25% through summer.
- Consider applying a granular wetting agent to the two driest sand greens.
- Aim to reduce thatch % and replace with sand dressing to firm up the greens.
- Lower the heights of cut to around 3.5mm in summer to produce faster surfaces.
- Roll the greens regularly to produce smooth, firm, and fast surfaces for the summer.
- Aim to produce speeds of 9-10ft in summer consistently.
- Micro-hollow core the greens regularly through the season to reduce thatch.
- Remove thatch on the greens using the Greentek Thatch-Away Units.
- Apply light top-dressings of around 10t/ha regularly through the season.
- Verti-cut to groom any lateral growth and moss out of the sward.
- Solid pencil tine the greens regularly through the season.
- Verti-Drain the greens regularly using needle 8-12mm diameter tines.
- Overseed any bare areas of the greens with brown top and creeping bent grass seed.

Performance data summary table

Measurement	Average	Target range
Soil moisture (%)	28% (Range 26-33%)	15-30%
Hardness (gravities)	89g (Range 77-100g)	85-110 g
Smoothness (mm/m)	29mm/m	<25 mm/m
Trueness (mm/m)	9.21mm/m	<10 mm/m
Green speed	7.4ft in	9-10 ft
Organic matter 0-20mm (%)	23.8 %	3-6%
Organic matter 20-40mm (%)	8.8 %	<4%
Organic matter 40-60mm (%)	5.9 %	<4%
Organic matter 60-80mm (%)	4.2 %	<4%
Soil pH	5.6 pH	5.0-6.0
Phosphate (P_2O_5)	11.6 mg/l	>10 mg/1
Potassium (K_2O)	53 mg/l	>30 mg/l

Key:

In target
Marginal variance
Out of target

Key points from the performance data:

- The moisture levels were in target on average but with a wide variation with some low figures.
- The firmness levels were lower than target and can be improved by lowering the thatch levels.
- The smoothness out of the 18-25mm target, due to the slow spring growth and seedheads.
- The trueness was <10mm which is good.
- The speed was lower than recommended ranges and should be picked up to 9-10ft.
- The organic matter results in the 0-40mm zone were concerning and had huge variance to the recommended ranges. This is a high priority matter and needs urgent attention.

Record of site conditions

Photo 1: The greens had a healthy dense sward of predominatly bentgrass on most greens. Isolated areas had annual meadow grass and moss believed to be caused by the drought damage.

Photo 2: The profile of the greens was healthy with no layering or black layer. The rooting was to a depth of 250mm stopping at the clay/limestone base layer.

Photo 3: There was sand throughout the profile indicating historic top-dressing. There was a small build up of thatchy material in the 0-20mm zone.

Photo 4: The 0-20mm zone requires targeted thatch removal and sand dressing dilution. There was fresh white rooting visable indicating a healthy rootzone.

Photo 5: The overall coverage was good. There were patches on the drier sandy greens where bentgrass looked to have lost coverage and the areas then colonised by annual meadow grass.

Photo 6: The bent patches looked healthy and disease free. The team overseed every year with bent seed. This has worked well with high percentages of prefered species.

Record of site conditions - Continued

Photo 7: Moss has colonised areas where bentgrass had lost coverage. Moisture levels were as low as 15% which have potential to drop too low and damage the bentgrasses.

Photo 8: The collars and approaches were presented to a very high standard with a tight sward and dense coverage. These provide high quality run-off short game areas around greens.

Photo 9: The fairways have struggled historically due to chafer grub infestations which cause a loss of grass coverage. The Team have applied Acelepryn (Chlorantraniliprole) and overseeded.

Photo 10: Reportedly, the Acelepryn (Chlorantraniliprole) did not work effectivly which needs to be investigated. The overseeding works very well with strong signs of germination.

Record of site conditions - Continued

Photo 11: High traffic areas around the greens have been worn during winter following damage from the chafer grubs. The overseeding program has been rolled out to the entire course using Fine-leaf Perennial Ryegrass (Lolium Perenne).

Photo 12: The bunkers were lined with tarram which blocked up with silt and hampered drainage. Stones also work their way into the sand and contaminate. Future plans should consider lining the bunkers with a modern capillary system.

Recommendations

Chafer Grubs

- One of the main issues that the course has experienced over the last few years is the chafer grub problem which has caused large areas of the course to lose coverage. The team currently use the registered insecticide Acelepryn which is the only registered insecticide on the UK turf market. This is best practice and has been shown in trials to be effective against chafer grubs.
- It would be worth seeking advice on best practice and application methods, timings, and application rates to coincide with the hatching cycle of these grubs. It is important that we make sure that every angle has been considered and that we get the best effective kill rate on these pests. I will get in touch with the Syngenta technical manager Glenn Kirby on your behalf to ask if he can help to guide us with the application and control of the pests. It will be in the company interest to know that it has not worked on your site.
- The product was not applied last year because of the drought which may influence the number we see this year. These pests can have a 3-year life cycle, so it is imperative that the product is applied each year. It is important that this year the product is applied when we have more balanced weather to try and get a maximum kill on these pests.
- It would also be worth looking at and considering using nematodes which can be used effectively to combat chafer grubs, these have very specific application requirements but have proved successful on other courses.
- The team have done an intense programme of overseeding using a ryegrass mix on all areas of the course which were damaged by the chafer grubs. This has worked well with strong signs of germination in all areas during the visit. This was very encouraging to see and is something we would recommend doing as standard practice. This method is not a cure for the chafer grubs but it is a good way to get the areas repaired ready for the season in quick time due to the fast germination of ryegrass.
- It would be worth considering adding additional wetting agent and fertiliser to the areas through the year to ensure that the areas have a thick grass coverage which may make the areas less attractive to the pests.

Greens Soil Health

- The soil was healthy on inspection. There was deep rooting and no black layer seen in the profile.
- The thatch layer in the top-surface may cause issues with performance and disease susceptibility if not tackled. Solutions on this area mentioned in the organic matter section.
- It is important to conduct alternate deep and shallow tine aeration through the year to avoid creating an aeration pan at 70-100mm.

Organic Matter Management

- Visually there was a build-up of organic matter in the top 0-40mm beneath certain greens. The more sand-based greens had a higher level visually of thatch which will require urgent treatment using a combination of aeration and top dressing.
- Having high thatch levels in the 0-40mm zone of the greens is not sustainable for the future and will mean the greens are more susceptible to disease. It is essential that you start a program of mechanically manually removing the thatch through scarifying or/and coring, followed by sand dressing to dilute and break down the thatch layer. If the work is done intensely for the next

couple of seasons you will start to see a big improvement to playability and reduction of disease outbreaks. The greens will also start to reduce the spongy surface in winter.

- The team have narrow gauge micro hollow cores and thatch away units which could be used throughout the year as a little and often approach to remove thatch all the way through the summer. Each time they aerate they could top dressing the greens with a light application of around 10 tonnes of straight sand per hectare. The team could then do a large-scale renovation in August where they use 12mm diameter tines and get much higher quantities of sand into the greens to dilute the thatch.
- The main aim of any large-scale thatch removal it to remove as much thatch as possible and replace it with as much clean dressing as possible. The type of material to use would be either 70/30 top-dressing, or straight sand dressing because it is much more cost effective.
- If the thatch is left untreated will make the surfaces spongy and has the potential to encourage more disease.
- This work can be slightly inconvenient to golf, but it is important for the members to understand that this is vital work and will benefit the greens in the future because it will make them much more consistent in playability.

Greens Performance Standards

- The moisture levels had a big variance which could be improved with the use of a moisture meter and wetting agent technology. The older irrigation system may have a poor coverage compared to a new modern system, so it is essential that the team are able to accurately measure the soils moisture to dictate how much wetting agent and irrigation they apply. In smaller isolated areas they could also hand-water any particularly dry areas of the greens such as walk off areas of where tree roots encroach.
- The firmness of the greens could be improved by reducing the organic matter to <6% in the top 0-20mm zone, and <4% in the levels below. At these ranges you can produce firm greens throughout the year. This layer acts a soft sponge and hinders the Team being able to produce firm, fast greens. This can be removed mechanically and then replaced with clean sand and diluted over time.
- The smoothness may have been affected by the poor spring growth of the annual meadow grass and the differential growth between that and the bent grasses. As the Team continue to overseed the greens with bent grass, they should start to produce smoother greens. The top-dressing will also help to smooth the greens out. This combination will produce smoother greens as a long-term goal.
- The trueness was good and should be maintained at these levels. The smoothness and trueness are intrinsically linked, and both respond well to top-dressing and consistent species coverage.
- The speed was slower than we would ideally like. The greens are contoured and build elevated from the surrounds, so we must be careful not to make them overly fast. It would be advised to aim for around 9-10ft average on the Stimp meter. This can be done by applying top-dressings regularly to smooth the surface, lowering the heights of cut to around 3.5mm through summer, and grooming the greens using verti-cutting when required. This combination will start to produce very groomed and smooth surfaces, which will then be very fast.

Greens Moisture Management

- The greens had a good sward coverage with high levels of bentgrass. There were some areas that had annual meadowgrass which appeared to be areas which may have lost coverage during the drought last year and then have been colonised by annual meadowgrass as an opportunist

species. It would be advisable to consider the purchase of a Moisture Meter for the team so that they are accurately able to monitor the moisture levels in the soil and keep the percentage between 15–25% volumetric water content (vwc). This will also help them to balance the use of wetting agents and irrigation on the greens successfully. It will also benefit the greens by encouraging more bentgrass within the sward and reduce damage from drought conditions when the moisture levels become too low, giving opportunity for the annual meadowgrass and moss to move in.

- The irrigation system is quite an old set up relying on a block system of twin irrigation heads with a single decoder on each green. This means that each sprinkler head cannot be operated individually. It would be advisable to start considering the upgrade of an irrigation system in the future because the PVC materials the pipework is made out of will become close to the end of life in the next coming years. At some stage the repair bills and labour spent on repairing the system will outweigh the cost of installing a new system. The poor coverage of the old system will also influence the quality and sward density of the grass on the greens.
- The greens construction can influence soil moisture. The sandier USGA greens will dry out faster than the traditional push up greens. The site is also very free draining due to the bedrock material. It would be worth considering application of a granular wetting agent to the driest greens to help the Team keep moisture levels between 15-25%. This would be run along side the normal liquid wetting agent program.
- It would also be worth trialling the current wetting agent at different rates. If you started early in the spring at 5L/Ha, then move to 10L/Ha in later spring, then up to 15-20L/Ha if the year becomes very dry in summer. This could be applied every 3 weeks through the year at varying rates depending on the conditions. Conversely if we get a very wet summer then rates could be dropped down to lower rates. It is vital that you keep on top of the moisture levels with it being such a dry site with dry USGA greens.

Disease Management on the Greens

- The team currently have a preventative programme using fungicides and turf hardening packages.
- The greens suffered from an outbreak of fusarium last winter because the team were not able to get on the greens and apply any products because of adverse weather conditions. The industry is heading towards using less fungicides and less being available on the market, so it is essential that we put the greens in the best possible place for the future, so they are more disease resistant without the use of chemicals.
- This can be done by overseeding the greens with as much bent grass as possible and providing conditions which have good enough moisture and nutrition so that the bent grasses thrive and outcompete the annual meadow grass.
- Bent grass is also vulnerable to high traffic and wear areas so anything you can do to reduce the amount of wear on certain walk-off areas and machinery wear will be advantageous.
- It would be worth the team considering using a turf hardener package like the Aquatrols Tough Turf package of the Headland 20:20:30 plus mantel package. These packages include iron, magnesium, calcium, phosphite and many other ingredients designed to protect the greens against disease without using a fungicide. This would be fully supported and advisable for the future.
- Strategic tree removal can also help to create better air movement around the greens which will reduce the likelihood of disease attack.

Tees & Approaches

- The tees and approaches looked in good health with a thick sward coverage and tight cutting heights which has made a good cutting surface on the approaches. The team have worked hard to improve the quality of the tees in the last few years which has paid off because they have a dense thick coverage and good teeing areas.
- A controlled release product had been applied to the greens prior to the visit. This product was designed to last the full season and provide constant growth rates all year. This is good practise and should be contained.
- It is important to continually divot and repair the tees as much as possible. This can be helped by using a quickly germinating Fine-leaf Perennial Rye grass (Lolium Perenne) and rich organise divot mix for speed of germination.

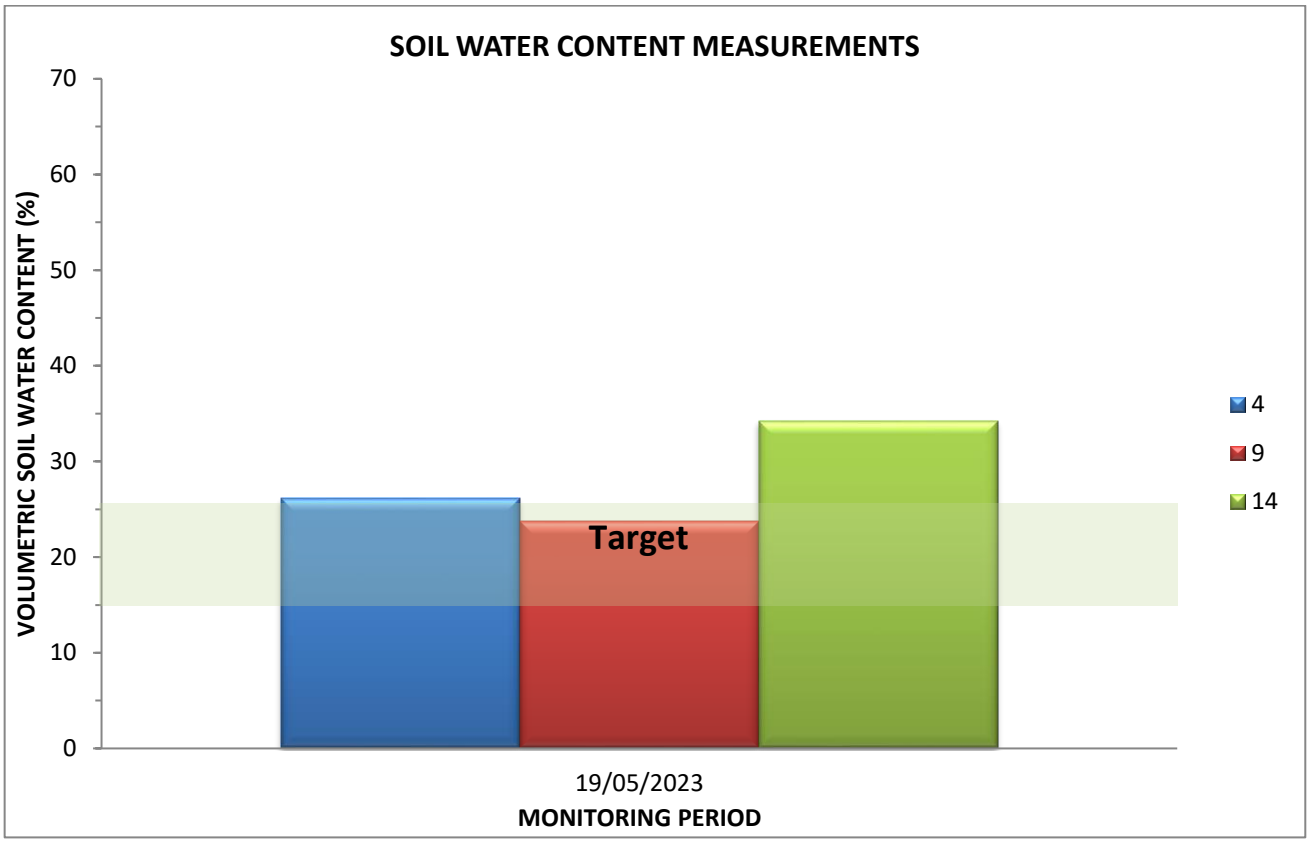
Fairways

- The Club has implemented a mat policy through the winter on fairways and outfield areas which has paid off because the quality of the sward was very high with minimal damage on landing zones. The course is incredibly popular in winter because of its dry nature and limestone sub-soil so it is essential the Club protect the course against high level of traffic and divots. This is fully supported and should be continued in the future.

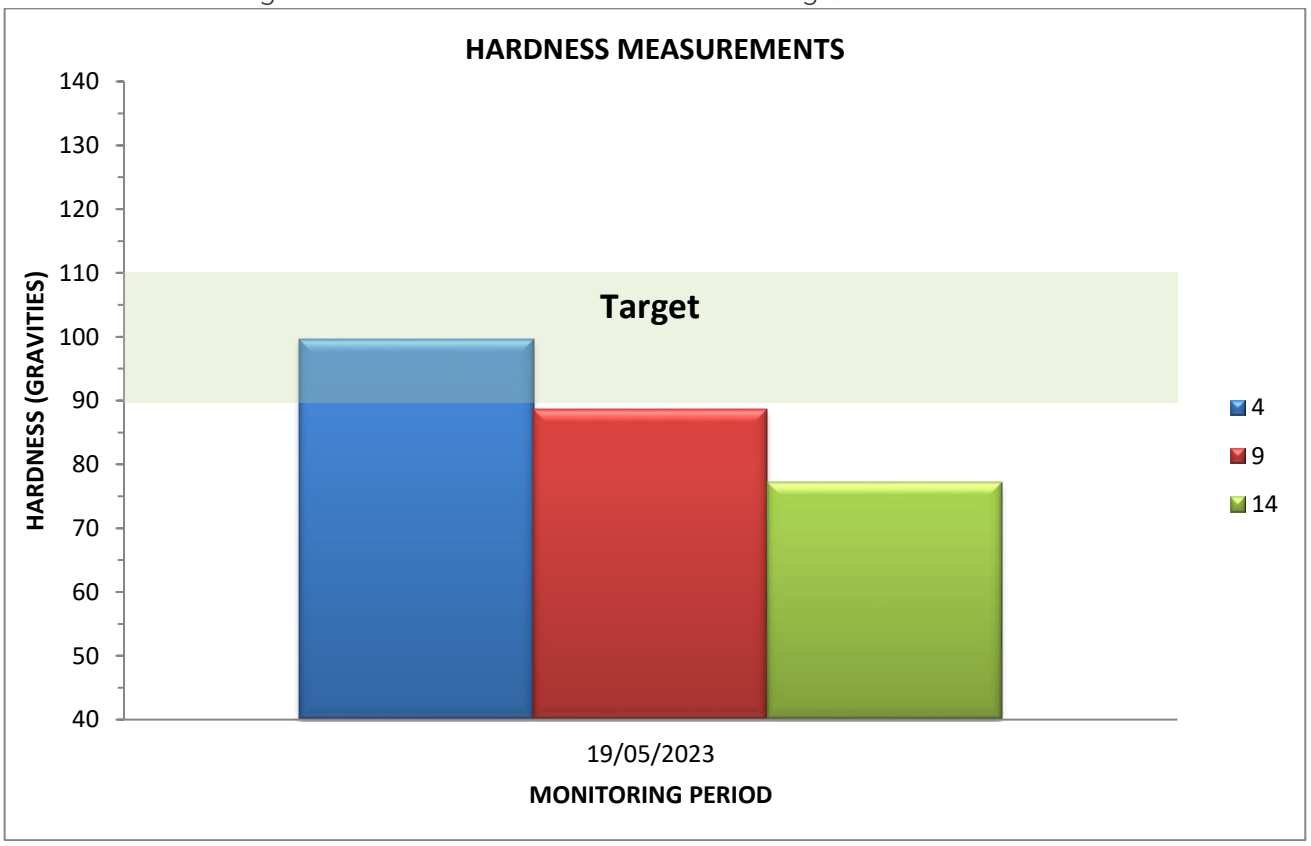
Bunkers

- The bunkers are traditionally built and have issues with stones rising through the base material and contaminate the sand.
- It would be worth considering lining the bunkers in the future which would create a barrier between the sand and the base material. There are a few companies who provide a variety of liner options (Eco-bunker, Whitemoss, billy bunker etc). It would be worth contacting them to see what the options are and get an idea of cost.

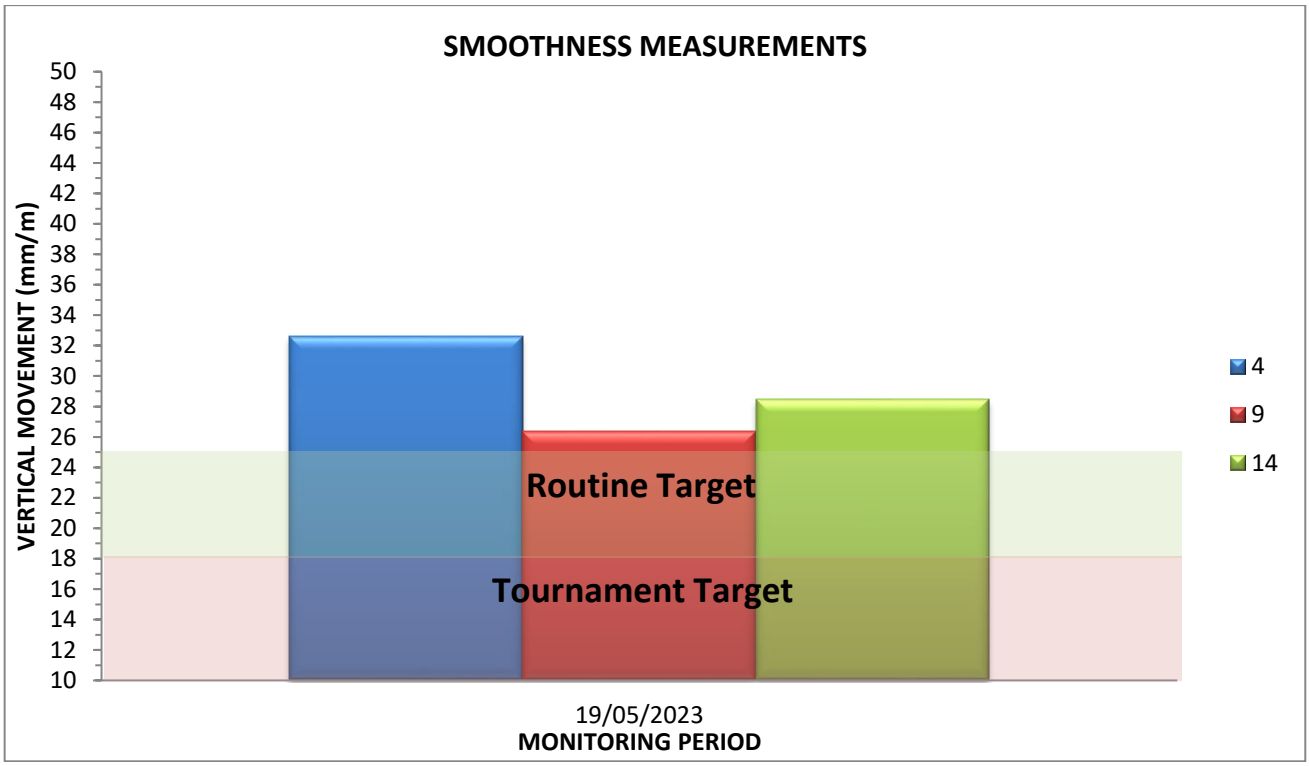
Graphs of performance data and soil results



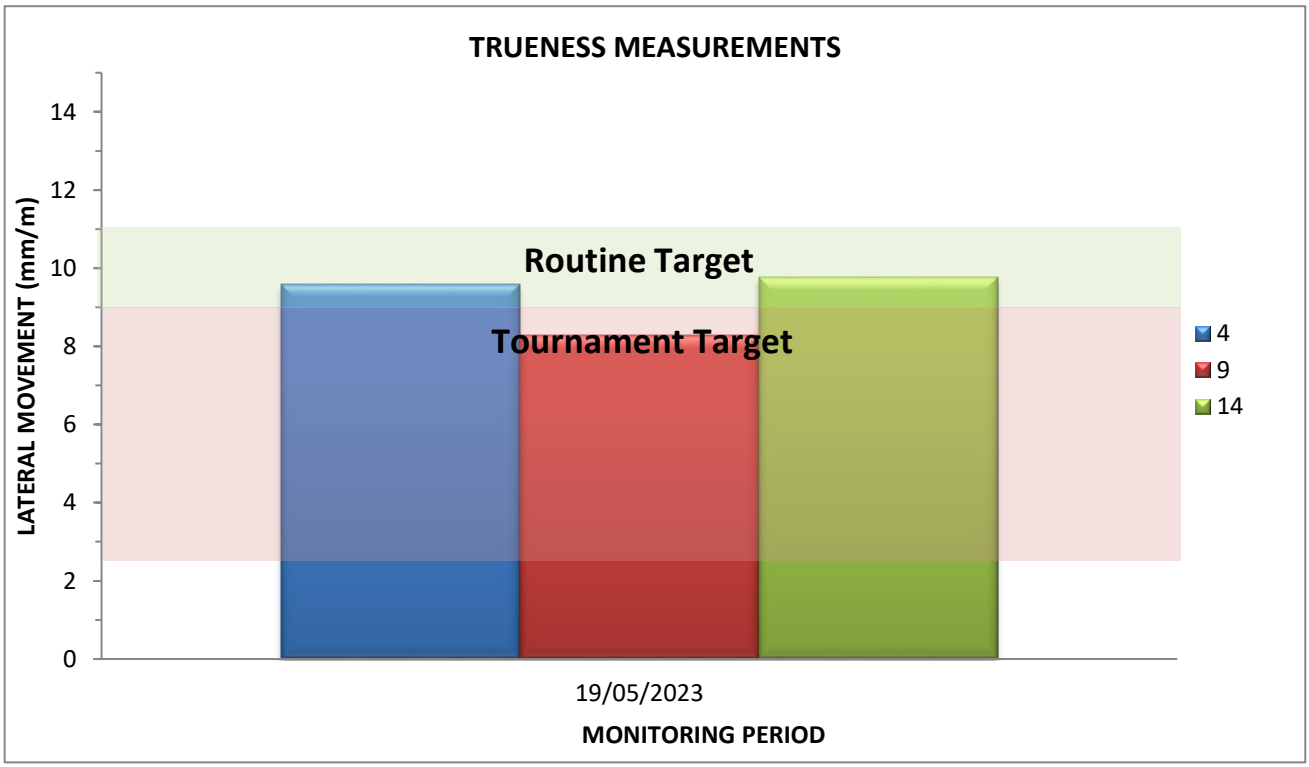
Performance Data Graph 1: The 9th green was lower on average and was close to being too dry. The 4th and 14th were higher in moisture and within the ideal range.



Performance Data Graph 2: The 4th green was within the target range, but the 9th was only just within range and the 14th was well below range.



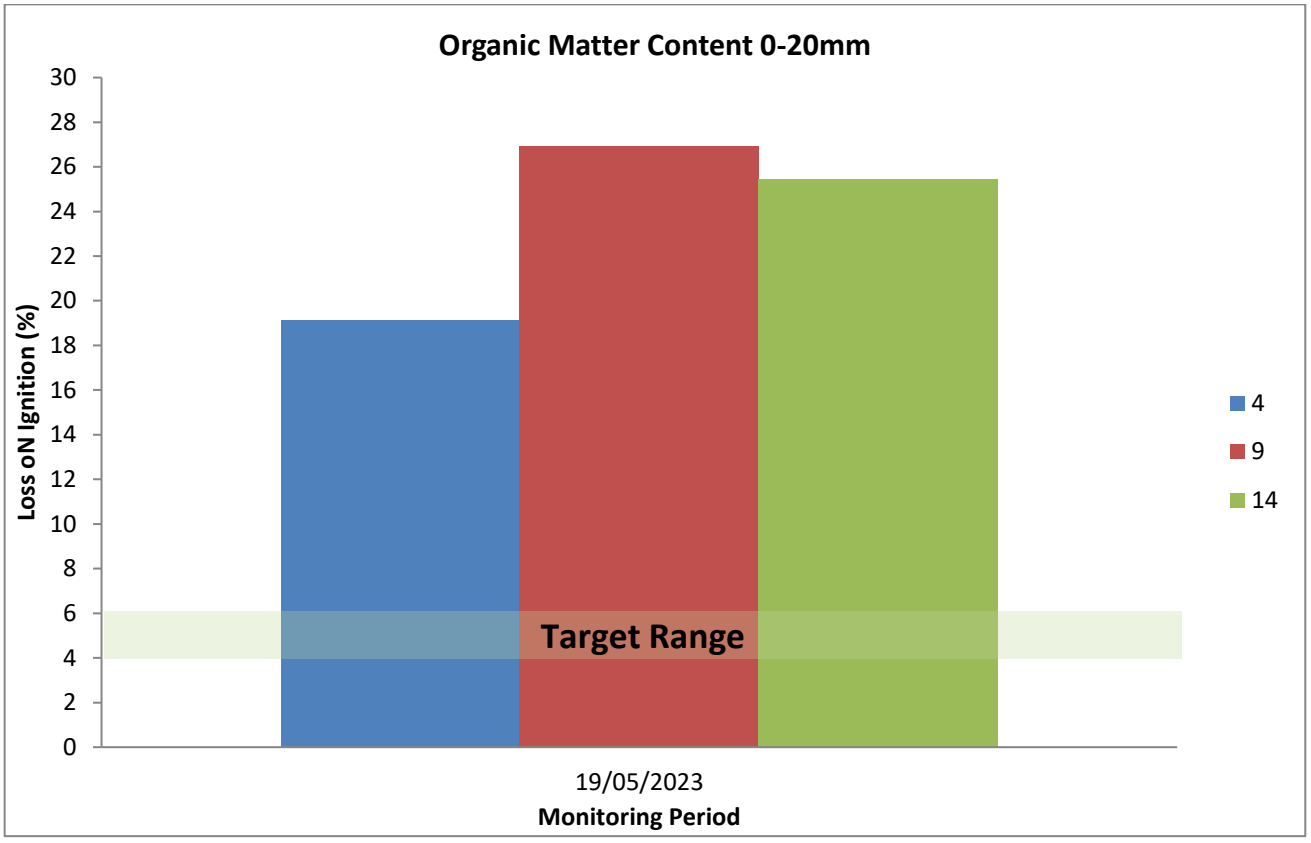
Performance Data Graph 3: The surface smoothness on the 9th was just outside the target range, and the 4th and 14th were much further outside the target range.



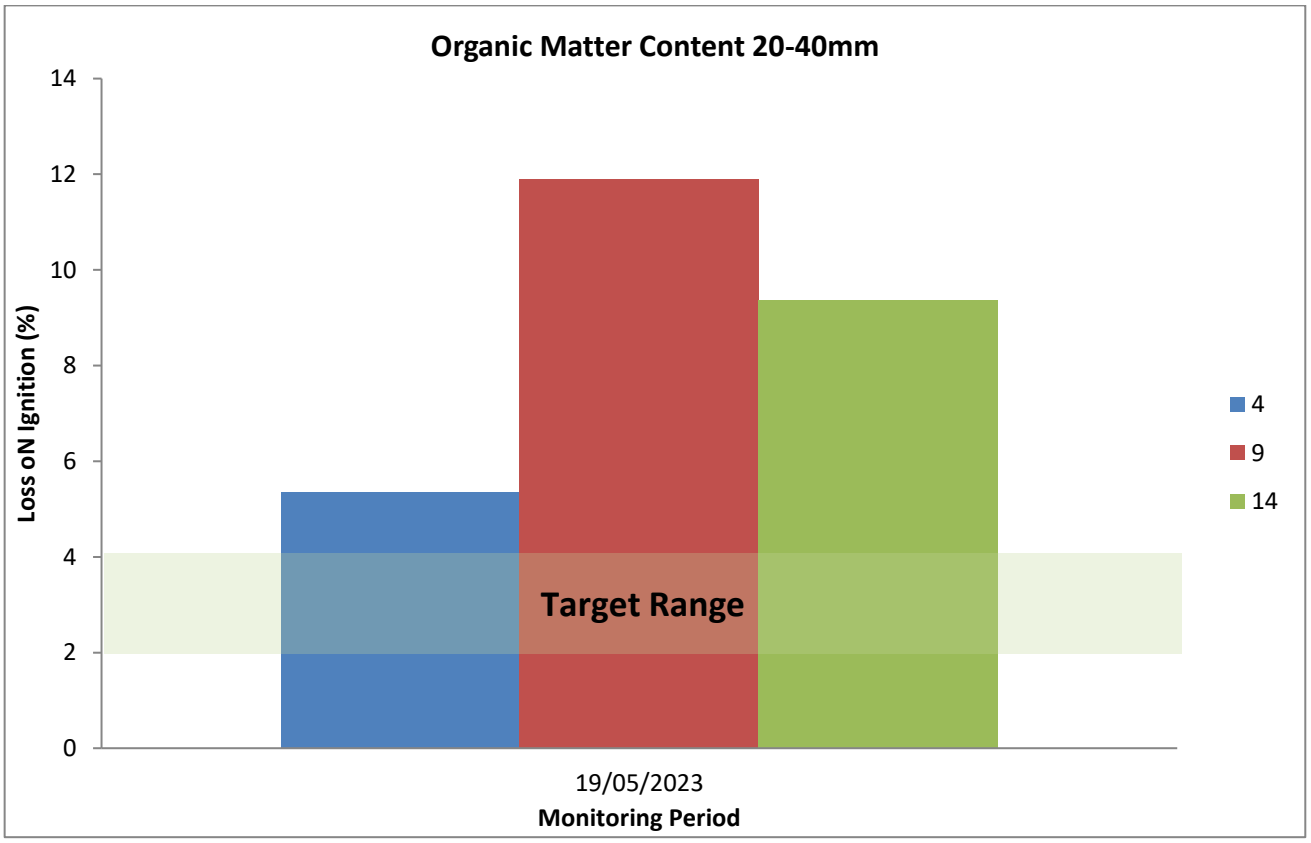
Performance Data Graph 4: The trueness on the 4th and 14th were both within the routine range, and the 9th green being in tournament range.

Performance Data Graph 5: All green speeds were consistantly lower than the target ranges.

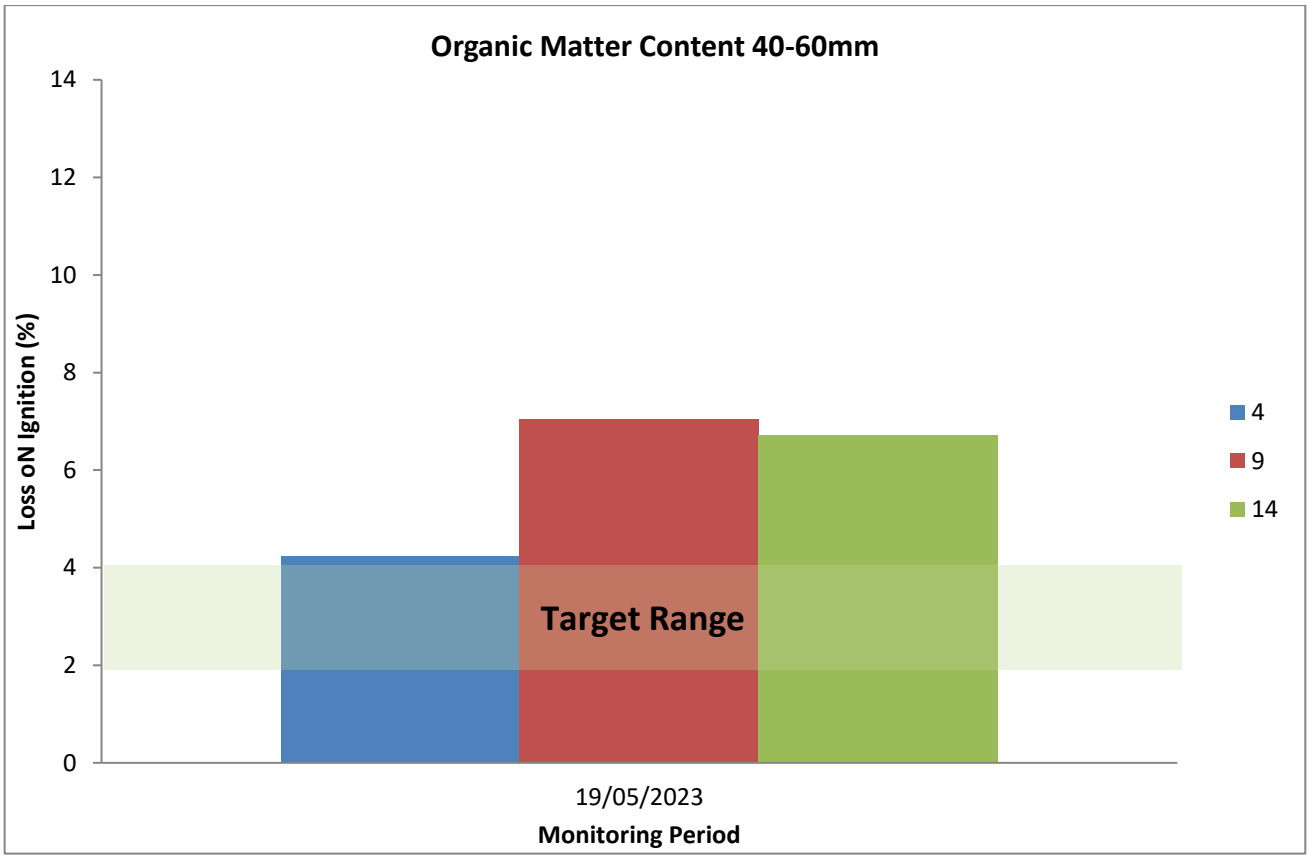
Soil Test Results



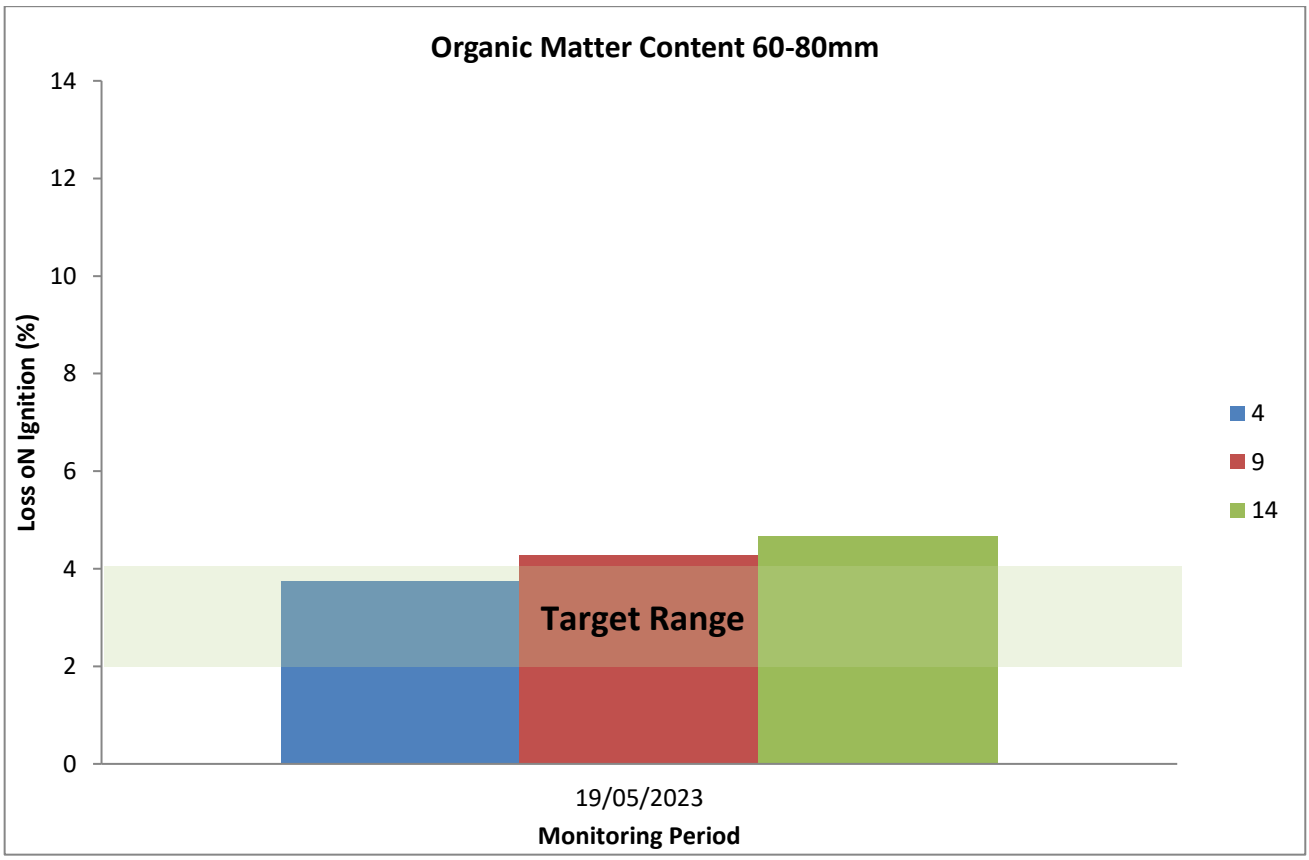
Soil Results Graph 6: The 4th was just outside target, with the 9th and 14th out of target.



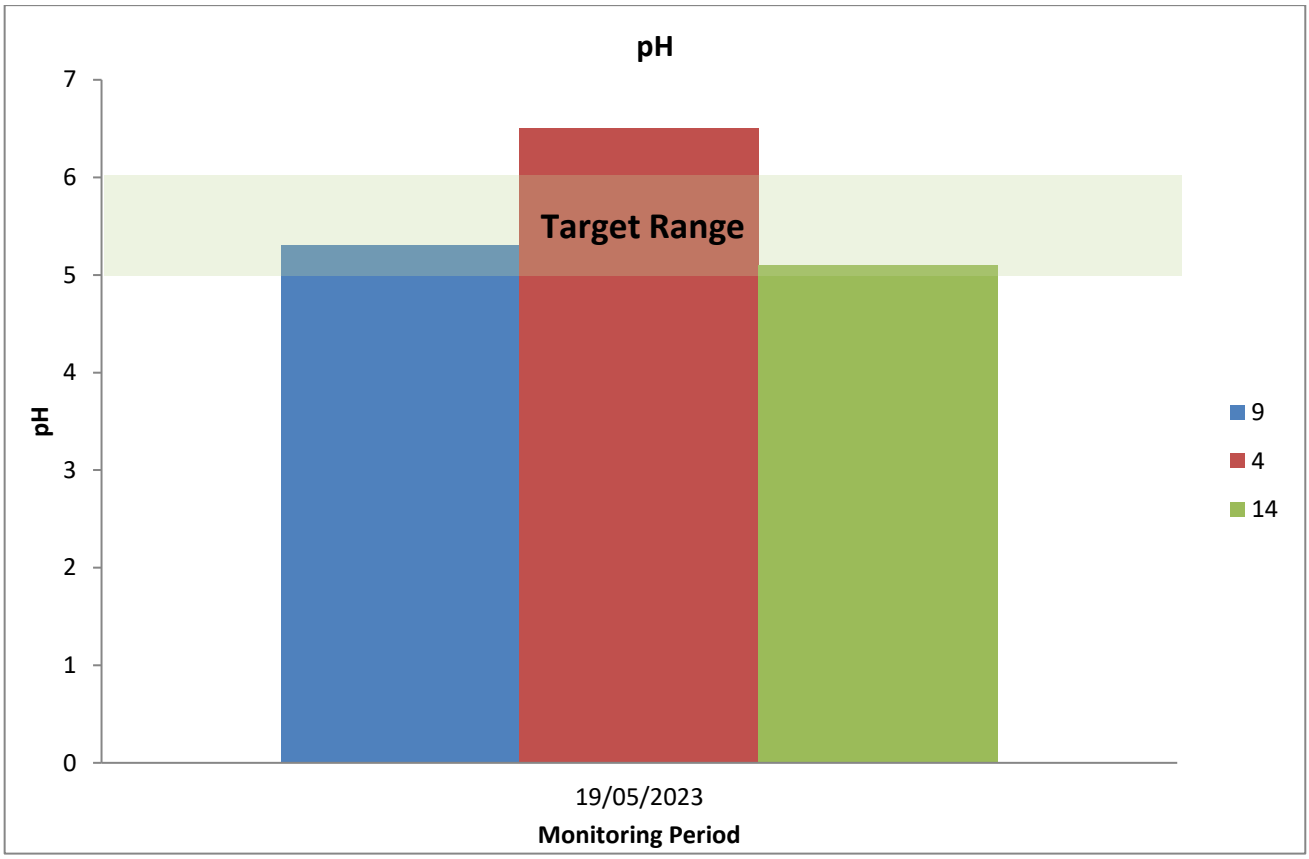
Soil Results Graph 7: The 4th green was the closest to being in range, with the 9th and 14th quite far out of target.



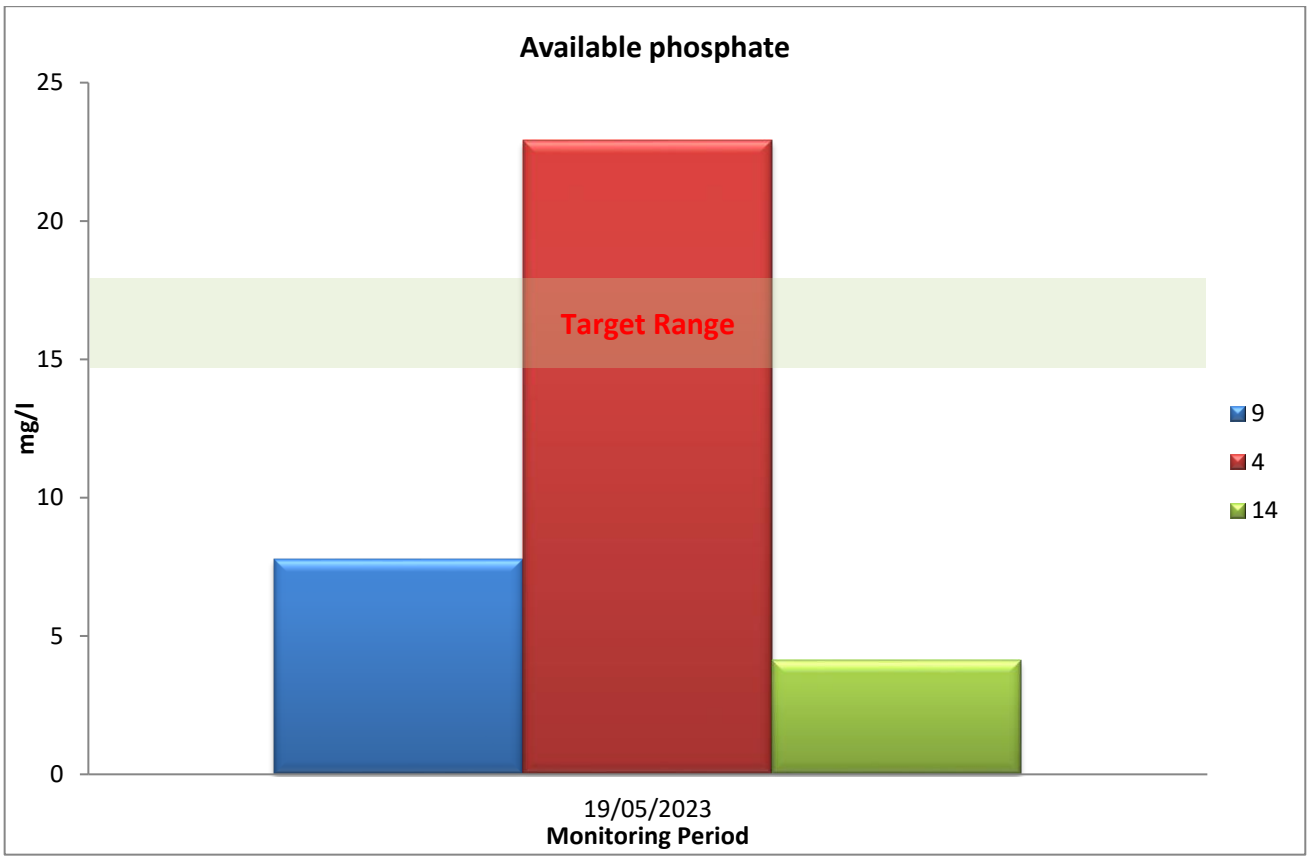
Soil Results Graph 8: The 4th was just outside the target range, with the 9th and 14th quite far out of range.



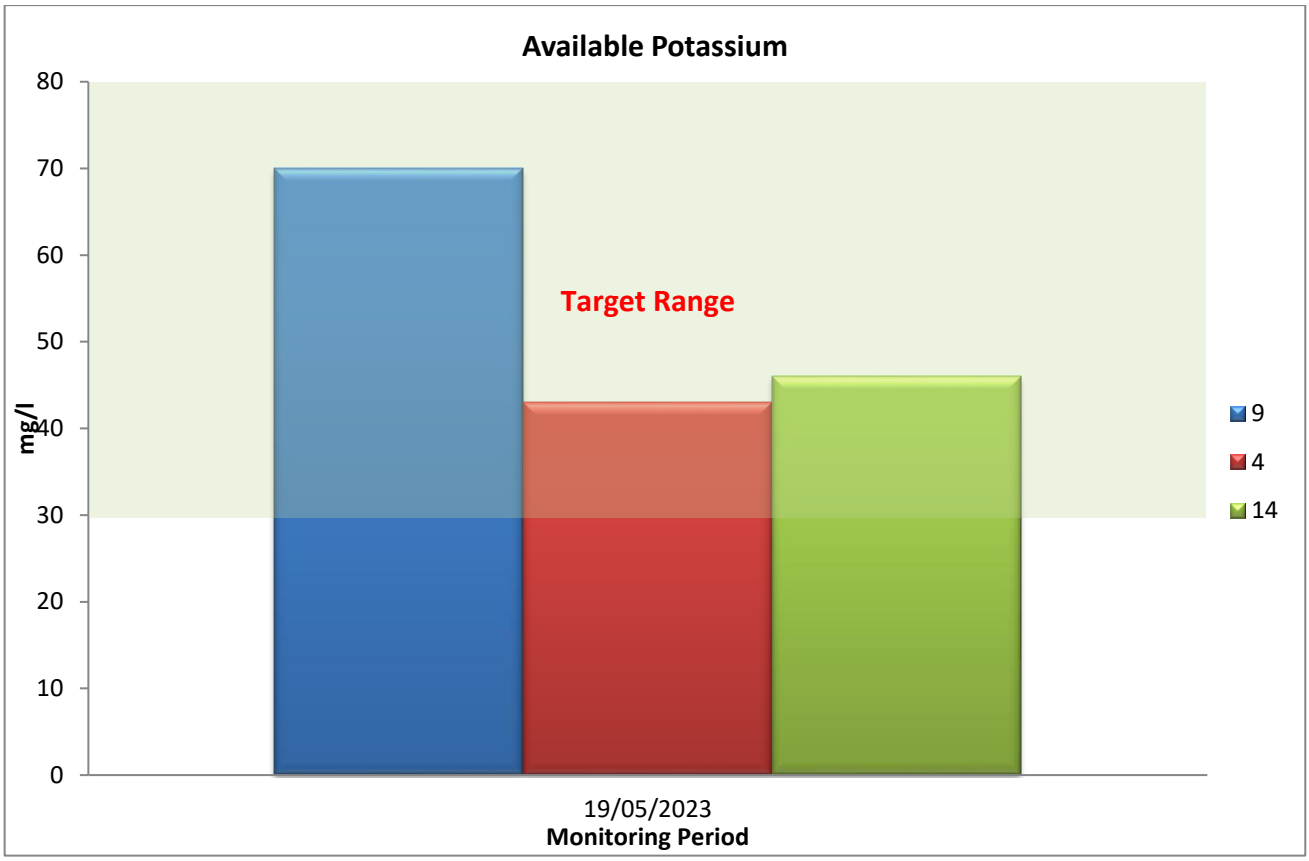
Soil Results Graph 9: The 4th was within range, but the 9th and 14th were outside range.



Soil Results Graph 10: The 9th and 14th were within range, but the 4th was more alkaline and out of range.



Soil Results Graph 11: The 4th was above range, and then 9th and 14th were out of range.



Soil Results Graph 12: All greens were above range.

Signed

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SOIL CHEMICAL ANALYSIS

CLIENT:	BLANKNEY GC
DATE RECEIVED:	26/05/2023
RESULTS TO:	BM

Lab No.	Source	pH	P_2O_5 (mg/l)	K_2O (mg/l)
A20214/1	4th HOLE	6.5	23	43
A20214/2	9th GREEN	5.3	8	70
A20214/3	14th HOLE	5.1	4	46

Mr M A Baines, Soil Laboratory Manager

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

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ORGANIC MATTER CONTENT

CLIENT:	BLANKNEY GC	DATE RECEIVED:	26/05/23
ADDRESS:	BLANKNEY LINCOLN LINCOLNSHIRE LN4 3AZ	DATE REPORTED:	07/06/23
		RESULTS TO:	BM
		TEST RESULTS AUTHORISED BY:	
CONDITION OF SAMPLE UPON ARRIVAL:	MOIST	Michael Baines, Laboratory Manager	

SAMPLE NO	DESCRIPTION		LOSS ON IGNITION (%)*
A20214/1	4	0-20 mm	19.12
		20-40 mm	5.36
		40-60 mm	4.23
		60-80 mm	3.74
A20214/2	9	0-20 mm	26.91
		20-40 mm	11.90
		40-60 mm	7.04
		60-80 mm	4.28
A20214/3	14	0-20 mm	25.44
		20-40 mm	9.38
		40-60 mm	6.71
		60-80 mm	4.66

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

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

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