Making great sport happen

ARCOT HALL GOLF CLUB

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: Thursday 1st June 2017
Consultant: Adam Newton

Arcot Hall Golf Club

Date of Visit:	Wednesday 31st May 2017	
Visit Objective:	To provide an agronomic review of the golf course, collect greens performance data and confirm ongoing maintenance requirements.	
Present:	Bryan Rumney – General Manager Steve Halsall – Club Captain Don McGruther – Committee Neil Melrose – Committee The Arcot Hall Greenkeeping Team	Michael Richardson – Chairman David Evans – Committee Simon Lunn – Committee Ian Kyle – Head Greenkeeper Adam Newton – STRI Ltd
Weather:	Sunny and warm, with temperatures of approximately 20°C.	

Headlines

- The course has performed superbly through what has been a very challenging spring.
- The greens were in excellent shape and offering very natural performance despite strong seedhead activity. Surface firmness levels were becoming a little fiery and need closely monitoring.
- Ball roll qualities were all in target ranges and trueness values were the best they've been.
- Organic matter levels have fractionally increased in the top 20mm, but reduced at greater depths.
- Pipe drainage work to the 11th and 18th greens has been successfully implemented. Installation to the remaining greens is still a priority to improve winter performance.
- The improvements to the 9th hole are fantastic and have greatly enhanced this feature Par 3. The same can be said for the excellent work carried out in front of the 13th Tee.
- Extension and management of rough grassland areas is a key area for consideration moving forward.

Key Actions

- Sustain mowing heights at 4mm and supplement with appropriate refinement to refine seedheads and optimise ball roll performance.
- Increase sand inputs to 130 tonnes this year to manage organic matter in the absence of the Graden.
- Intensify micro solid tining inputs to aerate the profiles and manage surface firmness.
- Ongoing pipe drainage to the 3rd, 5th and 7th greens this autumn.
- Scarification, cutting and collecting work introduced to rough grasslands to improve playability. Consideration should also be given to extension of grasslands in certain areas of semi rough.

Objective Measurements (Cut & roll at 4mm)

Measurement	Average	Target Range
Soil Moisture (%)	22.2% (range 20.6 – 23.2%)	15-30%
Hardness (Gravities)	116 Gravities (range 113 – 118g)	85-110 g
Smoothness (mm/m)	23 mm/m	<25 mm/m
Trueness (mm/m)	6 mm/m	<10 mm/m
Green Speed	8 ft 9 in	8.5-10.5 ft
Organic Matter 0-20 mm (%)	6.2 %	4-6%
Organic Matter 20-40 mm (%)	3.8 %	<4%
Soil pH	5.1	5.0-6.0
Phosphate (P_2O_5)	12 mg/l	>10 (mg/l)
Potassium (K_2O)	156 mg/l	>30 mg/l

Key: In Target | Marginal Variance | Out of Target

Photo Observations and Comments

Figure 1: Despite a cold, dry and challenging spring, the course was in excellent condition and well presented. Grass growth has been prolific following a spell of heavy rain showers and warm temperatures.

Figure 2: The greens were performing very well, despite prolific seedhead activity. Grass cover was strong and texture well refined. The consistency from green-to-green was particularly impressive and it was reported that performance through spring has been exceptional.

Figure 3: Soil profiles continue to improve agronomically. Organic matter has slightly increased in the top 20mm (see appendix), but still remains in target range. Managing organic matter and soil structure remain key objectives.

Figure 4: An improved growing medium is yielding excellent results with root development. Rooting depth and mass has seen a remarkable improvement over the last couple of years.

Figure 5: Improving winter performance of the greens is still a priority and I was delighted to see that both the 11th and 18th greens have now been pipe drained. Turf over drain lines has settled well, but further dressing is needed to perfect surface levels.

Figure 6: The drainage work to the 11th has settled equally well and is already paying dividends. Upgrade to the sprinklers on this green have also brought about a notable improvement in soil moisture distribution, which was highlighted during data collection (see appendix).

Figure 7: Widening and reshaping of the approaches has improved the entrance to the greens and is more favourable to the running approach shot.

Figure 8: Tree and scrub removal work in front of the 13th Tee has gone superbly well. This is now a far more attractive Tee shot aesthetically. Work to improve the grassland vegetation adjacent to the tree line is now required.

Figure 9: Creating thin, wispy fringing grassland in the wider roughs would improve course definition, character and biodiversity, whilst also reducing the vast amount of time semi-rough mowing. The area pictured above between the 6th and 7th fairways supports an array of fine grasses, orchids and heather. The area is currently rather fragmented, but highlights what could be achieved in wider areas.

Figure 10: The Par 3 9th has transformed following winter tree/scrub removal and reshaping work. This is a superb Par 3 and its character has now been enhanced. A job well done!

Figure 11: The pathway ends have previously been highlighted as a key area for improvement. The 10th (pictured) is a prime example.

Figure 12: Improving the quality of grass cover around the bunker edges and minimising the effect of sand splash are key objectives to improve bunker presentation.

Recommendations

Greens

- Sustain cutting heights at 3.75 – 4mm, there is certainly no need to mow any shorter at present.
- Apply occasional double cutting during periods of strong growth and seedhead activity, coupled with ongoing grooming and verticutting to set texture and optimise ball roll.
- Proceed with micro solid tining over the next 1 – 2 weeks as seedhead activity wanes to aerate the upper profile and help take the "sting" out of the surface. It is essential that this continues every 4 – 5 weeks throughout the year (when ground conditions are suitable).
- With Graden sand injection being omitted this year, it is crucially important that we maintain the pressure on organic matter management through dedicated sanding and micro aeration. With this in mind; it was recommended that an additional 30 tonnes of sand is applied to the greens this year, taking the annual target to 130 tonnes (80 tonnes have already been applied). Continue with fortnightly, light dressings and look to time one of these per month after micro solid tining to use the tine holes to "key" sand into the surface.
- Continue to apply some additional light sanding and true-luting to the drain lines on the 11th and 18th greens to help perfect surface levels.
- With no summer renovation planned this year due to fixtures, we agreed that a renovation window should be scheduled for the first week of October after the Arcot Vase. A programme of vertidraining (14mm tines) and sanding was agreed, followed by micro solid tining and further light dressing to help close-up the verti-drain holes. Ensure that a preventative fungicide is applied 2 – 3 days beforehand using a suitable product such as Instrata.
- Increasing bentgrass populations on the greens is a key longer-term goal and something we have discussed over recent visits. However; with the renovation window being put back to October this year, I feel it is too late to gain any real success with bentgrass overseeding and so, this should be omitted from the operation this year. Investing in overseeding is something we should consider closely from next year onwards.
- Deep aeration work is essential for the greens at Arcot due to the fine textured soils beneath. The Air2G2 air injection work went well last autumn and should be scheduled again for late winter/early spring next year. The above mentioned verti-draining work will help manage soil structure leading into the winter.
- Improving winter drainage performance of the greens is a primary objective and it is imperative that the programme of pipe drainage installation continues to help achieve this. I was pleased to hear that plans are for the 3rd, 5th and 7th greens to be pipe drained this autumn.
- The above-mentioned renovation work in early October should be omitted to these 3 greens to avoid any issues with lifting the turf. Ensure that a protective fungicide is applied prior to lifting the turf over drain lines to manage fusarium activity.
- Continue to upgrade the remaining 20 sprinkler heads around the greens. The benefit of this work was highlighted on the 11thduring the visit, where soil moisture distribution was far more consistent than in previous years, thanks to more accurate water delivery from the new sprinklers and better soil water movement, because of the new pipe drainage system.
- The fertiliser programme is very well balanced and should not deviate from the current, simple programme of Porthcawl, Revolution and Ferrosol inputs through the season. Annual nitrogen totals should be sustained at around 75 – 85kg/ha.
- Soil chemical analysis results (see appendix) highlighted that soil pH has seen a slight increase over the last year back into more favourable ranges - no action is needed. Phosphate levels have stayed relatively static and do not require any input this year. Potassium levels are extremely high and there is certainly no need to apply any further potassium for at least another year. With this in mind, the fertiliser

programme should mostly focus on "nitrogen only" inputs for the rest of the year. We discussed exchanging the Autumn Nutri-Pro granular feed (4:0:24) for light applications of water soluble ammonium sulphate. Applying 1 – 2 lighter ammonium sulphate feeds through the autumn (as growth and turf health dictates) will provide you with a greater control of nitrogen input and also avoid unnecessary potassium input.

Green Collars, Surrounds and Approaches

- These areas were generally excellent and are much improved in comparison to previous years. Continue to extend greens maintenance practices into the approaches and collars wherever possible, through the year (e.g. sanding, aeration, feeding etc.).
- Some immediate verticutting would be beneficial to the collars and approaches to refine the texture of coarser grass species.
- Allow for 2 – 3 wetting agent treatments through the summer to the 9th green approach (from the bunker to the green) to help combat dry patch issues. This area notoriously suffers due to its underlying material and a preventative approach to dry patch management would certainly help. Look to use a product such as 50/90 by Aquatrols or Breaker Advance.

Tree Management

- Look to remove the two beech trees to the back left of the 9th Tee this winter. Some excellent tree work has been carried in this area recently however; these two remaining trees are hindering turf quality at the back of the Tee.
- Continue to thin out tree populations on the 15th hole to improve airflow and sunlight to the putting surface. It was unsurprising to hear that this green suffered the most with fusarium patch disease last autumn – this is undoubtedly due to the enclosed microclimate in this area.

Bunkers

- Brush or blow sand splashed areas as much as practically possible through the year to avoid scorching of the turf.
- Allow for 2 – 3 urea-based liquid feeds to be applied to the bunker faces and edges through the growing season to strengthen grass cover and improve appearance.
- A review of the course bunkering would certainly be beneficial in the future to look at ways to improve their appearance and strategic positioning as well as assessing current sand areas and maintenance requirements.

Pathways

- Improvement to the pathway ends would be highly recommended to improve presentation and aesthetics. Installation of natural turf/rubber matting would be the most appropriate solution (as recommended in previous reports.

Fairways, Rough & Wider Areas

- Creating wispy fringing roughs in some areas of semi-rough would be recommended to improve the definition, character and diversity across the course. This would also greatly reduce maintenance time and costs. The grass composition in many of the semi roughs is very fine textured and with some work, would create excellent seedhead roughs. These must however be thin and playable and so a programme of scarification, cutting and clipping collection would be required in both autumn and early spring. To

facilitate this, either purchase or hire of a suitable flail collector (e.g. Amazone or Wiedenmann Super 500) would be required.

- The new rough carry in-front of the 13th Tee where trees and scrub have recently been removed should ideally be maintained as rough grassland. This would be in-keeping with the heathland feel of this area and would link well into the rough/heather area beyond the ditch. Currently; the area is being mown with a rotary mower. This is not only labour intensive, but the return of grass clippings is also feeding the rough. To achieve a thin, wispier grassland here, the above-mentioned programme of scarification, cutting and clipping collection would need to be adopted. Some spot treatment with selective herbicide (to manage weeds) and selective graminicide (to remove rank grasses) would also be recommended, providing this is permitted within the S.S.S.I guidelines. Further tree thinning is also necessary, but on a much lesser scale.
- We discussed the potential to extend the pond on the 3rd towards the fairway by 2 – 3m. This would make more of a feature of the pond, but would also widen the capture of drainage water through the winter months, particularly as the rig and furrow from the fairway falls in this direction.

Signed

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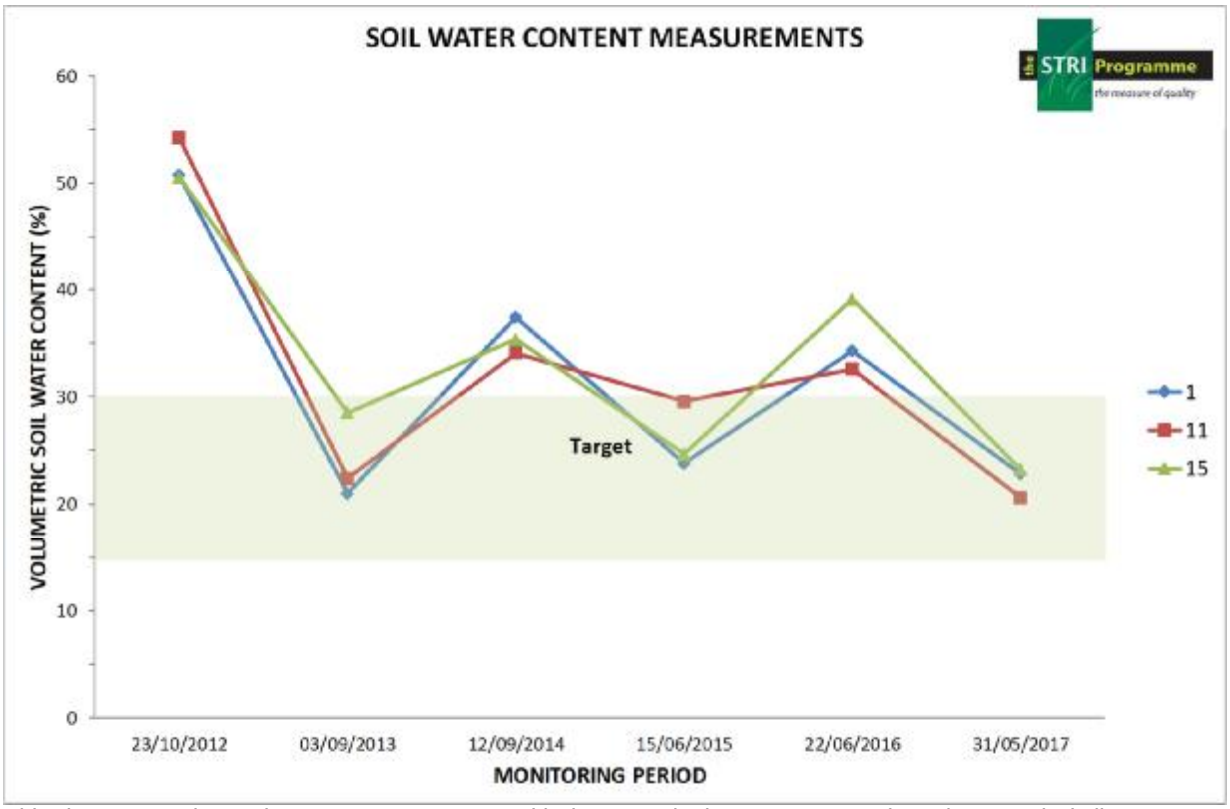
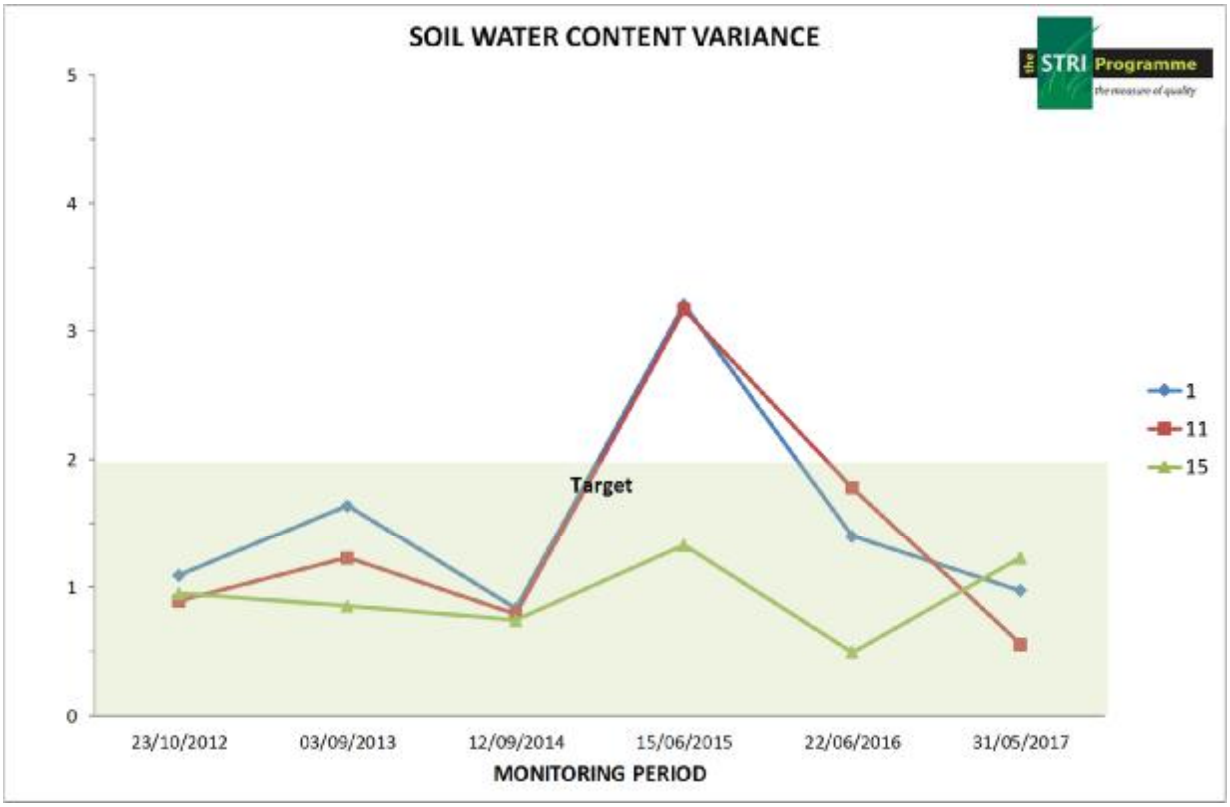
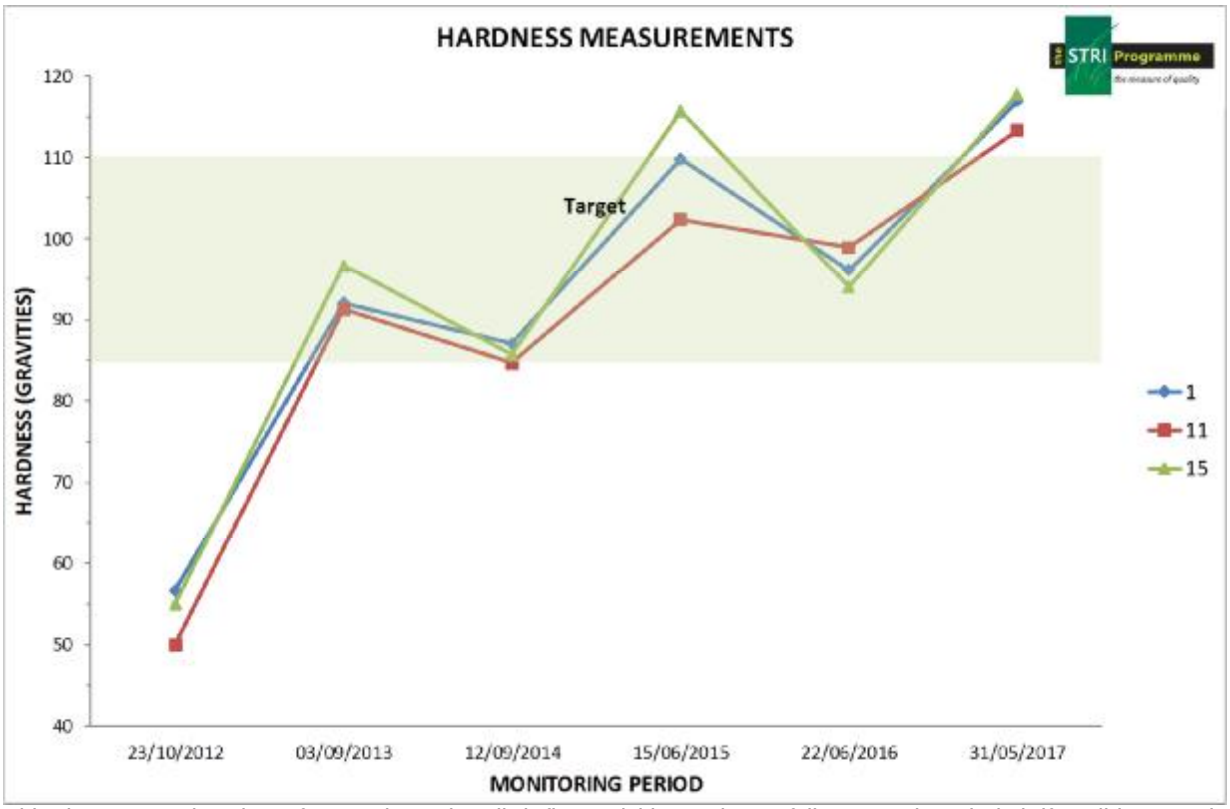
Objective Data



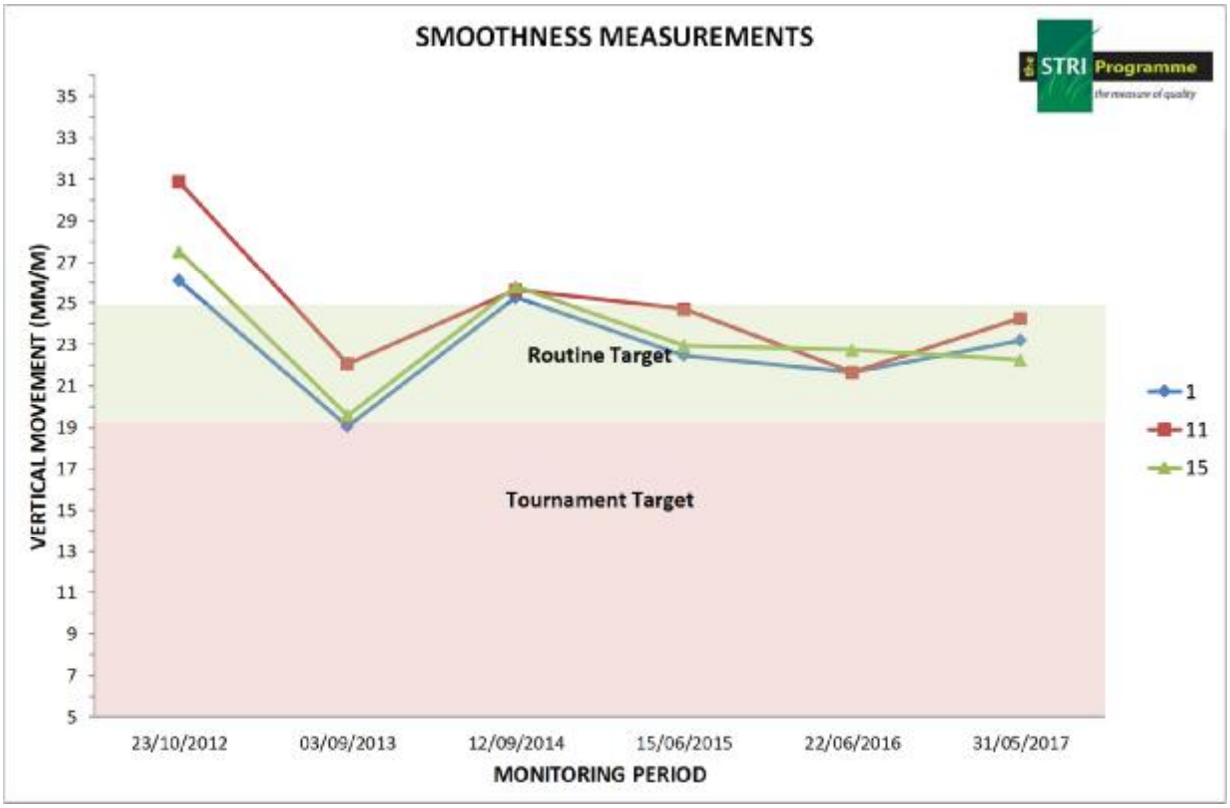
Objective Data Graph 1: Moisture content average at an ideal 22.2% and values were very consistent between the indicator greens.



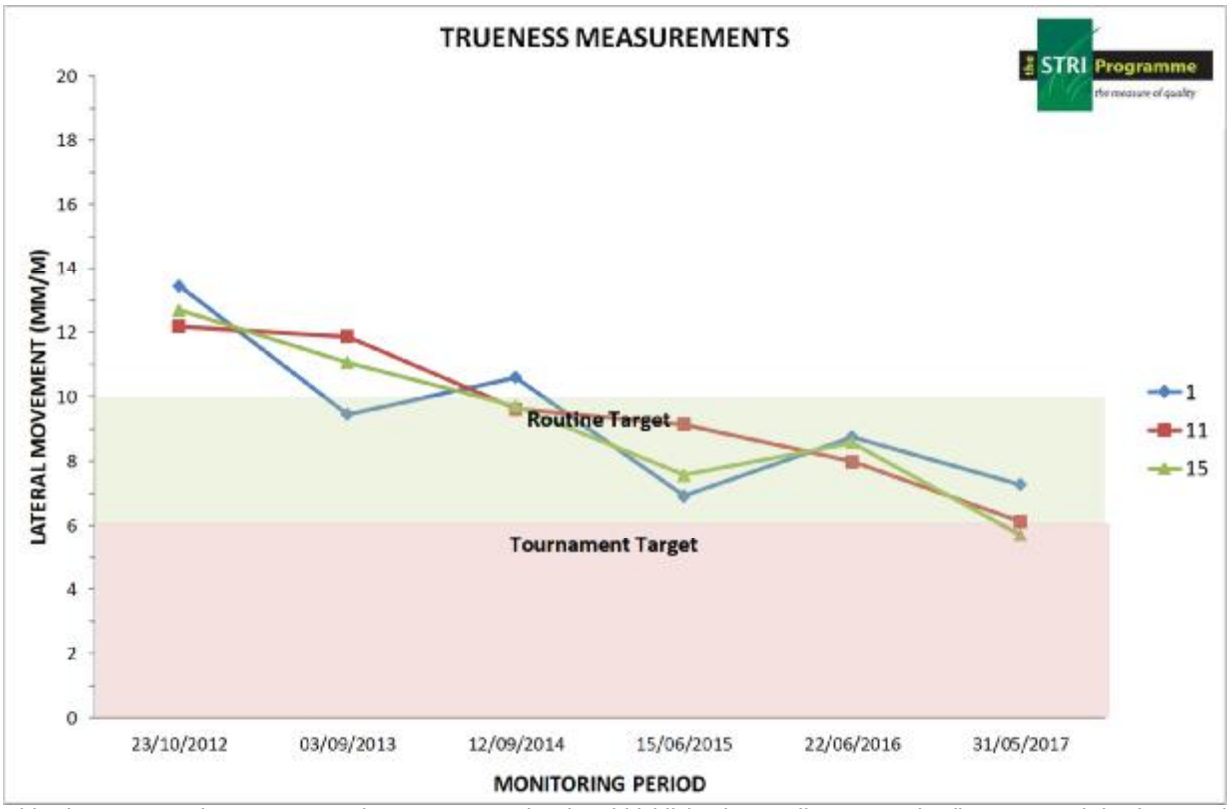
Objective Data Graph 2: This graph shows the variance in moisture content across each green. We can see that moisture was very consistent within the greens, but the most notable improvement has been the 11th green, which was the most consistent thanks to recent drainage installation and upgrade to the sprinklers. Historically this surface has been quite variable, with distinct wet and dry areas.



Objective Data Graph 3: The surfaces are becoming a little fiery and this must be carefully managed, particularly if conditions remain dry. An increase in non-disruptive micro solid tining was recommended to help avoid excessive surface hardness through the summer.



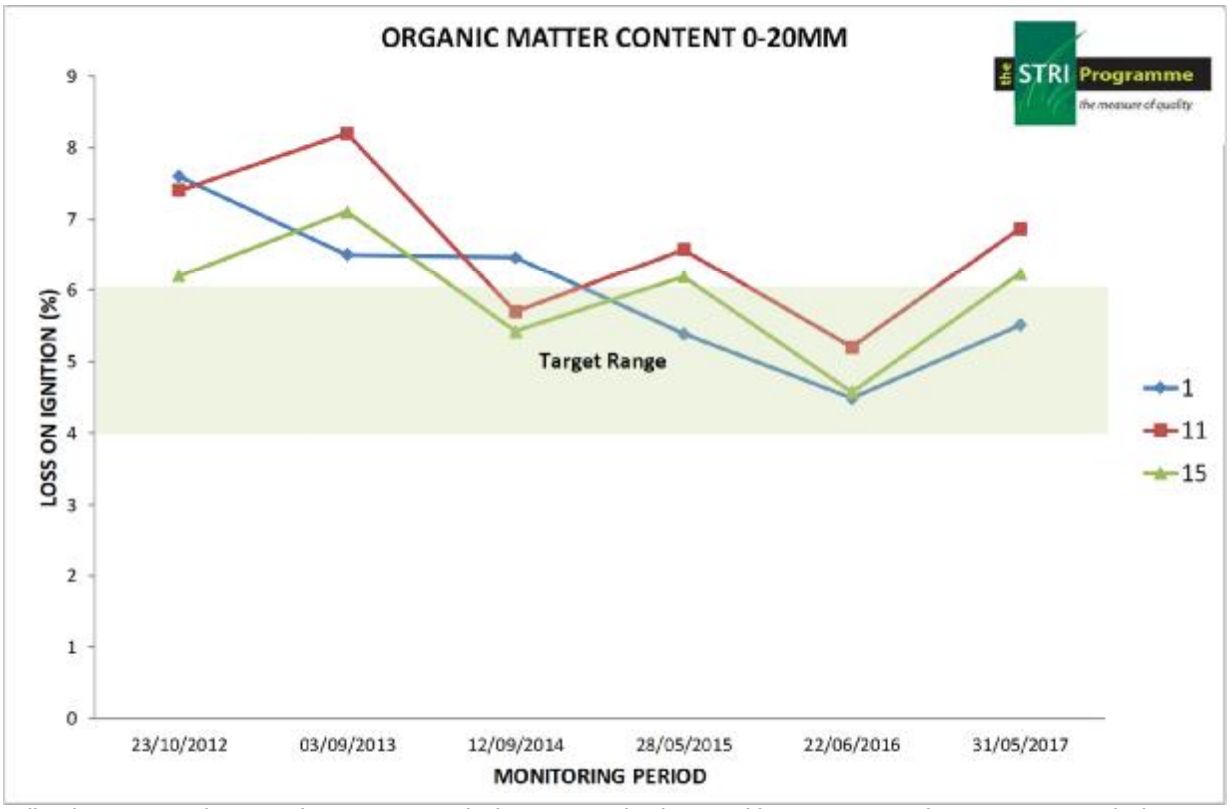
Objective Data Graph 4: Smoothness values were very good considering the high level of seedhead activity. All greens offered very similar values, which were within routine target ranges.



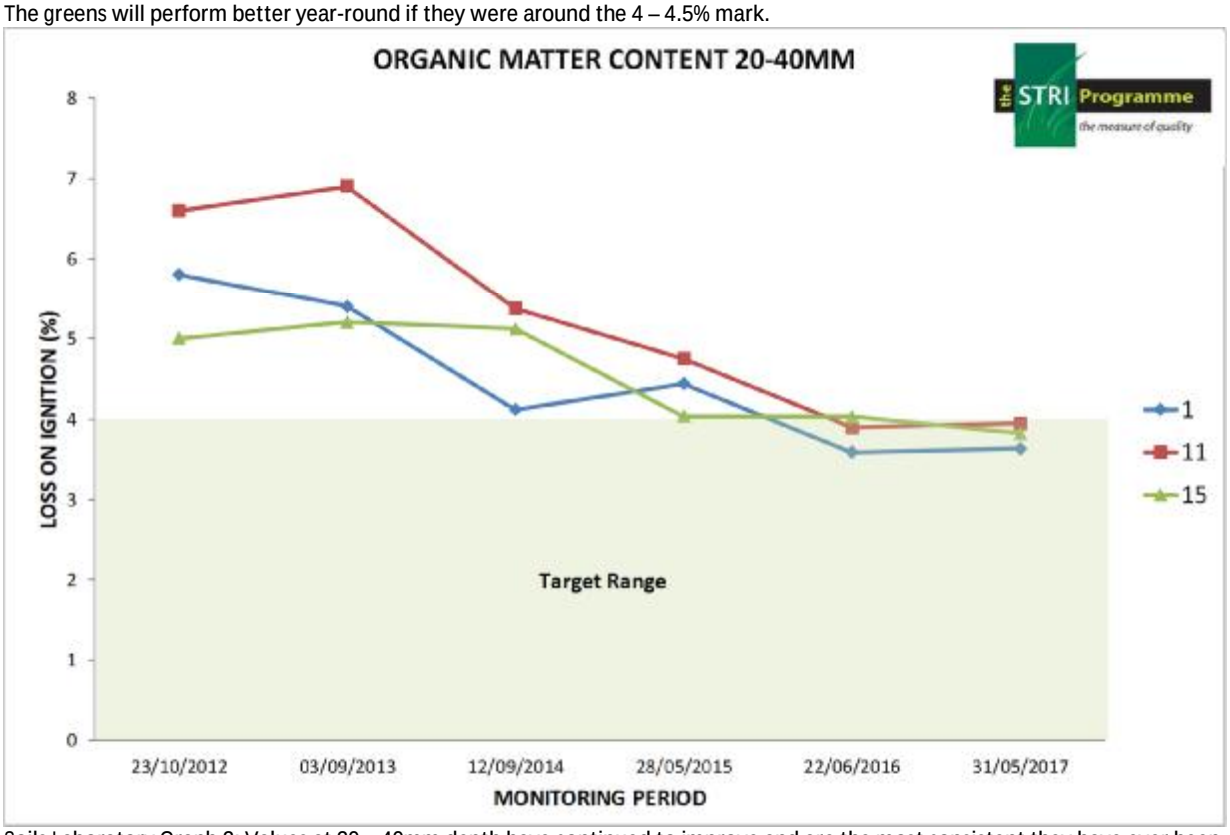
Objective Data Graph 5: Trueness values were exceptional and highlight the excellent textural refinement work implemented through the spring. These values are the best we have recorded since testing began and further support the positive golfer feedback of late.

Objective Data Graph 6: Greenspeeds averaged at a perfectly adequate 8ft 9" following a cut and roll.

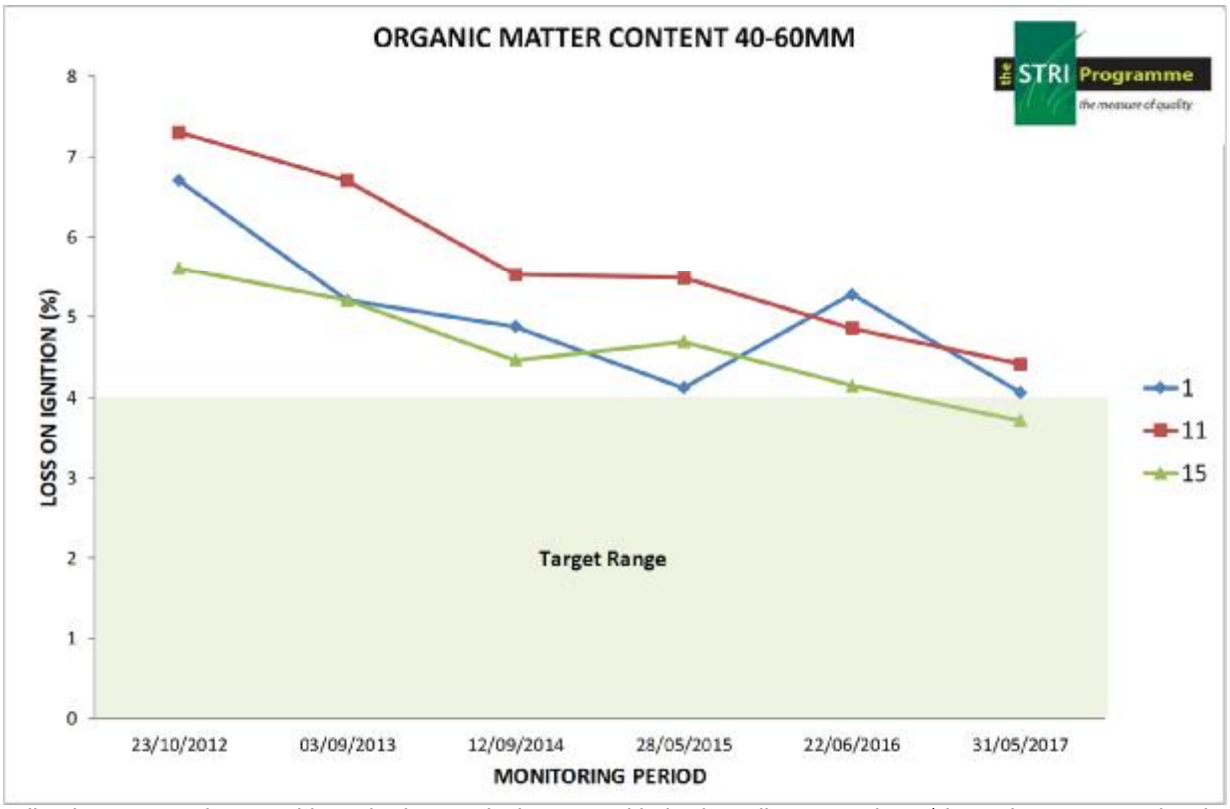
In summary, ball roll qualities were excellent for the time of year and will improve further as seedhead activity declines. I was particularly pleased that this level of performance is being achieved with cutting heights still being retained at 4mm.



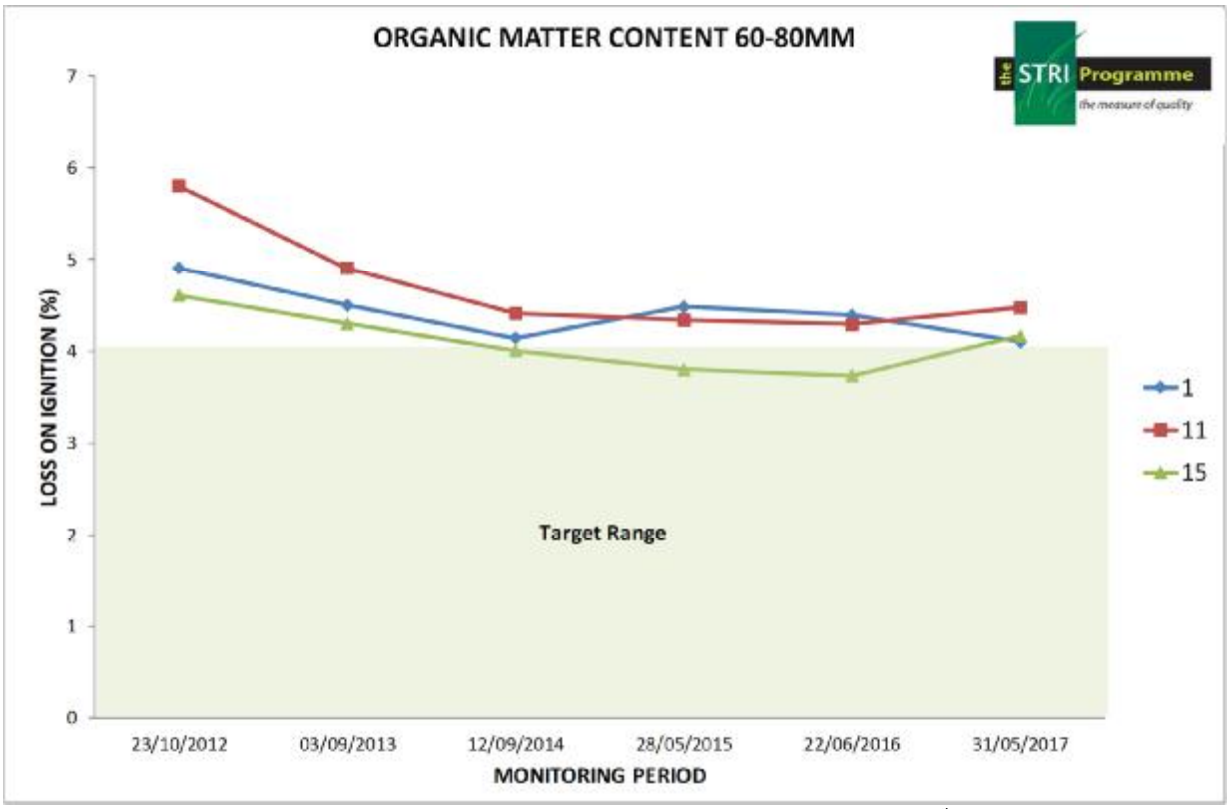
Soils Laboratory Graph 1: Organic matter content in the top 20mm has increased from an average of 4.8% to 6.2% over the last year. Values on the 11th are now outside the target range, but the 1st and 15th greens still within. This increase is not too concerning, but we must maintain the pressure on further reduction moving forward, particularly given that Gradening is being missed this year. The greens will perform better year-round if they were around the 4 – 4.5% mark.



Soils Laboratory Graph 2: Values at 20 – 40mm depth have continued to improve and are the most consistent they have ever been. The trend of reduction over the last 5 years has been extremely impressive. Values are now in target range, but would benefit from some further reduction.



Soils Laboratory Graph 3: A positive reduction can also be seen at this depth on all 3 greens. The 15th is now in target range, but the 1st and 11th just above.



Soils Laboratory Graph 4: At 60 – 80mm depth, values have remained relatively static, although the 15th has seen a marginal increase. Values are on the cusp of target range.

STRI

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SOIL CHEMICAL ANALYSIS

CLIENT:

ARCOT HALL GC

RESULTS TO: **ARN**

DATE RECEIVED:
13/04/2017

Lab No.	Source	pH	P_2O_5 (mg/l)	K_2O (mg/l)
A15786/1	GREEN 1	5.2	12	152
A15786/2	GREEN 11	5.0	15	195
A15786/3	GREEN 15	5.0	10	121

Mr M A Baines, Soil Laboratory Manager

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

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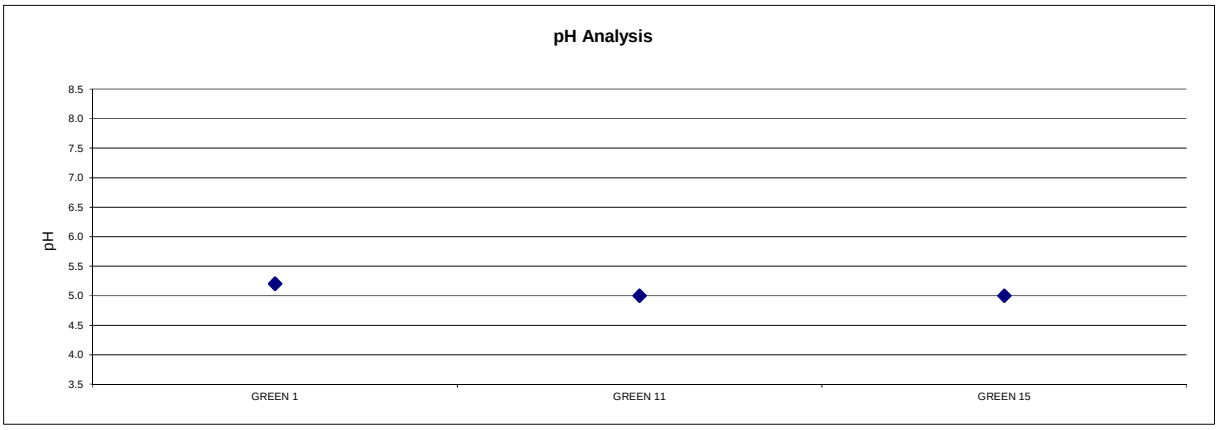
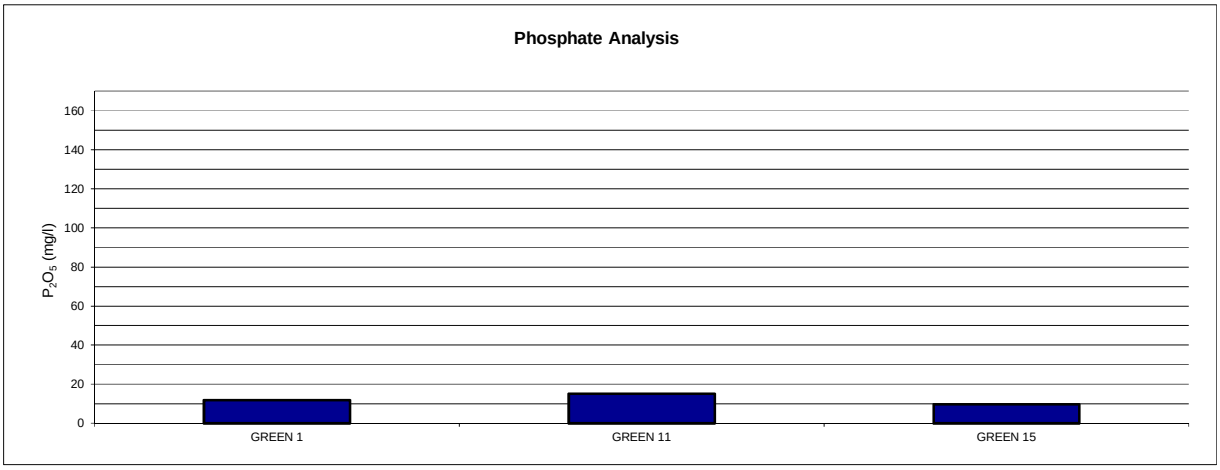
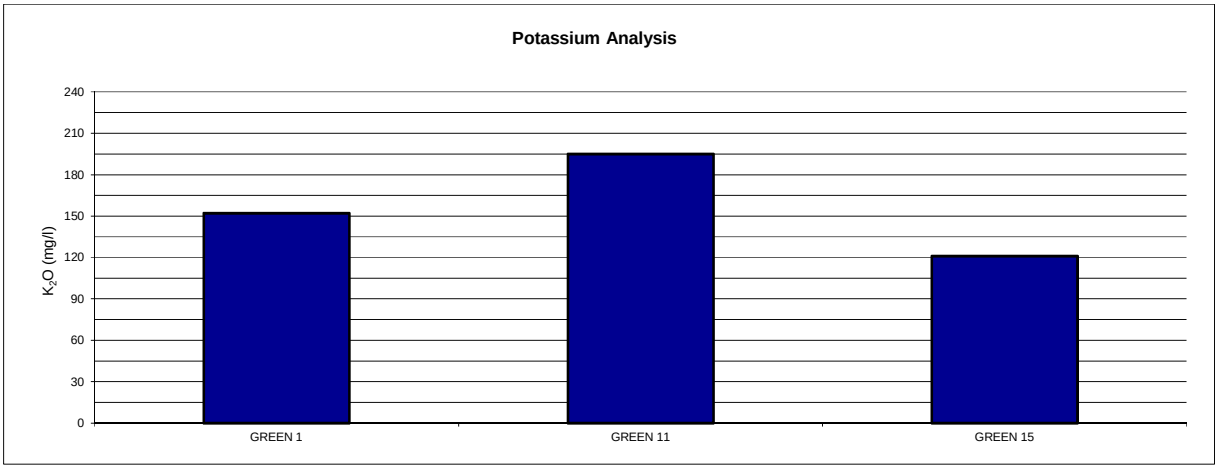
SOIL CHEMICAL ANALYSIS ARCOT HALL GC Date: 13/04/17







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ORGANIC MATTER CONTENT

CLIENT: ARCOT HALL GC

ADDRESS: ARCOT HALL,
DUDLEY, CRAMLINGTON,
NORTHUMBERLAND, NE23 7QP

DATE RECEIVED: 13/04/17

DATE REPORTED: 17/05/17

RESULTS TO: ARN

TEST RESULTS AUTHORISED BY:

Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION		LOSS ON IGNITION (%)*
A15786/1	1	0-20 mm	5.51
		20-40 mm	3.64
		40-60 mm	4.06
		60-80 mm	4.10
A15786/2	11	0-20 mm	6.87
		20-40 mm	3.95
		40-60 mm	4.41
		60-80 mm	4.47
A15786/3	15	0-20 mm	6.22
		20-40 mm	3.82
		40-60 mm	3.71
		60-80 mm	4.16

* 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