

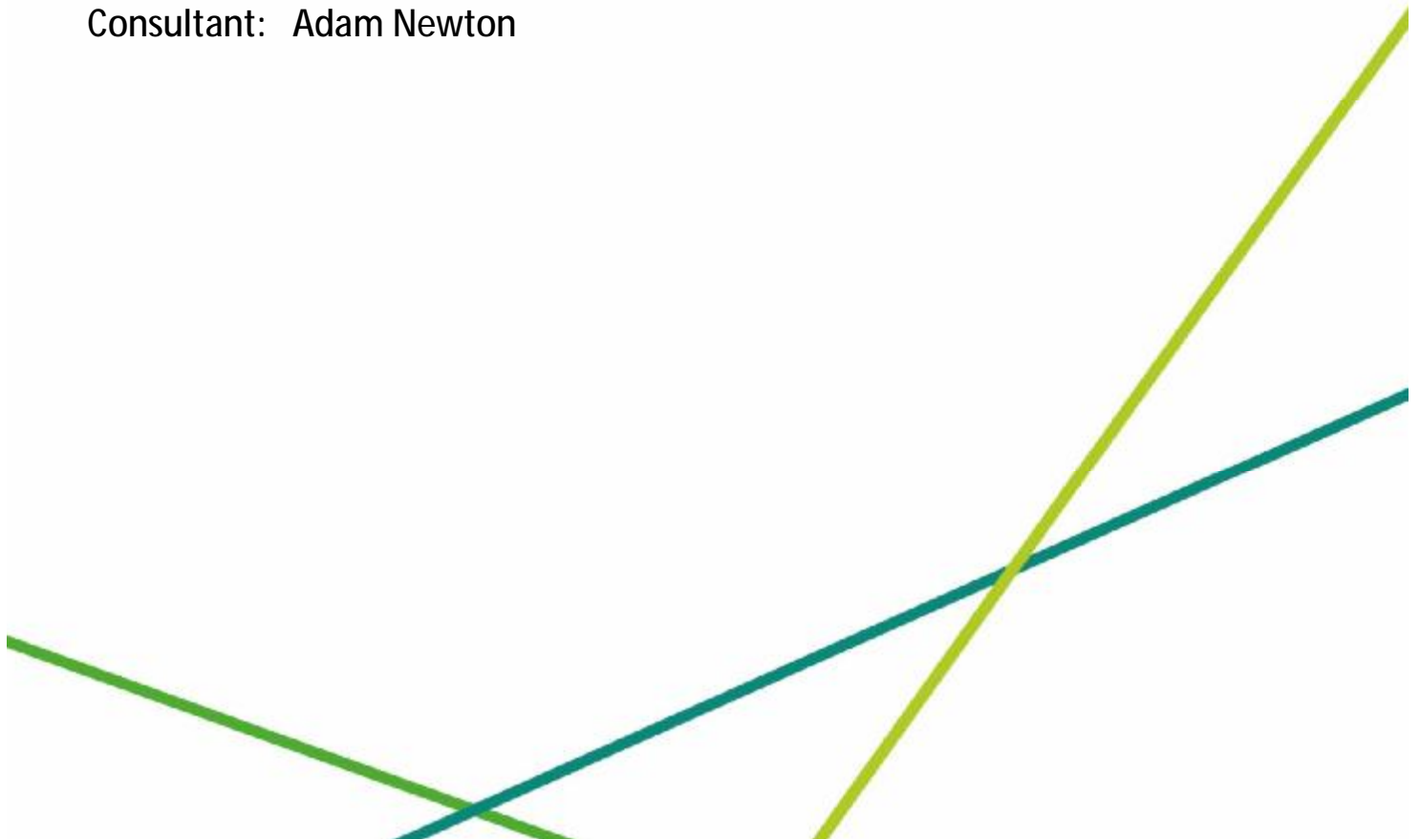


Making great sport happen

# WOLLATON PARK GOLF CLUB

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

Report Date: 21<sup>st</sup> June 2018  
Consultant: Adam Newton



## Wollaton Park Golf Club

**Date of Visit:** Thursday 7<sup>th</sup> June 2018

**Visit Objective:** To review agronomic conditioning, assess greens performance data and confirm ongoing maintenance requirements.

**Present:** Steve Sayers – General Manager      Jim Glazzard – Chair of Course  
 Martin Scothern – Course Manager      Adam Newton – Senior Agronomist

A post visit briefing meeting was also held with the Greens Committee

**Weather:** Fine, dry and sunny with temperatures of approximately 20°C.

### Headlines

- Considerable agronomic progress has been made over the last year, especially on the greens where turf quality, texture and consistency was impressive and a notable improvement on last year.
- Rooting mass and depth has improved in response to elevated mowing heights and careful aeration.
- Intensified sanding has helped organic matter levels reduce despite a wet year. Values do remain higher than ideal and deep scarification/sand injection was recommended to accelerate progress.
- Irrigation upgrades and the purchase of a soil moisture probe are resulting in far more accurate water delivery to the greens. This must continue.
- Tree removal has greatly improved turf quality and natural surface drying on the 6<sup>th</sup> green.
- Introducing tighter mowing to green surrounds would take the green complexes to the next level.
- Work to thin out and improve the playability of the roughs can now be accelerated following the recent purchase of a flail collector. A strategy for autumn grassland maintenance was agreed.
- The Club's ongoing commitment to course improvement is demonstrated by further investment in key machinery and additional staff. The impending bunker programme is also an exciting prospect.

### Key Actions

- Deep scarification and sand injection is needed to accelerate organic matter reduction.
- Maintain the excellent sanding and aeration strategy. Aim to exceed 150 tonnes of sand this year.
- Carefully manage moisture levels at 20 – 25% VWC where possible and continue irrigation upgrade.
- Maintain a leaner feeding programme (80 – 90kg/ha N) and slightly elevated cutting heights.
- Cut, rake and collect the roughs in autumn and spring, alongside with graminicide application.

### Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	28% (range 25.5 – 30%)	15-30%
Hardness (Gravities)	101 Gravities	90-110 g
Smoothness (mm/m)	26 mm/m	<25 mm/m
Trueness (mm/m)	9 mm/m	<10 mm/m
Green Speed	8 ft 8 in	8.5-10.5 ft
Organic Matter 0-20 mm (%)	8.5%	4-6%
Organic Matter 20-40 mm (%)	4.4%	<4%
Soil pH	5.7	5.0-6.0
Phosphate (P <sub>2</sub> O <sub>5</sub> )	6 mg/l	>10 (mg/l)
Potassium (K <sub>2</sub> O)	90 mg/l	>30 mg/l

Key:      In Target      Marginal Variance      Out of Target

## Photo Observations and Comments



Figure 1: The putting surfaces were in a far stronger position this year and demonstrated improvement in all aspects. Turf was strong and healthy and responding well to a slight increase in mowing height. The consistency from green-to-green was excellent and there was no reoccurrence of the thinning issues encountered last year.



Figure 2: I was delighted to hear that irrigation upgrade has continued with the 7<sup>th</sup>, 13<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> greens receiving a new ring main and sprinkler heads. The results were superb and supported by data collection (see appendix). The difference on the 13<sup>th</sup> was outstanding and illustrates the important influence of accurate water application. This green has always been the weakest on my visits, but this time was the strongest and most consistent in terms of soil moisture.

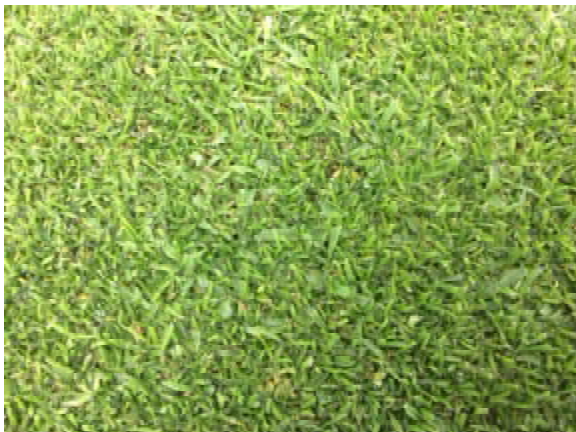


Figure 3: Species transition is a slow process, but I was delighted to see a notable increase in fine leafed browntop bentgrass on several greens e.g. 16<sup>th</sup>. Sensible cutting heights and accurate feeding and water delivery are responsible.



Figure 4: Sand inputs have been intensified this year despite the challenging weather conditions. A fresh build-up of sand was very evident at the turf base which has helped make progress with organic matter levels, despite a wet year. Further organic matter reduction remains a priority.



Figure 5: There was a notable improvement in rooting on all greens assessed thanks to increased aeration and cutting heights and more accurate delivery of moisture. The new moisture probe will further add to irrigation accuracy.



Figure 6: The 14<sup>th</sup> green and surround has responded well to removal of the London plain tree and root pruning. Turf quality at the back of the green was consistent with the rest of the surface. This has always been challenging before.

## Photo Observations and Comments (continued)



Figure 7: The 6<sup>th</sup> green has notoriously struggled but has greatly benefitted from tree removal this winter. The surface was strong and drainage properties are said to have notably improved. Previously we have discussed the option to pipe drain this green, but we have agreed to put plans on hold and continue to monitor the performance of the surface over the coming year after a further 2 trees are removed. However, the right hand green surround still needs some work to improve drainage and turf quality.



Figure 8: Green approaches were generally in good shape but would benefit from being increased in length on some holes (e.g. 12<sup>th</sup> pictured). This would provide a more attractive entrance into the greens.



Figure 9: Traffic management around the greens has been intensified this year and yielding good results. Turf quality is much improved as a result.



Figure 10: With the greens being in such good condition, the green surrounds were further highlighted as a weak point of the course. Semi rough mowing in these areas compromises aesthetics and hides some of the wonderful contouring both visually and strategically. The left side of the 1<sup>st</sup> (left picture) is a prime example where a wonderful tightly mown run-off area could be created. The right of the 5<sup>th</sup> (right picture) is another example. It is my opinion that this work would take the green complexes to the next level.





Figure 11: The tees were well presented but small Par 3's (like the 2<sup>nd</sup>) were heavily worn and divoted. This tee needs rebuilding and enlarging in the future as part of a releveling programme to all the tees. This has previously been discussed but will understandably be on the back burner until the bunker development work has been completed.



Figure 12: The fairways were beautifully presented and creating striking definition across the course. I still feel that holes where fairways are separated by semi rough (like the 14<sup>th</sup> and 3<sup>rd</sup>) should be mown out again to improve the flow of the hole. We also discussed widening the approach to the 14<sup>th</sup> green on the right side to bring the contouring more into play.



Figure 13: With the Club now owning their own Wiedenmann Super 500 flail collector, work to improve the quality and playability of the grasslands across the course can now be accelerated. The roughs are extremely diverse botanically and support some wonderful species but are too penal in areas. Our aim is to create wispy, playable fringing roughs like the area in the right-hand picture to the left of the 12<sup>th</sup>. A programme of scarification, clipping collection, raking and selective graminicide application is to commence in autumn.

## Recommendations

### Greens

#### Surface Refinement

- Cutting heights are perfectly adequate at 3.36mm at present and should be sustained. This slightly elevated height is striking an ideal balance between turf health and performance. Maintain heights at 3.25 – 3.75mm through the rest of the growing season, resisting the temptation to cut much shorter as this will set back agronomic development.
- Maintain rolling frequencies at 1-2 times per week with the exception of slight increases to three times for tournament preparations. Excessive rolling will encourage anthracnose and surface sealing; therefore, care is needed.
- Continue with occasional double cutting during stronger periods of growth but again avoid too much of this as it will impart disturbance pressure on the turf. If turf begins to thin through surface preparations, then look to ease back as soon as possible.
- Look to reduce perimeter mowing wherever possible to minimise the effects of triplex ring.
- The refinement programme is being well judged by the Greenstaff, with cycles of light verticutting and brushing being made in conjunction with routine mowing and rolling operations. It is impossible to be too prescriptive with refinement recommendations, but I would suggest that the Greenstaff are doing an excellent job given the well-refined texture of the turf at present.

#### Nutrition

- The nitrogen status of the greens is currently good with the surfaces being strong and productive following the recent heavy storm and Microflow feed. Allow nitrogen levels to ease back over the coming weeks and the turf to become leaner. If vigour is still strong by the time of the next plant growth regulator application, then make this with chelated iron instead of nitrogen to manage turf discolouration.
- Continue to supply light nitrogen inputs through the season on 3 – 4-week cycles via the Microflow liquid and Primo Maxx tank mixes, with Microflow rates being adjusted between 10 – 30l/ha in accordance with turf requirements. Aim to keep growth quiet but swards strong. Overly productive surfaces will perform poorly and require a greater level of refinement input.
- A leaner feeding programme was agreed this year and the plan is to keep nitrogen levels at circa 90kg/ha annually.
- Soil chemical analysis results were favourable but did highlight that phosphate levels were becoming a little low. With this in mind, I would recommend a change from the Microlite 6:0:24 product to C-Complex 4:3:4 for application after the summer renovation window. This will be effective at boosting recovery but will also supplement phosphate.
- Potassium levels were fine and other than the 4:3:4 feed, do not need supplementing for the remainder of the year.

#### Aeration

- The aeration programme is very well balanced and should continue in the same vein, with monthly Procore treatments being supplemented with occasional Air2G2 air injection to target deeper depths. Vary the depth with each Procore treatment to avoid the formation of structural pans in the soil.
- Continue with the vertidrain treatment in early/mid-October using 13mm diameter tines to maximum depth and 5° of heave. We agreed to reduce the heave setting this year given the increase frequency of Air2G2 application now taking place.

- Winter aeration should then focus on monthly Air2G2 work (when conditions suit) and occasional pencil tining (if needed).

## Organic Matter Management

- Organic matter reduction remains a key priority and our aim is to further reduce values in the top 20mm to within the lower end of target range (4-5%). See the appendix for further details. With this in mind I would recommend that we apply deep scarification and sand injection during the summer renovations this year to help accelerate the organic matter reduction process. To put this operation into context, the surface area impacted by deep scarification/sand injection will be the equivalent of 3 – 4 hollow core treatments.
- The following process would be advised, with either the GKB Sandfiller or Graden sand injection unit being selected:
  - Ensure the surfaces are strong going into the renovations to promote better recovery afterwards. This may involve a timely liquid feed prior to treatment.
  - If disease pressures are high, then protect the surfaces with a preventative fungicide application 3 - 5 days prior using a suitable systemic active ingredient e.g. *Azoxystrobin*, Propiconazole etc.
  - Deep scarify and sand inject using 2mm diameter blades to a depth of 25mm, injecting in the region of 30-35 tonnes per hectare of kiln dried sand.
  - Clear the debris from the surface (if using the Graden), then utilise the contra rotating brush to help work sand into the surface and restore the playing qualities.
  - If using the Graden unit, then look to inject top quality browntop bentgrass seed through the unit at a rate of 6-8g/m<sup>2</sup>. If the GKB Sandfiller is utilised, then injection of seed will not be possible and therefore this should be applied via a drop spreader onto the surface following debris removal. A further light dressing should then be applied, and sand and seed worked into the scarifying lines. A drag mat may be useful for this operation.
  - Promote recovery through application of the C-Complex 4:3:4 granular feed at 35g/m<sup>2</sup>.
  - Continue with light sand top dressings (as required) over the coming weeks to help top up surface levels and perfect ball roll quality. Supplement these with regular turf ironing
  - Maintain soil moisture levels at a slightly elevated 25-30% to help promote seed germination.
- The sanding programme has been excellent so far this year and we are well on track to exceed our annual target of 150 tonnes per hectare. Continue with light dustings through the season as and when possible (5-7 tonnes per hectare).

## Moisture Management

- Utilise the moisture probe fully from now on, aiming to keep moisture levels at 20 – 25% wherever possible.
- With a busy autumn schedule planned with the bunker development programme, it is understood that time and resources will be valuable. However, I would urge the club to continue the irrigation upgrade to the remaining seven greens where possible. The results on the recently upgraded 17<sup>th</sup>, 18<sup>th</sup> and 13<sup>th</sup> greens speak for themselves and highlight the importance of this work.

## 6<sup>th</sup> Green

- The 6<sup>th</sup> green has responded superbly well to tree removal and I fully support plans to remove two of the three remaining trees to the right side of the green this winter. This will further increase sunlight penetration and airflow to the putting surface and aid natural drying.

- With reports being that drainage properties have notably improved following tree removal, we can review the need for pipe drainage installation (as previously discussed) further down the line.
- The 6<sup>th</sup> green approach and right-hand collar continues to suffer from soft conditions and water retention through the winter months. Hopefully this will improve with tree removal, but I would suggest that the right-hand mounding does compromise drainage by encouraging water to be retained in this area. Architectural changes are to soften the contouring which will inevitably help, however pipe drainage installation will also be needed.
- Inspecting the sub-soils beneath this area highlighted a considerable amount of soil compaction from concentrated golfer traffic. Therefore, look to make regular deep aeration treatment using both the vertidrain and Air2G2 to this area throughout the year. Plan also for a deep hollow tine and sand top dressing treatment during the summer renovation window and repeat this again in early autumn (before soils become too wet).
- Continue to protect this area wherever possible through roping/hooping to reduce footfall.
- If we can sufficiently improve this area, then the right-hand side of the green can be taken back out to its original size in the future.

### Green Collars, Surrounds and Approaches

- The green approaches are in much better condition this year following increased maintenance input but do require ongoing textural improvement and organic matter reduction work to improve their year-round performance.
- Look to verticut the approaches and apply a light sand top dressing over the next few weeks to perfect surface levels and further improve texture. Also plan for a hollow core and sanding treatment at some point towards either the latter stages of the season, autumn or winter.
- A number of the green approaches could be extended in length to create more of a striking visual effect when playing into the greens. A good example of this is the 12<sup>th</sup> green approach which is currently only approximately 2-3m in length. This could be taken back towards the approach bunkers by a further 2-4m.
- Look to extend greens aeration and sanding to the green approaches and collars wherever possible through the course of the year.
- As discussed in previous reports I would highly advocate the introduction of tighter mowing to the green surrounds to incorporate run off areas to make the most of the wonderful contouring and improve both the visual and strategic interest of the green complexes. As discussed above, areas such as the left-hand side of the 1<sup>st</sup>, left hand side of the 3<sup>rd</sup>, back of the 12<sup>th</sup>, left hand side of the 13<sup>th</sup> are prime examples of where this would be of benefit.
- Mowing heights will need to be gradually reduced down in these areas to avoid over stressing the turf and we discussed the possibility of starting this work to stronger areas through the latter part of this growing season. In weaker areas, work should now begin to strengthen turf quality through applying additional feeding, wetting agent application (to drying areas) and introduction of back jet nozzles to greens sprinklers to allow for surrounds watering. Particularly weak areas such as the top of the banking to the left of the 1<sup>st</sup> green would also benefit from pot planting with a dwarf ryegrass and fescue seed mixture followed by a sand top dressing in autumn.
- Look to widen Procore aeration treatments to high traffic routes on the green surrounds wherever possible from now on and in particular to areas where tighter mowing is to be introduced in the future.



## Fairways

- We discussed the importance of autumn aeration to the fairways to manage soil structure at depth and agreed it is essential that this practice is maintained moving. Continue to make treatments in early October to ensure that maximum cracking and fissuring of soils can be achieved from the operation.
- The fairways are supporting a strong grass cover and despite recent dry conditions are retaining good vigour and minimal localised dry patch. If conditions continue to be dry through the summer, then localised wetting agent treatment would be of benefit to some of the tops of undulations to avoid soil hydrophobicity and the onset of turf thinning.
- The texture of the fairways could be improved through the introduction of occasional brushing through the growing season and/or verticutting. This would however come at a cost given that this equipment is currently not part of the Club's armoury.
- To really elevate the texture, presentation and quality of the fairways to the next level, the introduction of boxing off grass clippings during routine mowing operations should be considered in the future. By removing clippings, we will reduce nutrient recycling and therefore favour the establishment of the finer grasses within the swards. Turf texture will start to tighten up as the finer grasses dominate and there would also be a notable difference to the sharpness of presentation. One of the key by-products of this operation is that worm casting and thatch build will lessen over time. However, it must be noted that boxing clippings will come at a notable labour cost; particularly over the first few years whilst the fairways are still productive.

## Bunkers

- The bunker development programme scheduled for this autumn is an exciting prospect and will undoubtedly take course aesthetics and strategy to the next level. I look forward to seeing the results next winter and please keep me posted if I can help with any agronomic issues during the process.
- We discussed the importance of aftercare maintenance following introduction of the new bunkers and the need for elevating nutrition and careful monitoring moisture levels on the turf around the bunker tops. This is an essential requirement to allow the imported, farmed turf to adapt to its new environment. Bear in mind that this is grown as a crop and so is naturally more hungry and thirsty than indigenous turf.

## Tees

- The tees have been highlighted as an area for improvement in previous reports through introducing a programme of releveling (like that carried out on the 13<sup>th</sup> tee a couple of years ago). It is fully understood however that with the bunker development programme and other projects underway, that tees development is likely to be on the back burner until these projects near completion.
- Look to make an additional conventional release fertiliser application to the 2<sup>nd</sup> tee alone over the next few weeks to promote strong and vigorous recovery of the sward.
- Divoting practices were well up to date however I would recommend that you look to pre-germinate the grass seed prior to application on heavily divoted Par 3s and short Par 4 tees to speed up the germination process.
- We discussed the potential to introduce a greater level of input to the 1<sup>st</sup> and 10<sup>th</sup> tees moving forward to enhance first impressions to the course. Introduction of pedestrian hand cutting to these surfaces would be highly recommended with cutting heights being reduced to circa 6-8mm to create a striking visual effect. Additional feeding, sanding and verticutting would also be needed to optimise turf quality.

## Rough

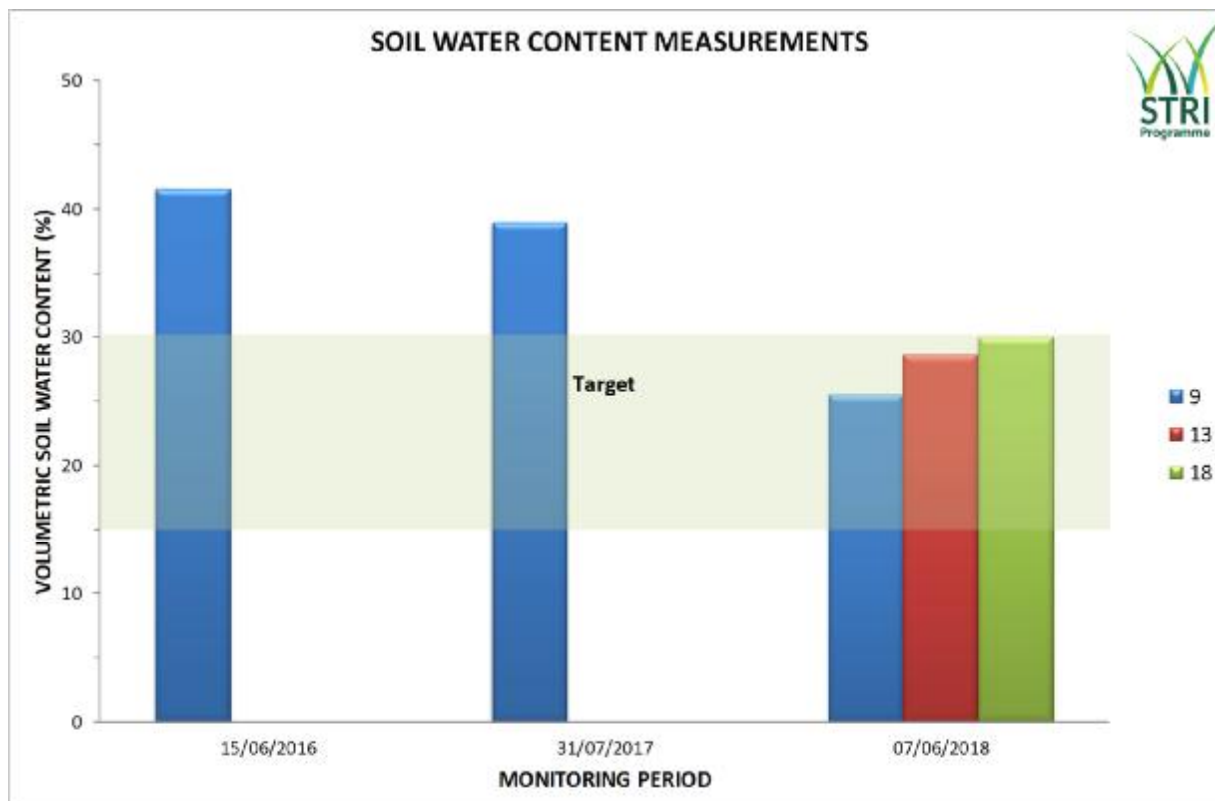
- Now that the Wiedenmann Super 500 has been purchased, management of the rough grasslands can really be ramped up. Look to start proceedings in early autumn with scarification and clipping collection being applied to fringing rough areas, followed by raking and further flail collecting. Look to rake back towards the tee to stand up procumbent growth and really thin out the density of the turf base. Once this is complete, treat these areas with the selective graminicide (Rescue) at the full recommended rate to help chemically remove coarse grass species. Ensure that this application is made whilst the turf is still actively growing.
- Look to repeat this full process in early spring once growth fully resumes. If there is opportunity to carry out some additional raking through drier periods in the winter months, then this would also be beneficial.

Signed

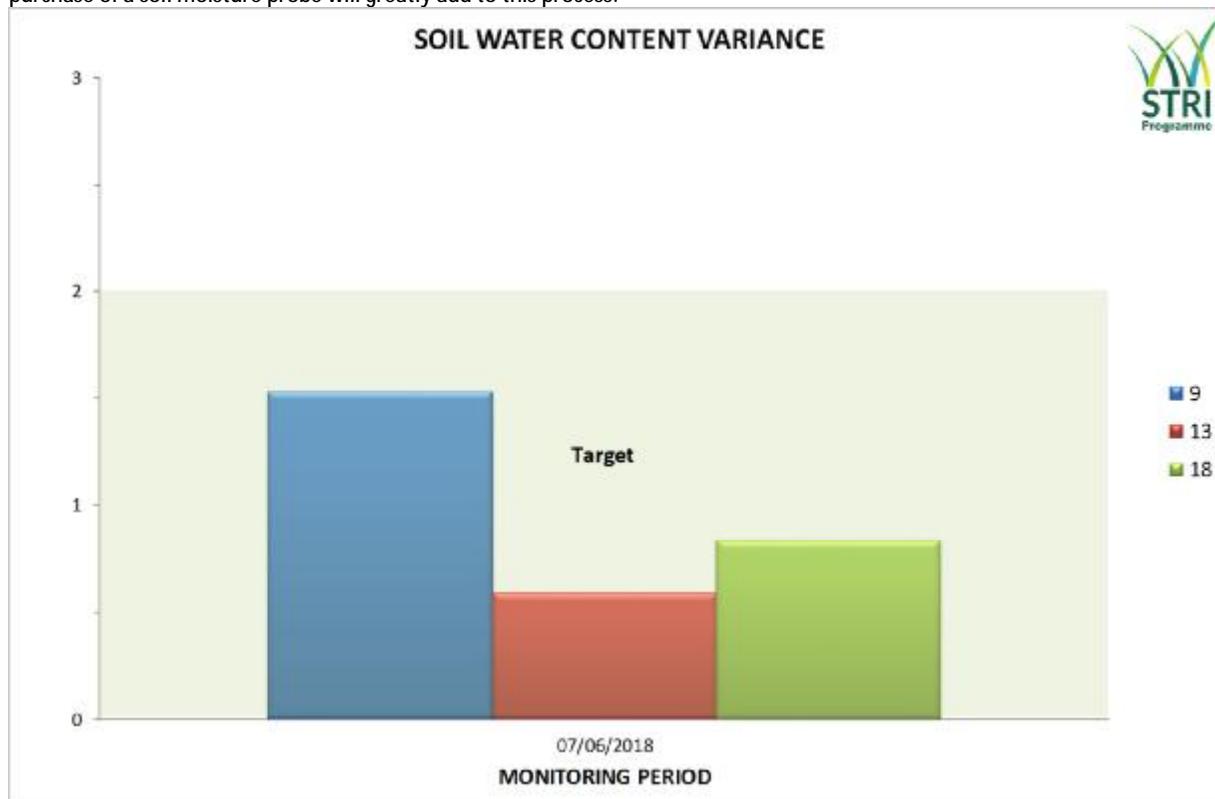
A handwritten signature in black ink that reads 'A R Newton'.

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# Objective Data

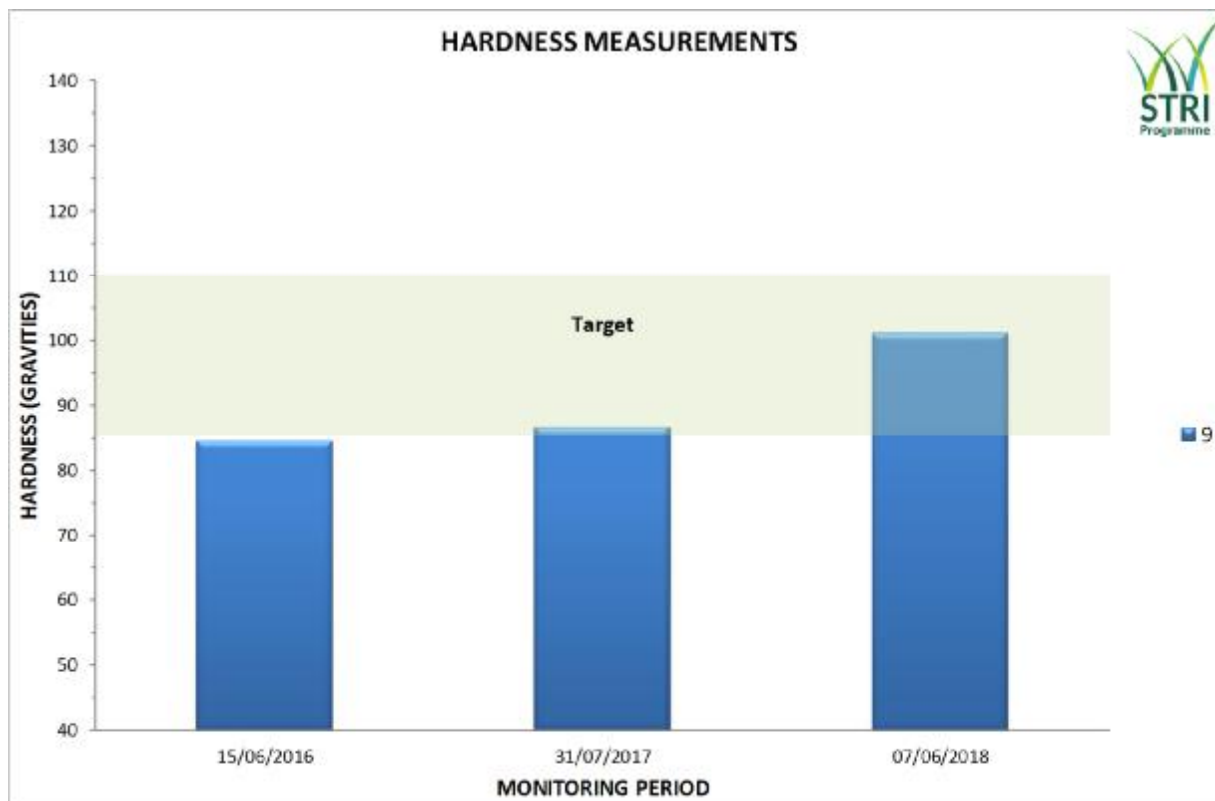


Objective Data Graph 1: Soil moisture testing highlighted some very interesting results. All 3 greens were still within target ranges despite the storms earlier in the week. Water delivery is becoming more accurate as irrigation upgrades continue and the recent purchase of a soil moisture probe will greatly add to this process.

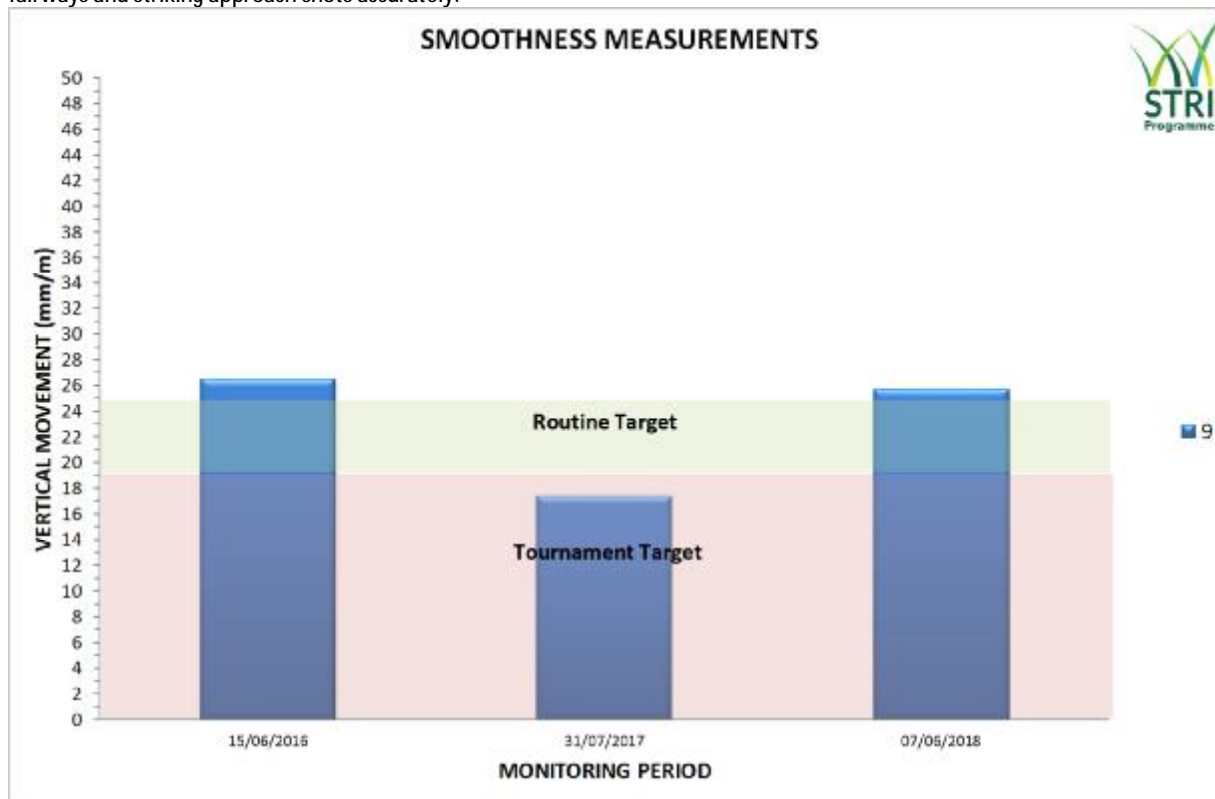


Objective Data Graph 2: Moisture variance across each green tested was generally good but it was interesting to note that the 9<sup>th</sup> stood out as offering the most variable readings. This green still requires irrigation upgrade whereas both the 13<sup>th</sup> and 18<sup>th</sup> have been upgraded over the winter.

## Objective Data (continued)

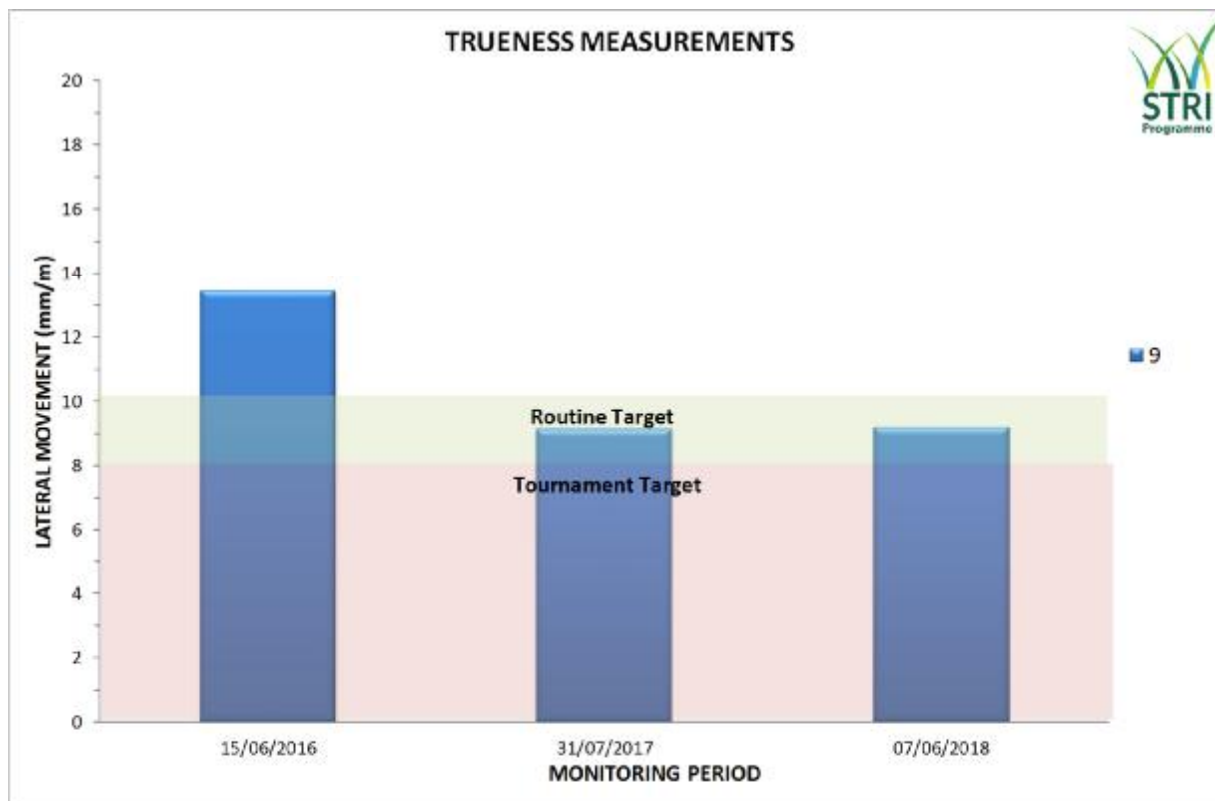


Objective Data Graph 3: The 9<sup>th</sup> was the firmest I have measured it and was sat nicely within target ranges. There was no evidence of footprinting or surface deformation as seen in previous years. At this level of firmness, there is a real premium on hitting the fairways and striking approach shots accurately.

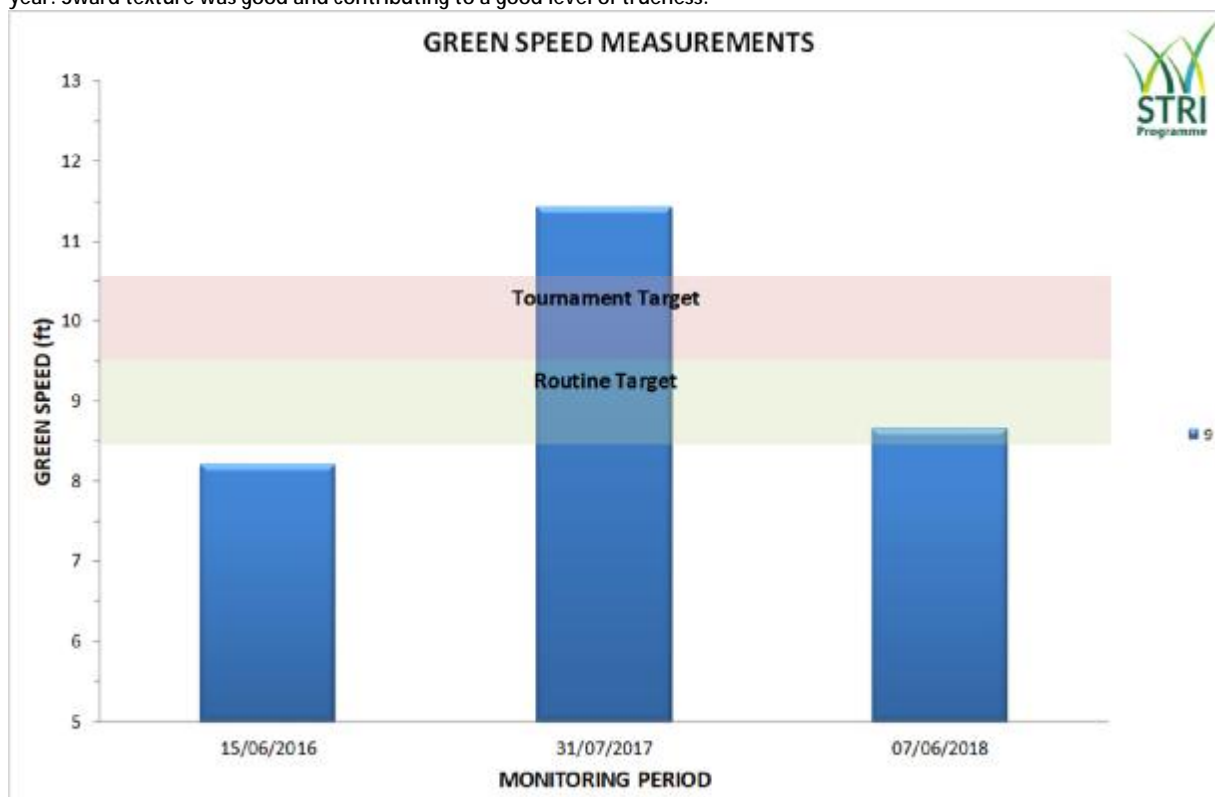


Objective Data Graph 4: Smoothness values were on the cusp of target ranges but being slightly held back by the succulent nature of the sward following recent rainfall. Pitch marking across the green was also very disappointing and impacting on smoothness values.

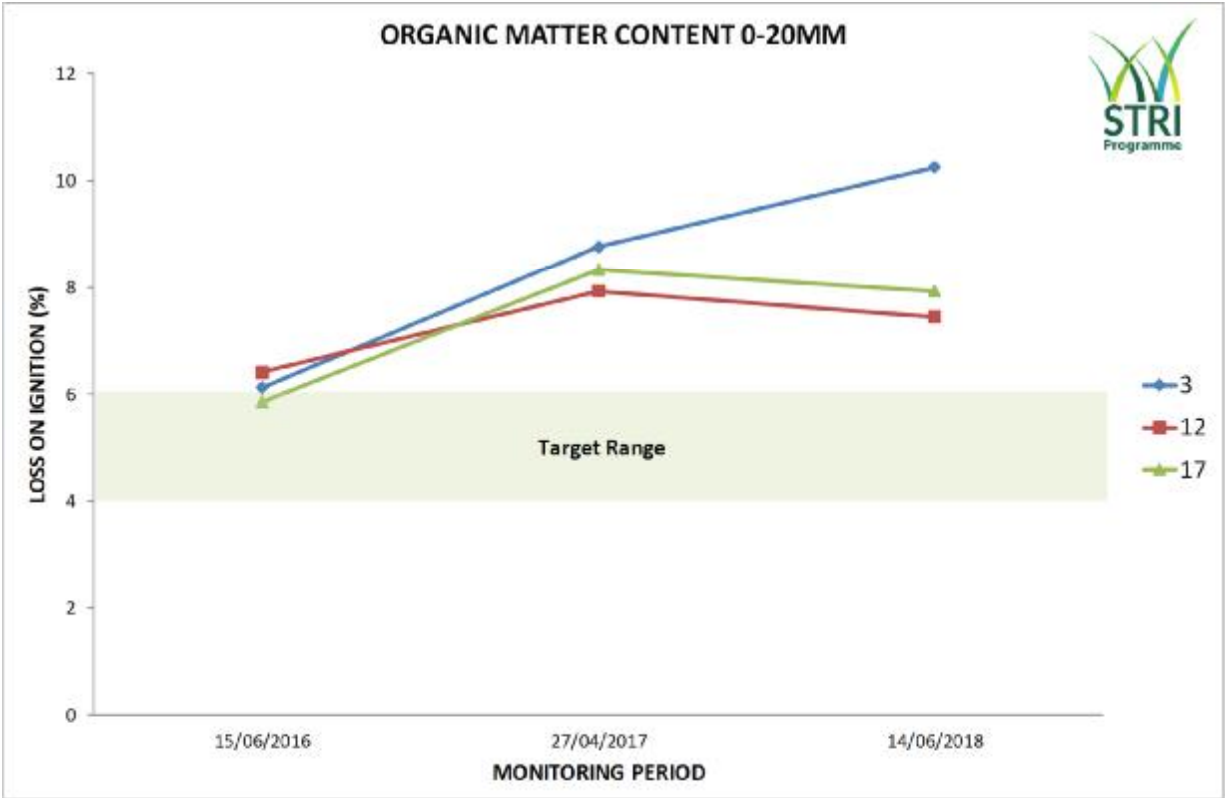
## Objective Data (continued)



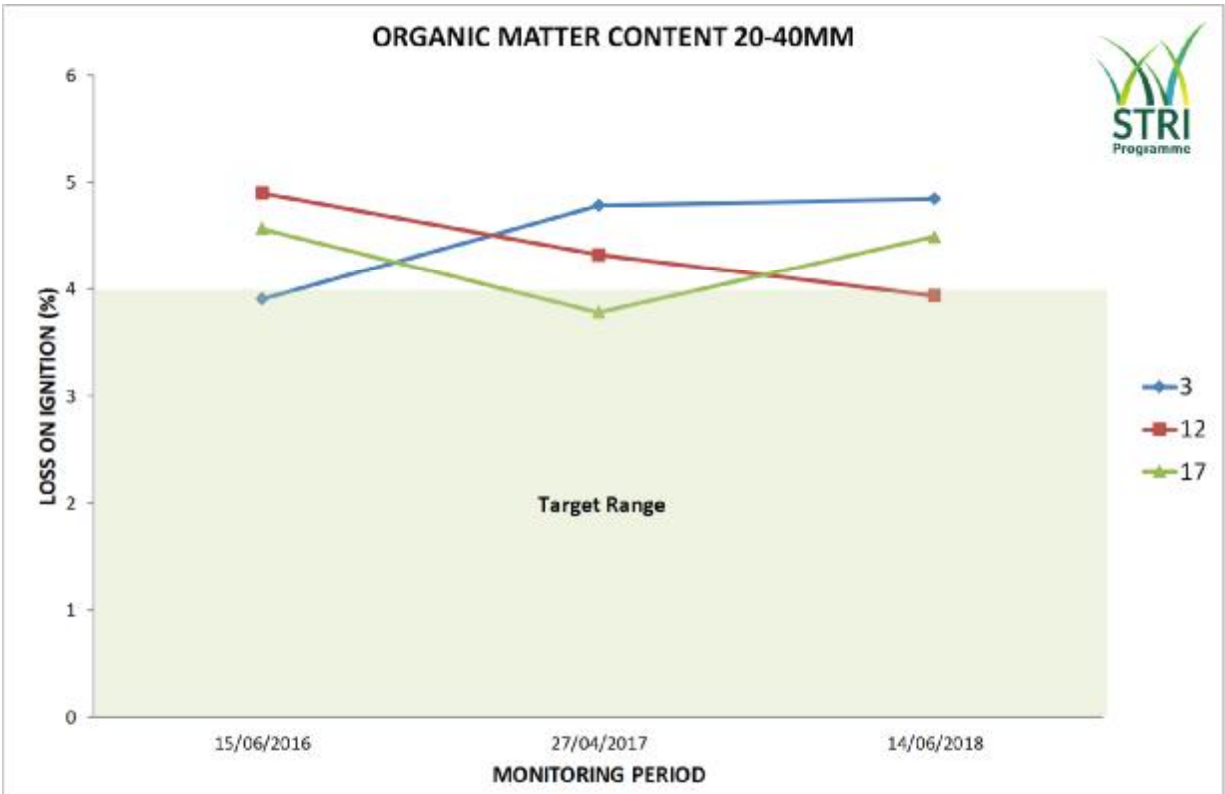
Objective Data Graph 5: Trueness values were very good and comfortably within target ranges with a slight improvement on last year. Sward texture was good and contributing to a good level of trueness.



Objective Data Graph 6: Green speeds were within target range at 8ft 8". Bear in mind that measurements were taken at approximately 1:30pm (around 7 hours after mowing) and so speeds will have naturally reduced. That said, these speeds would be considered an ideal pace for routine play and a sound balance for golfers of all abilities.

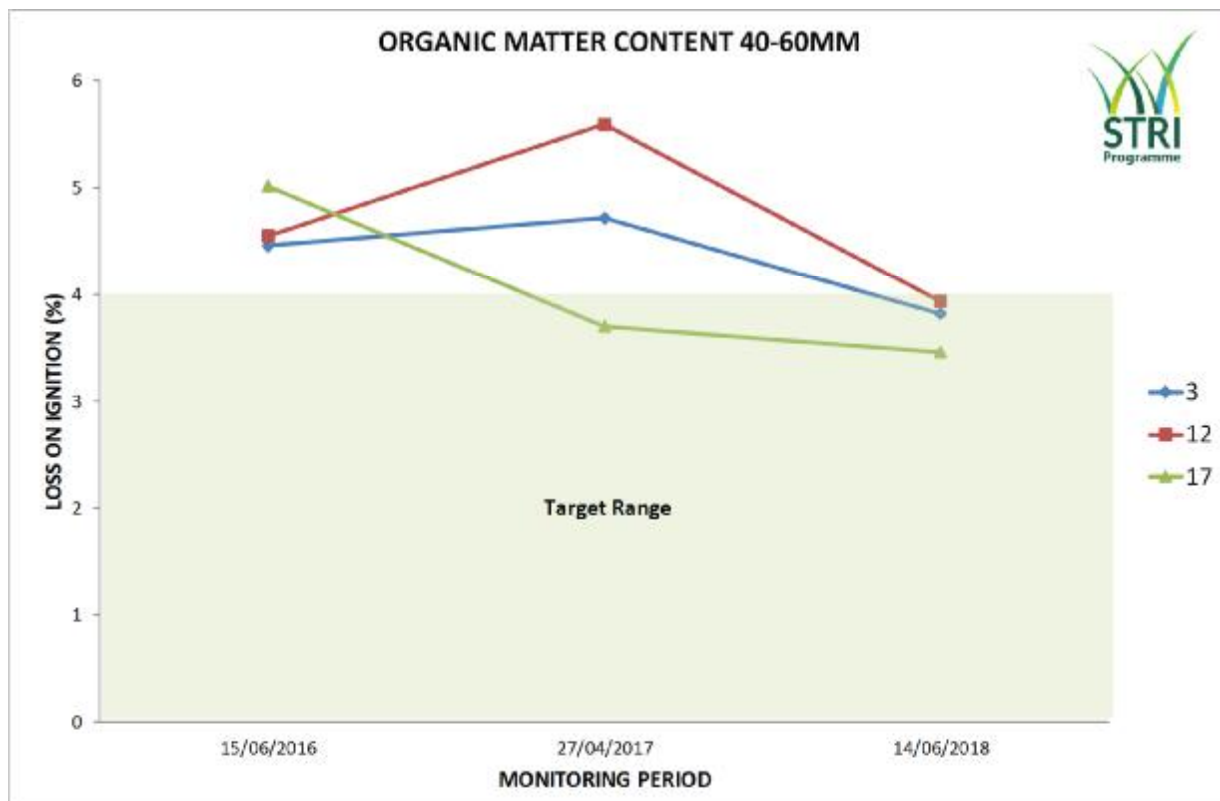


Soils Laboratory Graph 1: Organic matter levels have improved on the 12<sup>th</sup> and 17<sup>th</sup> greens but increased on the 3<sup>rd</sup>. To make progress in what has been a very wet year is pleasing to see but we are still some way from target ranges (4 – 6%). If we can reduce values down to circa 4%, the greens will really excel year-round. We agreed the need to intensify organic matter reduction during this summer’s renovation window.

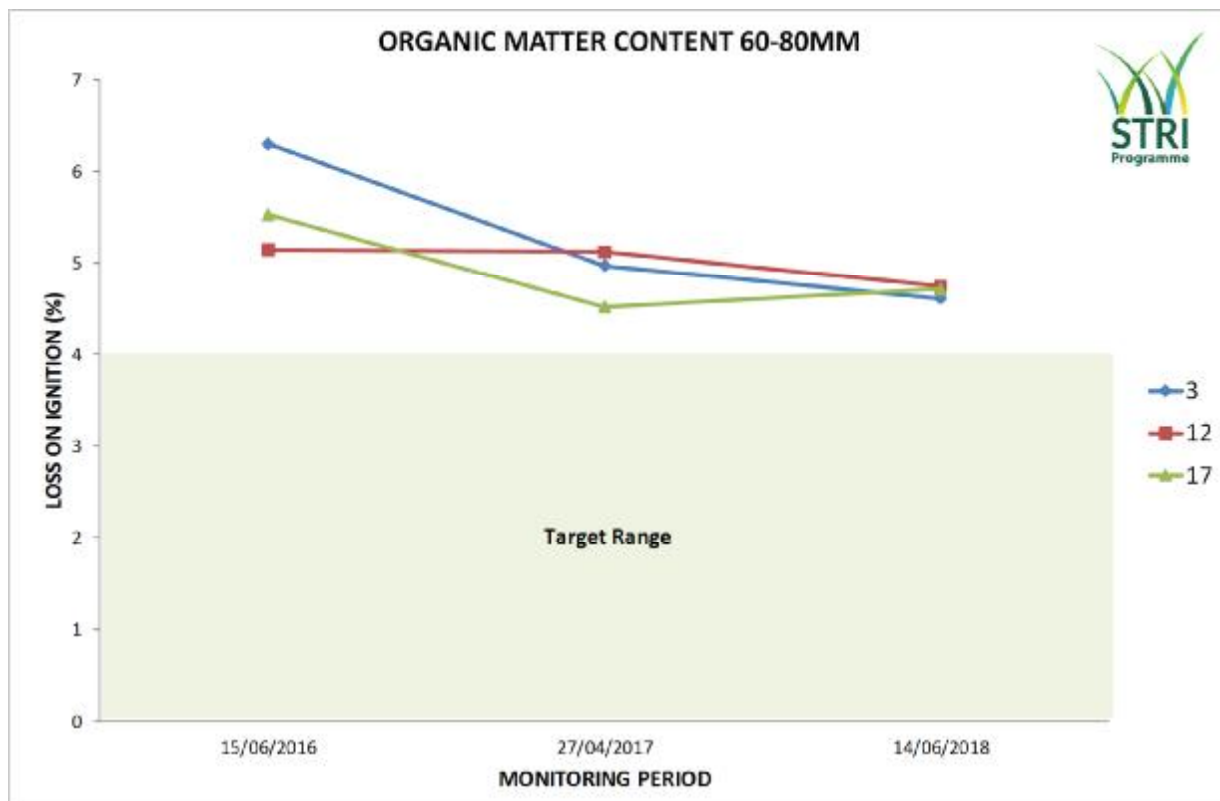


Soils Laboratory Graph 2: Values at 20 – 40mm depth are more favourable and within target ranges on the 12<sup>th</sup> and just outside on the other 2 greens.

## Soils Laboratory Data (continued)



Soils Laboratory Graph 3: Values at 40 – 60mm depth have seen a notable improvement over the last year and all 3 greens are within target ranges. This reduction can be attributed to an increased level of aeration over the last year.



Soils Laboratory Graph 4: Values at 60 – 80mm depth have improved slightly and become more consistent over the last year. Some further dilution would be beneficial at this depth, but it is really the top 20mm where our efforts must be concentrated.