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GILLINGHAM GOLF CLUB

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 9th October 2017
Consultant: Paul Woodham



Gillingham Golf Club

Date of Visit: Thursday 5th October 2017

Visit Objective: Review of course conditions and agronomic performance.

Present: Steve Smith – Head Greenkeeper, Piyush Patel – Club Captain
Paul Woodham – STRI Ltd

Weather: Dry following a brief morning shower. Prevailing dry year up to July.

Headlines

- The course was presented exceptionally well during the early autumn conditions. All areas have benefitted from the more frequent rainfall following exceptionally dry early summer conditions.
- Fairways have coped with the conditions well, still presenting a firm crisp surface ideal for pure ball striking opportunity. Remnants of localised dry patch stress is seen but the swards had retained cover, albeit with dormant growth, with fine grass species thriving.
- Greens are looking strong for the time of year. There was a low level of fusarium patch disease evident but the Greenstaff had acted quickly to apply a fungicide.
- Soil sample analysis results confirmed further reduction in organic matter thatch in the top 20mm. The last renovation has been successful in targeting thatch removal and soil exchange via dressing.
- Organic matter levels remain as a more obstructive layer of thatch in the sand based greens. Anaerobic black layer symptoms can be seen in the upper profile where excess soil moisture is liable to perch above a soil texture interface at ~110mm depth.
- At present, the sand based greens are more vulnerable softening surface conditions despite having a freer draining lower profile than the soil based greens. This trend needs to be reversed.
- The Club has not pursued installing greens drainage to soil based greens yet but has invested in a Graden sand injection scarification unit to use for greens renovation and management of organic matter. The need for drainage should stay on the agenda for review and be considered subject to the rate of progress achieved through aeration and renovation maintenance.
- The Club needs to understand and support the need for routine aeration in addition to strategic deeper tine aeration, ensuring that work frequently penetrates to the problem layer in the sand greens.
- The benefits of applying additional sand this year can be seen with the hollow core holes fully filled. The unexpected shortfall in dressing following renovation is likely to be due to a very clean hollow core extraction and dry conditions producing conditions conducive to integrating sand via brushing.
- Tees were in good condition with clear evidence of ongoing repair through divoting. The proposed plans to redevelop the 1st and 12th tees is fully supported for realigning the 1st tee shot but the option for installing a complete synthetic turf surface is not ideal nor maintenance free.
- The Club is not blessed with a big budget and the Greenkeeping team is understaffed but managed efficiently. There are tasks such as more frequent hole changing which would ideally be done but only consistently achievable if staffing levels are increased.

Key Actions

- Continue with plans to deep tine aerate the greens and apply remaining dressing. Future management of the sand based greens to focus on creating vertical drainage channels via sand filled solid tining.
- Commence autumn and winter greens slitting ideally fitting new deeper tines to the unit. Maintain regular pencil tine aeration to greens as part of main season maintenance.
- Application of Instrata fungicide leaving the remaining Medallion fungicide in reserve.
- Potential early spring maintenance to include Graden sand injected scarification. Plan for repeat main season hollow core aeration in addition to shallow Graden with overseeding. Sand based greens ideally required full Graden scarification in addition to coring at the next main season renovation.
- Tree management in many areas of the course. To include: continued removal of conifers; tree root pruning around fairways/green surrounds and installation of permanent root barrier left of 18th green; selected removal or relocation of trees which are damaging green/bunker surround areas.
- Invest in soil moisture probe as previously recommended to support and direct irrigation and cultural management requirements.

Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	38% (range 12-44)	15-30%
Hardness (Gravities)	86 Gravities (range 77-107)	85-110 g
Organic Matter 0-20 mm (%)	6.1%	4-6%
Organic Matter 20-40 mm (%)	5.5%	<4%
Soil pH	6.4	5.0-6.0
Phosphate (P ₂ O ₅)	29 mg/l	>10 (mg/l)
Potassium (K ₂ O)	143 mg/l	>30 mg/l

Key: In Target Marginal Variance Out of Target

Photo Observations and Comments



Figure 1: Greens have recovered well from the renovation work with current conditions looking strong heading into the autumn.



Figure 2: A clean and full fill of sand integration into the hollow core holes has been achieved. The 18th green, soil based profile, clearly shows the heavy texture soils, present from 170mm depth, which offer limited drainage potential.



Figure 3: The sand based green profiles appear less healthy despite having a free draining lower profile. Anaerobic black layer development evident in the upper 100mm, building as greens stay too wet for too long. There is an obstructive layer/pan in the profile at 110mm.



Figure 4: Minor fusarium patch disease activity was noted, generally occurring in the weaker or shaded areas. Early treatment had correctly been applied.



Figure 5: Holes are generally only changed once per week. Regular trimming can help keep the hole sharp but the edges are likely to become rounded over with the rigours of 3-4 days of use.



Figure 6: Localised damaged is seen at the rear left of the 13th green. This could be a legacy of heat and moisture deficit stress which occurred late June. This will recover but the low spot which is troublesome are prone to trapping water. Consider levelling this off to shed water onto the apron.

Photo Observations and Comments (continued)



Figure 7: Worm cast activity was yet to fully emerge in the autumn conditions, but the Club must prepare for the inevitable increase of castings in the coming months. All options for chemical control have been withdrawn for authorised use.



Figure 8: Last year's report discussed the benefit of selected tree removal to reduce shade cast onto the front of the 5th green. This work is yet to be done.



Figure 9: Tree thinning and height reduction has proved to be successful at the rear of the 6th green. This has resulted in improved turf conditions. Attention should now switch to target removal of the conifers adjacent to the rear right bunker.



Figure 10: It is understood that the tree management plan includes removal of the damaged fir tree left of the 6^h green. Take the opportunity to relocate the relatively new tree into the gap. This young tree is too close to the bunker and will cause issues with turf health close to the bunker in the future.



Figure 11: Tees turf health is well maintained. It would be a shame to lose the natural and authentic turf/ball interaction if reconstruction of the 1st and 12th tee complex uses artificial turf for all year play.



Figure 12: Future course improvement Projects should include bunker renovations with inclusion of a turf or membrane liner to eliminate stone and soils contamination.

Recommendations

Greens

- Monitor disease activity, employing integrated disease management strategies i.e. daily, early removal of dew and maintained aeration, in addition to scheduling a further application of fungicide once the recently applied Medallion treatment begins to lose efficacy. It is estimated that this will be towards the end of October at which point an application of Instrata fungicide is advised.
- Keep the remaining application of Medallion in stock as provisional application if the disease pressure is high towards the end of the Instrata efficacy period (4 – 5 weeks post treatment). Ensure the products are applied prior to the onset of disease.
- If fusarium patch disease unexpectedly occurs, even within the efficacy period of preventative fungicide, then an immediate application of iron could achieve some knock down control of the disease and allowing time for repeat application of fungicide to take effect.
- Press ahead with the planned deep tine aeration, Wiedenmann Terraspiking, treatment to the greens scheduled for the coming weeks. There should be an opportunity to apply the remaining quantity of sand dressing in addition to scheduling undisruptive pencil tine aeration at strategic points through the winter. This can be complemented with more frequent slit tine aeration.
- Take the opportunity to renew the slit tines on the Charterhouse unit to ensure that an effective depth of penetration is achieved. This is particularly important on the sand based greens where there is an obstructive soil texture layer which is perching water in the upper profile as discussed.
- Try to create sand filled columns in the sand based greens. The objective is to create unobstructed movement of water from the surface to the construction profiles.
- The Club needs to fully understand and support the need for maintaining undisruptive routine pencil tining through the main season period. Undoubtedly there will be pressure on the Greenstaff to ensure that good playing conditions are maintained. Immediate recovery can be gained with modern equipment and the correct resources for including a light dressing and surface rolling with the turf iron. Reducing the frequency of aeration could be counter-productive in terms of promoting conditions which will build thatch.
- Improve surface levels through the rear left of the 13th green. Present conditions show a depression in the green which is collecting water in a weak clean-up cut sector of the green. Turf cut the low-lying section to improve surface levels and lightly cultivate in a greens rootzone to raise the surface levels and create a natural shed of water away from the low-lying area.
- There is a requirement to hollow core the greens as part of main season renovation next year. Ensure that the depth of penetration is sufficient to remove full depth of accumulated thatch. This is seen to be deeper on the sand based greens where there is an excess accumulation of organic matter even in the top 20mm. At the time of the next main season renovation the opportunity could be taken to also Graden scarify the greens to a shallow depth (~6mm) on the soil based greens to allow for integration of seed through the integral hopper on the new Graden unit. On the sand based greens a full depth scarification could complement the hollow core work taking the opportunity to fully fill the hollow core holes with dressing prior to Graden scarification.
- Early season maintenance was discussed, and consideration given to bringing the proposed use of the Graden scarification forward to late February, April subject to conditions, from its planned spring use in. There will obviously be cool temperatures and the lack of growth during this period, but recent springs have shown that cold and dry conditions through April/May are equally as restrictive to growth. It may be better to get the renovation done and out the way early in a season with low rate applications of sulphate of ammonia applied to tickle the growth along until temperatures improve and are more

conducive to response from granular fertiliser such as ICL 11.5.5 Coldstart. There may also be more moisture available during late February/early March which could stimulate some initial recovery.

Worm Cast Management

- There needs to be understanding and support from the membership during the coming months when an increase in worm cast activity is expected. Previous control would have allowed for the use of Carbendazim as chemical control to reduce worm activity. All chemical options for control have been withdrawn from the market and there is unlikely to be any chemical solution in the future. This is an industry wide problem for sports turf and in the case of golf the best course of action is to apply traditional cultural methods such as sanding of problem areas i.e. adjacent to tees and through trafficked areas of green surrounds, in addition to maintaining good drainage through aeration to alleviate compaction and applying traffic control to minimise the smearing of worm casts. The Club could trial the extended use of brushing on dry winter days to disperse worm casts.

Tees

- The Club has the full support understanding the rationale for reconstructing the 1st and 12th tee complex, realigning the tees and moving the 1st tee shot away from the Clubhouse. It may be an opportunity to rebalance the alignment of the tee shot creating some mounding down the right side of the 1st hole rough or even constructing some bunkering.
- The suggested use of a full artificial tee is probably an overkill and unnecessary expense. Whilst artificial tees would suggest long term cost saving and reduced maintenance this is not guaranteed to materialise.
- The Club are maintaining the turf tees in good order and with small tees the use of artificial mats during the winter is prudent maintenance. Any redevelopment of the 1st and 12th tees could include dedicated areas of modern artificial mats which can offer winter relief.
- Reconstruction of the existing tees is advised and take the opportunity to construct a minimum 200mm depth of tees grade rootzone prior to re-turfing. The opportunity to reroute the paths and level the tees would make maintenance much easier. In essence, maintaining natural turf provides the best first impressions and will ensure authentic ball to club interaction.

Tree Management

- Continue with the plans to remove conifers through the course in strategic areas. Work should be done focusing in compartmental zones to reduce the impact on the ecology.
- Consider options for reducing tree root invasion which penetrates through the semi-rough onto the fairways in many areas. Investigate options for hiring an Imants Root pruner as a circumference pass around all fairways and green surrounds could be done in as little as a week.
<http://www.imants.com/en/machines/product/14/imants-rootpruner>
- In the case of the left side of the 18th green take the opportunity as previously advised to install a tree root barrier to intercept root invasion into the green which is causing turf health problems.
- The Club also needs to consider options for relocating or removing trees which are too intrusive to bunkers. An example of this seen front left side of the 6th green where a four year old tree has been planted too close to the bunker. This will cause problems in future years droughting out growth in an area where good turf quality is required for finesse shots and maintaining bunker surround health.

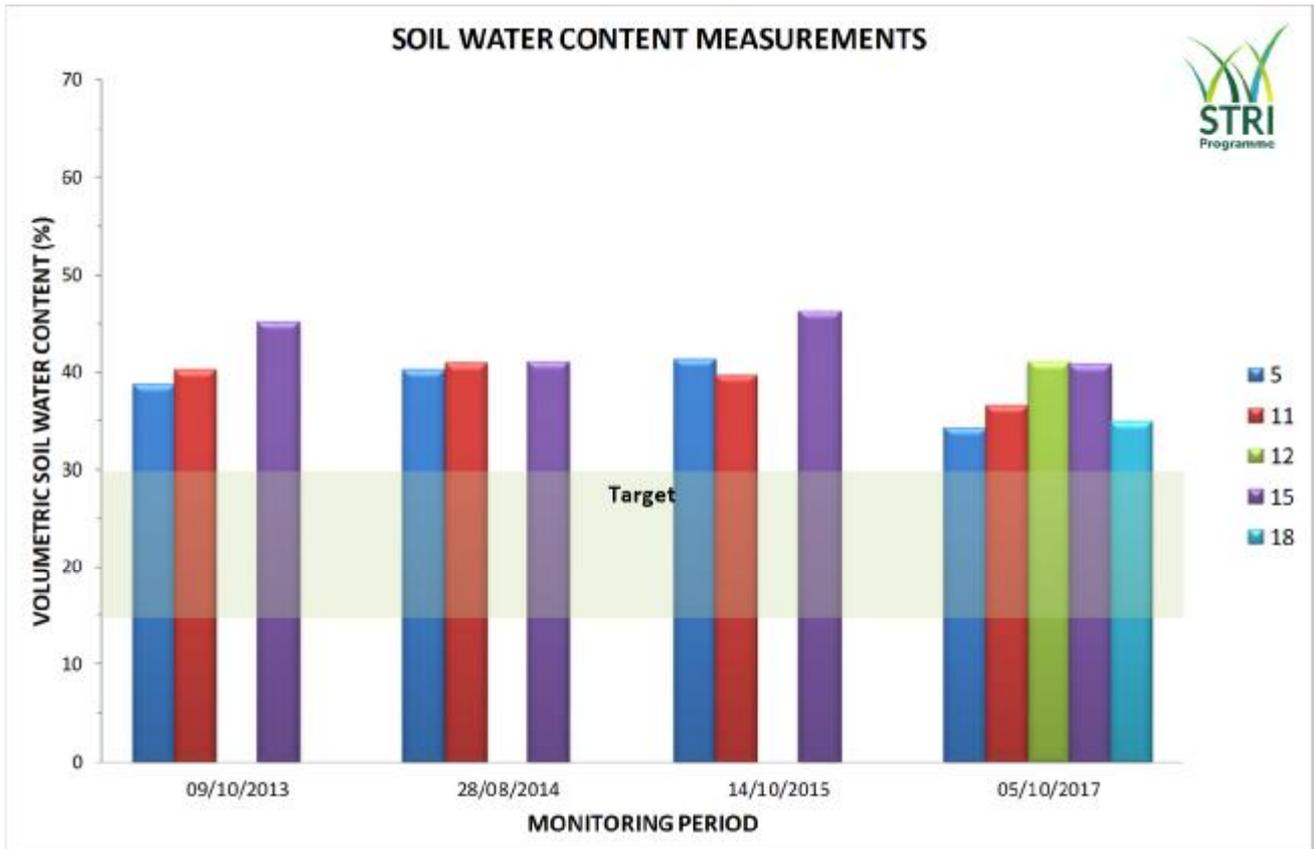
Signed

A handwritten signature in black ink, appearing to read "Paul Woodham".

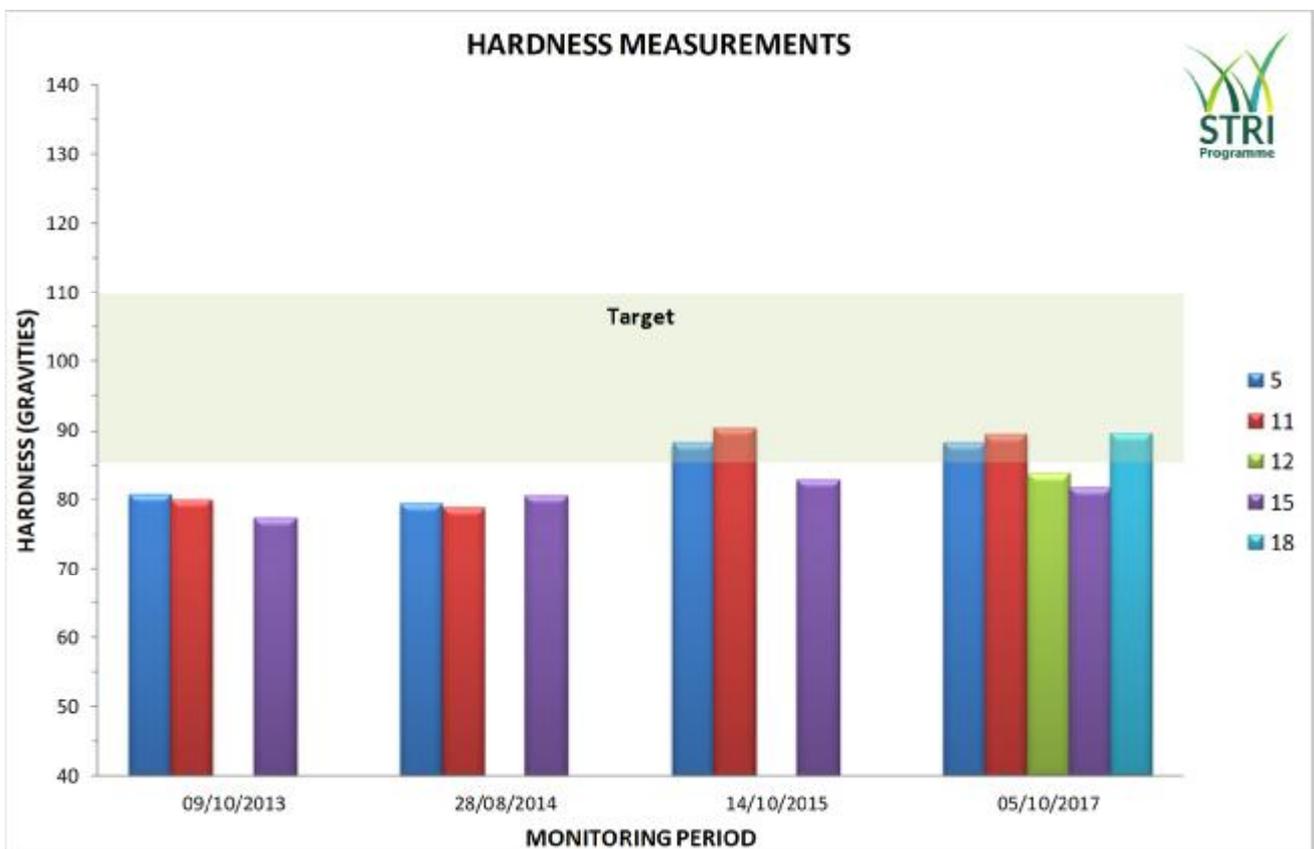
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STRI is completely independent and has no alliances to commercial products, services or contractors. This ensures that our design, project management and advisory services provide the best solutions for each individual client.

Objective Data



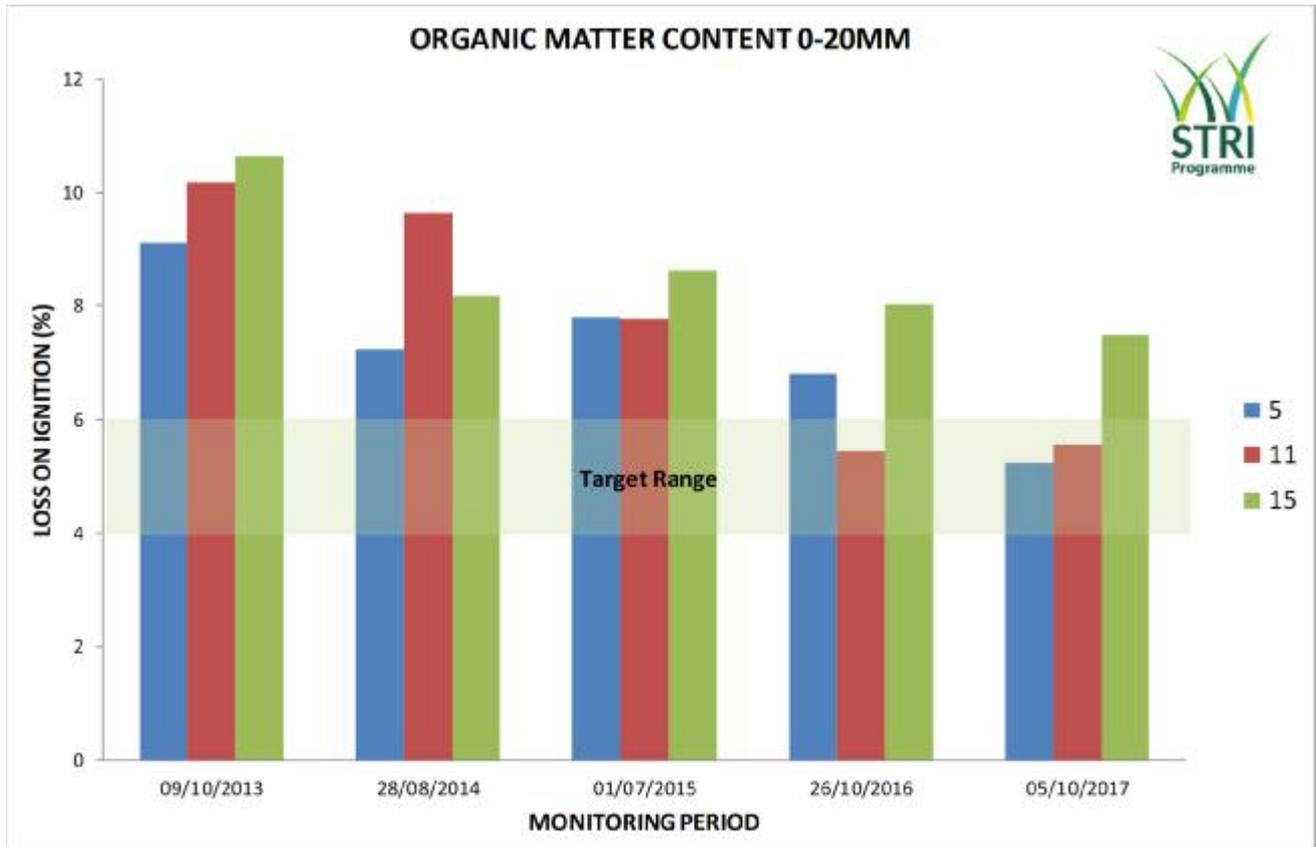
Soil moisture content will vary depending on the amount of rainfall or irrigation management applied at the time of testing. A brief heavy shower occurred just before the visit. Our objective is to create a set of agronomic conditions which allow good drainage and surface infiltration. This will ensure the surfaces stay firm under the pressure of high moisture. We can see that the trend provides evidence demonstrating the upper profiles tend to hold moisture irrespective of being sand or soil based.



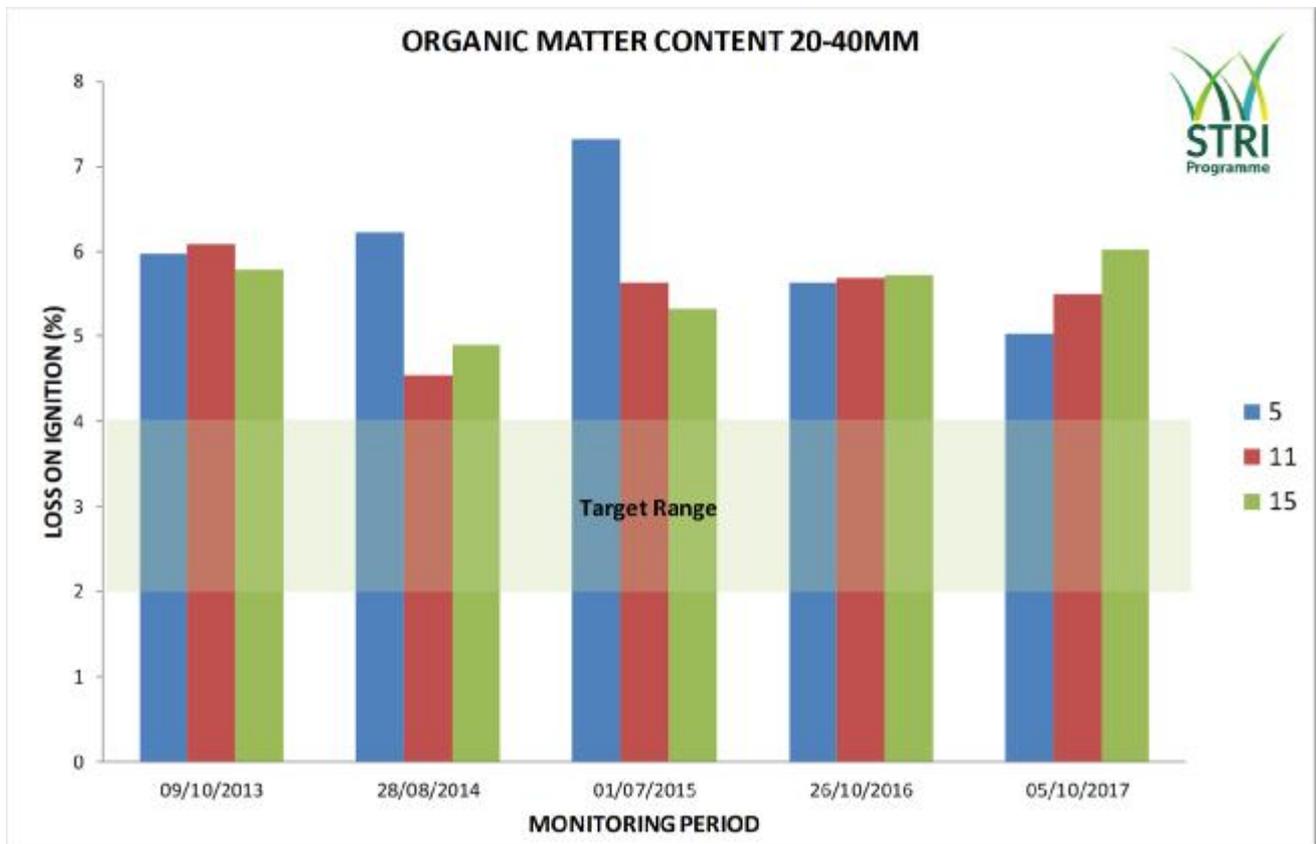
Two of our sampled sand based greens, 12th and 15th, are offering lower firmness under the same moisture content. This is the influence of additional organic matter thatch.

Gillingham Golf Club

Soils Laboratory Data

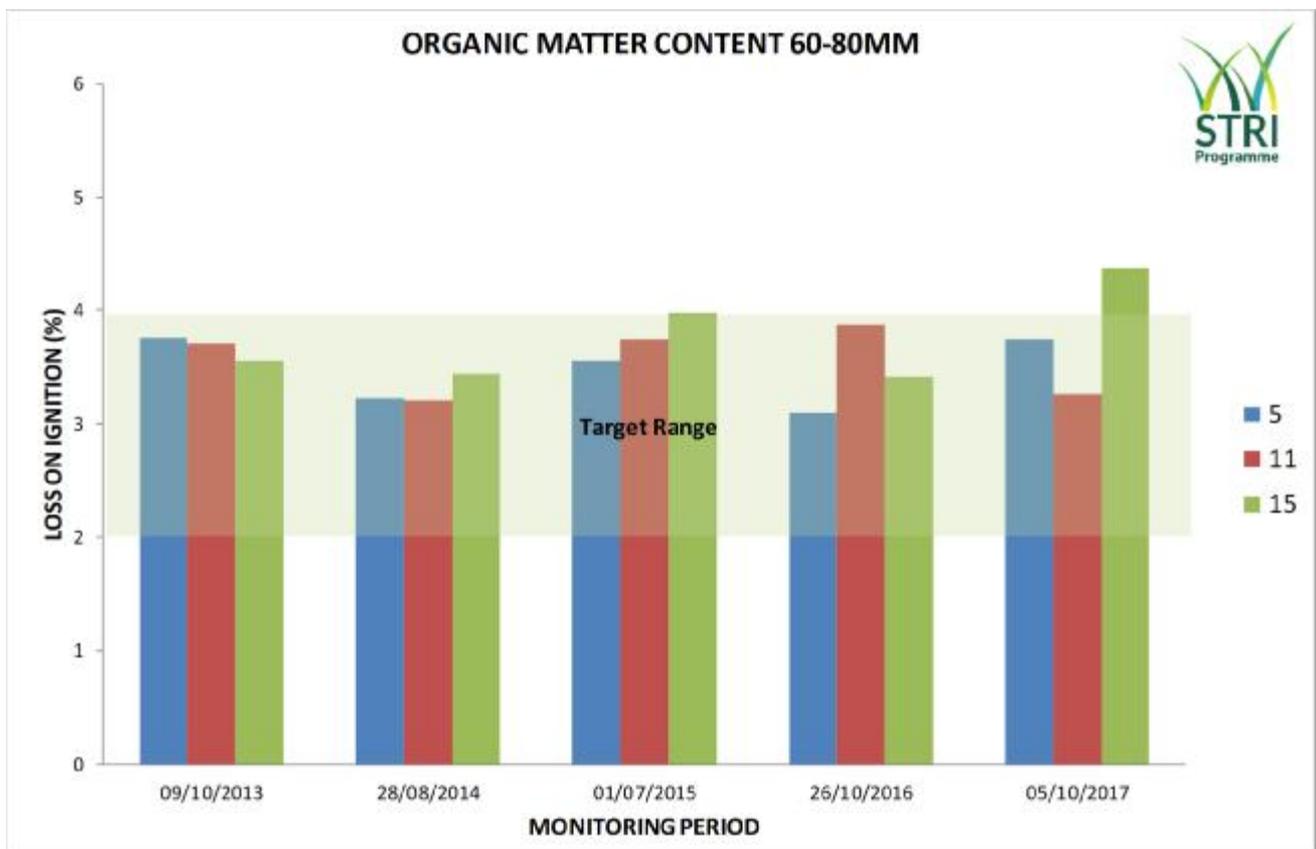
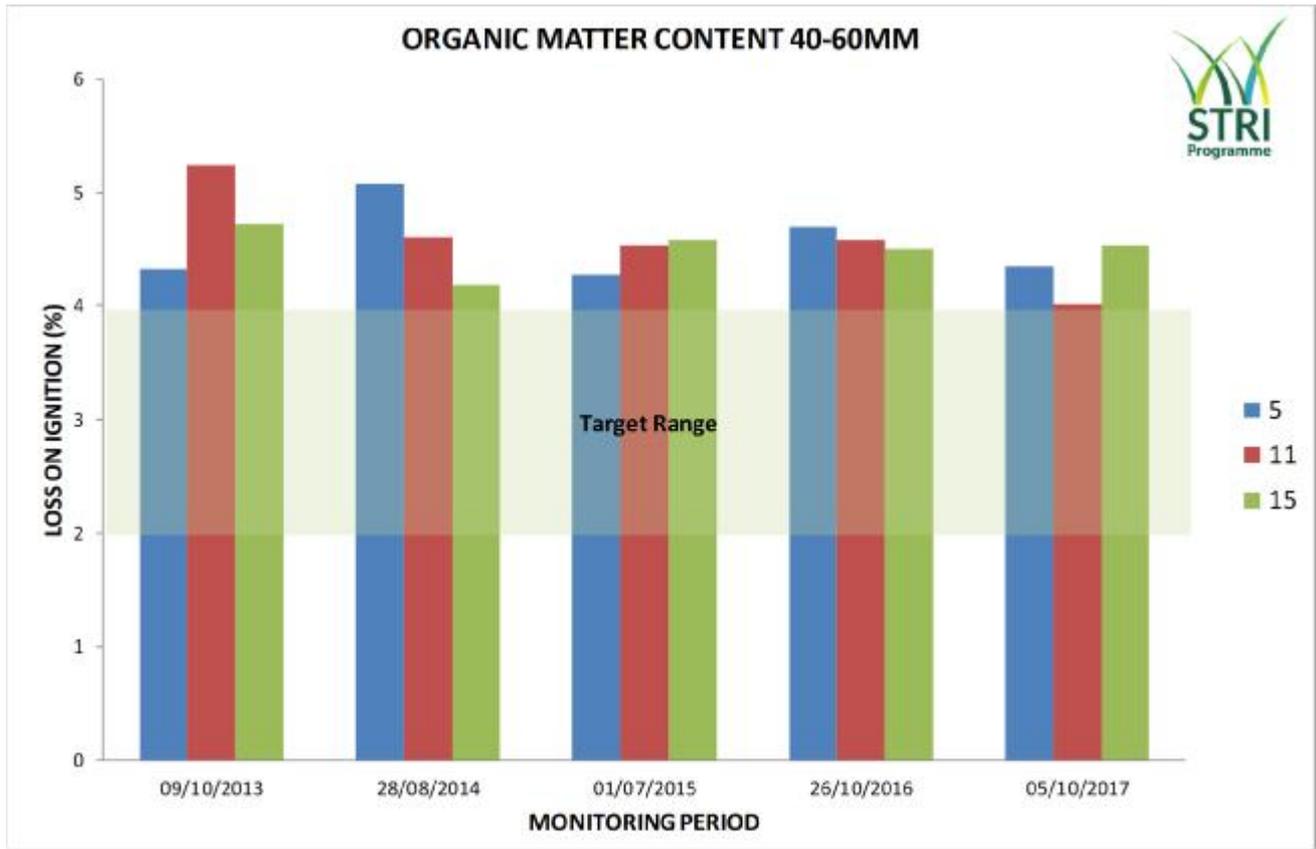


It is encouraging to see a continuation of the trend showing reduction of organic matter in the upper 20mm. The sand based 15th green still has an excess accumulation.



Excess organic matter is seen through all greens once beyond 20mm depth. Hollow coring and general aeration is required to improve conditions and promote better moisture movement.

Soils Laboratory Data (continued)





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ORGANIC MATTER CONTENT



CLIENT: GILLINGHAM GC
 ADDRESS: WOODLANDS ROAD,
 GILLINGHAM,
 KENT, ME7 2AP

DATE RECEIVED: ~~25/09/17~~

DATE REPORTED: ~~29/09/17~~

RESULTS TO: PW

TEST RESULTS AUTHORISED BY:
 Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION	LOSS ON IGNITION (%)*
A16311/1	5 0-20 mm	5.23
	20-40 mm	5.02
	40-60 mm	4.36
	60-80 mm	3.75
A16311/2	11 0-20 mm	5.57
	20-40 mm	5.50
	40-60 mm	4.01
	60-80 mm	3.26
A16311/3	15 0-20 mm	7.49
	20-40 mm	6.01
	40-60 mm	4.54
	60-80 mm	4.37

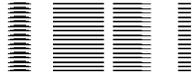
* ASTM F1647-11 Standard Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes (Method A)



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

Testing Certificate 2159 - 01

STRI



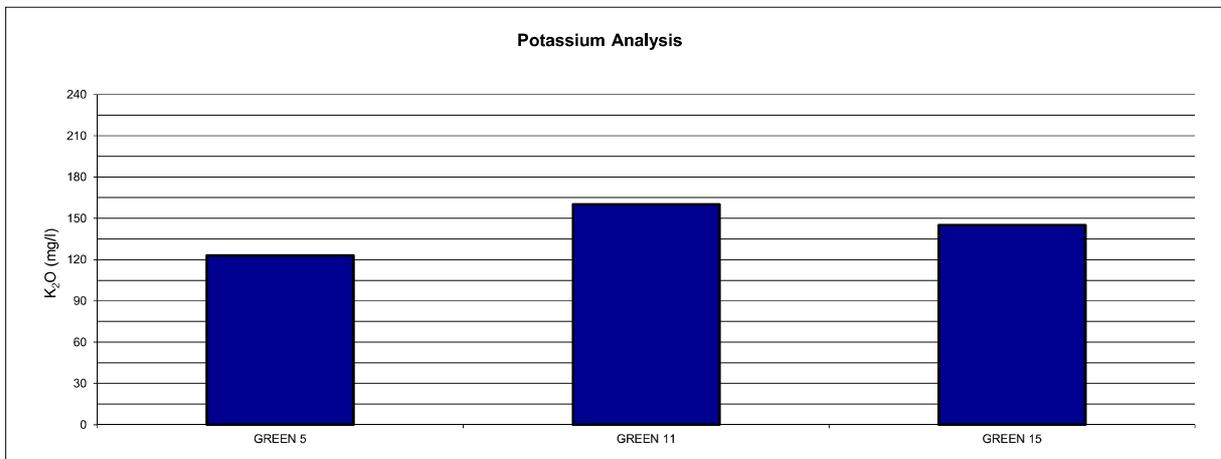
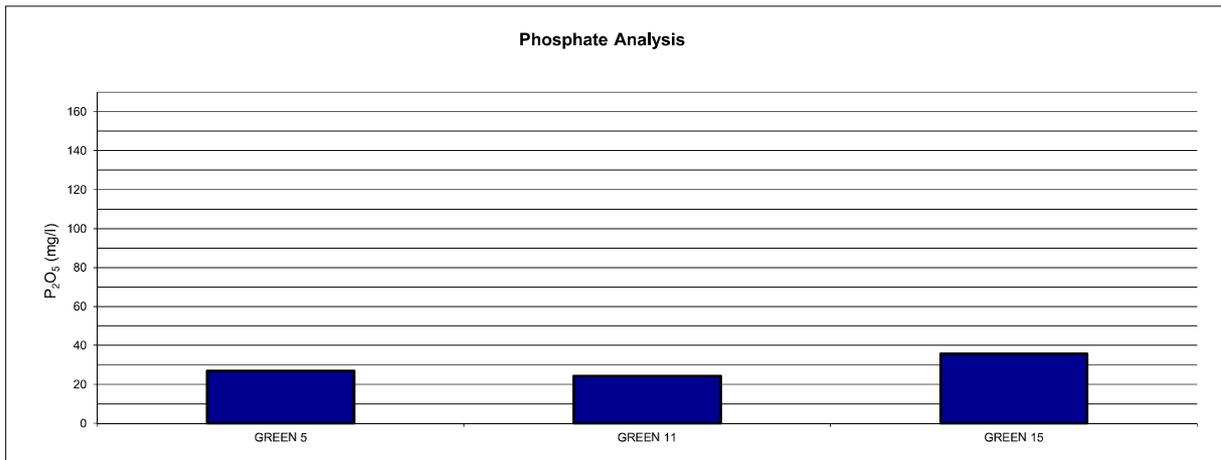
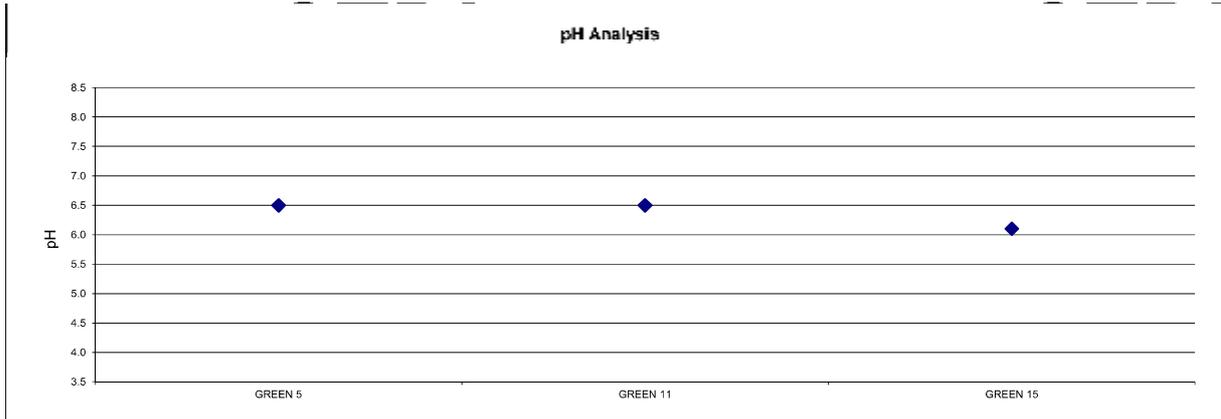
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SOIL CHEMICAL ANALYSIS

GILLINGHAM GC

Date: 14/09/17



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