Making great sport happen

GLAMORGANSHIRE GOLF CLUB

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 7th June 2018
Consultant: Paul Woodham

Glamorganshire Golf Club

Date of Visit:	Tuesday 5th June 2018
Visit Objective:	Annual review of course conditions and agronomic performance.
Present:	Mike Williams – Course Manager, Colin Toshack – Chair of Green Russell Thomas – General Manager, Paul Woodham – STRI Ltd
Weather:	Dry. No significant rainfall during the days leading up to inspection.

Headlines

- Greens performance and playability is currently in a fragile state with the putting surfaces experiencing aggressive pitting with damage from leatherjacket grub activity and significant damage from birds pecking the greens in search of this food source.
- The extent of damage is concerning and above acceptable thresholds. Damage has also been observed in localised pockets of south west and north west coastal courses. Leatherjacket activity and the challenge of control is becoming concerning following the withdrawal of Chlorpyrifos in 2016.
- The damage that has emerged out of an already difficult spring period is accentuated by the volatile early season differential growth patterns of bentgrass and poa annua. Added disturbance from fusarium patch disease is a further annoyance with all factors combining to disrupt surface smoothness.
- The issue of surface pitting and lack of smoothness has been more commonly seen this year. The opportunity to apply sufficient volumes of dressing and nutrient uptake has been compromised by a lack of growth and wet conditions. The sudden shift in conditions to warm and dry soils has left impoverished surfaces bumpy prone to sward texture remaining procumbent rather than upright.
- Fairy ring activity was noted in areas of greens where excessive wet/dry cycles can occur. This is largely in the peripheral areas close to bunkers i.e. right side 18th green and left side of the 5th. These rings largely a visual disturbance although care needs to be taken to avoid the onset of further stress.
- Deal with the issues immediately in front of you. Actions are prescribed to recover surface smoothness and promote turf health/sward refinement. These actions need to be applied irrespective of fixture scheduling as the surface will struggle to recover without remedial treatments.
- Leatherjacket and bird damage is also prolific in the 3rd tee where a significant area of turf has been torn up. These areas could also be treated although, unlike greens, not annually and future damage in other tees can not be ruled out.
- Fairways are starting to achieve main season conditioning and it is pleasing to see that weeds are starting to die back following application of selective herbicide. Current presentation is slightly blemished by the appearance of washboarding left over from mowing the fairways in wet conditions. This should smooth out as the season progresses, and if the direction of mowing is adjusted from time to time.
- Fairway drainage pipes profiles are working as intended, but that surface connection of secondary drainage is capped of and/or compromised by soils migrating into the narrow gravel slit drains. The acquisition of a tractor mounted gravel banding unit will help to renew the link to drainage. This work should be a priority for late summer and autumn before the onset of wet ground conditions.
- Tree management projects have progressed well but there is so much more to do. Opportunities are being missed where tree removal needs to happen to avert turf stress in sensitive areas. This is seen in areas such as the right side of the 13th green where tree roots invade the green collar and putting surface in addition to sprouting roots at the surface of the green surround.
- Bunkers continue to struggle due to poor drainage, soil erosion and contamination. Bunkers will remain substandard until a major overhaul is carried out. The foundation for improvement must be created by reshaping, contouring and constructing reliable drainage ideally with a membrane liner.
- The first step is to conduct an architectural review and to cost up the project, ideally to be phased over a two-three year period.

Key Actions

- Apply solid tine aeration to prepares the greens for a heavy application of top dressing. Dressing needs to be carefully brushed and smooth dragged out to fill the turf base.
- Increase nutrition to promote stronger sward vigour and growth to stimulate recovery of damages and uneven putting surfaces.
- Seek a supply of Acelepryn for emergency application to target the next leatherjacket population.
- Apply proactive management of greens top dressing and aeration aimed at controlling organic matter and improving playability.
- Increase deep aeration to green approaches.
- Architectural review of bunkering with the aim to reduce the number of bunkers and create more interesting, better performing, and longer term sustainable maintenance. Include the use of a membrane system.
- Commence late summer/autumn Lytag or gravel banding through problem sections of fairway.

Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	31% (range 7-45)	20-30%
Hardness (Gravities)	104 Gravities (range 88-123)	85-110 g
Smoothness (mm/m)	28 mm/m	<25 mm/m
Trueness (mm/m)	11 mm/m	<10 mm/m
Green Speed	8ft 2in	8ft – 10ft 6in
Organic Matter 0-20 mm (%)	7.3%	3-6%
Organic Matter 20-40 mm (%)	3.6%	<4%
Soil pH	6	5.0-6.0
Phosphate (P_2O_5)	14 mg/l	>10 (mg/l)
Potassium (K_2O)	73 mg/l	>30 mg/l

Key: In Target | Marginal Variance | Out of Target

Figure 1: Bird damage is the most visually apparent damage to the greens. The extent of damage is more aggressive and widespread than previously seen.

Figure 2: There is plenty more damage occurring from leatherjackets feeding on grass tissue. This leaves a pitted surface with numerous indentations, some grassed over and many others remaining bare (above).

Figure 3: Fusarium patch disease activity has been widespread during late May. The disease is not as concerning as when occurring during autumn/winter. New growth emerges just as rapidly as the disease takes hold so there is no requirement for application of fungicide.

Figure 4: Fairy ring activity is present as Type II fairy ring growth. Hydrophobic soil has triggered fungal basidiomycetes activity and stimulated the development of puff balls within the 18th green.

Figure 5: Soil profile show good control of organic matter although with a remaining excess within the turf base. Profiles are otherwise well structured and continue to stimulate good root growth, especially when aerated.

Figure 6: Maintaining a uniform and healthy soil moisture balance is critical if the onset of stress is to be avoided. We again observed how damaging tree root invasion and competitive moisture uptake is in areas such as front right of the 13th green.

Figure 7: Leatherjacket and bird damage at the 3rd tee. This will need to be recovered by overseeding, dressing and protecting the repairs using a termination sheet.

Figure 8: 10th tee surface levels are poor, especially through the white tee positions.

Figure 9: The network of drainage is clearly seen at this time of year in holes such as 6th. Lytag or gravel banding can be effective at moving surface water to drains over short distances. Their effectiveness will be compromised when the profile caps off so a frequent return to re-band problematic areas is required.

Figure 10: Washboarding could be seen through many fairways. Washboarding occurs when the mowing units bounce or dig in during periods of soft surface conditions. These should smooth out as the season progresses.

Figure 11: Bunkers are not performing well and lack interest. Many are frequently exposed to flooding and continually exposed to soil and stone contamination.

Figure 12: The rear right green side bunker at the 2nd is a good example of a situation where the bunker could be filled in and some cleverly designed contouring created to divert run off water away from the green.

Recommendations

Greens

- A significant increase in top dressing is required in order to smooth out the surface which is full of minor imperfections. Large holes where birds have torn into the surface will also need to be smoothed out and if necessary plugged repaired to the side of the green. The first steps in preparing for top dressing is to aerate the greens using 8mm or 10mm diameter sold tine aeration with the John Deere Aercore unit.
- Immediately increase nutrient inputs by increasing the volume or frequency of liquid fertiliser treatment. Combine this with a seaweed application and commit to wetting agent treatment management to help avert lingering stresses and promote stronger growth. This is required to help the sward knit through the heavy application of dressing.
- Short term issues will be seen with the higher volume of dressing potentially picking up on golf balls all dulling the quality of cut in subsequent days following dressing. This is short term pain which needs to be accepted if the greens are to smooth out and promote a uniform smooth and true ball roll. Green speeds may well slow although at the time of inspection speed was constrained by the bumpiness of the surface. There is little merit in maintaining a sward which is too lean and not able to stay one step ahead of leatherjacket and bird damage.
- Onsite recommendation was made for the application of a new insecticide, Acelepryn, which has just received authorisation for emergency application to treat leatherjackets. Every effort is being made to ensure that the Club has access to this chemical which will be distributed by ICL.
- It has to be understood that the application will only treat the next population of leatherjackets. Each leatherjacket has the capacity to lay 400 eggs and the application of Acelepryn will be timed for mid-July and will be residual in the soil profile offering control for the egg laying life cycle stage of the invertebrate.
- Continue to monitor the quality of cut carefully once the surface smoothness and sward vigour has been improved. Reduce the height of cut to 3.25mm for main season and promote improved refinement through brushing, verticutting and more intensive mowing and then use the option of turf ironing to polish off the surfaces. Aim for consistency rather than papering over poor surface texture through turf ironing.
- Main season renovation should include deep solid tining using the incoming new Wiedenmann unit and preferably opt for a combined intensive pattern of shallow solid tining using the John Deere Unit with the opportunity to integrate higher volume of sand into the profile. The objective is to dilute the organic matter and further smooth out the turf base and upper profile organic matter. A strong commitment to routine aeration needs to be maintained as the soil profiles are prone to staying too wet for too long during the year.

Greens Surrounds and Approaches

- The acquisition of the new Wiedenmann GX8i unit for the greens will hopefully free up the Wiedenmann XP Unit for use on greens surrounds and fairways where more intensive and robust deep aeration is required. An article accompanies this report which discusses the issue of greens approaches appearing to soften down excessively during winter periods. This issue is strongly linked to compaction of sub-soils and as an industry Clubs have refrained from doing enough deep aeration through heavily trafficked areas of poor sub-soil over many years.

Bunkers

- The last two years of STRI reports has documented the need for bunker improvement and this year's observations are no different. Many courses are investing in bunkers often funded by VAT return, selling off land for development or other by means of investment. Clubs are no longer prepared to waste huge sums of budget and time management on bunkers which are failing to perform. Even replenished sand levels at Glamorganshire quickly becomes contaminated with soils migrating from the bunker base or eroding from the faces.
- The popular route to improvement is to include some form of geotextile or membrane liner. I see most success coming from the use of rubber crumb liner which has been professionally installed into a bunker which is correctly designed.
- I would urge the Club to sanction an architectural review of the bunkering with the following objectives.
    - Review the strategic positioning of bunkers and look for opportunities to reduce the number of bunkers, currently 60 on the course, opting for better more visual bunkers which are easy to maintain.
    - Ensure that the bunker surrounds can divert water away from the bunker and away from greens. Bunkers which could be filled in could still be subtly maintained as contours which can help to channel water in the right direction away from the main playing areas.
    - Design the bunkers very much with drainage in mind. This may involve raising the height of bunkers away from the sub-soil profiles and if this is the case then the project needs to be resourced correctly with available supply of top soil. The inclusion of a membrane will help with drainage. Options for lining can be discussed, but the first principle would be to consider rubber crumb membranes.
    - Create mounding which is attractive but reasonably easy to maintain. Avoid sharp faces in the bunkers which will cause movement of sand especially when dry.
- STRI can conduct an architect review however I would suggest employing Jonathan Gaunt, Gaunt Golf Design (07703 595441) who I have worked with on other projects as he has a very sharp eye for detail and a thorough understanding of bunker design using membrane systems. The Club could then create up a plan or tender to go out to contractors or look at partnership opportunities working with contractors but with the Club participating where required to reduce costs.

Fairways

- Trail the use of the Shelton gravel bander with either Lytag or appropriate drainage aggregate which will flow though the unit. Once satisfied with the selection material then drainage should be installed at 1m centres intercepting lateral pipes.
- It is important that the Club appropriately resources this element of work which is likely to be scheduled for late summer and early autumn. At this time of year there are many other projects and general maintenance to undertake including the management of leaves. Delaying the work until later in the summer will run the risk of unfavourable ground conditions causing damage or loss of traction from the tractor unit.

Tees

- A project to improve the surface levels of tees was discussed. In the case of holes such as the 10th, then there is a clear requirement for improving levels.
- The principle for improving levels would be to strip and discard the turf before reconstructing the levels using an appropriate depth of tees rootzone material. This may well be a 70:30 sand soil blend but to be careful of handling the material particularly in wet winter conditions as the high percentage of organic matter can lock the profile and slow drainage potential dramatically.

- Whilst the Club will undoubtedly want to progress projects such as tees levelling, the priority should be to strengthen the drainage network and reconstruct bunkers. Any tees work should be kept to a minimum in my opinion until other projects are progressed.

Tree Management

- It is encouraging to hear the Club progressed well with tree management works during the past winter despite the wet conditions. This work needs to be continued and the Club should remain very focused on the need to remove problematic trees which are affecting playability of sensitive areas such as green and tee surrounds.

Signed

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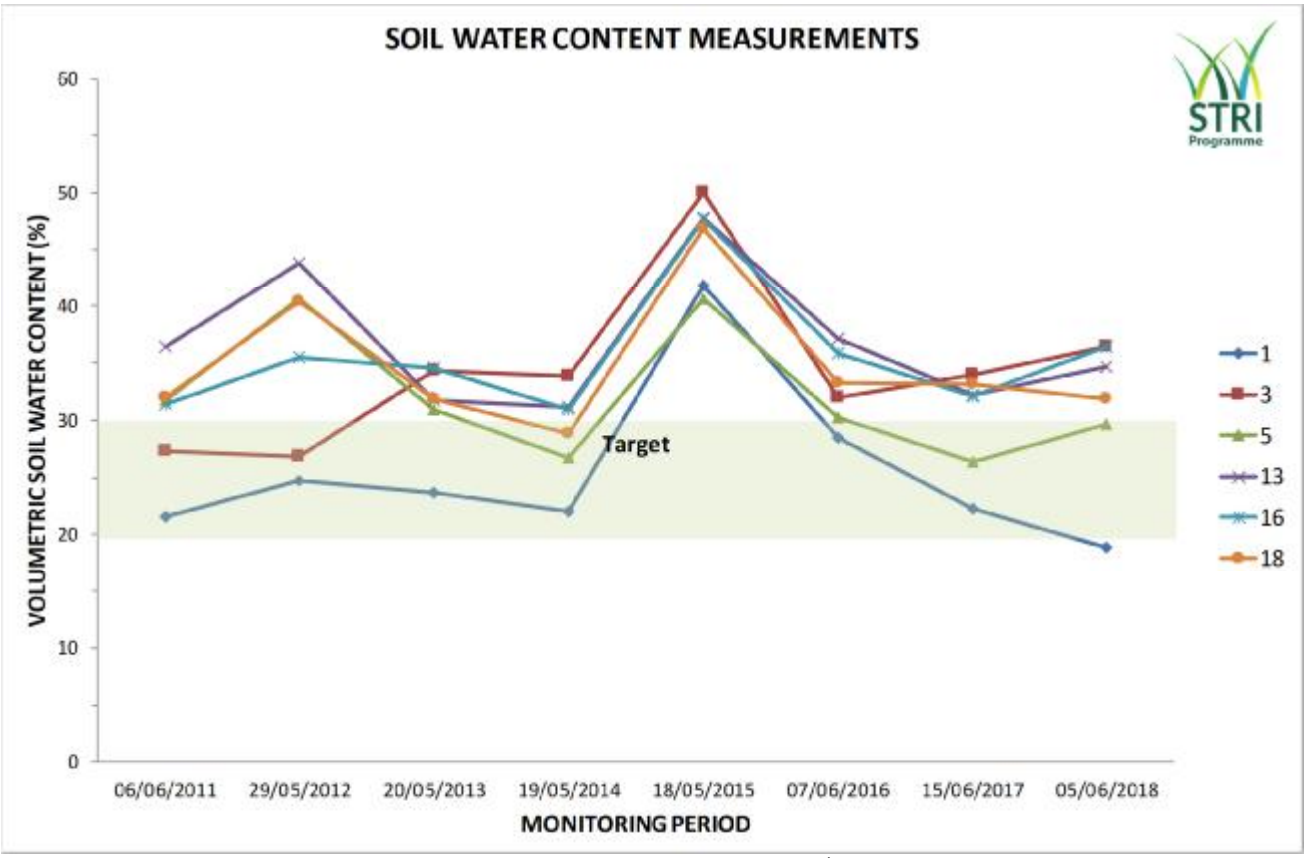
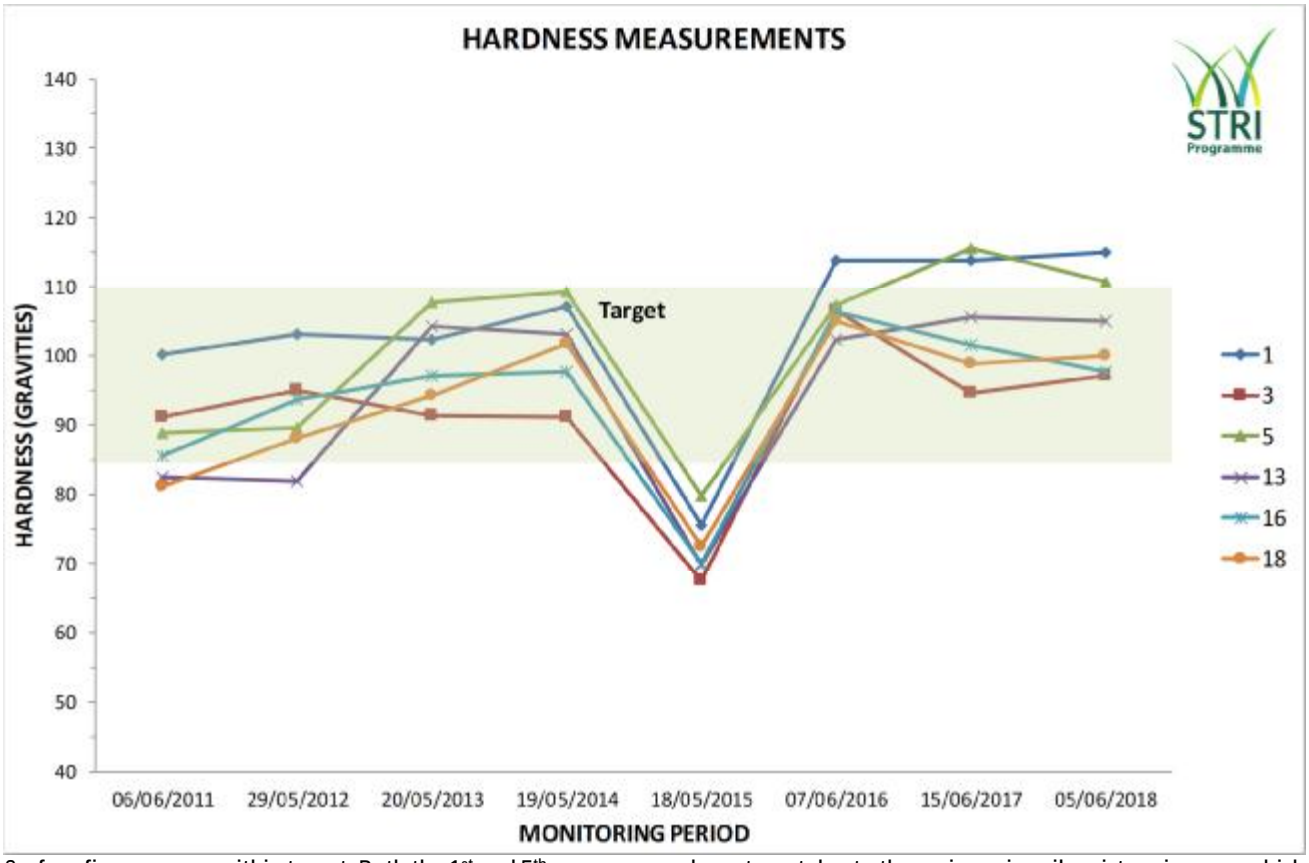
Objective Data

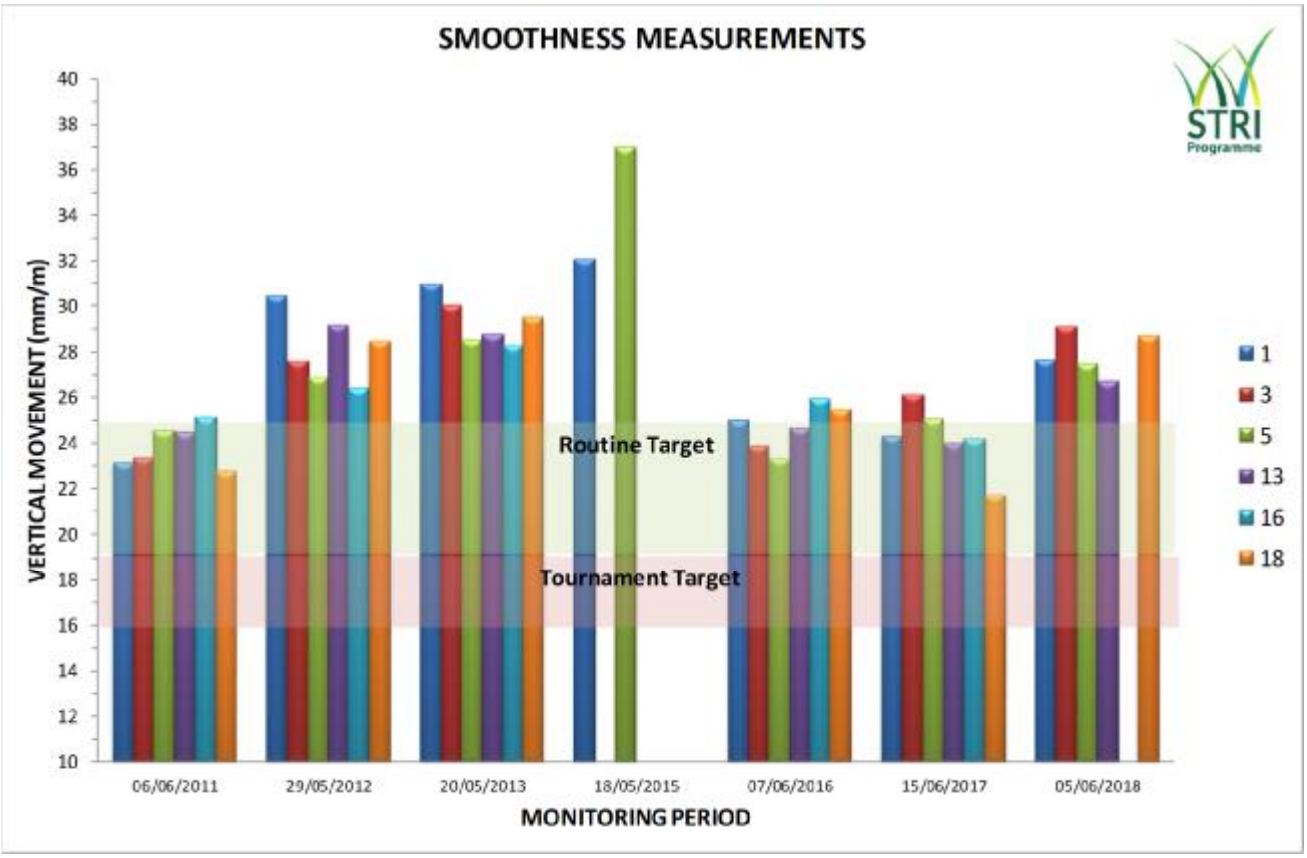


Average soil moisture content values were skewed by high variance in the 1st and 5th green where moisture ranged from 8-35%. The dry areas were showing some hydrophobic activity which needs to be controlled using a wetting agent programme. The overall wet/dry cycles were stimulating fairy ring activity in zones where soil moisture is likely to fall below 12% and then re-wet.

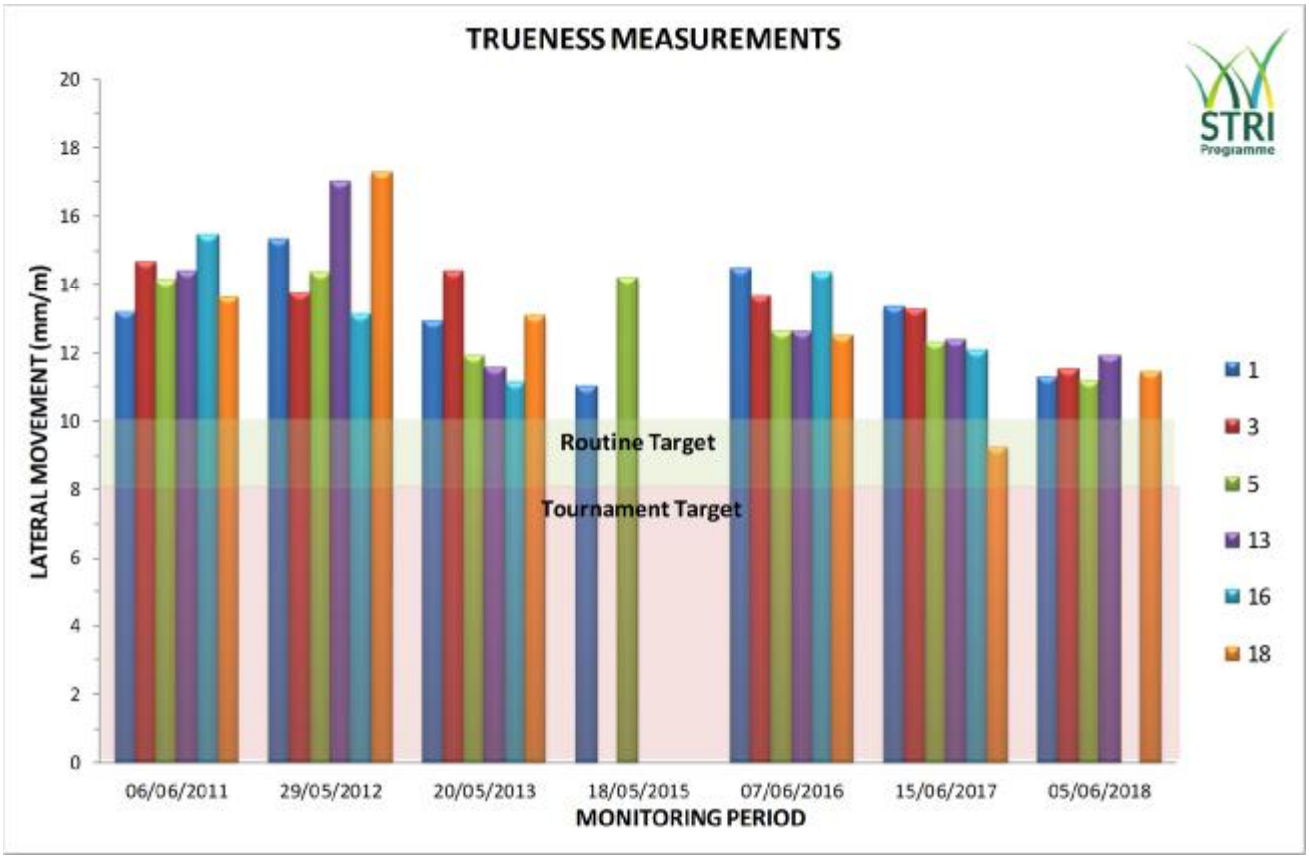


Surface firmness was within target. Both the 1st and 5th greens were above target due to the variance in soil moisture in areas which were drying down.

Objective Data (continued)

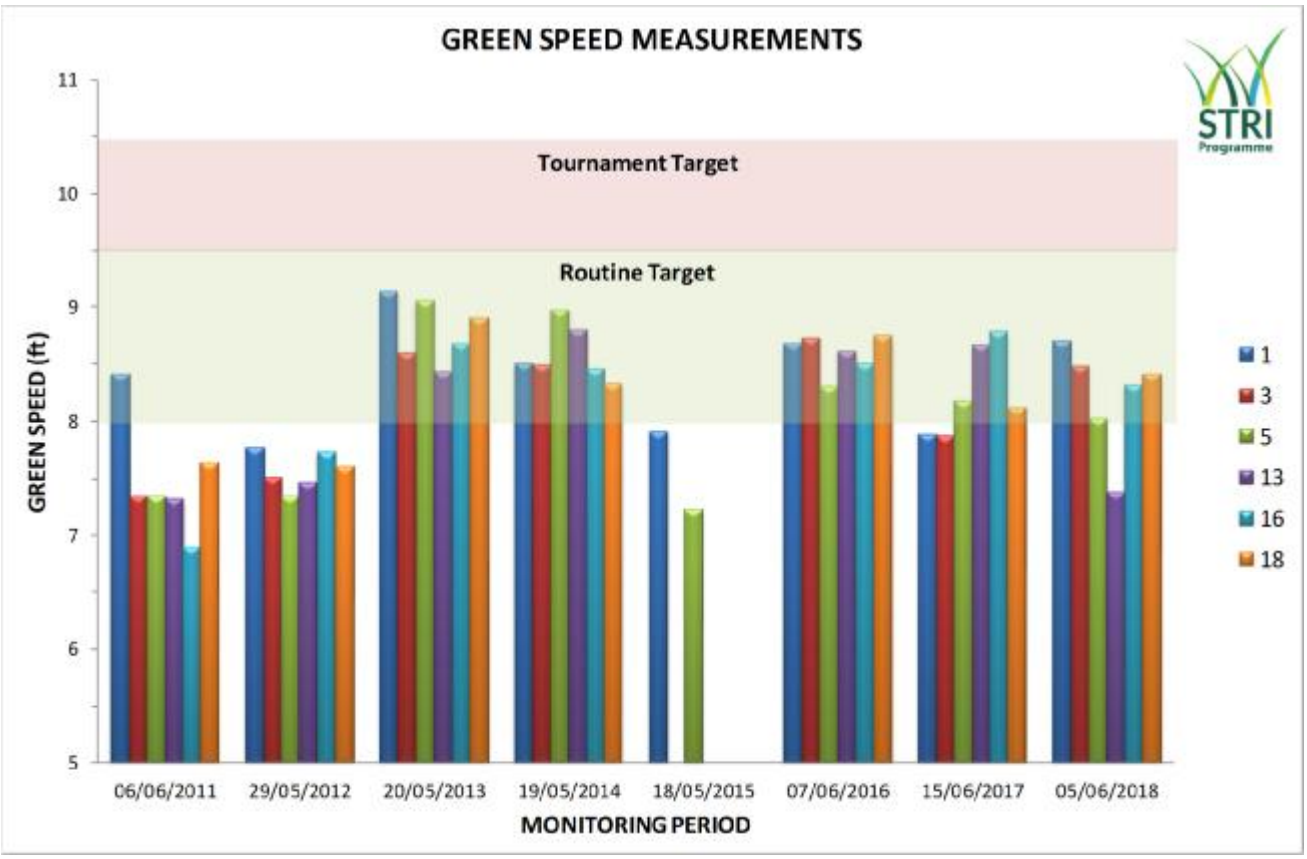


Surface smoothness was above target due to the pitting and marking caused by leatherjacket and bird damage. The overall sward texture was also needing refinement although a trial on the 18th green using the new mower to achieve a clinical 3.5mm cut made little difference to the measurements.

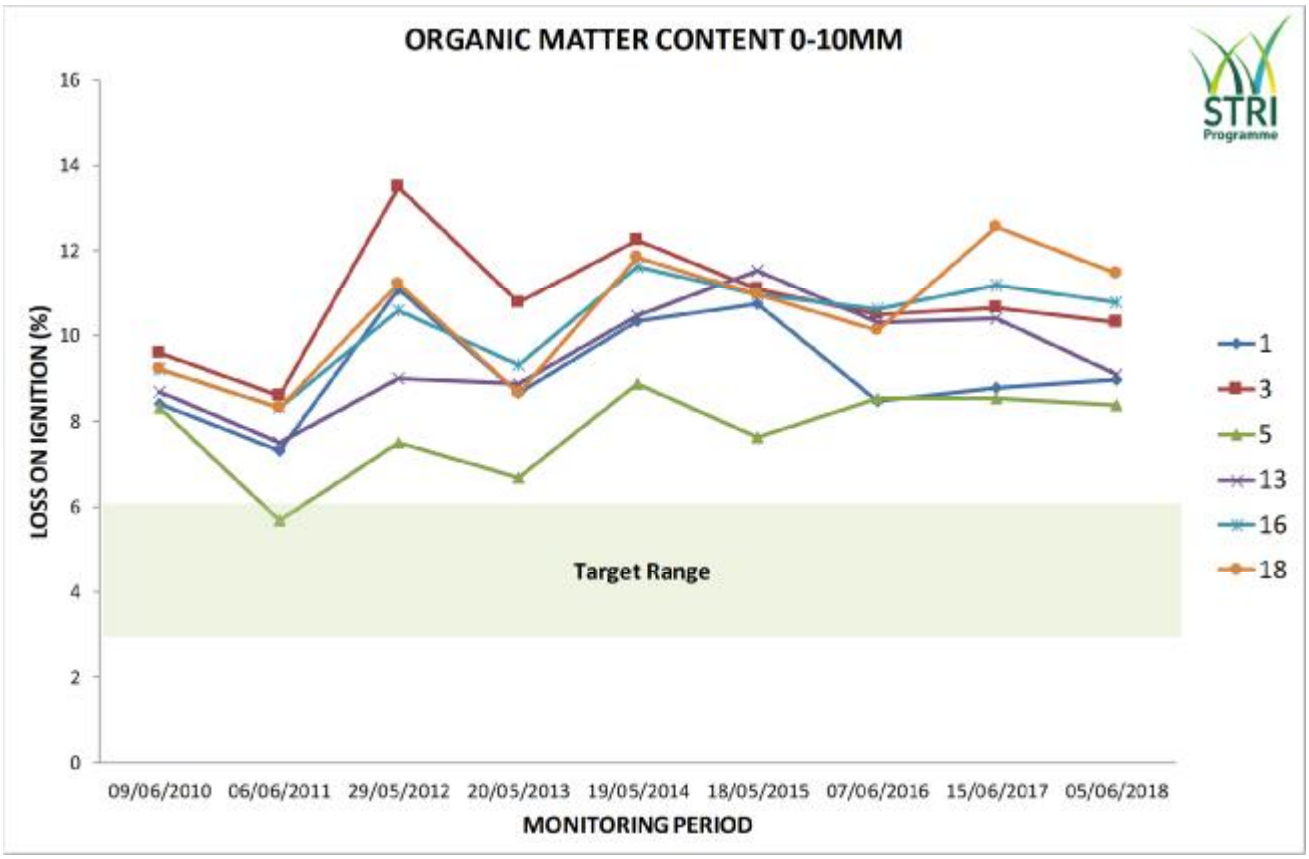


Trueness was not affected as much as smoothness, but values were still above target. Overall smoothness and trueness will not improve until sufficient top dressing has been applied to smooth out the surface.

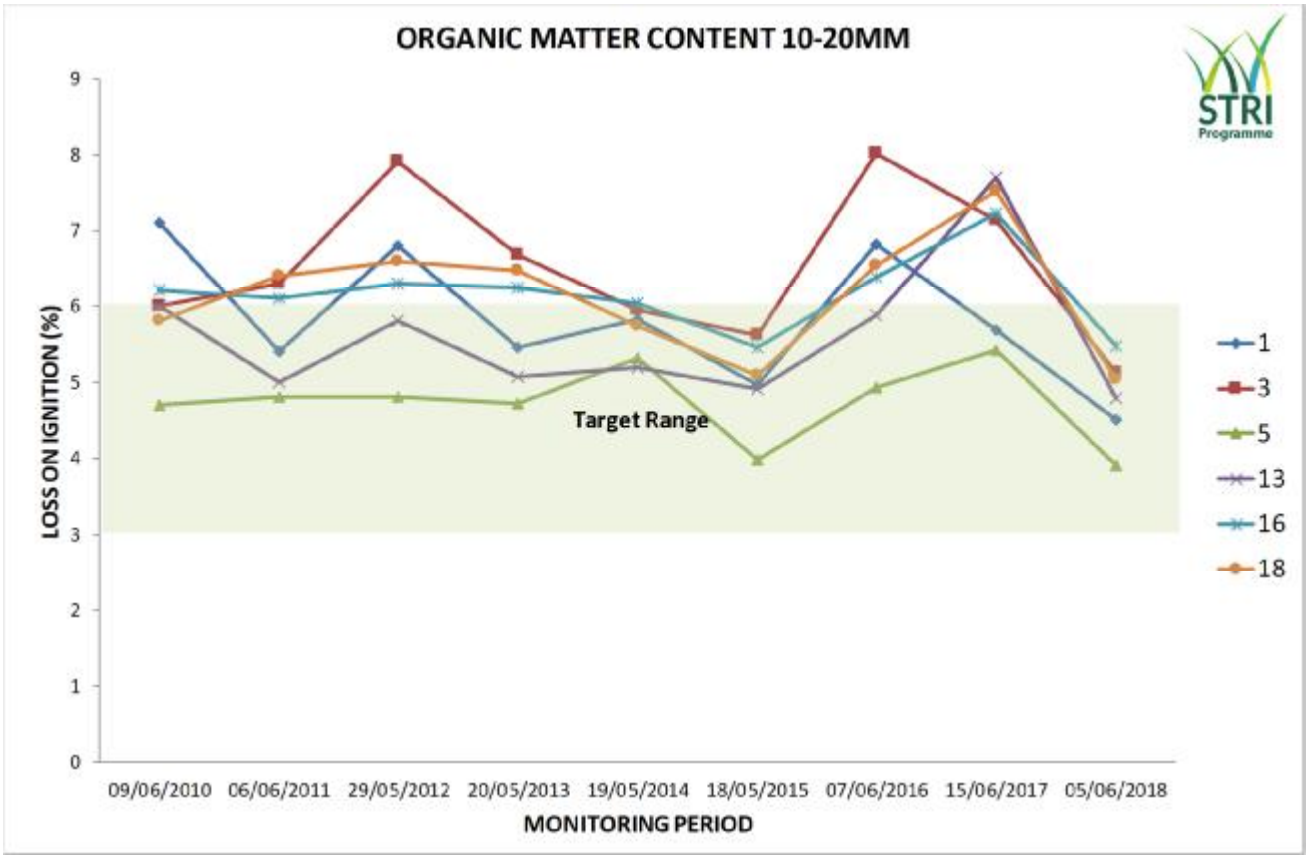
Objective Data (continued)

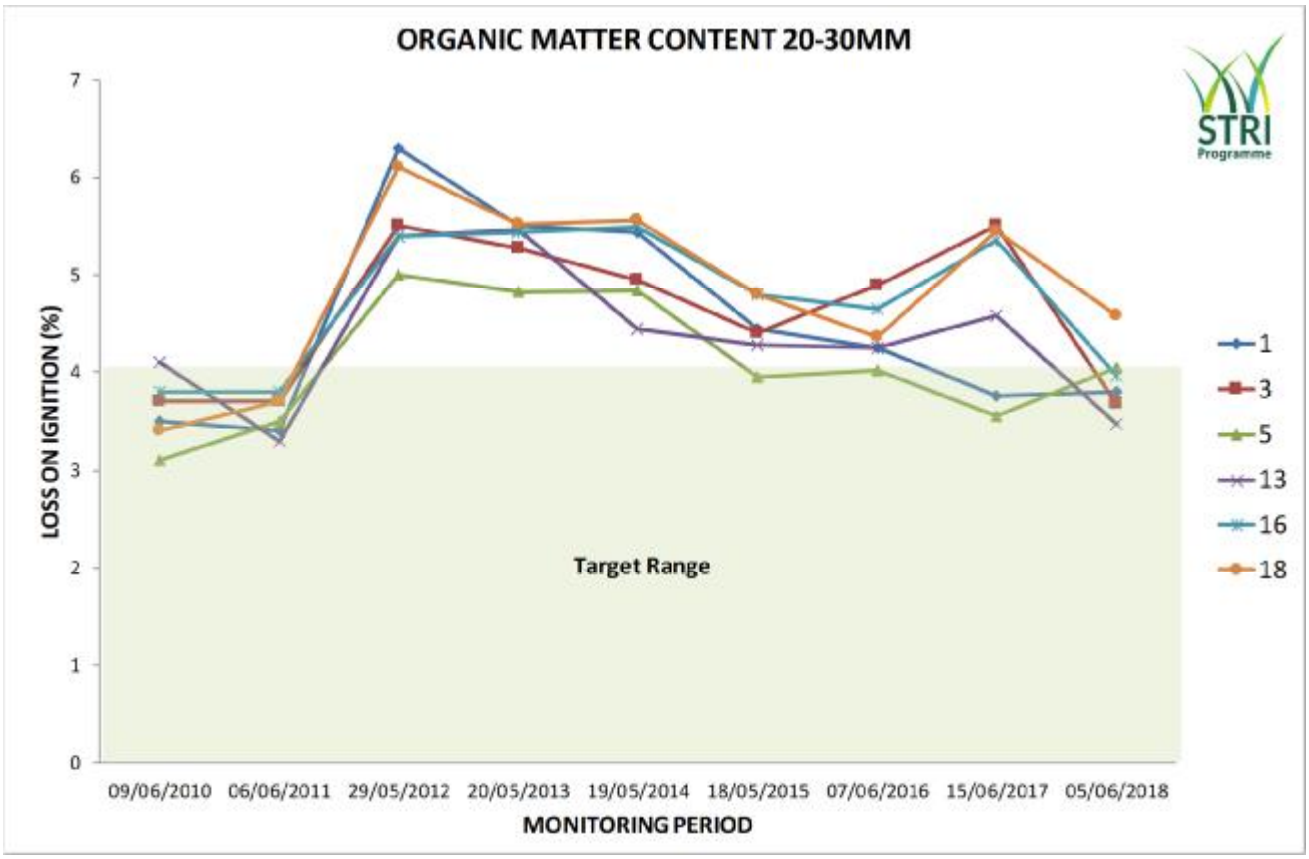


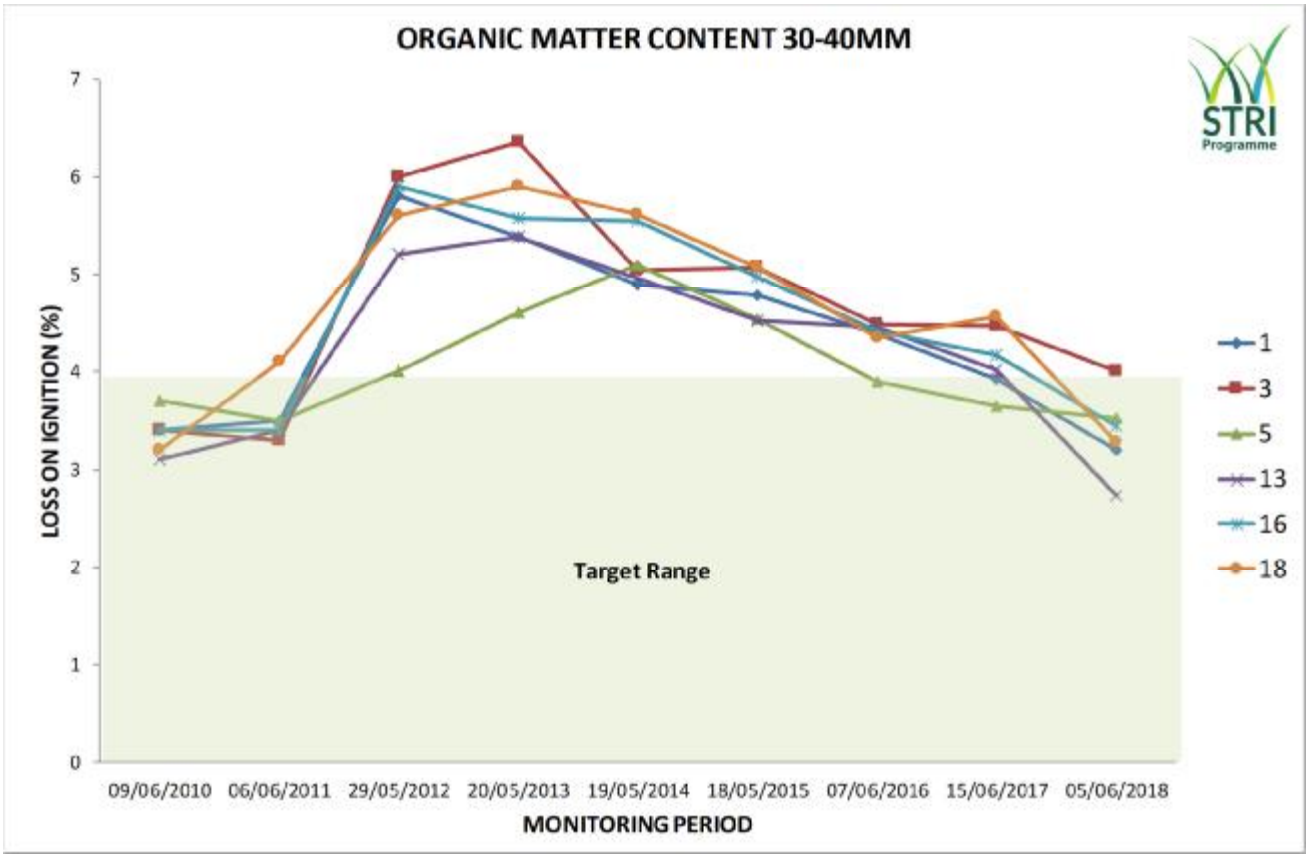
Green speed was largely in target, but ball roll was not running out or running smooth enough to satisfy the requirements.



Soil organic matter analysis is quite encouraging with target ranges generally achieved other than excess organic matter remaining in the top 10mm.




ORGANIC MATTER CONTENT 20-30MM
LOSS ON IGNITION (%)
0
1
2
3
4
5
6
7
Target Range
09/06/2010
06/06/2011
29/05/2012
20/05/2013
19/05/2014
18/05/2015
07/06/2016
15/06/2017
05/06/2018
MONITORING PERIOD
1
3
5
13
16
18


ORGANIC MATTER CONTENT 30-40MM
LOSS ON IGNITION (%)
0
1
2
3
4
5
6
7
Target Range
09/06/2010
06/06/2011
29/05/2012
20/05/2013
19/05/2014
18/05/2015
07/06/2016
15/06/2017
05/06/2018
MONITORING PERIOD
1
3
5
13
16
18

STRI

St Ives Estate, Bingley, West Yorkshire, BD16 1AU

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ORGANIC MATTER CONTENT

CLIENT: GLAMORGANSHIRE GC

ADDRESS: LAVERNOCK ROAD,
PENARTH,
VALE OF GLAMORGAN, CF54 5UP

DATE RECEIVED: 25/08/18

DATE REPORTED: 31/05/18

RESULTS TO: PW

TEST RESULTS AUTHORISED BY:

Michael Baines, Laboratory Manager

CONDITION OF SAMPLE UPON ARRIVAL: MOIST

SAMPLE NO	DESCRIPTION		LOSS ON IGNITION (%)*
A16888/1	1	0-20 mm	8.97
		20-40 mm	4.50
		40-60 mm	3.81
		60-80 mm	3.20
A16888/2	3	0-20 mm	10.30
		20-40 mm	5.12
		40-60 mm	3.68
		60-80 mm	4.00
A16888/3	5	0-20 mm	8.36
		20-40 mm	3.92
		40-60 mm	4.05
		60-80 mm	3.53
A16888/4	13	0-20 mm	9.10
		20-40 mm	4.79
		40-60 mm	3.47
		60-80 mm	2.73
A16888/5	16	0-20 mm	10.78
		20-40 mm	5.47
		40-60 mm	3.96
		60-80 mm	3.45
A16888/6	18	0-20 mm	11.46
		20-40 mm	5.04
		40-60 mm	4.58
		60-80 mm	3.27

* 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

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SOIL CHEMICAL ANALYSIS

CLIENT:

GLAMORGANSHIRE GC

RESULTS TO: **PW**

DATE RECEIVED:
25/05/2018

Lab No.	Source	pH	P_2O_5 (mg/l)	K_2O (mg/l)
A16888/1	GREEN 1	6.0	15	49
A16888/2	GREEN 3	5.9	12	80
A16888/3	GREEN 5	6.0	12	71
A16888/4	GREEN 13	6.0	14	96
A16888/5	GREEN 16	5.9	16	72
A16888/6	GREEN 18	6.0	15	71

Mr M A Baines, Soil Laboratory Manager

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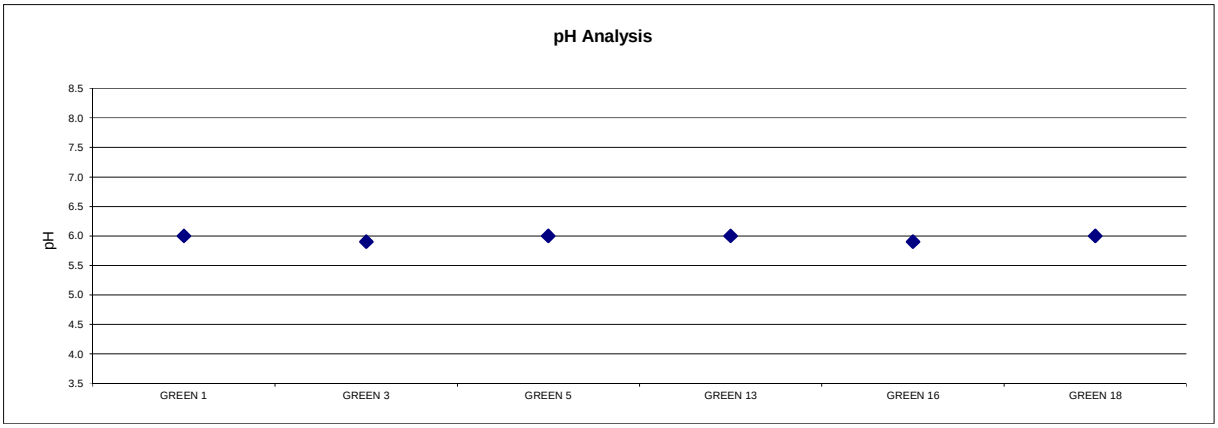
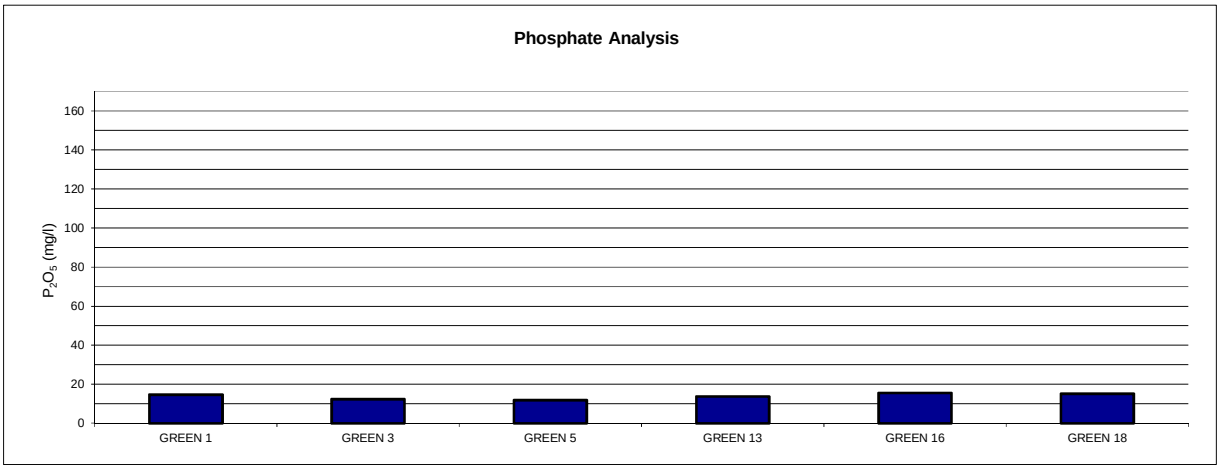
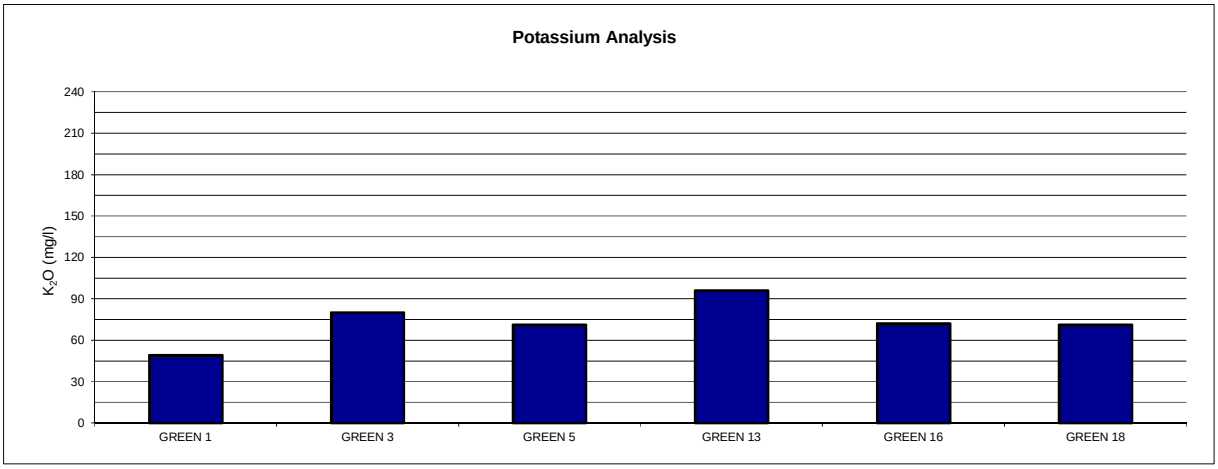
SOIL CHEMICAL ANALYSIS GLAMORGANSHIRE GC Date: 25/05/18







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