

The logo for STRI (Sports Turf Research Institute) features the letters 'STRI' in a white, bold, sans-serif font. The text is set against a dark green rectangular background that has a subtle, stylized pattern of grass blades or turf tufts.

Tynemouth Golf Club

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 27th August 2015

Consultant: Stuart Ormondroyd

A detailed, close-up photograph of a lush green lawn, showing individual blades of grass in sharp focus. The lighting is bright, highlighting the texture and color of the turf.

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Date of Visit: 20th August 2015

Visit Objective: To assess green playing quality through data collection with a view to making recommendations relating to future improvement. Other aspects of course management were also reviewed.

Present: Mr Jamie Foreath – Secretary
Mr Keith Miller – Past Chairman of Green Committee
Mr Ian Kerr – Head Greenkeeper
Mr Stuart Ormondroyd – Senior Agronomist, STRI Ltd.

Weather: A muggy, misty early morning which was calm and dry after overnight rain. Clearing and warming up later.

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Executive Summary

- After the mid-April course visit, the weather remained exceptionally cold hampering playing quality development. Some concerns were expressed at this time but since then the level of maintenance has increased along recommended lines and resource investment has been made available to achieve a number of the desired objectives.
- Staffing issues have been a real problem all season, but again we seem to be coming out the other side and the prospects for the rest of the year and for 2016 look much more favourable at this stage.
- The problems with the growth differential between annual meadow grass and bent have largely been evened out with additional maintenance from May onwards, as noted on the day and in terms of playing quality assessment at the 2nd, 7th and 8th greens, there was very good consistency from green to green and within putting surfaces.
- Performance values were very good and in target range, even following significant rainfall last week. Moisture levels were however high, although we have to take into account rainfall prior to the visit.
- The real issue lay with surface uniformity and speed i.e. bobbly and slow respectively. This was put down to very strong growth in the muggy conditions and the difficulty gaining a clean cut when the surface is wet. A second cut on the 18th green highlighted this point through the fact that a considerable amount of clippings came off in the box and speed plus surface uniformity improved quite noticeably, especially pace. Accordingly, immediate changes were advised to the height of cut and refinement through frequency of cut and additional rolling.
- Sample results made available before the visit were discussed on the day and the general message was that for organic matter progress is slow over time and there is a need to intensify the work to speed up the reduction into the target range. Use of the Graden unit in the autumn was one element that would help fulfil this remit. The chemical status of the greens is very satisfactory and no changes were advised.
- Surface blemishes on the day were confined to some fusarium activity symptomatic of the prevailing muggy weather and worm casting e.g. the 2nd. Resource limitation has hampered extension of work to raise the standard of other areas of the course and in particular bunkers and tees. This is an area mentioned previously but with the improvements proposed I do hope these two areas can be tackled in earnest, starting with autumn bunker perimeter refurbishment.
- I agree for any club it is good to have a Course Policy document setting out the management strategy and would endorse a plan to develop each area over the next five years. It would make sense to have bunkers as a separate entity along with immediate and general surround and looking to extend aprons for definition, presentation and playing quality.
- Moving onto tees, these lack basic general maintenance as well as a long term strategy for extension and levelling, as mentioned previously. A start on the maintenance element has been made through scarifying, top dressing and seeding a few tees but this really needs extending to all tees as part of the autumn programme, as proposed.
- I was very pleased the Club had put forward a strategy for overcoming the staffing issues experienced this year and looking at resource investment i.e. the utility vehicle, a top dresser and sweep and fill brush. All of these changes will make a significant difference and speed up the rate of progress. The key now is to organise management practices for best effect.

Key Observations

Greens

Sub Surface Conditions

Apart from fundamental drainage, one of the main factors affecting firmness of greens is organic matter build-up. This has been an issue in the past and following testing and analysis of samples sent in, the results for 2015 are detailed below.

Organic Matter Content			
Loss on Ignition (%)			
	Green 2	Green 7	Green 8
0-20 mm	9.7	7.0	9.4
20-40 mm	5.8	5.6	6.5
40-60 mm	5.0	4.7	5.1
60-80 mm	4.8	3.2	4.7

Soil samples taken in advance of the visit this year, from the 2nd, 7th and 8th greens were analysed in the laboratory measuring organic matter levels through the top 80mm of the profile, as in the past. In the lab the samples were then cut up into 20mm segments and measured individually to identify values at each depth, as given in the above table. As a reminder the target ranges for the various depths are 4-6% for the top 20mm and between 2-4% for the other three depths.

Looking at the table the values for each green are similar with the lower values corresponding to the 7th green due to its free draining nature and lower rate of build-up.

Turning to the bar charts in appendix 1, for the 0-20mm depth all values are outside target range, as they have been consistently so since 2011. On the positive side, the 7th is showing a regular decline towards the target range, but for the 2nd and 8th there has been no real progress. The same applies to the 20-40mm range with the slight decline here relating to the 8th. All values are above target range by about 2%. For the 0-20mm this is 4% in relation to greens 2 and 8 and 1% for the 7th.

The 40-60mm depth reveals all three above target range and again there has been little change since 2011 with values around 1% above target. Finally, for the 60-80mm depth, the value for the 7th remains in target range as in the past, with the 2nd and 8th about 1% above with a slight decline for the 8th over time, but not the 2nd.

Looking at the results as a whole, the 7th is showing some response but for the 2nd and 8th there has been little progress, although on the plus side there has been no deterioration. Any minor changes are positive. Therefore the aim for the coming year is to see a more dramatic reduction, especially for the 2nd and 8th and the aim would be to achieve this through the changes discussed i.e. an improvement in staffing levels, management strategy, the arrival of equipment and especially the top dresser, a switch to sand only top dressing and the amount of sand applied plus controlling the rate of build-up. The reduction particularly applies to the top 40mm.

As can be seen in the following photograph, the organic matter situation is not a major one but we still need to accelerate the process of improvement to gain better playing quality, particularly in

wetter weather. However, there are encouraging signs of natural breakdown and with the fertiliser programme plus amendments, helping aeration to develop deeper root growth. This is very encouraging.



Organic matter reduction is broadly static but there are early signs of an increase in reduction and the aim is to keep up the pressure over the coming 9 months.

Grass Composition

As you are well aware the main issue experienced in the immediate past has related to differential growth between annual meadow grass and bent. In the spring it is all about encouraging infilling and then knocking down stronger growth followed by refinement. To your credit, following the slow start hampered by the exceptionally cold spring, the additional treatments in May, June, July and August have helped this process, which was very noticeable on the day. As bent produces about half as much organic matter in a year given the same maintenance programme as annual meadow grass, then clearly there is a real plus in adjusting the maintenance to encourage fine grass and weaken the annual meadow grass, yet retaining playing quality.

Bent generally provides the best putting surfaces with the least maintenance problems and has a lower input requirement. So the strategy for the future will be adjusting the maintenance programme to favour the finer grasses and to speed up the rate of progress through oversowing, as is current practice. However, we did discuss adjustments in the schedule to try and gain a better end result in terms of persistence and enhancing playing quality whilst going through the process.

Summer Playing Quality

The number one issue on the day was the volume of grass, which was adversely affecting surface uniformity and pace in the muggy weather and strong growing conditions. Immediate refinements were recommended in terms of the height of cut plus refinement as resources are made available e.g. rolling, double cutting and verticutting.

Surface blemishes were confined to some active fusarium, which did warrant control and significant worm casting e.g. the 2nd. Discussions centred around reducing the effect of smearing.

STRI Programme

Introduction

As in the past the full range of STRI Programme tests were carried out on the day using the same greens as in the past for comparison and consistency, namely the 2nd, 7th and 8th. With taking the weakest, best and average greens the aim is to achieve good consistency overall and within target range so that other greens can be associated with one of these categories and appropriate work scheduled for these based on the results gained.

Year on year the data collection process is improved and positive changes made for 2015 include the aforementioned testing of organic matter samples and chemical analysis prior to the visit so that we have the results for discussion on the day. This worked well. In addition the report format has been altered with appendix 1 at the end of the report, containing a protocol sheet for testing to be used as reference as well as putting the performance table and performance/organic matter bar chart results together for ease of reference.

The factors affecting testing and analysis on the day are recorded as 2mm of rain overnight with 8mm over the weekend plus 30mm the previous weekend. In addition to the three greens tested, we also looked at the 18th green and following testing carried out a further cut with the triple mower at the 4mm height of cut followed by retesting again for pace and surface uniformity.

Surface Playing Quality Analysis

In appendix 1 the summary table shows the values for the day and relates to consistency from green to green and within greens. In this respect there was good consistency across the board in terms of green speed, smoothness, trueness, firmness and moisture content. The exceptions were a slightly lower firmness reading for green 8, possibly due to surface runoff, as reported on the day and a higher smoothness and trueness reading, which could well be related to the fact that they is slightly more differential between annual meadow grass and bent here than the other greens. Nevertheless, overall consistency was good, including within putting surfaces, especially for firmness and moisture levels.

In terms of smoothness and trueness, it was noticeable that values were better on the up and down runs and diagonal rather than across and this could well relate to mowing patterns i.e. during the year the mowing pattern would be more up and down and slight diagonal than across. It does take time but it would be worth considering redressing the balance.

Turning to the bar charts in appendix 1, these relate to target ranges and progress over time. Starting with the moisture content, the values have not really changed over the four years i.e. being around 5-10% above the top of the target range. We have to take into account recent rainfall, but even so moisture retention is staying longer than would be desirable and whilst improving does require further attention. A reduction in organic matter would help this process.

Turning to firmness (hardness), the good news is that figures have been consistently within target range and increasing year on year. For 2015, they are in line with the firm category as desired and following significant rainfall, has seen them becoming less firm but still well within the target range. The 18th is lower and may benefit from additional organic matter reduction measures but overall the results here are where we want to see them to maximise playing quality.

In terms of smoothness (bobble) the values have been within target range for the last three years or less, but on this occasion they were well outside predominantly due to excessive growth, as commented on. The additional cut on the 18th highlighted this with a significant amount of grass clippings coming off, aided by a dry cut. Smoothness did improve although it was still outside the target range. Immediate remedial work was therefore advised to bring the level down. Exactly the same comments applied to trueness, as can be seen from the bar chart values.

Green speed was not surprisingly slow, which is disappointing bearing in mind the previous three years were in target range. An additional cut did make a difference but it was still below target range. So the answer lies with improving surface uniformity and pace will come, starting with a reduction in the height of cut.



An additional cut on the 18th green improved pace, surface uniformity and presentation significantly but further refinement was advised to achieve the midsummer standard desired.

Other Points

Green Surrounds

The Club are well aware that green surrounds and bunkers are below the standard desired, both in terms of presentation, definition and playing quality. It all comes down to frequency of treatment and hopefully the additional staffing and resources will result in an improvement. For green surrounds this relates to mowing frequency plus verticutting and extending treatments given to putting surfaces into these areas i.e. aeration, top dressing and fertiliser application.

As mentioned in the past the next stage is bunker refurbishment and in particular strimming and improving the walk-ins through removal of the sand build-up at the entrance and renovation of eroded sections. There is also the question of topping up with sand and raking to give consistent depth throughout the bunker and from bunker to bunker.

Tees

This is another area where lack of frequency of treatment is leading to poor presentation and recovery capacity from wear and tear. Within increased resources a positive step forward has been taken in respect of a few tees i.e. scarification, top dressing and oversowing and it is hoped this can be pushed out to include all tees this autumn along with other work i.e. mowing frequency, regular divoting and spreading wear more effectively through tee marker positioning.

Resources

Manpower, machinery and materials have been at a much lower level than desired for an 18 hole golf course of this standing. It is therefore very heartening to find investment has been made in a new utility vehicle to improve efficiency and to develop the top dressing programme with the purchase of a Dakota top dresser and sweep and fill brush system. The early signs are very positive and hopefully these can all be used to maximum effect in the coming months.

The other element is manpower/facilities, which have been improved through provision of the toilet and showers and in particular staffing levels. Adjustments have been made following earlier problems and hopefully these will be finally resolved shortly and we can build on the numbers to the minimum level really needed to achieve the standards desired on all areas i.e. one plus four plus a part time summer helper.

Key Recommendations

Greens

Summer Playing Quality

- I recommended an immediate 0.25mm drop in the height of cut and this will have an immediate effect in terms of speed and surface uniformity but will take two or three cuts to gain the maximum benefit.
- The sward vigour and density plus strong growing conditions under favourable weather mean that this can be achieved without weakening the sward. I would even consider a further 0.25mm reduction if the sward will take it.
- There has only been one verticut treatment to date i.e. in June. Before the next top dressing I would recommend verticutting again. This will help the situation and with the reduction in height of cut, reduce moisture retention at the surface and hence lower the risk of fusarium.
- In terms of the fusarium, this was quite active and weather conditions were conducive to spread. Therefore I did recommend treatment on the affected greens with a systemic approved fungicide.

- An approved growth regulator such as Primo-Maxx or Maintain will help to thicken out the sward and reduce top growth. One application has been made in August but really we need to start this much earlier as growth picks up to 10.5°C soil temperature. Bear this in mind for 2016. In the meantime repeat the August treatment in September and possibly October, even if it is half the rate.
- One additional treatment you could consider is the product Spike, which is potassium silicate from Rigby Taylor. This makes the grass cell walls more turgid and therefore the grass stands up. I have found this helps in tandem with verticutting so is something I would strongly consider. It has been very effective elsewhere. I would suggest a three to four weekly application in the growing season prior to cutting.
- Continue with good rolling practices but remember this effect is short lived i.e. a day and in the current strong growing conditions you would be better with a double cut with rolling confined to special events.

Grass Composition

- First of all the current seed mixture is a good quality one and I am perfectly happy continuing with it. Secondly, we have been seeding on a regular basis but I feel the best chance of success would be towards the end of September when we have warm soil temperatures, moisture guaranteed thereafter, still adequate growth for germination and establishment and you are relaxing the maintenance regimes i.e. mowing height and verticutting.
- Introduction of seed is vital and the general recommendation is to avoid seeding on the surface or below 12mm (½ in). Target the zone in between with your Dyna-seeders.
- During the season, if thin or bare areas form for whatever reason or we have weak sections of annual meadow grass, then do overseed locally with surface pricking and working in browntop bent seed mixed with top dressing. With overall oversowing always stick to the manufacturer's recommended rate, which is the optimum one. Doubling the rate not only costs more but also leads to a thinner, weaker sward which is vulnerable to disease such as damping off.

Organic Matter

- The first process is to encourage natural breakdown through bacterial action and while your amendment programme might help in this respect through improving the rootzone environment, the main processes are through oxygen supply to encourage the bacteria i.e. aeration and top dressing. Therefore continue with a regular Sarel rolling but add in solid tining and deeper work such as the air blasting/verti-draining. The 6mm diameter verti-draining operation through May to August is to be commended as well.
- Moving onto top dressing, the switch to sand only will help the organic matter reduction and should be continued, even considering light winter applications if ground and weather conditions permit (in tandem with solid tining). It is important to aim for at least 100 tonnes per year and in respect of the current sand, if there are problems then bring this to the attention of the supplier and if there is no improvement then you can consider an alternative. It should be of the same particle size distribution and be lime free so ask the supplier for a specification sheet and have it tested independently. This is a service we can provide.
- The next element is to control the rate of build-up and this relates to irrigation input in drier weather and in particular fertiliser. The more growth, the more dieback so restrict nitrogen input to around 80kg/N/ha per year and try and achieve the fine balance by encouraging the bent component of the sward and weakening the annual meadow grass yet retaining playing quality.

We know this is a difficult balance to achieve but it is the aim. Nitrogen inputs should be recorded to evaluate the amount applied.

- With these two options in place, then the next element is physical removal to speed up the process i.e. verticutting, hollow tining or scarifying. With regard to the autumn programme, it was agreed that the best option would be a Graden with sand injector to a depth of 20mm (preferably 30mm) ensuring the slits are fully filled in. Give time for recovery. I confirm that this form of work takes out more organic matter material than hollow tining and targets the immediate surface layers where we have the greatest issue.

Worm Control

- Worm activity was significant as can be seen in the following photograph on the 2nd green. As discussed worms are beneficial in that they aerate the soil and break up compaction and the majority of species do not cast. However, in this instance there has been significant smearing and this affects surface uniformity, surface drainage and can increase the amount of weeds present through bringing up weed seed from underneath and smearing, forming a seed bed. Therefore in this instance we have to look at suppressant measures.
- For greens, removing clippings is standard but does help in reducing the food source and should therefore continue.
- Secondly, avoid limey materials inadvertently applied i.e. check your top dressing plus bunker sand and water supply for lime content. On the other hand do apply acidifying materials as the pH from the chemical analysis shows we are in the right category to encourage finer grasses i.e. between 5.0 and 5.5. Therefore acidification through the use of sulphate of ammonia/sulphate of iron is to be welcomed and especially the latter through the autumn to spring period.
- The third element is to use an approved product based on carbendazim to act as an irritant and suppress casting. To improve the effectiveness add in an acidifier such as Aqua-tick or similar and a penetrant such as Pervade or equivalent.
- Sand dressings in the winter, when appropriate will help the process by acting as an abrasive irritant and also work well on traffic routes in a similar fashion as well as stabilising the surface against wear and tear in the winter i.e. overall sanding and verti-draining in. All of these processes are recommended.

Other Points

Green Surrounds

- Do what you can to extend treatment into collars and aprons, including regular mowing, occasional verticutting/scarifying and during the winter applications of iron, switching when there is a dew and occasional topping as all of these prevent moisture retention and the risk of disease, which can then spread to the greens.
- In the long term I would budget for extension of aprons for definition, presentation and playing quality reasons but as an immediate priority concentrate on bunker refurbishment, including regular raking, strimming and tidying up edges plus removing weed and looking to budget for an autumn programme of renovation especially along the entrance edge. Here I advised removing the sand build-up from raking backwards towards the entrance and then re-turfing along the edge, taking in eroded areas including surface level improvement and removing excess sand and

introducing appropriate rootzone. Complete the work as early as possible to give maximum time for knitting in and rope off.

- Continue with other aspects such as weed control and avoiding dry patch through hand watering.

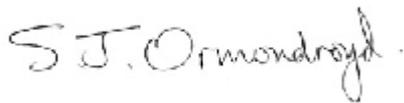
Tees

- Extend the scarification, top dressing and oversowing programme to all tees this autumn using the deep scarifier and for the general programme I would look at trying increase mowing frequency in the main growing season to say three times a week, ideally scarifying monthly and divoting weekly and in particular the Par 3's. For the latter, top dressing between hole marker positions rather than individual divoting is quicker, more efficient and gives a better end result.
- Ensure wear is always spread evenly throughout the width of the tee with two or three lateral tee marker movements and where there is width, especially the middle section as often I see wear down the two edges only.

Resources

- It was agreed that we chase up the supplier for the Dakota top dresser and use this to maximum effect on greens as soon as it arrives, using the sweep and fill brush to improve efficiency. Remember the unit could be employed on other areas with good results e.g. sanding extended aprons and the aforementioned sanding/verti-draining traffic routes. You could also look at occasional overall top dressing for selected tees.
- I would recommend adopting a Course Policy Document for consistency and a planned phased strategy in terms of an overall management plan. The areas discussed during the report should be included.
- I do hope we can sort out the staffing issues in the short term and build towards the one plus four plus one part time summer helper as this will make a difference in achieving the additional aims laid out in the report.

Signed



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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.

The STRI Programme provides golf courses with measurements and data that help to monitor and assess golf course performance. The R&A has recently developed CourseTracker (www.coursetracker.org), a free, online business management tool for golf courses, to record, review and analyse golf club performance across many areas of your business, including the golf course. STRI believes The R&A CourseTracker combined with the STRI Programme provides the tools you need to objectively monitor and assess your golf course performance.

APPENDIX 1

PERFORMANCE DATA

Performance Data

STRI Programme Measurement Protocols

By taking measurements of the playing qualities you can accurately describe the standards being set and also compare the results against the target performance levels. Essentially, the aim is to produce a set of greens that receive approach shots correctly then provide smooth/true and well-paced surfaces for putting. It is important that the greens are performing consistently on any given day and as well as possible throughout the year.

Soil Moisture Content

The soil moisture content is measured using a Theta Probe Moisture Meter. Nine points are sampled on each green (3 x 3 grid pattern) and the average calculated. The Theta Probe measures volumetric water content (VWC) through the upper 60mm of the soil profile.

The moisture content of the soil profile has a significant impact on the playing qualities of the greens and also the health of the turf. When the soil moisture content is too high, the surfaces can become soft and the turf health can also suffer. When the soil moisture content is too low the consistency and uniformity of the turf can become compromised.

Surface Firmness/Hardness

The firmness of the greens is measured using the Clegg Impact Hammer. A 9-point sampling grid was employed to allow us to calculate an average hardness reading for each green and also determine the level of consistency within the 9 readings.

Green Speed

The speed of the greens is measured using a Stimpmeter. The speed is expressed as the average distance rolled by 3 golf balls that are delivered from the Stimpmeter ramp on a flat area of the green and repeated in the opposite direction. The greater the distance the faster the surface is deemed to be. At least two readings are taken from each green then the results were calculated using the Brede equation to take out any slope effects.

Smoothness/Trueness

The smoothness and trueness of the selected greens is measured using the Trueness Meter™. This device measures the smoothness (vertical deviation) and trueness (lateral deviation) of the putting surfaces with the level of deviation being expressed in millimetres per metre (mm/m). With these results, lower readings indicate a smoother or truer surface.

The aim when maintaining the greens is to produce surfaces that are smooth and true for putting for as long as possible throughout the year. You are aiming to create smooth and true surfaces for putting that do not deflect the ball from its intended path ("snaking") or kill its momentum ("bobbling" and "chattering"). During the main playing season, the target range for smoothness is <25 mm/m of vertical deviation and for trueness <10 mm/m of lateral deflection. The lower end of these target ranges represents excellent putting surfaces with the higher end providing really good standards for routine play. These target ranges are very challenging but we are striving to achieve the highest standards of play.

Performance Measurement Results							
Green No.	Speed (distance)	Smoothness (mm/m)	Trueness (mm/m)	Firmness Mean (gravities)	Firmness SEM (±)	Moisture Content (%)	Moisture Content SEM (±)
2	7 ft 3 in	28.1	13.3	91	1	35.0	1.1
7	7 ft 5 in	27.8	13.2	97	2	38.2	0.8
8	7 ft 3 in	27.1	11.7	85	1	39.5	1.3
18	7 ft 3 in	29.4	16.7	94	1	38.1	0.8
18DCUT	8 ft 0 in	27.4	14.6				

Figure 1

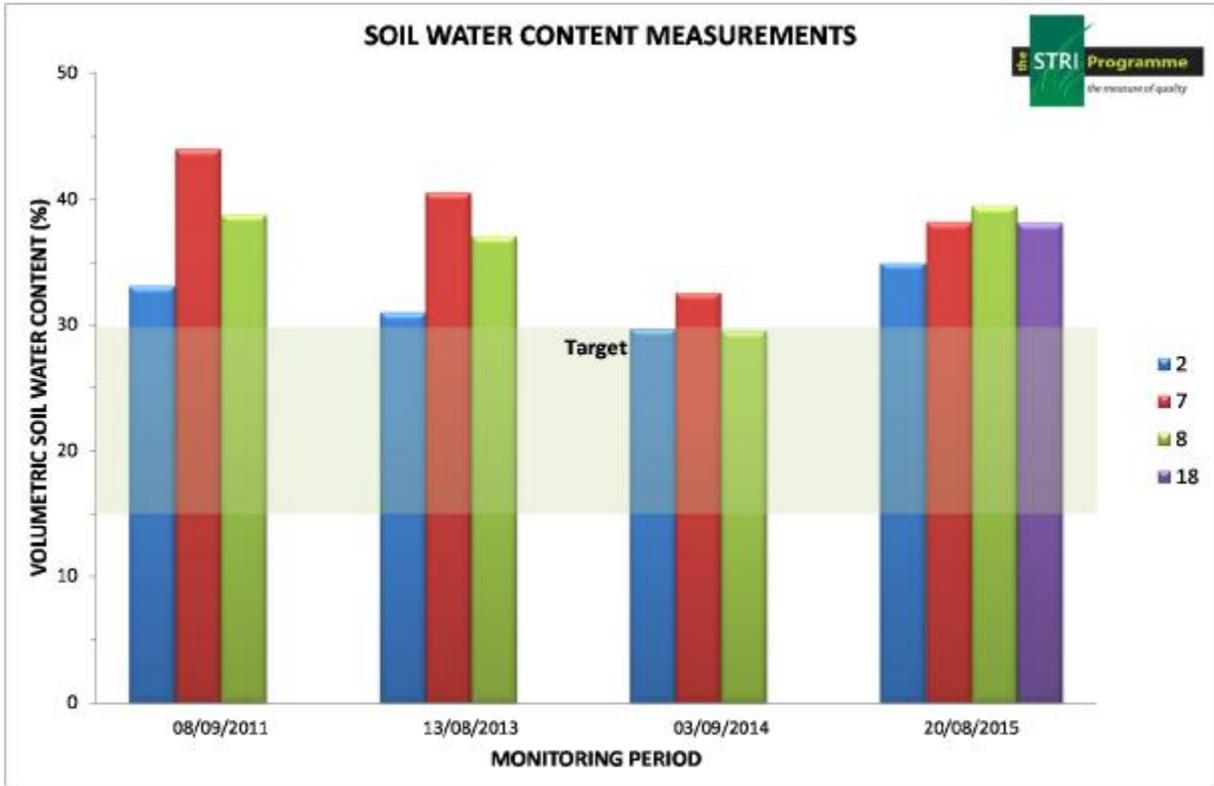


Figure 2

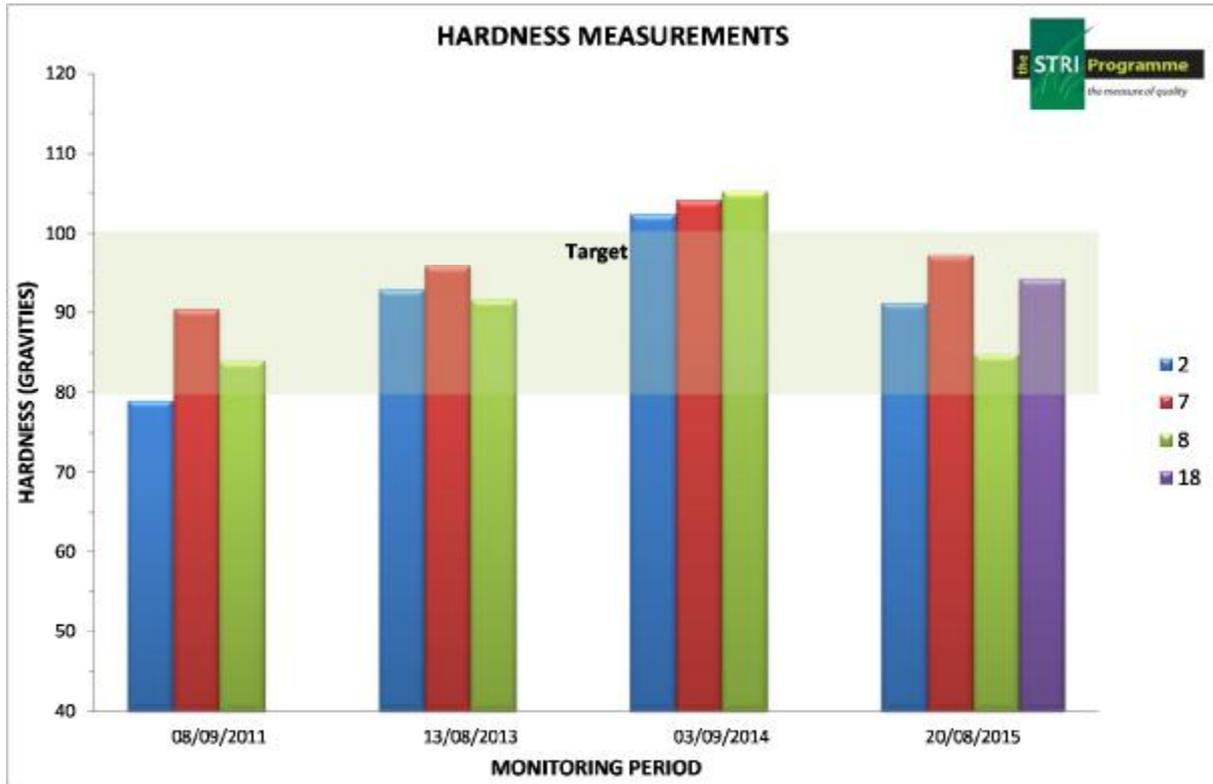


Figure 3

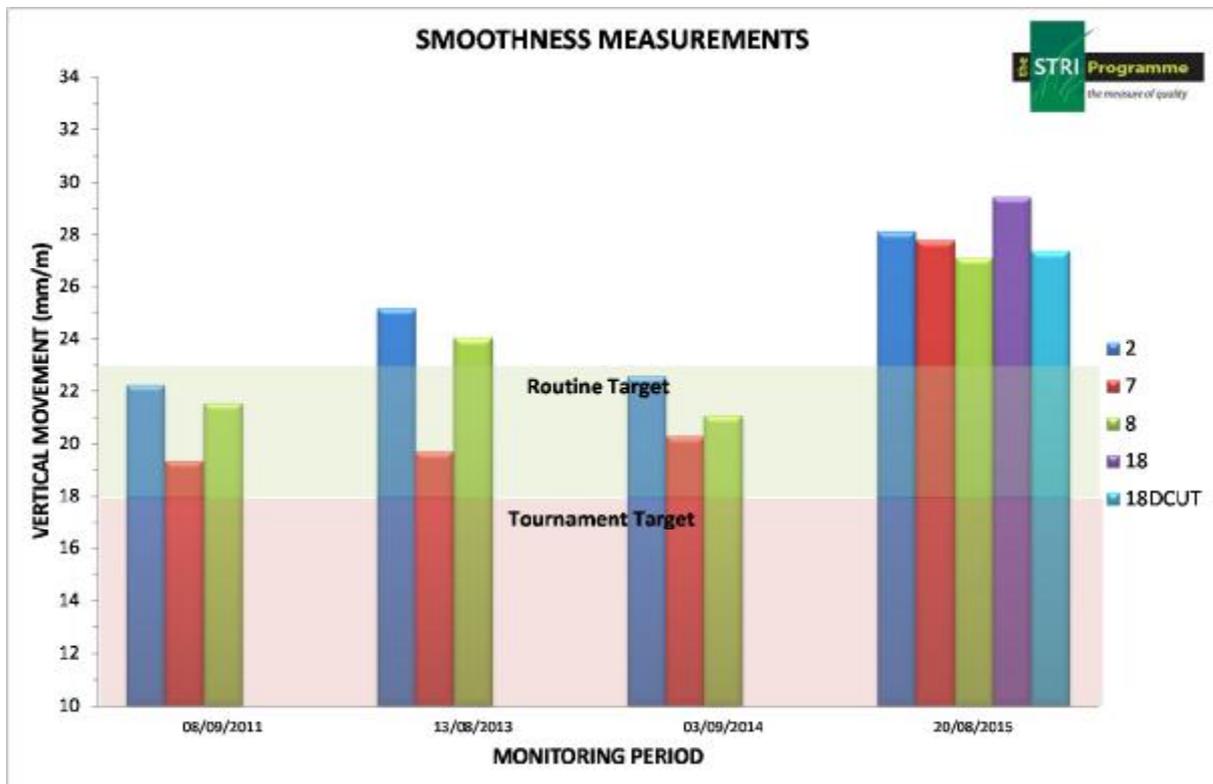


Figure 4

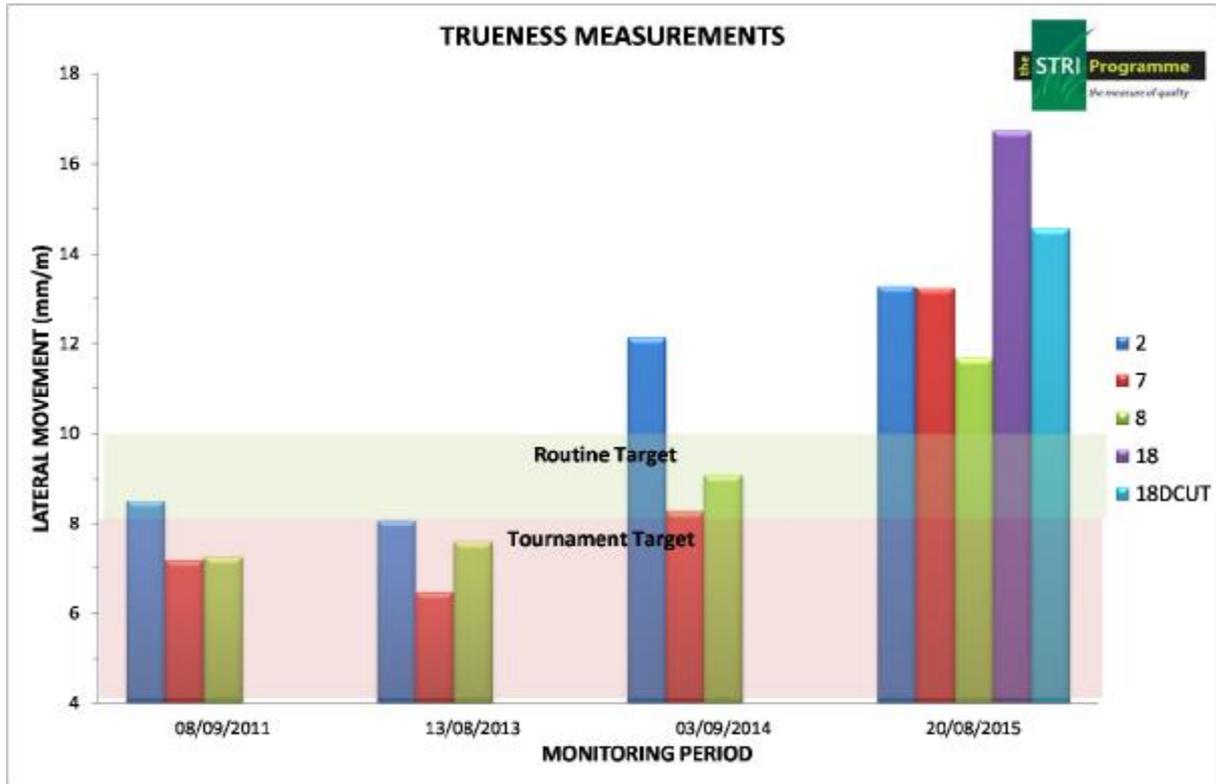


Figure 5

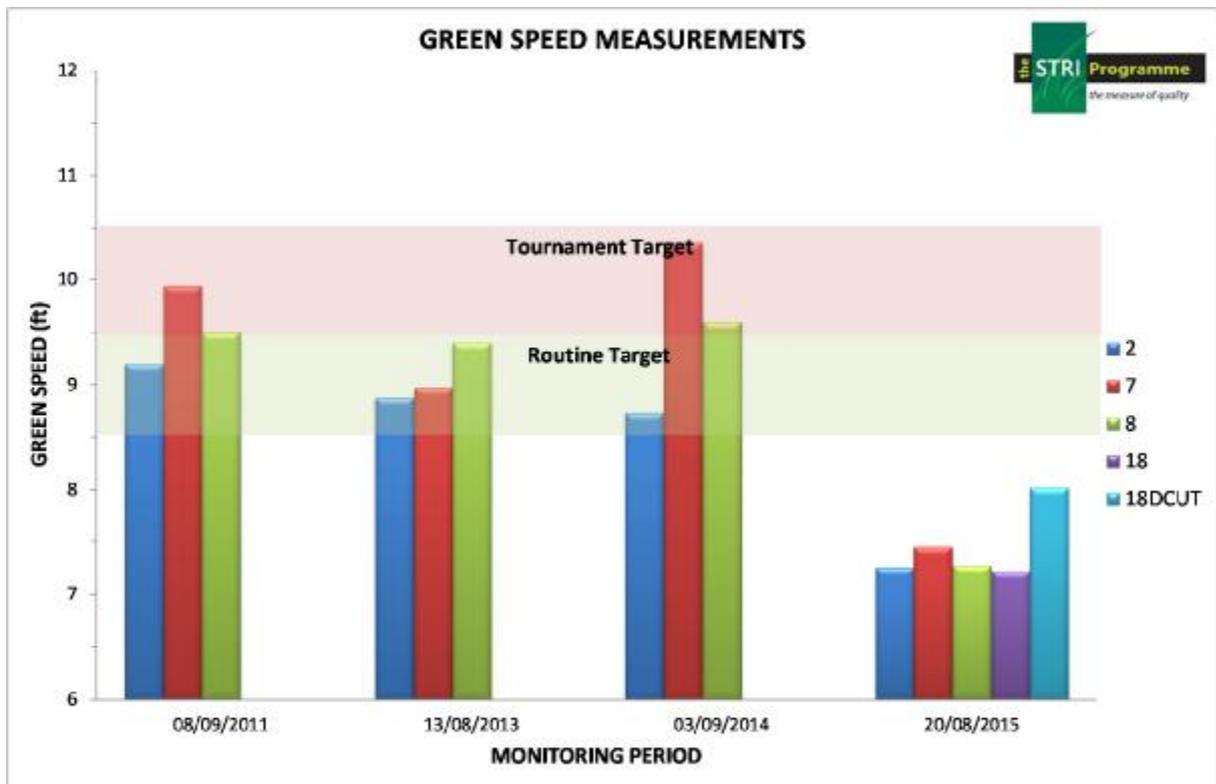


Figure 6

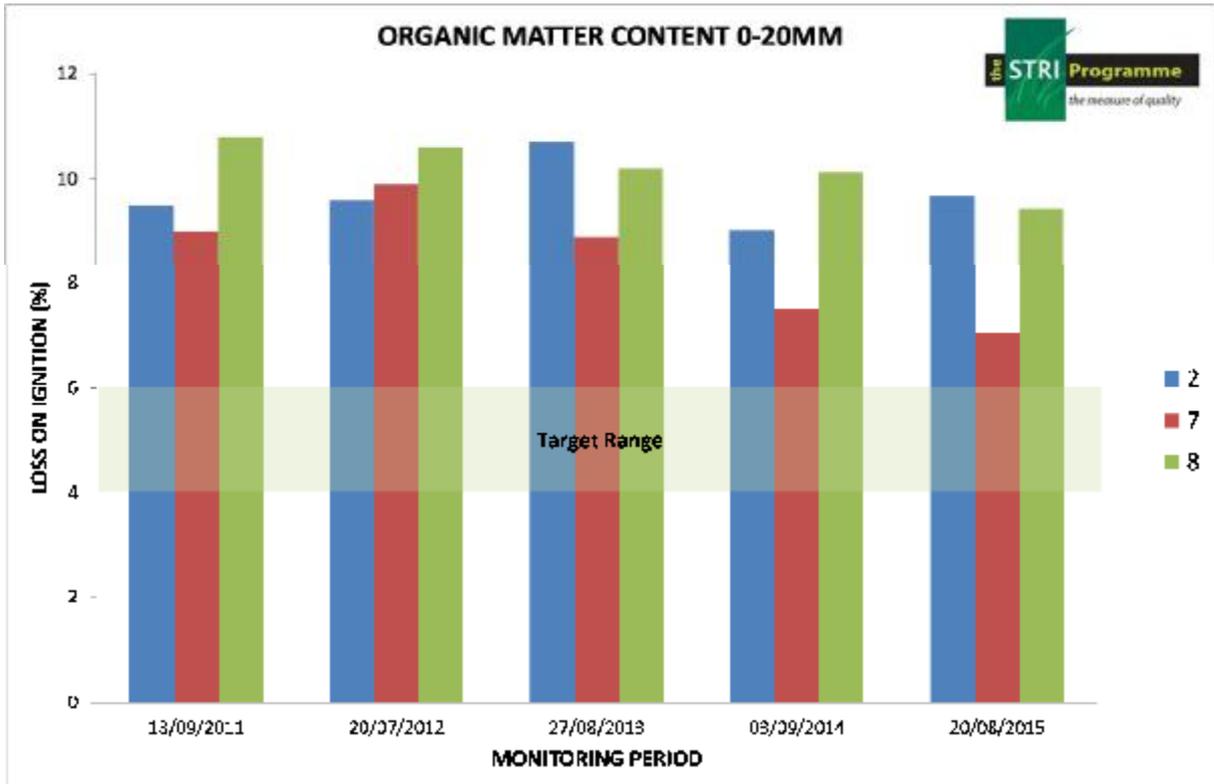


Figure 7

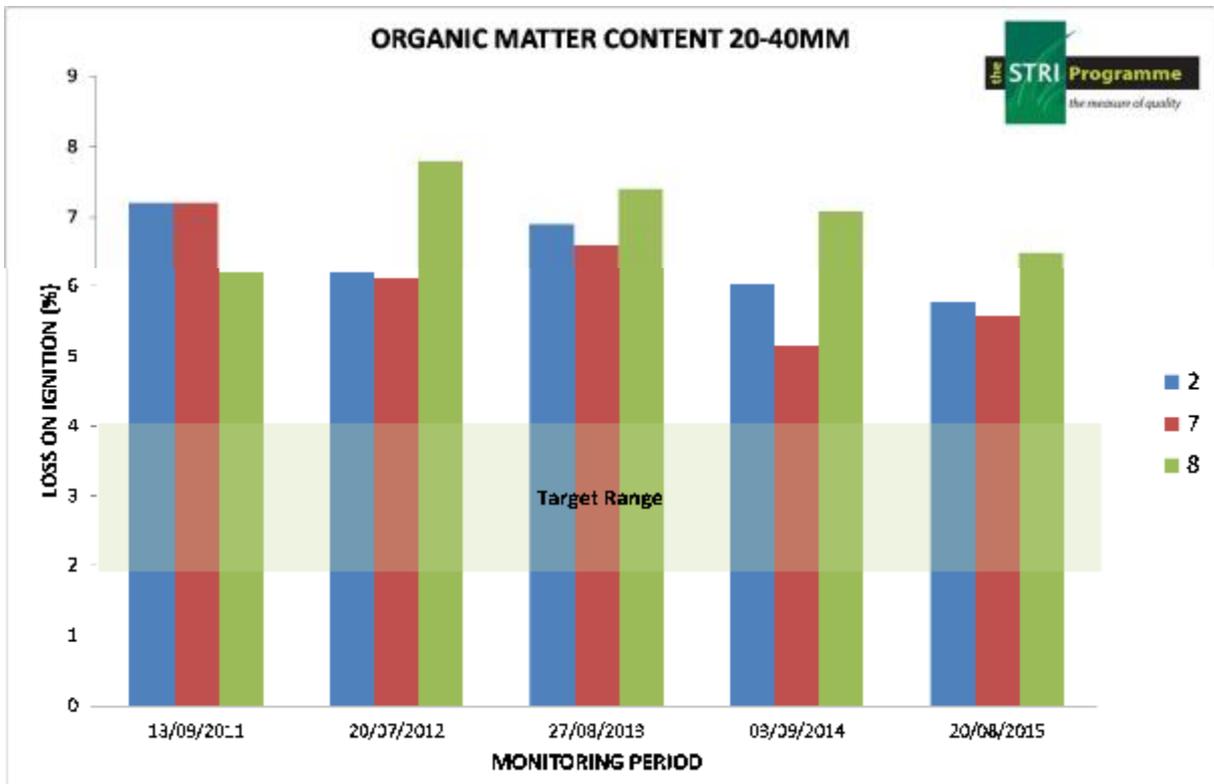


Figure 8

