



Greystones Golf Club

Report on the golf course incorporating
programme performance testing

Report date: 8th August 2023 – Revised 16/08/2023

Consultant: Conor Nolan

Date of visit:	2 nd August 2023
Visit objective:	To objectively measure greens playing quality in addition to review of overall course condition and provision of general advice on maintenance issues throughout the course. Data collection was postponed until the 15 th of August due to persistent rainfall on the day of the initial visit.
Present:	Mr F Wheeler – Greens Convenor, Mr L Moulton – General Manager Mr K Clancy – Head Greenkeeper, Conor Nolan – STRI Group Ltd Conor Nolan – STRI Group Ltd
Weather:	14-16C, persistent rain. 13mm day previous. Wet since mid-June following a very dry period.

Introduction

Our previous visit was in July 2022 at which time the establishment of bentgrass was very significant to the vast majority of greens. The aprons remain generally uniform and well presented, although establishment of better grass type was preferred. Ball support to fairways was very good with some light drought noted only.

The document details the following:

- [Executive summary](#)
- [Essential actions](#)
- [Record of site conditions](#)
- [Recommendations](#)
- [Graphs of performance data and soil results](#)

Executive summary

- The putting surfaces continue to be beautifully managed. They offered very good ball roll and good conditions underfoot despite the wet weather.
- Bentgrass increase to greens is progressing well considering the high traffic. To some greens where foot traffic is more concentrated progress is slower.
- The extension to the 3rd green was well executed and adds more pin positions to take pressure of central parts.
- The aprons and surrounds were generally uniform with no spotty ryegrass of significance seen. Green complexes like the entire course was very well defined.
- Teeing surfaces offered very good grass cover. No softening down was noted of significance despite the wet weather.
- Ball support to fairways was very good. Some softness was noted to the newer 4th hole.
- The quality of the 1st cut of rough reflected the effort and quality of course being delivered. It was superb.
- Enhancement overall is largely about improving grass species to reduce vulnerabilities to weather and legislative changes.
- Course staff should be heavily praised as they are overachieving. Standards are very high.

Essential actions

- Move play away from the traditional spots (which are much weaker to some greens) more often if you can to places where there is a higher percentage of bentgrass and closer to the sides.
- Further green extensions are encouraged and supported to the 1st, 4th and 6th greens in-house. In the case of the 4th and 6th extension to the rears seem the best options given the terrain. To the 1st overcoming the current design that channels balls and traffic towards the centre would most probably demand removal of the left side shoulder and widening the green in that area.
- It should be clear from reports over the years that foot traffic along with other variables such as watering practice is a key factor in determining successful speed of bentgrass establishment. With your higher traffic levels any rest days with inclement weather would be welcome as would curtailment of the annual number of playing rounds. A set upper threshold of 40,000 annual rounds would be preferable to be most confident of achieving a high level of bentgrass population and uniformity.
- That putting surfaces are blackened by iron sulphate is something that players will have to become more accustomed to as it forms a significant part of suppressing conditions for disease activity during the autumn/winter period. Apply at 35-40kg/hectare in 400 litres of water as often as every one to two weeks.
- Overseeding of the aprons with bred grasses is desired to enhance playability and year round performance. Plant pot twice per year i.e. April and late September/early October using Bar Ultrafine 60 which comprises fine diploid ryegrasses and slender creeping red fescue. Use 16mm diameter solid tines and sow at 80kg/hectare.
- Fertiliser application to tees and fairways in the future would be best by foliar application to deliver a level that allows overseeding to have benefit as well as giving more consistency of growth.

Performance data summary table

Greens set up: 3.5mm (pedestrian cylinder mower)

Measurement	Average	Target range
Soil moisture (%)	% (25.5-29.9)	25-32%
Hardness (gravities)	g (102-105)	90-110 g
Smoothness (mm/m)	15.50 - 19.39 mm/m	<23 mm/m
Trueness (mm/m)	6.17 - 9.39 mm/m	<10 mm/m
Green speed	9ft 6 in - 10ft 7in	9-10 ft
Organic matter 0-20mm (%)	3.99-4.24 %	3.5-4.5%
Organic matter 20-40mm (%)	2.26-2.37 %	<4%
Soil pH	6.4-6.6	5.5-7.5
Phosphate (P ₂ O ₅)	43-57 mg/l	10-30 mg/l
Potassium (K ₂ O)	28-35 mg/l	15-30 mg/l

Key:

In target

Marginal variance

Out of target

Key points from the performance data:

- Data was very good all round. Speed had not suffered much despite the slightly higher height of cut more favourable to bentgrass promotion.
- That the 12th and 16th were well within tournament target for smoothness was very pleasing. The 8th was not quite as good which has tended to be the case and may well be due to the presence of older bentgrass types and more concentrated ball marks. It is also the green that presented more niggling anthracnose (disease of annual meadow-grass).
- Organic matter content being slightly higher in recent years but still within target has made for more favourable receptivity levels, and rightly so.

Record of site conditions



Photo 1: The 8th green in particular has come a long way over the last few years in terms of bentgrass spread. Then it was primarily limited to the left side. I suspect that raising the summer height of cut has helped. Note that there are a fewer and fewer paler patches of annual meadow-grass, the grass we are gradually replacing due to its need for fungicide etc.



Photo 2: Bentgrass has continued to spread on the first towards the centre. Note the paler section to the middle where meadow-grass is holding on because balls and play tends to congregate in that zone. How bent will colonise those central areas remains to be seen.



Photo 3: Hardly any bentgrass spots were seen to the 10th green above last year. It has progressed the most of all. It was always surprising that it hadn't give the good level of pinnable area.



Photo 4: The add-on to the 3rd was very well executed with minimal disruption. That 30% compost organic amendment was used is helping rooting (i.e. 65mm)



Photo 5: Even the more exposed 7th green had seen substantial bentgrass increase. As bentgrass increases the greens become more and more inviting and of course helps secure the future.



Photo 6: Drier conditions from previous tree root activity on the 15th green stifling bentgrass spread which is probably the reason why bentgrass is of low population to the very rear of the 11th, albeit it is also water shedding.



Photo 7: Is it any wonder that the 18th green has so much bentgrass. The ability to spread wear is allowing input to come through and bentgrass to dominate.



Photo 7: Laboratory testing and visual assessment of the profiles indicate sand input is controlling organic matter well enough as seen to the 2nd green above.



Photo 8: The most impressive section of apron was seen to the rear of the 14th whereby fescue and bentgrass dominated. To most others annual meadow-grass is the main grass, a grass that can collapse due to dryness and disease. It is also a sticky grass that hampers ball roll.



Photo 9: The well grassed and attractive 13th tee. Higher ryegrass content would be preferred for many reasons including durability and less fertiliser demand.

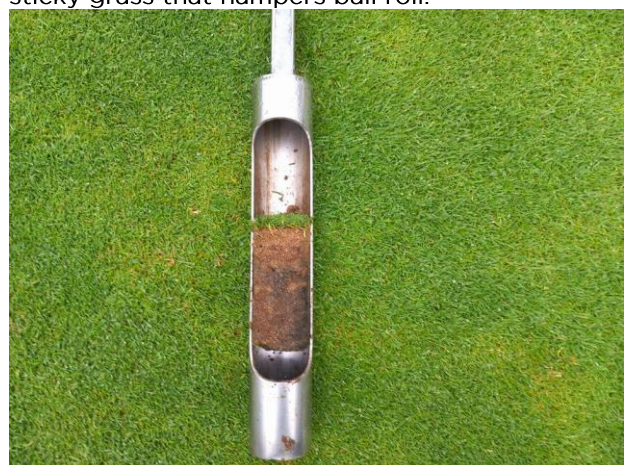


Photo 10: The 17th tee profile indicating good sand inputs and subsequently better stability underfoot. They were all holding up well under the persistent rain on the day and wet weather of late.



Photo 11: The 10th fairway was typical of the quality of ball lie and uniformity of appearance. Some surface water was felt underfoot on the 4th.



Photo 12: Some casts were found to fairways such as the 17th above which is no surprise. The better quality turf tended to be on the newer ground where ryegrass dominated.



Photo 13: Excellent definition was typified in the photo of the 8th hole above.



Photo 14: It's not from lack of sand input that the lower a shaded side of the 9th fairway is softer. It's the topography that's the main issue.

Pesticide Update

The current rules of the [Sustainable Use of Pesticides Directive](#) have proven to be too weak and have been unevenly implemented according to the EU Commission. Also, insufficient progress has been made in the use of Integrated Pest Management as well as other alternative approaches. Chemical pesticides harm human health and cause biodiversity decline in agricultural areas. They contaminate the air, the water and the wider environment. The Commission is therefore proposing clear and binding rules.

The proposal for a new Sustainable Use of Pesticide Regulation (SUPR) was therefore launched on the 22nd of June last year by the EU Commission. It will be directly binding on all member states and without the need to transpose it through national laws. The proposal delivers on a key element of the [European Green Deal](#): the [Biodiversity Strategy for 2030](#) commitment for Europe to lead by example on reversing biodiversity loss and restoring nature. It is the EU's key contribution in the ongoing negotiations on a post-2020 Global Biodiversity Framework.

“The problem we had in the past is that there was way too much room for manoeuvre in how to interpret the directive,” said a Commission official explaining the reasons behind the change in the legal framework.

“The EU needs to change course on pesticides”, “the overuse of pesticides poses major risks to human health and biodiversity”. - stated Stella Kyriakides, the European Commissioner for Health and Food Safety.

The regulation will include a ban on the use of pesticides in what are deemed sensitive areas. These are defined as urban green areas, public parks, gardens, playgrounds, recreation sports grounds, and ecologically sensitive areas. One would believe that golf courses come under recreation sports grounds. The regulation will have to be voted on by the parliament which is expected to occur within a year.

https://food.ec.europa.eu/system/files/2022-06/pesticides_sud_eval_2022_reg_2022-305_en.pdf

https://ec.europa.eu/commission/presscorner/detail/en/ip_22_3746

The European Commission proposed regulations on pesticide use and banning use in recreational areas is due to be voted on by the parliament in early October.

<https://www.euractiv.com/section/agriculture-food/news/meps-agree-eu-pesticide-reduction-plan-votes-pushing-final-deal-into-2024/>

Recommendations

Greens

- To favour bentgrass during the summer irrespective of wet weather aim for a moisture content of 22-28% (TDR 350) or 25-30% (Delta-T). Continue to apply ICL H2Pro Trismart wetting agent but do it every two weeks at 10 litres per hectare to help deliver the moisture target with greater certainty in dry spells. A fortnightly application interval should deliver more control and help reduce fairy ring. It can be added to applications of iron sulphate and indeed fertiliser to save time.
- Continue to make regular applications of Aqueduct Flex (Aquatrols) or ICL H2Pro Conserve granular wetting agent to high parts prone to drought and existing localised dry spot even during wet weather. Repeat every three weeks at 2.5kg/100m² until October.
- Move play away from the traditional spots (which are much weaker to some greens) more often to places where there is a higher percentage of bentgrass and more close to the sides.
- Green extensions are encouraged and supported to the 1st, 4th and 6th greens in-house. In the case of the 4th and 6th extension to the rears seem the best options given the terrain. To the 1st, overcoming the current design that channels balls and traffic towards the centre would most probably demand removal of the left side shoulder and widening the green in that area. Continue to use 30% compost as a rootzone amendment, as on the 3rd.
- It should be clear from reports over the years that foot traffic along with other variables such as watering practice is a key factor in determining successful speed of bentgrass establishment. With your higher traffic levels any rest days with inclement weather would be welcome as would curtailment of the annual number of playing rounds. A set upper threshold of 40,000 annual rounds would be preferable to be most confident of achieving a high level of bentgrass population and uniformity.
- When extending greens request ryegrass free sward dominated by annual meadow-grass so that you have a 'blank canvas' to which you can add known bentgrasses from seed in the future.
- The approach to nutrition is balancing playability and grass improvement very well and is based on visual assessment and clipping yield. Rates that supply 0.30-0.4g of nitrogen/m² are still appropriate as is a year-end total of 70-80kg/hectare.
- Continue to maintain a main season height of cut of 3.5mm (pedestrian cylinder mower) before gradually rising in early October to reach 5.0mm in early November. Hold the latter until March to favour bentgrasses.
- It would be beneficial to bentgrass spread and establishment if mowing were skipped a couple of times per week or at least on the day of sand application.
- The seed mixture for overseeding greens shall remain with 50% quality browntop bentgrass and 50% creeping bentgrass. Use Arrowtown, Cleek or Manor as some recent research has shown vulnerability of Charles to Fusarium patch disease. Cleek is demonstrating some added tolerance to Fusarium patch. Avoid Pure Select creeping bentgrass as there is little data to support its use. Choose creeping bentgrass that are well rated for dollar spot disease (e.g. Ignite, 007, L93XD, Tourpro or Riptide).
- Additional seed should be added to patches of turf thinned by anthracnose as they appear. Scatter the seed and press into the surface with a Bray slot seeder or hand fork.
- Thankfully no mechanical disturbance pressures (verticutting/grooming) are deployed or necessary while turf ironing is limited to a very low level.
- Continue to apply manganese as a pre-cautionary measure against Take-all patch disease. Apply as manganese sulphate (32% manganese concentration) at 10kg/hectare in August and late September.

- Efforts will be made to reach the end of year sand input target of 175 tonnes per hectare per year from 120 tonnes at present, although 150 tonnes may be more realistic this year to reduce applying larger amounts during the autumn high disease risk period. Supply in light amounts as you do weekly during the main season.
- Alleviate excessive hardness by solid tinning with 6-8mm diameter tines as often as up to each month.
- Verti-Draining all greens to the 20cms depth in the early part of October is recommended with narrow 8mm diameter tines to reduce vulnerability to hardness the following summer. Deploy no heave.
- Apply iron sulphate at a higher rate of 35kg/hectare or so in 450-500 litres of water to alter conditions that would be otherwise favourable for Fusarium patch if damp warm weather is expected and once activity is first seen during the summer.
- Application of Coragen insecticide is no longer permitted for leatherjacket control. Somewhat oddly Acelepryn insecticide with the same active (a.i. chlorantraniliprole) now has full approval at the labelled rate of 0.6 litres per hectare to control leatherjackets. It replaces the legal agricultural version which could only be applied of late at 0.175 litres per hectare. Acelepryn when applied at peak daddy-long-leg flight (July to October) followed a week later by application of plant entomopathogenic nematodes at half the labelled rate achieves best control of leatherjackets under recent research at STRI.
- From September end each year until March apply the following:
 - Apply Headland ppt114 at 10kg/hectare to trigger the plant defences each month. Increase the rate to 20kg/hectare when disease pressure is high.
 - Apply Headland Turfite SR3 (no phosphite) at 15 litres per hectare to the above each month.
 - Apply Ferrromel 20 (Melspring) powder iron sulphate at 15g/m² with a drop spreader in early November (once there is no frost) and once there is no wind to deliver an intensive quantity of iron. Mow afterwards without the grass collectors. Ferrromel 20 can be purchased online (countrylife.ie).
 - Apply iron sulphate regularly to help dry the leaf and alter the environment. Apply at 35-40kg/hectare in 400 litres of water as often as every one to two weeks. players should expect blackening of the sward.
 - Apply dew dispersal agent (e.g. Dewcure, ICL Dewsmart or Magnum Recoil-Indigrow) separately if dew is forecast when mowing is only required weekly later in the autumn. Repeat at the labelled rate no more than every three weeks.
 - The above are made in addition to preventative applications of fungicide when disease pressure is high between October and December while available to minimise scarring and the need for additional nitrogen.

Green Aprons and Surrounds

- Overseeding of the aprons with bred grasses is desired to enhance playability and year round performance. Plant pot twice per year i.e. April and late September/early October using Bar Ultrafine 60 which comprises fine diploid ryegrasses and slender creeping red fescue. Use 16mm diameter solid tines and sow at 80kg/hectare. Set tines to reach 10-12mm depth. Move the seed to the pots and sand once seedlings emerge.
- Resume tree root pruning to green complexes where roots are competing with turf for moisture e.g. rear 11th.

- Make sure that mowers and other machinery turning off the putting surfaces turn in a slow, broad and varied manner to greatly reduce disturbance pressure and allow the good grasses to develop. It is best to turn in the semi-rough.
- To the green surrounds sand with the fairways to counter softening down in wet weather.

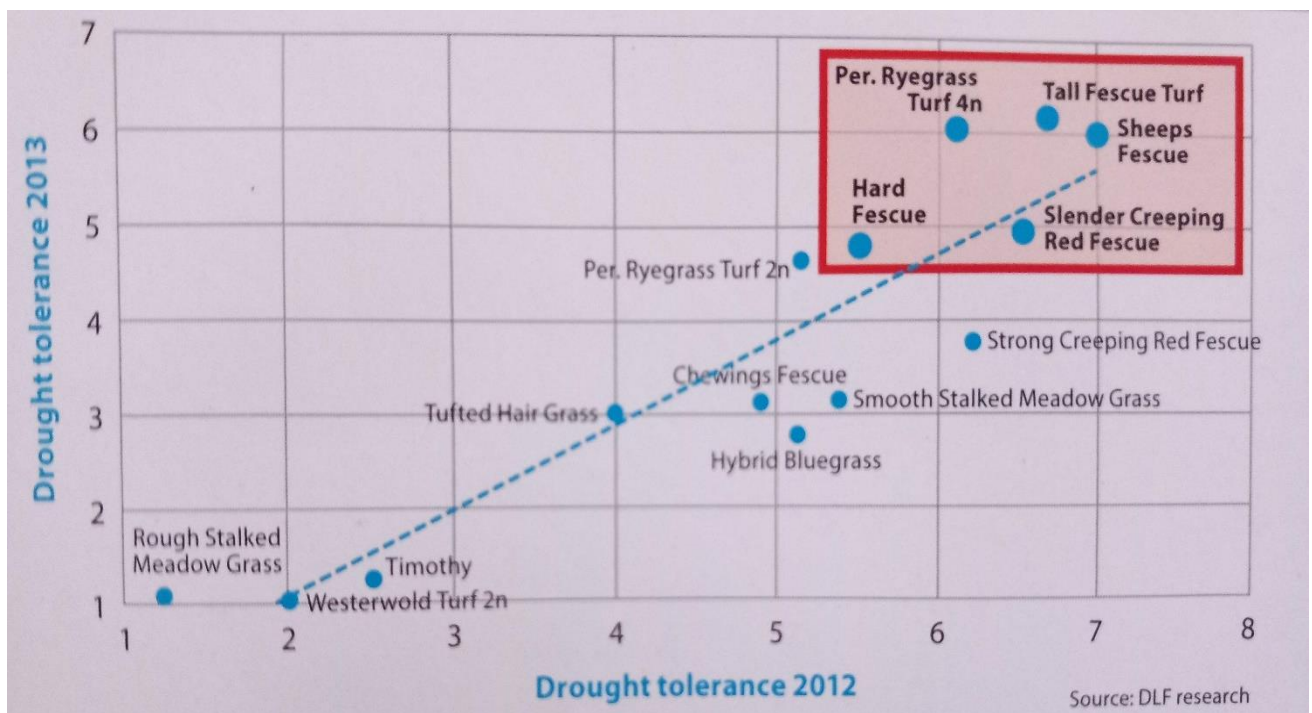
Tees

- To reduce the risk of softening down sand monthly at 20-25 tonnes per hectare during the main season and 15 tonnes per hectare during the low season when growth is less.
- The current approach to fertiliser application is achieving very good recovery from wear but in time I would suggest with reduced nitrogen levels a legal possibility the better way to fertilise tees is out through the sprayer year round. It gives more consistency and control and reduces nitrogen demand and it allows addition of wetting agent and/or iron sulphate. And it reduces competition to a level that achieves benefit from overseeding. Fertilise then with 30:0:0 at 30 litres per hectare or Krista Mag Yara) containing 11% nitrate at 100 litres per hectare every 4 weeks from April until October end. Switch to application of ammonium sulphate at 40-50kg/hectare in 600 litres of water if mild between November and April.
- Verticutting is still recommended to reduce biomass somewhat and help deliver a truer 7mm main season height of cut. A 10-12mm low season height of cut is advised.
- The existing divot mixture should remain as it is serving you well.
- Wetting agent can be added to the above foliar fertiliser applications to help deliver most consistent growth during the summer months. Include ICL H2Pro Tri-Smart at 10 litres per hectare per month until October.
- The conditions for weed growth are reduced greatly by lowering the pH of the upper canopy through use of iron sulphate. 4-5 applications of iron sulphate applied at 40-50kg/hectare in 600 litres of water is probably sufficient to alter growth conditions for weeds. Commence this autumn to see how you will manage without herbicides. Apply with dew or drizzle to get the best oxidising effect. Apply between September and April when fertilising with 30:0:0 and with ammonium sulphate.
- Overseeding of tees should be an annual process at least to enhance durability, presentation and grass cover. Sow with a medium textured diploid Lolium perenne seed mixture e.g. Bar Extreme. Sow at 125kg/hectare using the plant potting technique but only if growth rates are reduced somewhat e.g. 20-25%. Overseeding is a sign of progression.

Fairways

- It would be desirable to sand the fairways with a coarser sand e.g. Darcy's bunker sand, a new 0/3 sand from Wicklow (contact Eddie Fitzachary, Tel: 0872343215) or 0/3 sand from Conways Concrete, Kildavin, Bunclody, (lconwaysons@eircom.net) instead of the finer sportsgrade sand. A coarser sand helps firm up the ground during wet periods, increase surface stability and reduces earthworm casting. Once drier conditions are available during the low season apply at 12-15 tonnes per hectare. If trialling the new Wicklow sand obtain one load first to check for suitability as he is a new entrant to the market.
- Softer fairways sections shall receive a total of 125 tonnes per hectare per year but with 0/3 sand recommended for most effect. To maintain the status quo of others and to keep thatch under control apply a total of 60-70 tonnes per hectare of Wexford sand. Apply both in lighter amounts of 20-25 tonnes per hectare a few times per year to avoid smothering the turf.
- To reduce the impact of lateral bentgrass growth verticutting is required every 4-6 weeks between May and October start. How the grooming rake performs remains to be seen.

- The current approach to fertilising fairways is serving you very well. Top up with occasional nitrogen application in the low season with ammonium sulphate at 40-50kg/hectare in 400 litres of water. Kick start recovery from turf cover lost to earthworm casts in the early to mid-spring with ICL Proturf 21:5:6 or equivalent shall continue and be applied at 25g/m². The existing 3 month controlled release 25% nitrogen granular fertiliser shall follow when natural growth arrives.
- In time it would be desired to progress ball support for your fairways by focusing on making foliar fertiliser applications on a regular basis. Avoiding peaks and troughs is achieved in that way. Foliar applications give more control and allow levels of growth that give overseeded grasses a better chance to establish. Furthermore, with the expected loss of herbicides to control weeds sooner rather than latter there will be a need to make foliar applications together with iron sulphate 4-5 times per year.
- The current summer 13mm height of cut is supported rising to 20mm in the low season to help mask earthworm casts, although heights closer to 25-30mm are likely to be much more effective but not practical.
- To further counteract dieback during dry spells and with drier conditions increasing over time from continued sanding and to enhance playability promotion of sheep's fescue is encouraged in the future together with dwarf perennial ryegrass (e.g. Bar Extreme). Sheep's fescue offers the most drought tolerant grass option, good winter grass volume/colour, offers good playing quality, competes well against weeds while there is anecdotal evidence that it suppresses bird pecking. It doesn't like 'wet feet' however. 'Quatro' is a particularly good performer of the species. It is available from Goldcrop or Greentech (eamonn@greentechsportsturf.ie). Sow 50% sheep's fescue 'Quatro' and 50% Bar Extreme ryegrass. Make at least one pass with the Vredo disc seeder (25mm drills) to sow an overall rate of 100-125kg/ha.
- Add sheep's fescue 'Quatro' to the divot mix with ryegrass whenever divoting is undertaken.



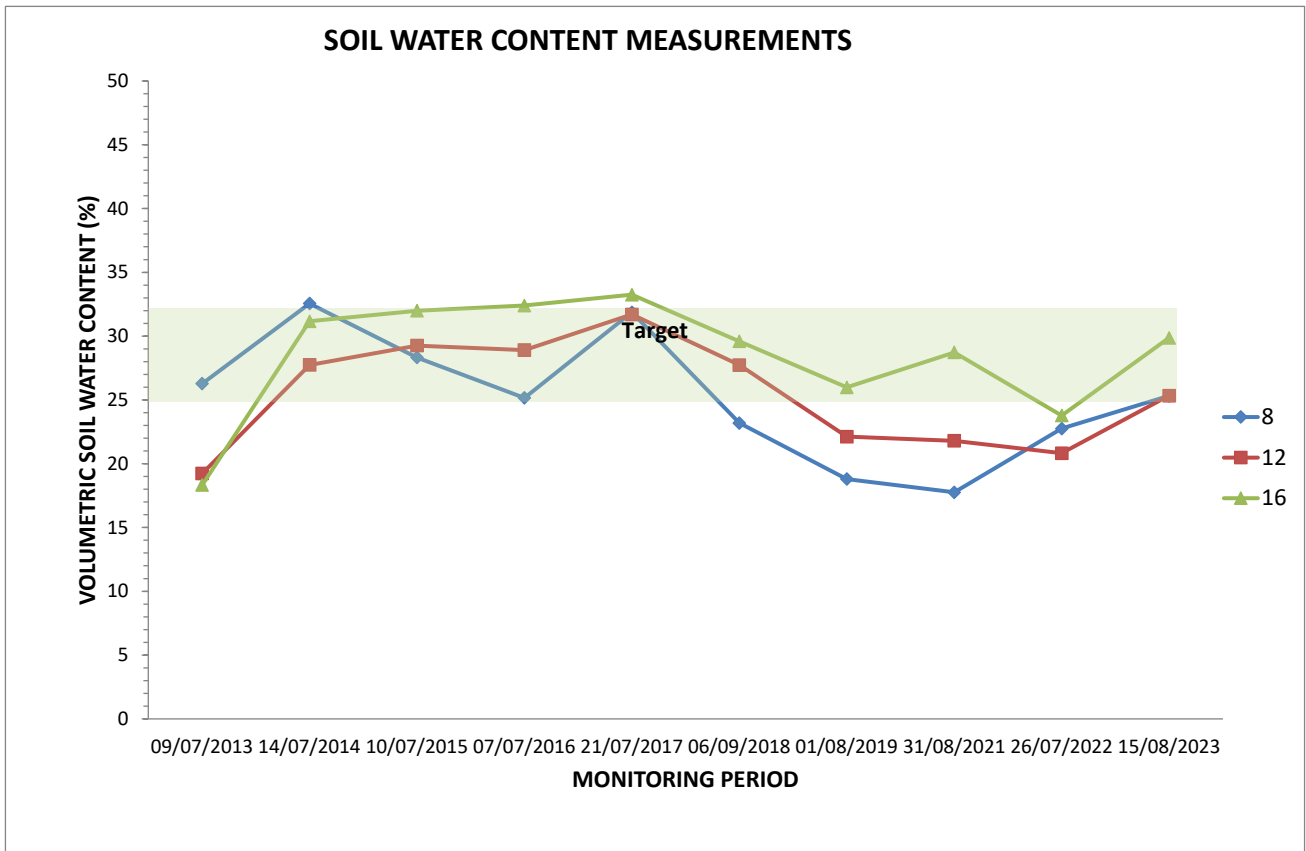
Sheep's fescue superior drought tolerance-source DLF

Signed

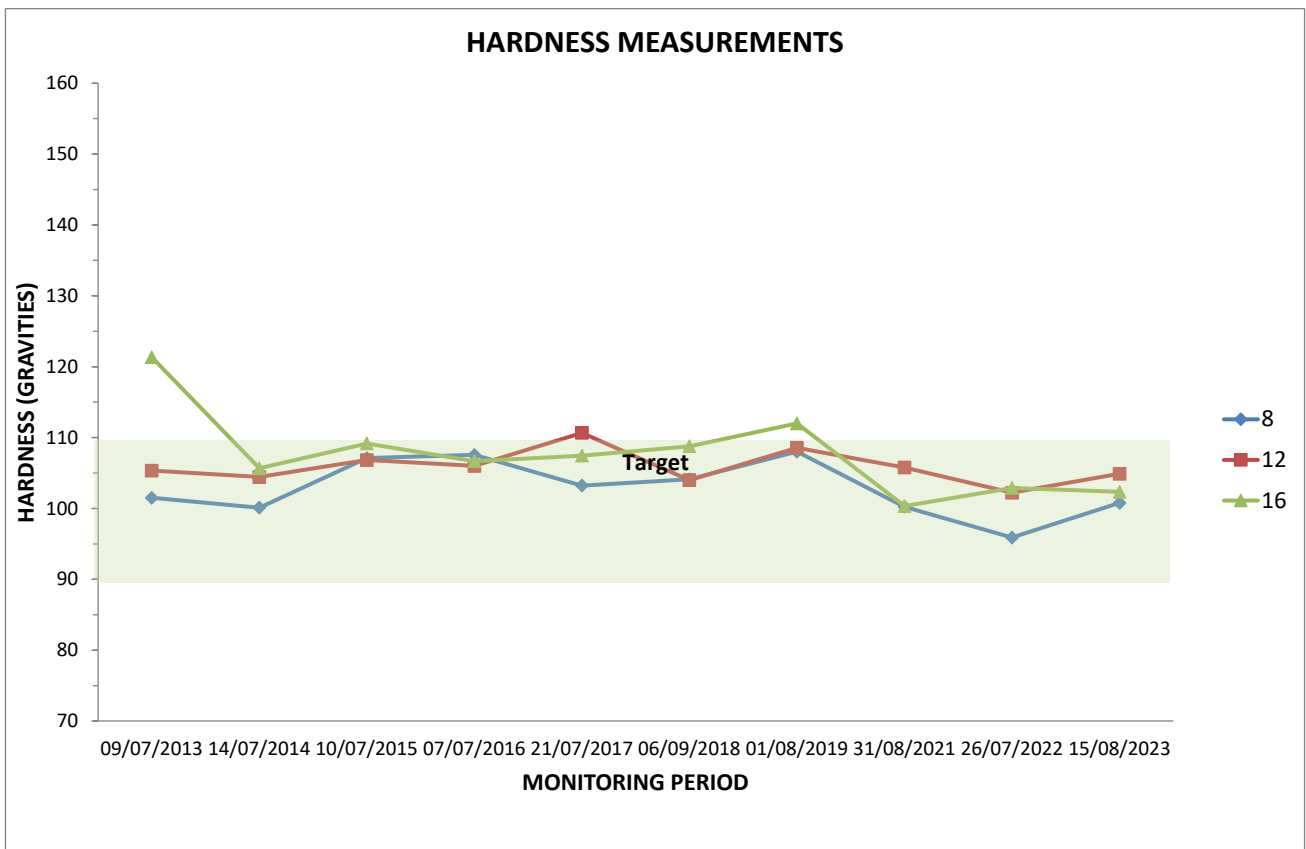
A handwritten signature in black ink that reads "Conor Nolan".

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Graphs of performance data and soil results

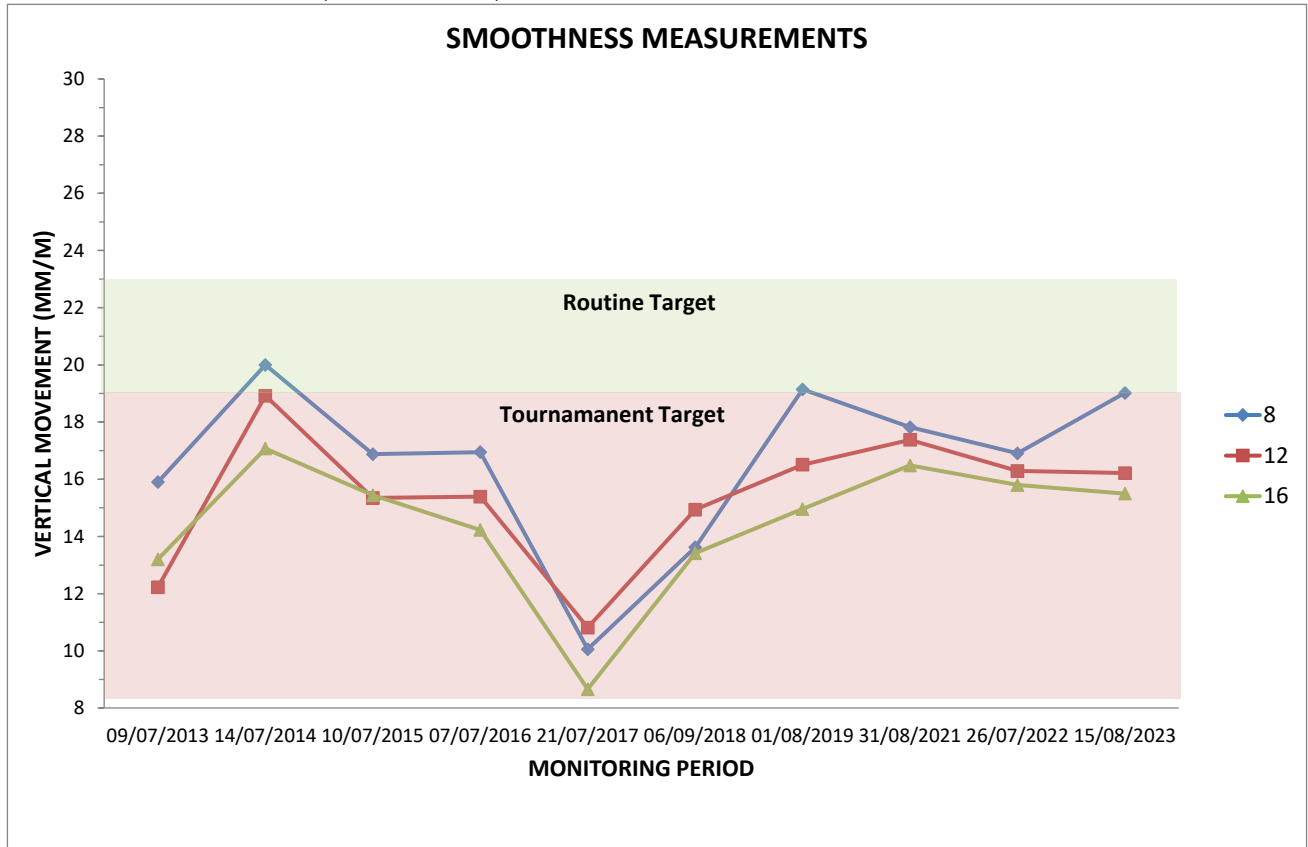


Graph 1

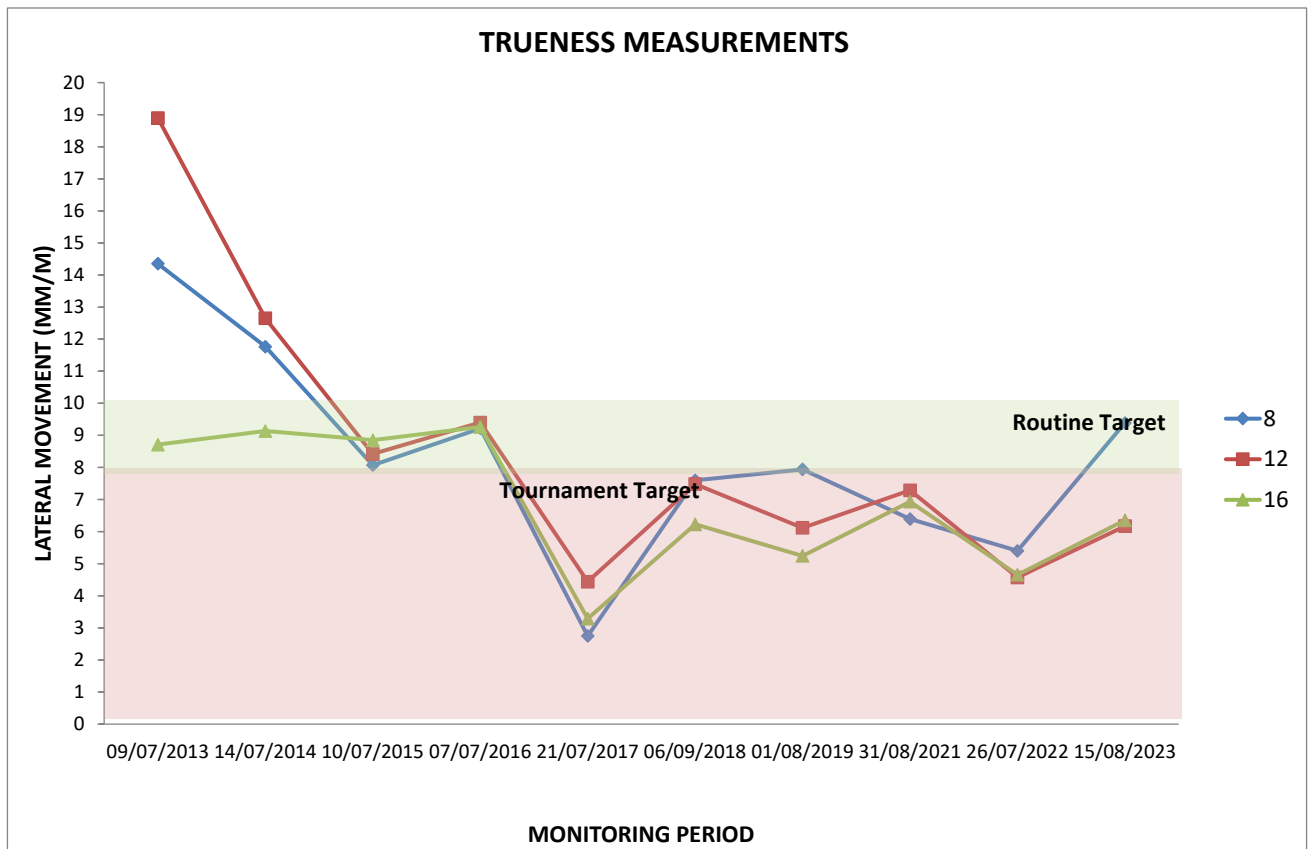


Graph 2

Performance Data (continued)

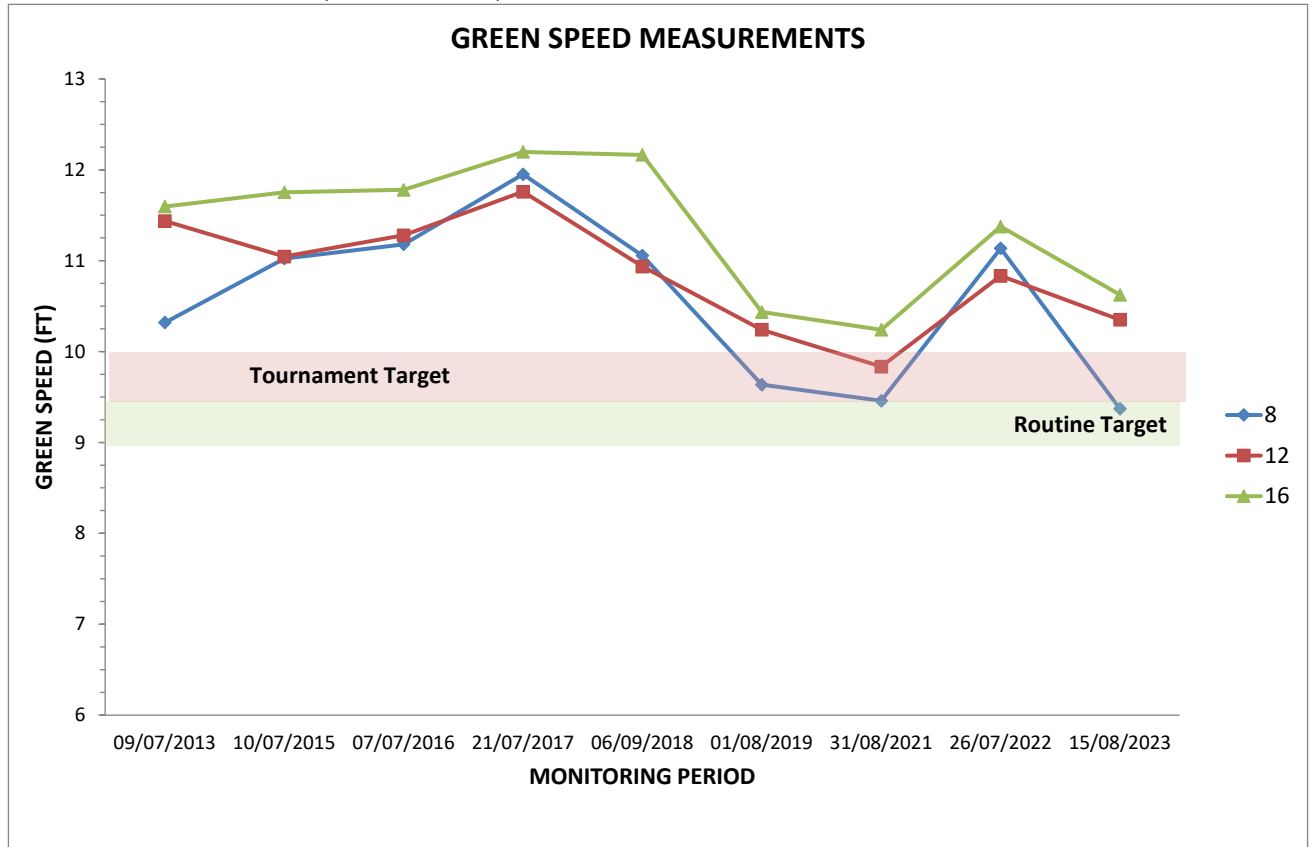


Graph 3



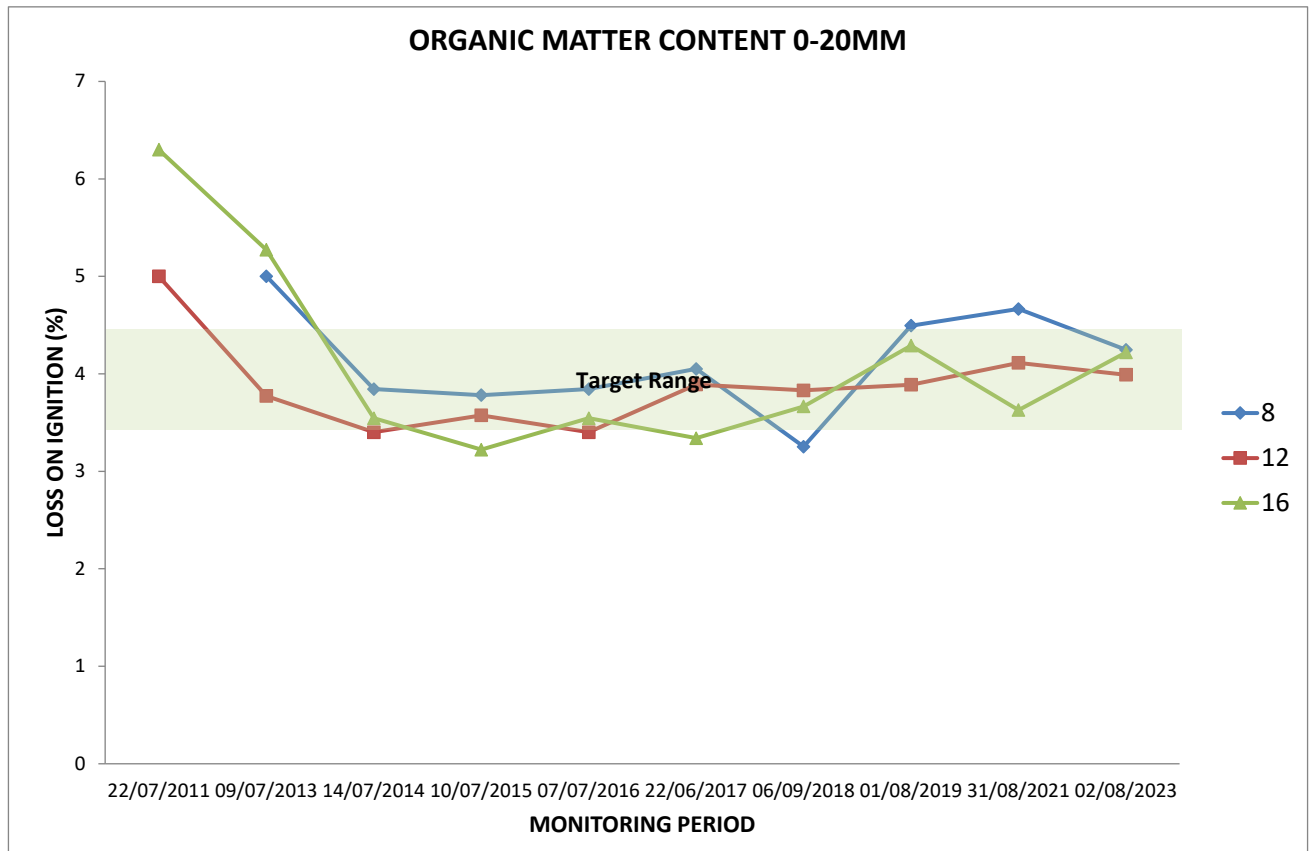
Graph 4

Performance Data (continued)

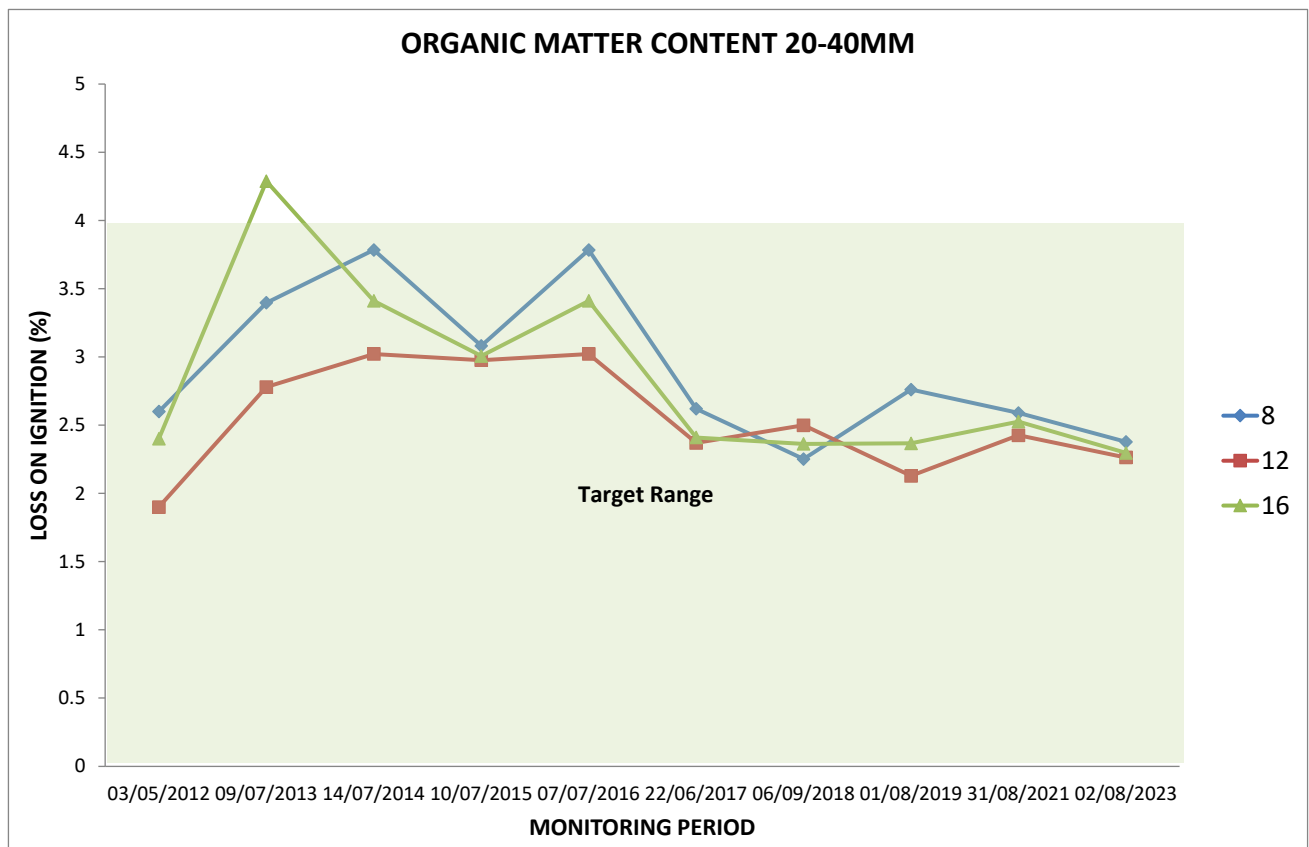


Graph 5

Soil Results



Graph 6



Graph 7

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