



Making great sport happen

KIRKHILL GOLF CLUB

Advisory Report on the Golf Course incorporating the STRI Programme

Report Date: 19th September 2018 Consultant: Richard Windows

Kirkhill Golf Club



Date of Visit:	13 th September 2018
Visit Objective:	To review the condition of the golf course, take objective measurements of green performance and confirm ongoing maintenance operations.
Present:	Scott McKittrick – Course Manager Richard Windows – STRI Ltd
Weather:	Cool, windy with passing showers and 13 mm rain over last 24 hours

Headlines

- The course has played very well through summer with excellent feedback.
- The level of presentation was superb and greatly aided with sensible use of growth regulator.
- The level of conditioning, presentation and performance is particularly good given only five staff.
- The irrigation system was under pressure but maintained delivery to greens, tees and approaches.
- Ball roll qualities were excellent but green speed was perhaps too fast at 10 foot for routine play.
- It is essential to manage organic matter with annual Graden and routine sand top dressing.
- Closer mowing around green surrounds has enhanced presentation but did lose some grass.
- Tree management and planting is required to certain areas of the course.

Key Actions

- Increase routine sand inputs from 100 t/ha to 120 t/ha to reduce organic matter.
- Alter the sanding process to apply dustings so cut, top dress, irrigate and play.
- The process of Graden sand injection will commence next week with a double pass.
- Target 80-120 kg/ha nitrogen with granulars in spring and autumn and liquids in season.
- Change to liquid straights through the season to increase accuracy of application and reduce cost.
- Phosphate levels are falling a little low and therefore some input is required in the spring.
- Extend programme of Primo Maxx certainly during early part of season to the greens.
- Relax rolling and set pace with mowing and a Primo rather than routine rolling.
- Extend Osprey wetting agent into weak areas of surrounds to retain stronger grass cover.
- Tree removal with priority to 15th and planting using Rowan, hawthorn etc to 5th/10th

Objective Measurements

Measurement	Average	Target Range
Soil Moisture (%)	41.7% (range 38-45%)	15-30%
Hardness (Gravities)	92 Gravities (range 89-94g)	90-120 g
Smoothness (mm/m)	16.3 mm/m	<25 mm/m
Trueness (mm/m)	5.1 mm/m	<8 mm/m
Green Speed	9 ft 9 in	9-10 ft
Organic Matter 0-20 mm (%)	11.0%	4-6%
Organic Matter 20-40 mm (%)	6.1%	<4%
Soil pH	5.3	5.0-6.0
Phosphate (P ₂ O ₅)	12 mg/l	>10 (mg/l)
Potassium (K ₂ O)	43 mg/l	>30 mg/l
	Kev: In Target	Marginal Variance Out of Target

Photo Observations and Comments





Figure 1: The presentation of the course was first class with excellent mowing patterns and great definition between surfaces. Such presentation is particularly good given the low numbers (5) of staff.



Figure 3: Sward texture and uniformity was excellent and there was very good consistency between greens, i.e. between the sand and soil-based surfaces.



Figure 5: The use of Primo MAXX growth regulator to fairways and semi-rough is superb and helping to deliver sharp presentation but with minimal input and very little clipping production.



Figure 2: The greens were performing excellently and have received great feedback all season. Ball roll qualities were excellent, but speed was perhaps a little fast at 10 ft for routine play. Firmness is the ongoing issue to address.



Figure 4: The work to sustain grass cover to tees including the small 6^{th} tee is excellent and plenty cover remains for the remainder of the season.



Figure 6: Shade continues to be a problem to the 15th tee and further removal to the rear will help but some form of backdrop/screen is required so plant with smaller species such as Rowan and hawthorn.

Recommendations



Greens

- It is essential ongoing action is sustained to further reduce organic matter in the top 30-40 mm of the soil profile. This is the foundation for firmer, drier and more resilient surfaces.
- The process comes in two parts:
 - Reduce the rate of accumulation by reducing nitrogen inputs and implementing more in season top dressings and scarification.
 - Reduce previous accumulations by more intensive removal operations using the Graden sand injection.
- The process of Graden Sand Injection is working well and should be continued with a double pass next week. This requires no change other than to ensure it is annual fixture in the maintenance calendar.
- Solid tining and light dustings of sand will continue through the winter and summer to keep the upper soil profile open and help achieve target top dressing inputs. With sanding, apply dustings of less than 5 tonnes per hectare and use the roller or irrigation to work the sand into the sward. If this is achieved, weekly or fortnightly, then a dramatic increase in sand volumes will be achieved towards the minimum annual target of 120 tonnes per hectare.
- With light dustings of 5-6 t/ha, it will be possible to mow the greens, top dress with sand and then irrigate without the need to brush the sand off the surface. With this level of sanding, disruption to play is minimal if not non-existent.
- A couple of air injection aeration operations (with the Air2G2) would be useful with the first being achieved in the autumn and the other as the soils begin to dry in the spring. The 7-inch tines would be ideal to focus compaction relief through the upper soil profile.
- The nutrient programme using granulars in the spring is working well and should continue with the 14:2:7 in the mid spring and 4:0:14 Invigorator in October.
- However, the only change would be to use soluble straights to give better control of inputs and less flushes through the season.
- A combination of ammonium sulphate and urea would be ideal in this regard, using the ammonia during cooler periods, i.e. February to May and October to December then a mix of ammonia and urea during May-September.
- We should aim to apply 5-6 kg/ha of nitrogen every 10-14 days.
- To supply 5-6 kg/ha of nitrogen with ammonium sulphate apply at 20-25 kg/ha.
- To supply 5-6 kg/ha of nitrogen with urea, apply at 10-12 kg/ha.
- For a combined mix, apply 10-15 kg/ha of ammonia (supplying 2-3 kg/ha nitrogen) and 6-7 kg/ha of urea (supplying 3-4 kg/ha of nitrogen).
- Seaweed could be added to this mix if necessary.
- In addition, add 5-6 kg/ha of magnesium sulphate to provide good colour and turf health and iron sulphate if necessary at the same rate.
- Some trial and error will be required to find the desirable rate at which a good response occurs. In addition, the mix can be tailored depending upon the desired response or the time of year and for specific greens. For instance, naturally more vigorous greens should have less whereas weaker ones could receive a double pass.
- The growth regulator Primo-MAXX could easily be integrated into the above liquid feeding programme starting at the 0.2 litre per hectare rate every 10-14 days and potentially increasing to 0.3-0.4 l/ha every 14-21 days. This will really help improve consistency of performance through each day.
- The plan next season should be maintain target speed of 9 9 ft 6 in with mowing and growth regulator with an occasional roll to polish the surfaces as and when necessary rather than a routine operation. Kirkhill Golf Club



- To reduce disease pressure, implement the following:
 - Apply monthly applications of phosphite from August to November.
 - Apply regular dew dispersants from August to November using products such as Magnum Recoil, Headland DewCure, ICL DewSmart of Rigby Taylor Dew Reducer.
 - Use iron sulphate (e.g. Higgi Iron at 5-6 kg/ha) at the very first signs of fusarium patch to 'sting' and desiccate the disease.
 - Apply a high iron granular feed based on ammonium sulphate such as ICL Invigorator Plus (4:0:14 + Fe) in September and again in November if needed.
- Ensure a preventative fungicide programme is implemented through the autumn. This is now essential given the lack of contact fungicides. The plan should be 2-3 applications through the vulnerable time of October-December. There are some excellent preventative fungicides available, but it is important to vary the active ingredient/mode of action to gain optimum control but apply them preventatively rather than once symptoms are seen.
- Soil pH and potassium levels were satisfactory and require no amendment but ensure some phosphate is applied to the greens in the spring to avoid levels dropping further.

Green Collars Surrounds and Approaches

- The main maintenance issue to these areas is the need to restore grass cover to areas where it was lost from closer mowing through the summer. A process of seeding and feeding is needed to achieve this objective.
- Next season, extend the Osprey wetting agent programme into the closely mown surrounds to help moisture penetration and avoid drought stress developing.

Fairways & Semi-Rough

• The maintenance of these areas is excellent, and the use of Primo growth regulator is working superbly and should be continued.

Tree Removal & Planting

- The removal of the 5-6 poor quality conifers is required to the rear/left of 15th medal tee to increase light and airflow penetrating this surface and therefore improving turf quality.
- Some re-planting through this area would be sensible to provide some form of screen but lower growing deciduous species such as Rowan, hawthorn or hazel would be ideal.
- The area between the 5th and 10th should be planted to provide some separation between holes. The conifers are not doing that well and a better choice would be species that are flourishing, e.g. Rowan and hawthorn. Buy these are 1 metre whips and plant densely at 1 metre spacings with a view to thinning once established.

Signed

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Objective Data





Objective Data Graph 2: Average firmness was 92 gravities and all greens were in target except for 4G that fell slightly short. The firmness levels are generally good given the rainfall and high moisture, but this is the parameter we need to keep working on by organic matter reduction to deliver further progress.

17/08/2016

13/09/2018

20/06/2014

MONITORING PERIOD

14/09/2010

17/05/2012



Objective Data Graph 3: Average smoothness was 16.3 mm/m and was exceptionally good with excellent consistency between greens and all were in Tournament Target.



Objective Data Graph 4: Average trueness was 5.1 mm/m and was exceptionally good with excellent consistency between greens and all were in Tournament Target.









Objective Data Graph 5: Average green speed was 9 ft 9 in and all greens were in target, but they were perhaps on the fast side of ideal for routine play.

Soils Laboratory Data





Soils Laboratory Graph 1: Average organic matter at 0-20 mm was 11% and there has been a steady increase since 2014. We need to reverse this trend with Graden sand injection but also by increasing sand top dressing inputs to at least 120 tonnes per hectare and reduce growth rates by lowering nitrogen inputs.



Soils Laboratory Graph 2: Average values at 20-40 mm were 6.1% and out of target.





Soils Laboratory Graph 3: Average values at 40-60 mm were 3.3% and all greens were within target.



Soils Laboratory Graph 4: Average values at 60-80 mm were 3.3% and all greens were within target.