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Making great sport happen
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Agronomic update
Woodbrook GC
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Agronomist




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The STRI Programme


- My greens are firm but how firm are they exactly?
- Are they too firm or too soft-ideal target ranges?
- My greens soften down too much during wet weather!
- Are the surfaces getting firmer over time?
- What adjustments do I need to make changes?



The STRI Programme

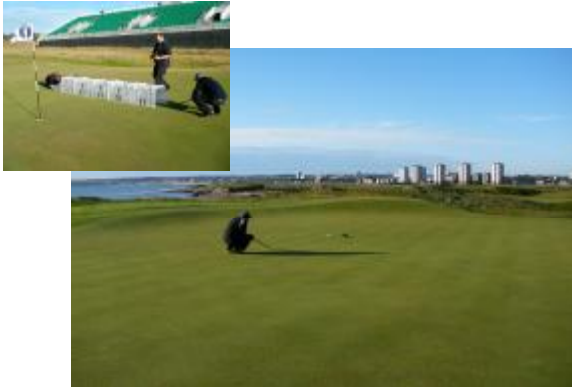
- Playing quality at heart
- Objective measurement
- Informed decision making
- Target setting for each club
- Benchmark current performance and monitor improvements
- Communication of results

STRI **Playing Quality**



- Smooth, true, firm and dry
- Provide an acceptable & sustainable pace
- Consistent
- Year round performance

STRI **The Stimpmeter**



STRI **The Clegg Impact Hammer**



STRI **Firmness Target Levels**

Clegg Value	Description of Firmness	Ideal
Over 130	Hard and unreceptive. Ball impacts and continually bounces forward. No control from well-struck shots as hardness increases. Frustrating to all levels of golfer.	
100-130	Very firm. Ball impacts, bounces on, checks and then rolls out. Well-struck shots need to be positioned correctly. A true test of ball striking and accurate play.	Links
80-100	Firm. Ball impacts, bounces forward, checks and then quickly stops. Good control of well-struck shots but less control from loose ball striking (especially at the firmer end).	Parkland
70-80	Receptive. Ball impacts then stops on first bounce or spins backwards. No footprinting. No real premium for ball striking. Such surfaces are flattering to average play.	
60-70	Soft. Balls stop dead and leave a large pitchmark. Footprinting becomes evident to make putting surface uneven. Not a good surface.	
Below 60	Very Soft. Unstable and unplayable.	

STRI The STRI Trueness meter



STRI Smoothness and Trueness Targets


STRI Smoothness and Trueness			
	Vertical Deviation	Lateral Deviation	Smoothness Score
Routine Summer Play	19-23 mm/m	8-10 mm/m	7-8
Tournament Conditions	<19 mm/m	<8 mm/m	8.5 +

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STRI Moisture Target Levels

STRI Soil Moisture Content – Target Values	
	VMC (%)
Parkland	15-25%
Links	10-20%
USGA	15-25%




Soil Organic Matter Targets



3 - 6 % in top 20 mm

< 4 % from 20 – 80 mm

Excess organic matter leads to surface softening and increased disease pressure.

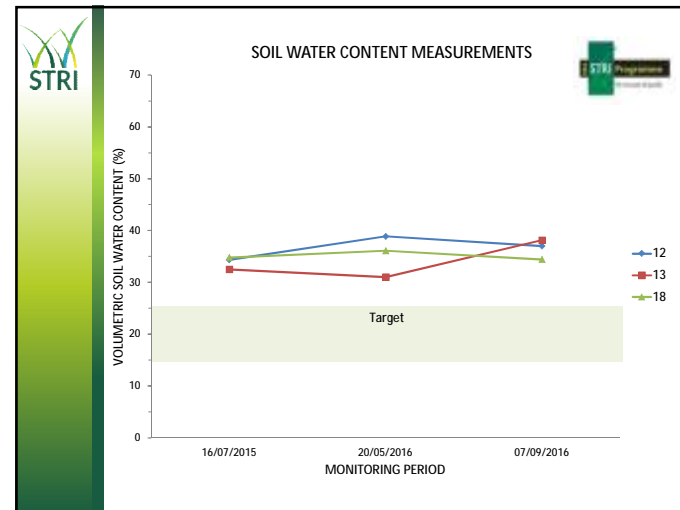


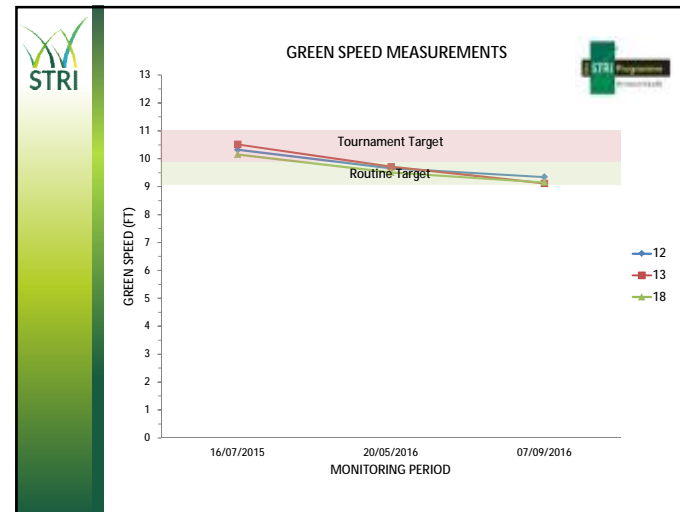
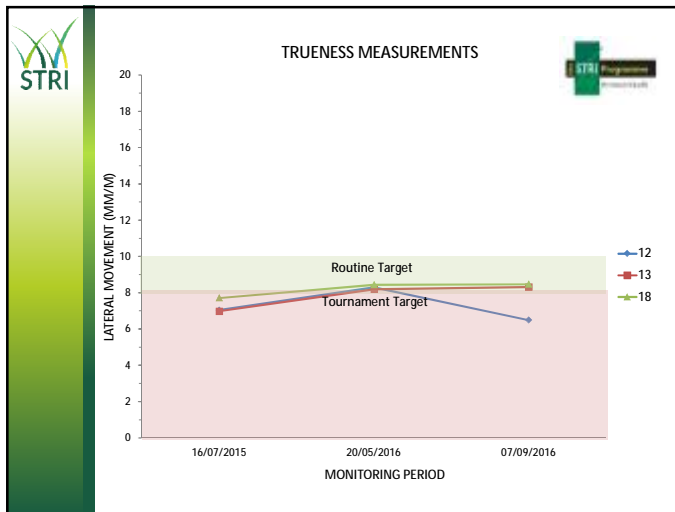
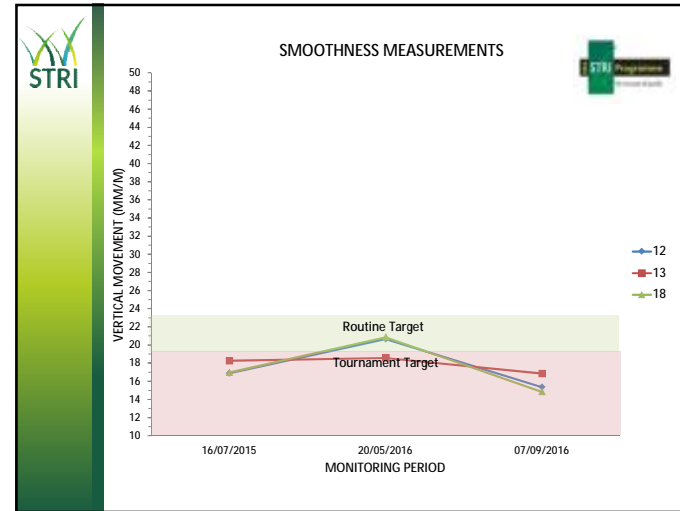
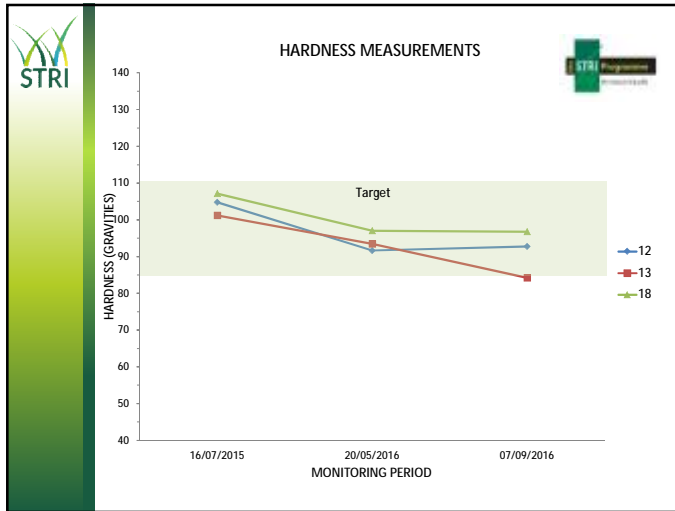
Current Target Ranges


Course Type	Firmness gravities	Trueness mm/m	Smoothness mm/m	Organic Matter %	Moisture %
Parkland	85-110	8-10 (Routine) 0-8 (Tment)	19-23 (Routine) <19 (Tment)	3-4	15-25



Reporting








Analysis of Data 2009-2016

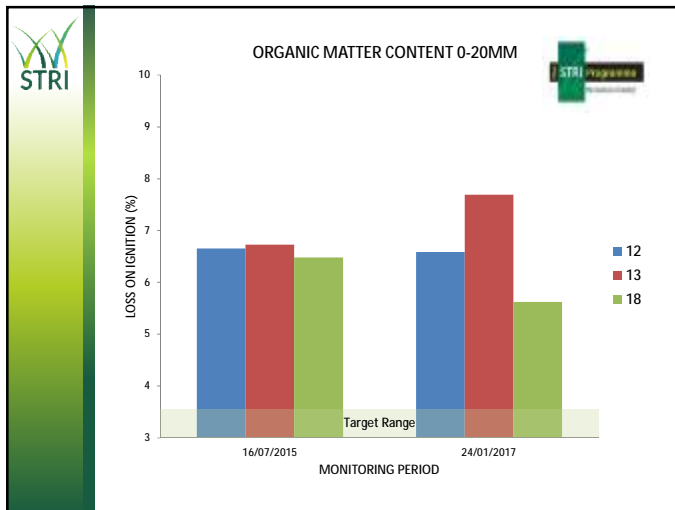

- 8,861 measurements from 2,567 greens across UK, Ireland & Northern Europe.
- 1,659 parkland, 546 links and 362 heathland and 17 other.
- Data from 488 courses.
- 1,573 measurements from 1,092 greens in 2016.
- Championship to Municipal.
- January to November each year.
- Quantative assessment of grass composition.



Green Speed 2009-2016

Average Green Speed by Course Type 2009-2016

Course Type	Year							
	2009	2010	2011	2012	2013	2014	2015	2016
Parkland (795 greens)	7 ft 9 in	8 ft 3 in	8 ft 3 in	8 ft 2 in	8 ft 7 in	8 ft 8 in	9 ft 0 in	8 ft 11 in
Links (562 greens)	9 ft 1 in	9 ft 1 in	9 ft 1 in	9 ft 0 in	9 ft 2 in	9 ft 2 in	9 ft 6 in	9 ft 4 in

2016 Organic Matter Content

Mean Soil Organic Matter Values (and Ranges) for all courses at 0-20 mm and 20-40 mm during 2016

Course Type	0-20 mm Depth	20-40 mm Depth
	OM Value (Range)	OM Value (Range)
Parkland (649 greens)	7.7% (2.7-24.5)	5.0% (0.7-15.9)
Links (302 greens)	6.5% (2.8 to 17.8)	4.6% (1.0 to 8.5)





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Botanical composition – Creeping Bentgrass

Green	July 2015	Sept 2016
12	40	50
13	40	50
18	40	50

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Performance vs Sward Type 2016

Performance vs Sward Type Across All Course Types in 2016. Number of greens shown in brackets.

Sward Type	Performance Characteristic					
	Speed	Firmness	Smooth	True	VWC	OM 0-20
Bent (426)	9 ft 1 in	104	21.1	7.4	25.9	7.7%
Meadow (887)	9 ft 0 in	95	22.9	9.9	33.7	8.2%
Fescue (81)	9 ft 3 in	109	19.5	6.3	22.9	5.6%
Bent & Fescue (168)	9 ft 4 in	104	19.0	6.3	24.4	6.4%
Creeping (13)	11 ft 10 in	100	15.5	7.7	30.8	5.2%

Caution. But, meadow-grass less smooth & true with higher OM and moisture.












 **Greens**

- Reduce growth inputs by 15-20% generally
- Optimise regulation of organic matter – 150 tonnes of sand per hectare annually
- Promote somewhat higher heights of cut year round
- Promote browntop bentgrass throughout
 - § Overseeding technique
- Promote red fescue to high parts
- Follow a preventative disease programme between end of September and December





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Aprons/surrounds

- Remove ryegrass clumps ?
- Introduce fine red fescues - lively conditions
- Sand aprons and surrounds – 135 tonnes per hectare
- Ensure balls gather towards centre of bunkers + flatter bases

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Tees

- Maintain good recovery potential year round
- Promote quicker divot recovery through use of compost
- Reduce biomass where puffy through occasional verticutting
- Increase current sand topdressing inputs to enhance firmness

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Fairways and Roughs

- Build up sand content on fairways
- Introduce fine red fescue gradually through overseeding
- Apply sufficient nitrogen for consistent and sufficient ball support
- Scarify fairways on occasion
- Cut back deep roughs annually, remove clippings and scarify well.
- Apply grass herbicide to remove rogue grasses in semi-rough and roughs



Any questions?



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