



WP3

Use of compost in the root zone or in the topdressing sand on red fescue greens

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Demo trial with topdressing

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Aim

Compare topdressing with 'Green Mix' and topdressing with pure sand combined with different N application (0,3, 0,2, 0,1 0 extra per year)



Experiment on Smørum golf course
2012-2014

Maintenance of the green

Mowing 6mm, 5,5mm, 5mm and 4,5mm over the season

Topdressing every 3-4 week

2012 – 5 times, 2013 - 5 times, 2014 - 6 times

Verticutting

2012 and 2013

Resowing

2-3 times a year with pure Fescue

Aeration

2-3 times a year

Fertilizer – program shown later

Fertilizer application

Year		N	P	K	Fe	S	Mg	Mn
2012	Kg/100 m ²	0,35	0	0,35	0,2	2,9	0,05	0,07
	Times/year	3			8	2	7	4
2013	Kg/100 m ²	0,48	0	0,52	0,25	2,2	0,05	0,08
	Times/year	2		1	8	2	6	5
2014	Kg/100 m ²	0,48	0	0,84	0,19	0,46	0,13	0,09
	Times/year	2		1	7		2	4
Ekstra	In august	0,3 0,2 0,1						

The experiment



- Two types of topdressing
- Total topdressing rate correspond to 8 mm per year
- Input of 0, 0.1, 0.2 and 0.3 kg N/100m² on top of the standard fertilizer rate of 0.4 kg N/100m²/year
- The additional fertilizer is applied as a complete liquid fertilizer solution in late august, corresponding to the expected time of maximum mineralization from Green Mix
- Measurement
 - Turf grass visual quality every month during the growing season
 - Registration of fungal occurrence
 - Thatch accumulation each year
 - Organic matter content each year
 - Grass composition.

Plot 2 x 6 m

Green mix

0,1 N

0,3 N

0,2 N

0,0 N

0,3 N

0,1 N

0,0 N

0,2 N

Blok 1

Blok 2

Sand





GreenMix Sjælland

Anvendelsesområder

Til anlæg og pleje af golf greens samt højeste kvalitet tee-steder og boldbaner:

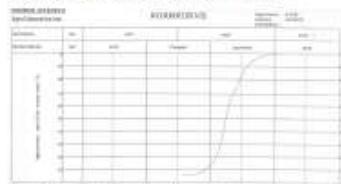
- Vækstlag
- Topdressing
- Reparation

Anbefalinger om brug

- **Nyt vækstlag:** 30-40 cm lag udlægges oven på drænelaget, udjævn, gennemvand, komprimer, tilså. Tilføj gødning efter fremspuling.
- **Topdressing:** Greens: Udlæg 1 mm hver 3. uge i vækstsæsonen. Boldbaner: Udlæg 5 mm 1-2 gange pr. år, mens græsset er i god vækst, slæbet. Anvend svovlsur ammoniak som N-gødning. Gødning i 10 mm topdress svarer til ca. 0,12 kg N, 0,14 kg P og 0,50 kg K pr. 100 m².
- **Reparation:** Udlæg passende lag, udjævn, læg græstørn, vand.

Fremstilling og analyser

GreenMix er fremstillet af meget stabil have- og parkkompost og en enskornet kvartssand. Komposten er udsat for temperaturer over 70°C og derfor fri for ukrudtsfrø og plantesygdomme.

Typisk kornkurve for GreenMix:

Tilstand ¹⁾	
Grovsand	87,0%
Finsand	7,8%
Silt	1,5%
Ler	2,3%
Humus	1,2%
Hydraulisk Ledningsevne 385 mm/t	
Luftkapacitet ved 30 cm tension 24,0%	
Totale porevolumen 39,2	

Næringsstoffer ²⁾	
Reaktionstal, Rt	7,4
Ledningstal, Lt	1,8
Fosfortal, Pt	3,0
Kaliumtal, Kt	26,0
Magnesiumtal, Mgt	6,5
Nitrat, Ni	12,0
Sulfattal, St	59,0
Jern, Fet	0,3
Kobber, Cut	3,0

Kvælstof, total (kg/m ²)	0,6
Kvælstof, vandopl. (kg/m ²)	0,02
Fosfor, citratopl. (kg/m ²)	0,4
Kalium, vandopl. (kg/m ²)	0,4
Magnesium, total (kg/m ²)	0,3
Kalkvirkning (kg kalk/m ²)	5,0
CEC (mækv/100 g)	12,0

Rumvægt (ton/m ³)	1,3
Sild (mm)	3 ³⁾

¹⁾Gennemsnitsværdier for de seneste 2 år.²⁾Lagvare, topdressing (Vækstlag 6 mm).Solum Roskilde A/S (Dansk Jordforbedring), Vestre Hedevej 34, 4000 Roskilde
Telefon +45 4675 5070, solumroskilde@solum.dk, www.solum.dk

Greensand

Anvendelsesområder

Til pleje af greens, højeste kvalitet tee-steder og boldbaner:

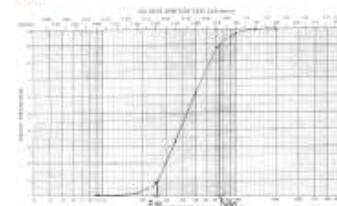
- Topdressing
- Forbedring af dræningsegenskaber

Anbefalinger om brug

- **Topdressing:** Greensand anvendes især ved evt. problemer med algeforekomst. Greens: Udlæg 1 mm hver 3. uge i vækstsæsonen. Boldbaner: Udlæg 5 mm 1-2 gange pr. år, mens græsset er i god vækst. Træk over med slæbet efter udbringning. Hyppig topdressing med rent sand giver lagdannelse. Dette undgås delvist ved vertikalskæring/prikning/propotrækning.
- **Forbedring af dræningsegenskaber:** Efter prikning og/eller propotrækning arbejdes materialet ned i hullerne med et slæbet. Herefter eftersås.

Fysiske egenskaber

Greensand er en meget enskornet kvartssand uden ler, silt og kalk.

Typisk kornkurve for Greensand:

Middelkornstørrelse D ₅₀ (mm)	0,43
Grædbandsindex D ₆₀ /D ₁₀	3,0
Uensformighedsstal D ₆₀ /D ₃₀	1,9

"The sand meets the USGA recommendations for particle size in all particle fractions."
(European Turfgrass Laboratories, Scotland)

**Partikkelform**

Lit fladtrykt kugle (Karakter M)
Helvt afrundede kanter (Karakter SR-SA)

"This shape is considered suitable for golf green construction and topdressing materials."
(European Turfgrass Laboratories, Scotland)

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1,2 % humus (compost)



Topdress compost
and sand

Topdress sand



Sand

Greenmix

2015

Photo; Per Rasmussen

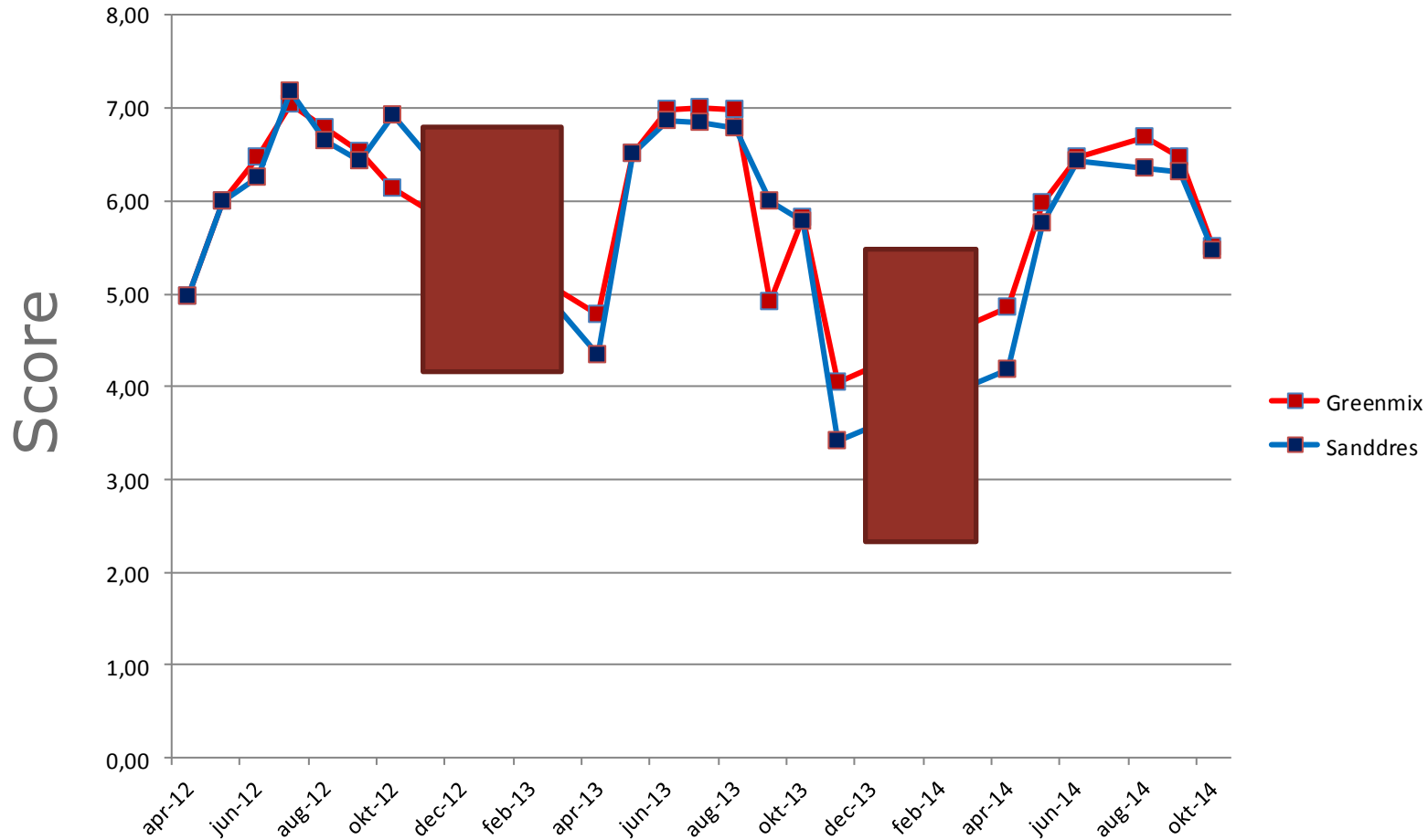
What to expect – general appearance?

Effect of topdressing material mainly investigated on bentgrass greens

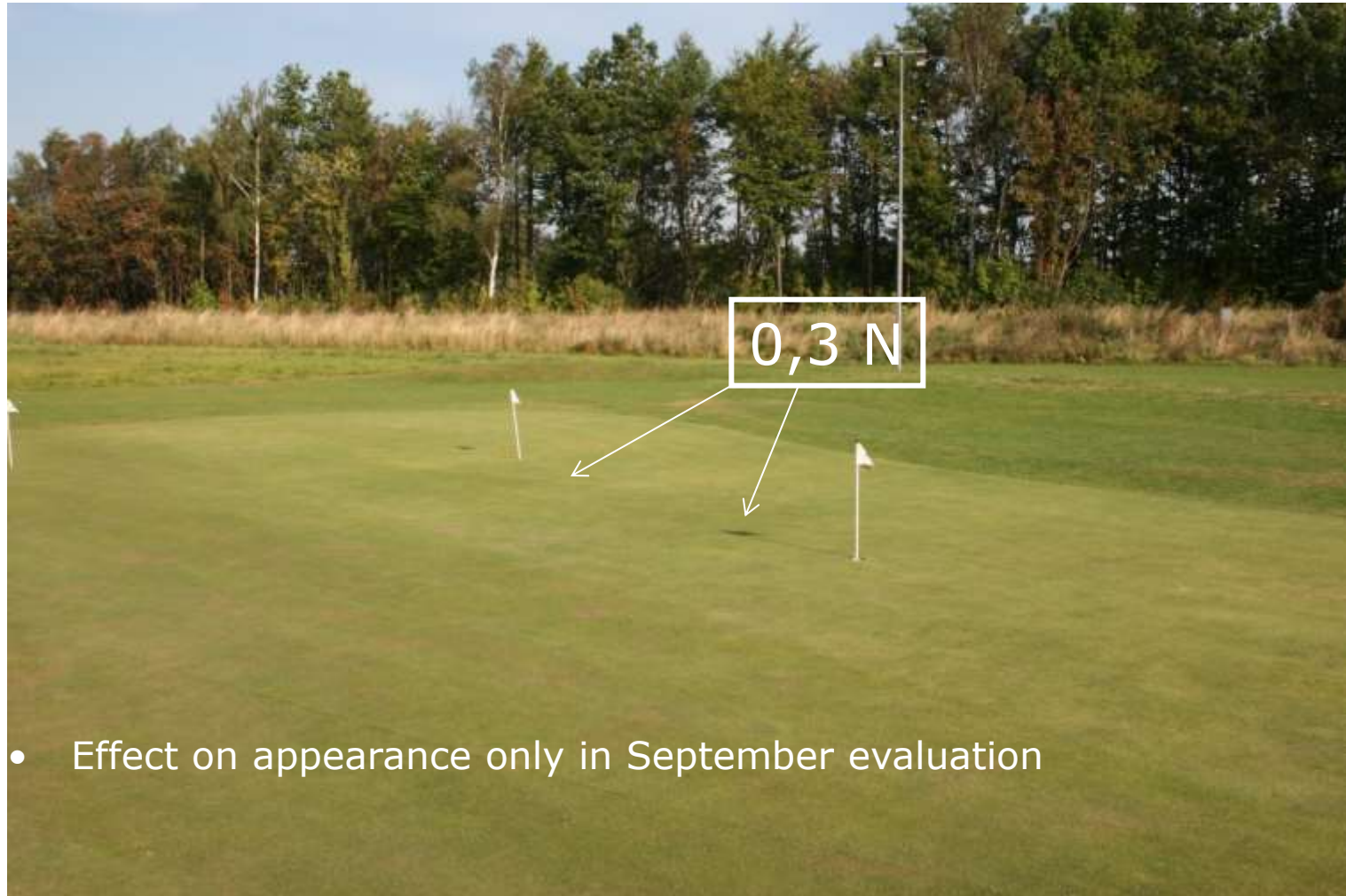
- Compost in topdressing can suppress fungal disease
- Extra Nitrogen will influence the general appearance



Visual appearance



Fertilizer effect



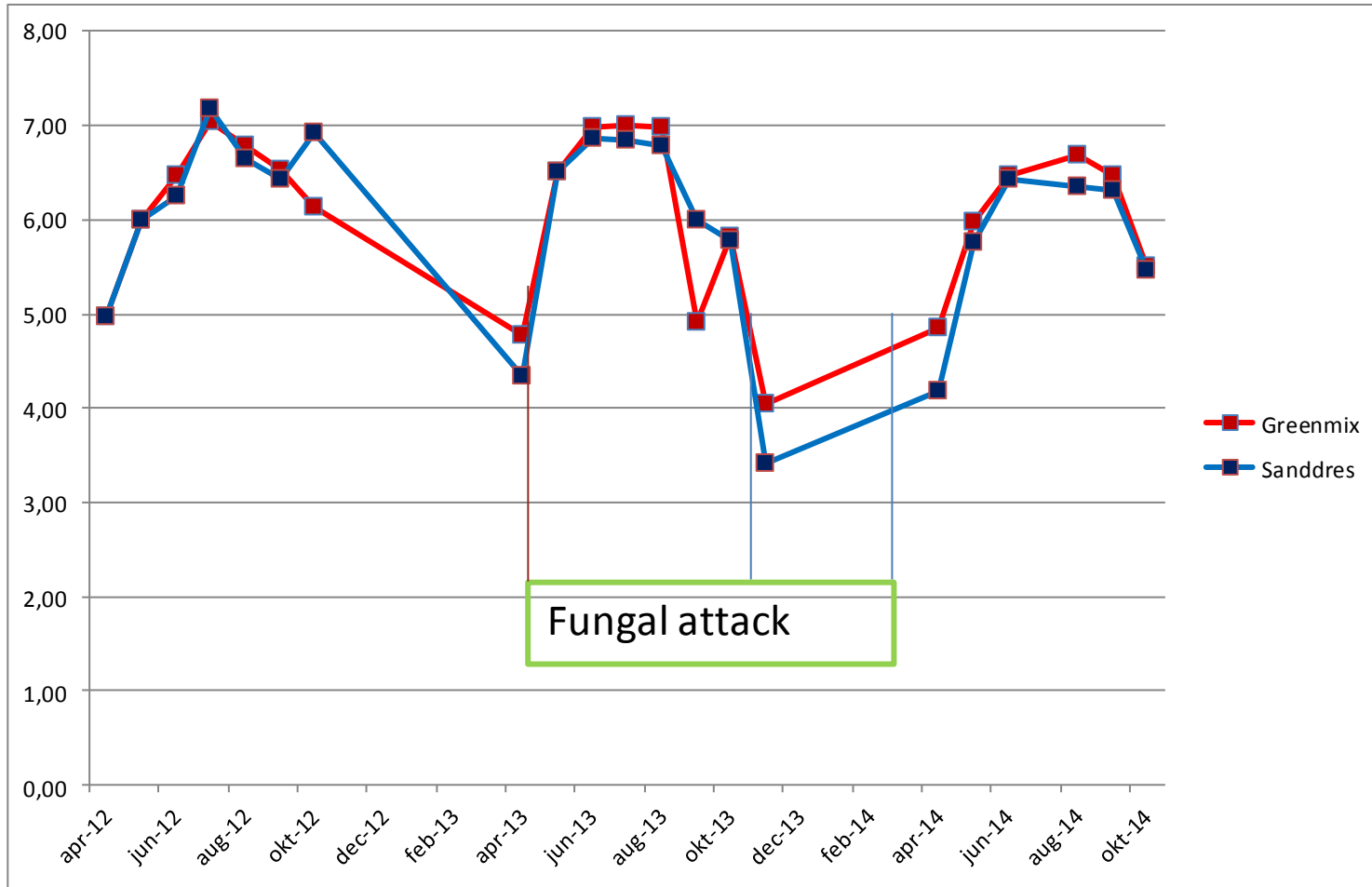
- Effect on appearance only in September evaluation

Fungi attack



	April 2013	November 2013	March 2014
Greenmix	20,31	4,12	25,5
Sand	38,13	7,5	37,25

Visual appearance

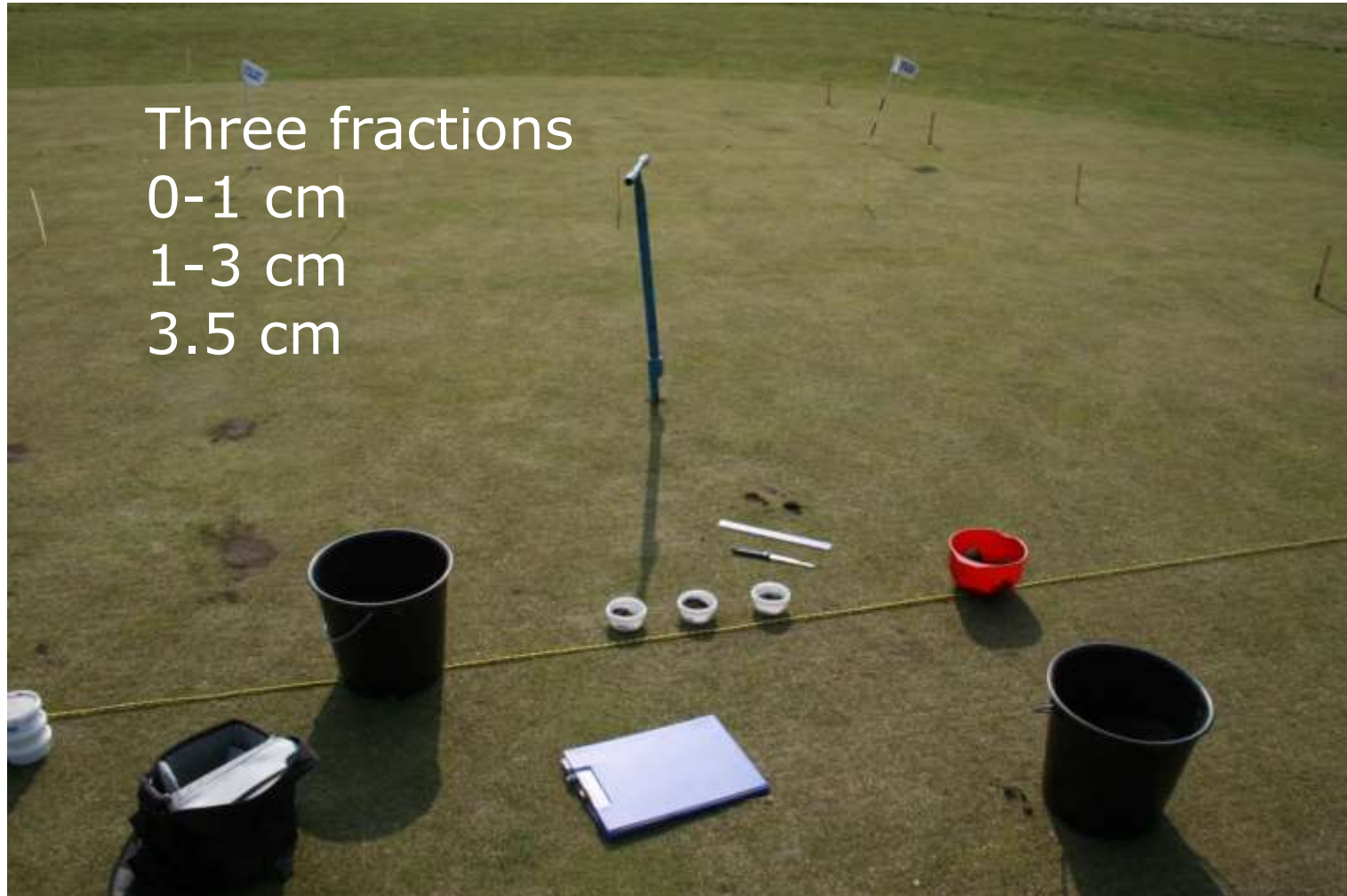


What to expect – thatch and org. cont?

Effect of topdressing material mainly investigated on bentgrass greens

- The experience is that less thatch is accumulated when sand topdressing is used
- New Zealand – Topdressing with sand compared to a soil type dressing. Higher accumulation of thatch when soil type dress is used. They applied 360 kg N / ha / year. Far from what we are doing.

Organic content and thatch accumulation

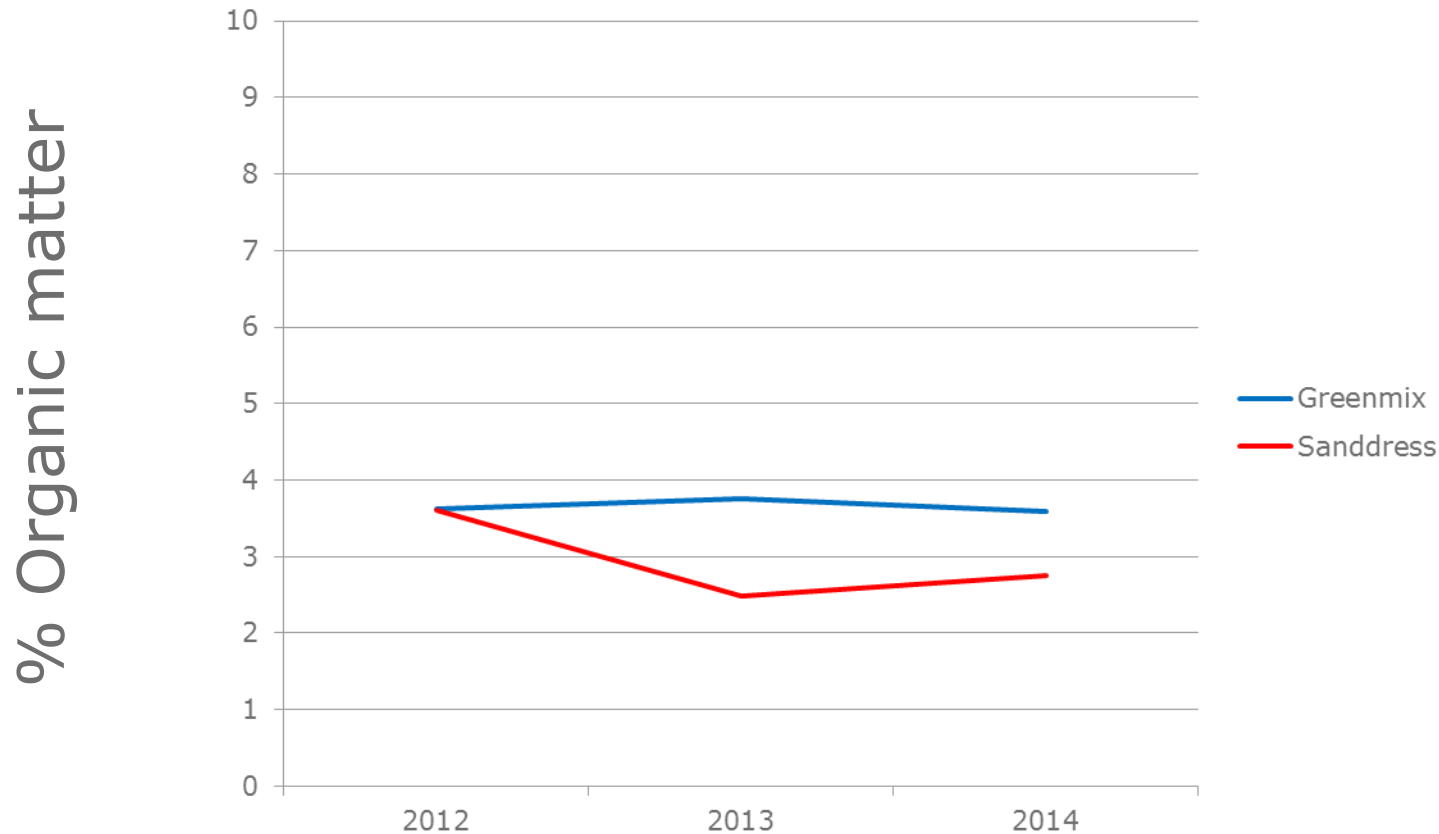


Thatch

- Thatch measurement – 2 plugs per parcel
 - April 2012
 - November 2013
 - October 2014
- There is practically no defined thatch
- Not possible to register any development in size (mm)



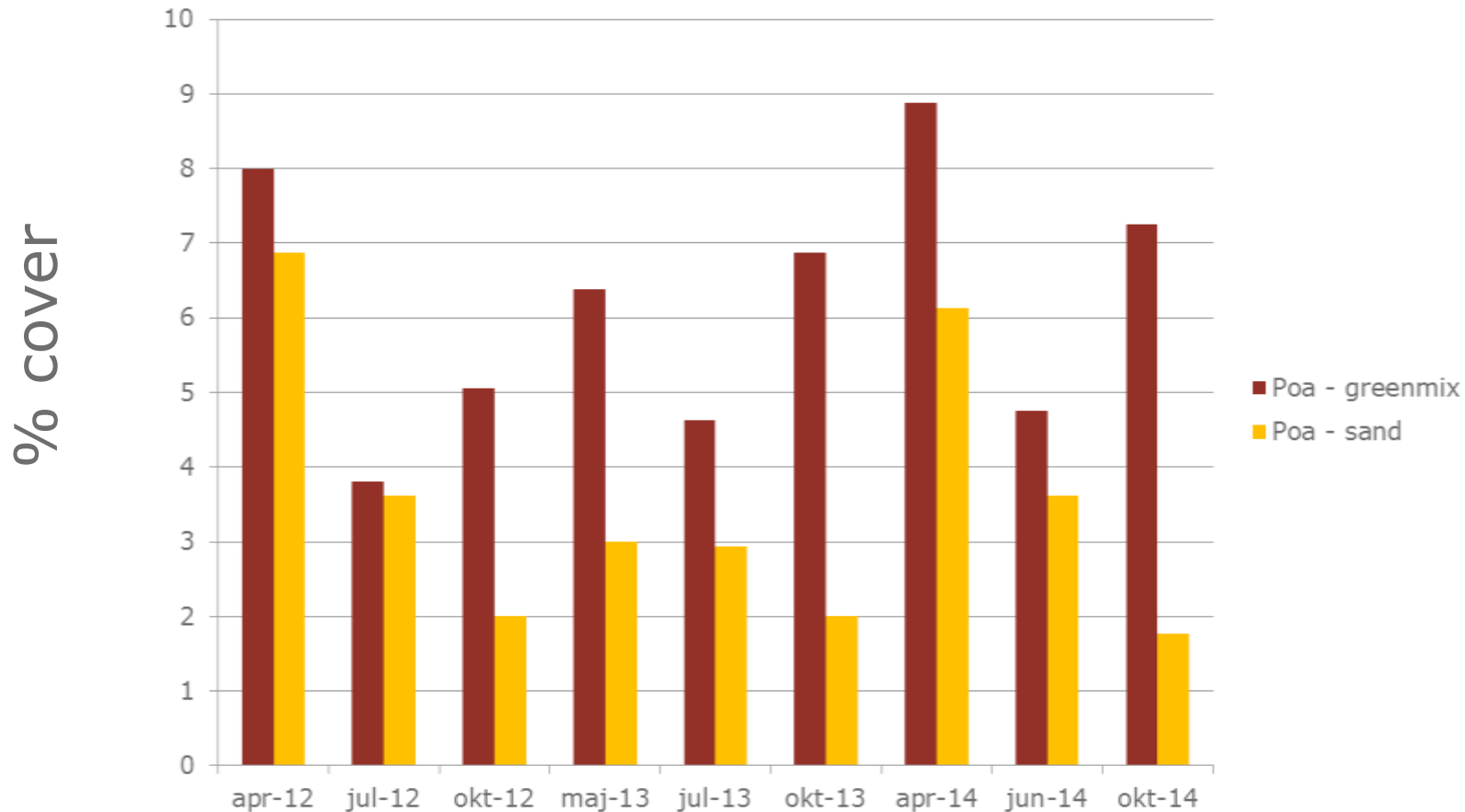
Greenmix compared to sand



What to expect - grass composition?

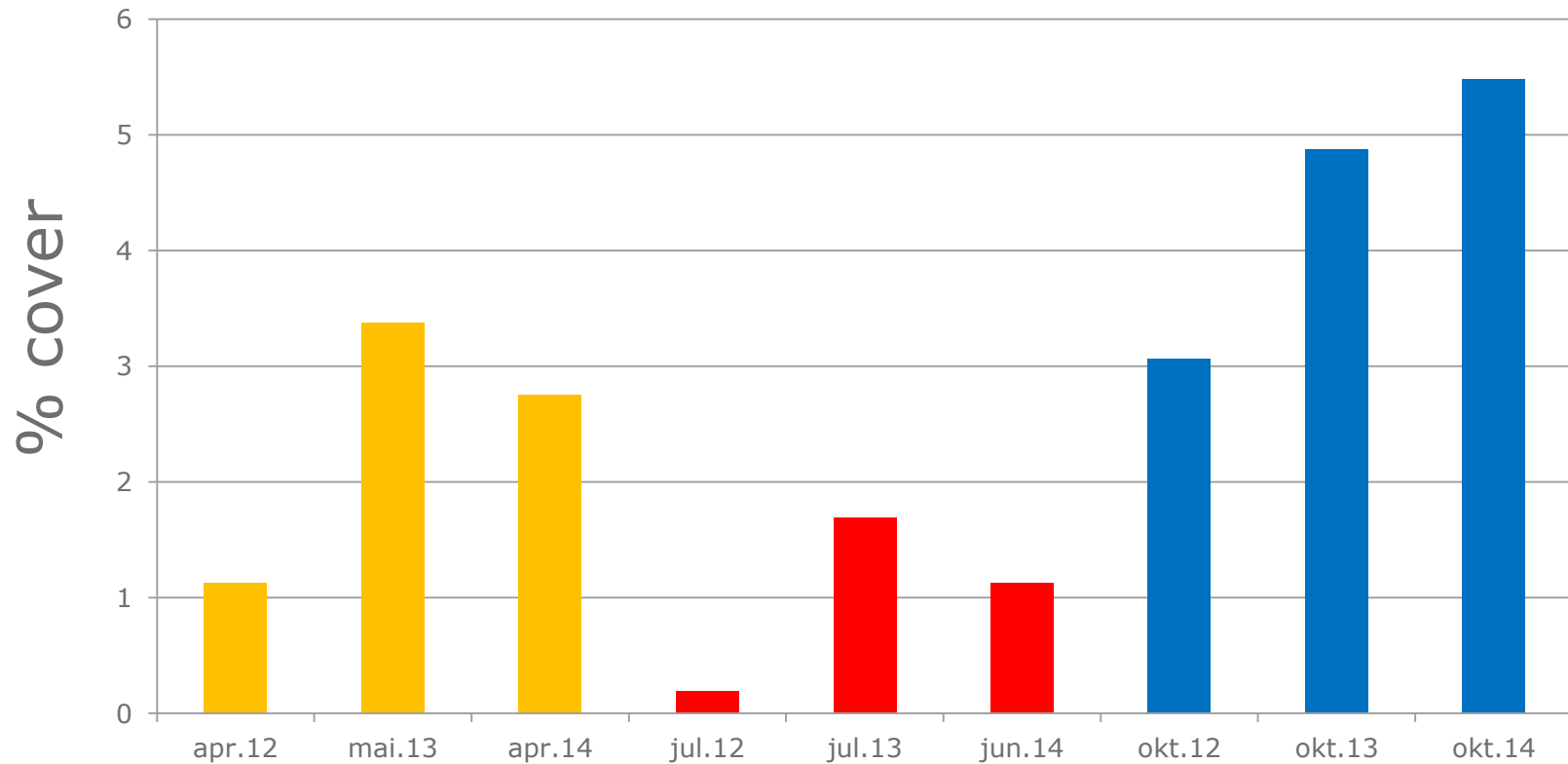


Poa occurrence from 2012 to 2014

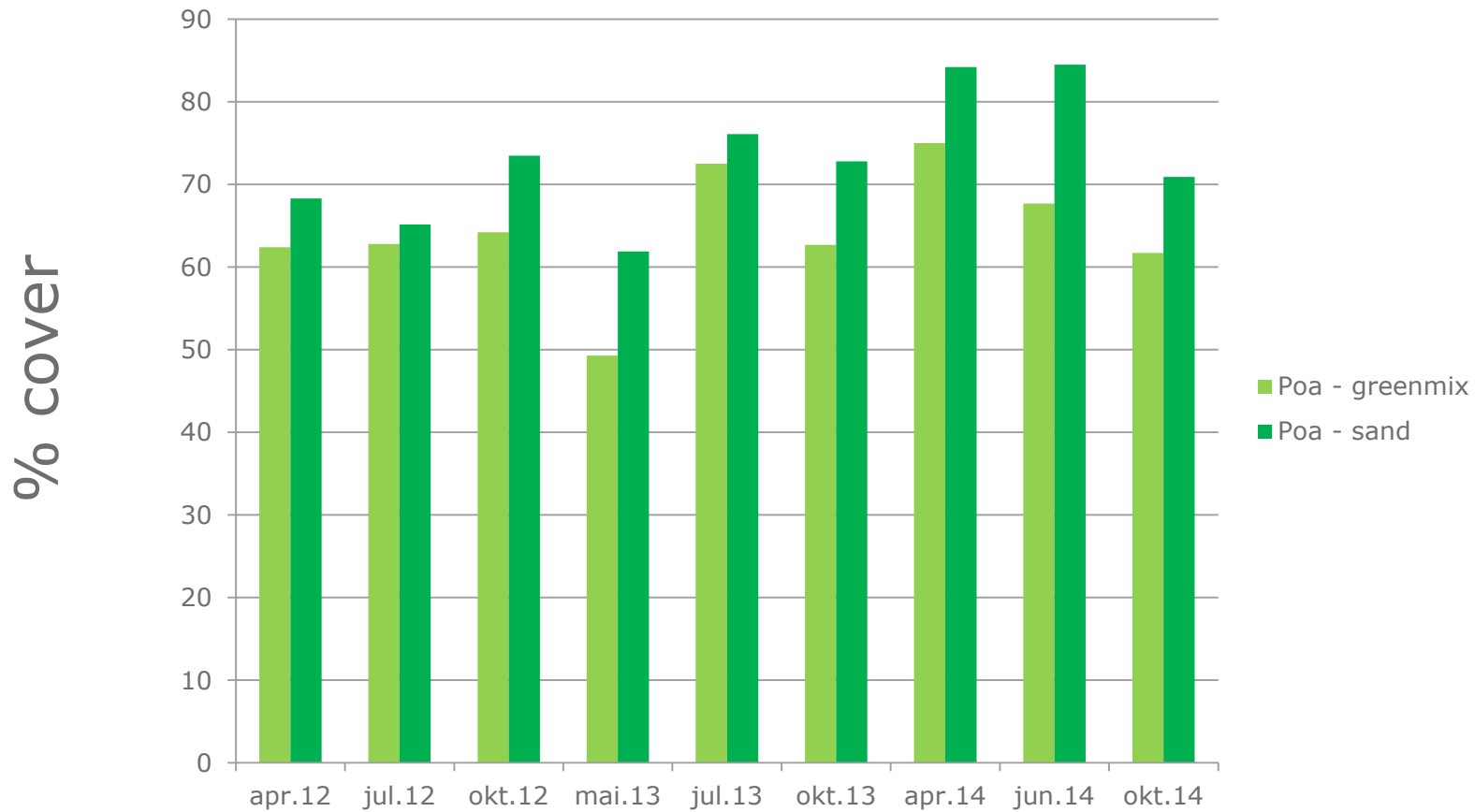


Poa occurrence

Difference in Poa occurrence



Fescue occurrence



Grass composition

- Does topdressing with sand reduce the amount of Poa?
- Does it make sense?
 - Yes – Poa plants are often very small – nearly no large colonies at Smørum
 - They are more sensitive to lack of water – superficial roots
 - Water is disappearing quickly from the first 3 cm of the green
 - The dry surface is not a suitable growth environment for small Poa plants and it is difficult for the seeds to germinate.

Demo trial summary

- Topdressing type affect the Poa and Fescue occurrence?
- Better suppression of fungi when dressed with Greenmix?
- Thatch/organic matter accumulation affected by top dress type?



Thanks

- Solum, Dansk Jordforbedring for sponsoring the topdress material
- Greenkeepers at Smørum golf course for performing all the maintenance (+ topdressing and fertilizer application)
- Mads Madsen Krag (KU) for help with the measurements
- Thanks to STER for financing the project.

