

Bentgrass, Creeping Establishment with Organic Fertilizer, Mycorrhizae and Vermicastings - South Africa

**Creeping Bentgrass Establishment at Metropolitan Golf Course 2009-2010**

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#### METROPOLITAN GOLF COURSE CONSULTANT REPORT FOR NOVEMBER 2009

Visits were made on Friday the 6<sup>th</sup> and 20<sup>th</sup> of November. The newly sown greens were then 1 and 3 weeks from sowing (6<sup>th</sup>) and 3 and 5 weeks from sowing on my last visit. Germination appeared very good with no disease visible. See attached photographs.

The grow in fertilizer program is attached indicating the actual amount of nutrients applied. From this it can be seen that we are about at the 50% level of the average annual requirement for Nitrogen and Potassium for narrowly cut turf. It is however commonly understood that this regime does not hold true for the first year which includes the grow in phase and levels of 1.5 times the norm is often reported.

Our objective during the grow in phase is to provide the correct amount and balance of all the required plant nutrients over this period.

The limitations to achieving this are low in cation exchange capacities (cec) very good hydraulic conductivity and a completely microbial sterile condition.

This makes the use of slow release fertilizers where microbial activity is involved initially very difficult. It further makes the use of complete soluble or instantly available fertilizers also very difficult as these will be quickly leached below the root zone.

Although our program took all of these conditions into consideration we may have faltered with just a little too much soluble nitrate fertilizer into the starter mix which we should have applied just a little later.

This situation is now corrected with the application of 150 litres of "Liquid carbon fertilizer" 13-3-5 . This is a very newly developed product where a high density carbon source is "liquidized" through a unique pyrolyzation process and then added to the soluble fertilizer. With the unique but extremely large surface area of carbon it is able to hold the solubilized nutrients in its folds and slowly release these to the plant roots. The use of this product does therefore limit extreme leaching losses of nitrates and other soluble forms of nutrients,

Soil and clippings will be analysed during the first week of December to establish future fertilizer applications.



6<sup>TH</sup> November 26, 2009 One week after seeding.



20<sup>th</sup> November 26, 2009 Three weeks after seeding.

**Kg / ha over top 100mm.**

<b>Base application</b>	<b>Application Rate</b>
Calcium CaSO4	1000 Kg / ha
Magnesiun MgSO4	300 Kg / ha
Potassium K2SO4	75 Kg / ha
KNO3	75 Kg / ha
Phosphate Bonemeal	200 Kg / ha
<b>TOTAL</b>	

**Fertilizer & Ammendments**

SUSTANE 8-2-4	1500 Kg / ha
BIOCULT Mycorrhiza	600g / ha
BIOSOIL Humic / Fu	40 Litres / ha
<b>TOTAL</b>	

<b>N</b>	<b>P</b>	<b>K</b>	<b>Ca</b>	<b>Mg</b>	<b>S</b>	<b>Fe</b>
			215		170	
				30	42	
10		31 29			13	
	20		44			
120	30	60	33	6	26	4
<b>130</b>	<b>50</b>	<b>120</b>	<b>292</b>	<b>36</b>	<b>251</b>	<b>4</b>

**Additional programme**

2nd week I Micromax	5 Kg / ha
2nd week I 13-3-5 OCF Liquid fertil	75 Litre
Biofer (Iron)	
4th week I K2SO4	25 Kg / ha
2nd week I 13-3-5 OCF Liquid fertil	75 Litre

Kg / ha  
**TOTAL**

<b>N</b>	<b>P</b>	<b>K</b>	<b>Ca</b>	<b>Mg</b>	<b>S</b>	<b>Fe</b>
						0.4
10	2	4				
						0.5
		10			4	
10	2	4				
<b>150</b>	<b>54</b>	<b>138</b>	<b>292</b>	<b>36</b>	<b>255</b>	<b>4.9</b>

METROPOLITAN GOLF COURSE CONSULTANTS REPORT  
FOR DECEMBER 2009

Visits were made on the 11<sup>th</sup> and 22<sup>nd</sup> of December.

The growth appeared very healthy with good colour with a very tight knit covering of the surface area.

Our objective now must be to get the covering as tight as possible as this will prevent / delay the invasion by Poa.

Soil and tissue samples were taken on the 11<sup>th</sup> of December see below for results.

Green #	pH	P Bray II	K	Uitruilbare katione (cmol(+)/kg)				Cu	Zn	Mn	B	Fe	C
	(KCl)	mg/kg		Na	K	Ca	Mg	mg/kg				%	
4 & 13	6.3	73	75	0.13	0.19	1.38	0.17	0.51	1.4	3.5	0.19	29.7	60.28
1 & 10	6.9	56	42	0.15	0.11	3.02	0.21	0.41	1.0	2.1	0.20	26.1	60.34
Metodes <sup>#</sup>	S05	S12	S15	S15	S15	S15	S15				S10		S08
Good level	5.5 6.5	30 - 50	80- 100					0.3- 1.0	1-3	5- 20	0.5- 1.0	5 - 20	

**Base Saturation.**

Green #	Lab. No.	Na %	K %	Ca %	Mg %	T-Value. cmol/kg
4 & 13	29527	6.9	10.3	73.6	9.1	1.87
1 & 10	29528	4.2	3.10	86.7	5.9	3.48
Ideal		Less than K%	4 to 8	50 to 75	10 to 20	

To get to grips with this soil analyses we must start by looking at the T-value which is roughly interpreted as the cation exchange capacity or in layman's terms the nutrient adhesion capacity.

Klipheuwel sand has a cation exchange capacity of less than 0.5 meq / 100g (cmol / Kg). The addition of 2% peat will move the root zone mix to 0.6 meq. The organic

fertilizer (Sustane) used as the base application together with the carbon based soluble fertilizer used has therefore given this very good increase to an average value of 2.67 meq / 100g. This is substantiated by the carbon percentage analyzed at an average of 0.31%.

As far as the macro nutrients are concerned Potassium and Magnesium must be slightly increased to get the base saturation balances in line.

The micro nutrients are nicely in balance with Manganese slightly low. This will be taken care of in future fertilizers programmes. Leaf samples were also taken but these were too small for proper analyses.

The issue of getting a tightly nit Bent green covering can be achieved by stimulating the Mycorrhizae fungi complex, which was inoculated at seeding. Very new research results have proved overwhelmingly that Earth worm casting extract stimulates the Mycorrhizae complex dramatically and it is suggested that we apply one application to the greens.

Fertilizer program for next month.

- Continue with 75 Litres of 13-3-5 liquid carbon fertilizer every second week.
- Apply 100 Kg of Magnesium sulfate.
- Apply 50 Kg of Potassium sulfate.
- Apply 5 Kg of Micromax.
- Apply one application of earth worm casting extract. Application rates to be advised.



11 December 2009

9 weeks after sowing



Root samples 11<sup>th</sup> December 2009

## METROPOLITAN GOLF COURSE CONSULTANTS REPORT FOR FEBRUARY AND MARCH 2010

The course was visited several times over this period (5<sup>th</sup>, 19<sup>th</sup> February, 4<sup>th</sup> March and the 19<sup>th</sup> and 23<sup>rd</sup> of March) and the greens were visually inspected for any problems as well as for the effect of the Vermi compost treatment.

The greens were during this period regularly verti cutted and lightly top dressed and the growth recovery after these treatments were very quick indicating an extremely healthy turf surface.

A visual inspection of the roots indicated healthy roots down to a length of 120 mm (pics to follow later).

A root sample was also taken to establish the percentage of roots colonized with Mycorrhizae, as one of our prime objectives here is to get this association as strong as possible to prevent Poa from establishing. Results should be available in the next 10 days.

The vermi compost tea extract applications most certainly had a visible improvement on the intensity and uniformity of the colour. This product contains an extremely wide diversity of beneficial micro organisms as well as humic acids that assist with plant growth stimulation and would also offer protection against disease infestations which have not been a problem here.

As we grew these greens in with the proper base fertilizers in balance together with very high quality organic fertilizer that provided the base stratum for the beneficial organisms to establish at the germination phase it would be a good idea to continue with monthly applications of this vermi compost tea extract to keep the beneficial populations in tact.

It is also suggested that representative soil samples be taken again to establish any shortages in nutritional status. It does not visually appear to have any deficiencies but a check particularly as it relates to Magnesium and micro nutrients would be a worth while exercise.

Evaporation rates during late February and up to mid March were in excess of 25 mm per day and with most greens in the Western Cape displaying serious stress the Metropolitan greens looked extremely good.



The 5<sup>th</sup> green just after first vermi compost tea application on the 5<sup>th</sup> of February. Notice the darker intense green spots.  
It is summation that these are highly mycorrhizal colonized areas and our objective is to get this dense uniform colour throughout the green.



The 5<sup>th</sup> green on the 23<sup>rd</sup> of March 24, 2010, notice the even dark green colour.