Greens Grade Fertilizer Comparisons Sustane® - Simplot GreensKote®

Accordia Golf Management & Sumitomo Corporation

Daiatsugi Country Club Hon Course and Daiatsugi Sakura Course

November 22, 2006

Trial Description:	Compare two different greens grade slow release nitrogen fertilizers, a 100% coated synthetic slow release nitrogen fertilizer (Simplot's GreensKote 18-3-18 and Sustane Natural Base 10-2-10+Fe on Bentgrass putting greens, in [prefecture]. Japan.	
Trial Dates:	September 6 – October 28, 2006 - Report Date, October 30, 2006	
Trial Location:	Daiatsugi C.C.	Hon course and Sakura course
Attendance:	Accordia Golf:	Mr. Sakamoto, Agronomist
	Daiatsugi C.C.	Mr. Kuwabara, greenskeeper for Hon-course
		Mr. Kanda, greenskeeper for Sakura-course
	Sumitomo	Otani-san
		Takaya-san
		Mr. Craig Holden

Daiatsugi C.C. Hon-course Oct 30, 2006 - Trial area：220 ㎡・Putting green・Bentgrass

Sustane Natural 10-2-10+Fe - Simplot GreensKote 18-3-18

Commodity	Dosage	N elements	Trial period
Simplot – GreensKote	15g/㎡	2.7g/㎡	Sept 2 – Oct 30
Sustane10-2-10＋Fe	27g/㎡	2.7g/㎡	

・Volume of mowed turf after mowing（unit=liter）

Date	Sep27	Sep30	Oct5	Oct7	Oct9	Oct11	Oct14	Oct16
GreensKote	3.2	6.0	10.9	5.0	7.2	6.0	5.0	2.5
Sustane	4.0	4.5	11.2	5.7	6.0	7.0	4.0	3.2

Date	Oct17	Oct21	Oct23	Oct24	Oct25	Oct27	Oct30	Totals
GreensKote	1.5	2.8	3.5	2.0	1.3	4.0	1.0	**61.9**
Sustane	2.8	3.6	3.7	2.0	1.0	4.5	1.8	**65.0**

Last fertilizer application date: Oct21.

The Simplot GreensKote treatment exhibited mottled (non-uniform) turf color from particle separation and irregular release of nitrogen components. Additionally, Simplot's Polyon®

product provides color for about four weeks only. Sustane 10-2-10 provided a homogenous particle which allows for more even application.

Evaluation Photos of Sustane v. GreensKote treatments

Enlargement of GreensKote area – note mottled appearance

Enlargement of Sustane area – note uniform color distribution

Root samples taken from the Sustane® treated area are significantly more developed that roots taken from GreensKote® treated area:

GreensKote®：60 mm-45 mm　　Sustane®：75 mm-65 mm

Daiatsugi C.C. Sakura-course

Trial area：315 ㎡・Bentgrass Putting green

Commodity	Dosage	N elements	Trial period
Simplot - GreensKote	10g/㎡	1.8g/㎡	Sep 2 – Oct 28
Sustane10-2-10＋Fe	18g/㎡	1.8g/㎡	

・Volume of mowed turf after mowing（unit = liter）

Date	Sep 9	Sep 11	Sep 13	Sep 15	Sep 17	Sep 19	Sep 21	Sep 23	Sep 25
GreensKote	0.8	0.6	0.5	0.7	0.7	0.8	0.3	0.3	0.6
Sustane	0.8	0.5	0.5	0.7	0.5	0.7	0.2	0.3	0.5

Date	Sep 27	Sep 30	Oct 3	Oct 7	Oct 9	Oct 13	Oct 16	Oct 19	Oct 21
GreensKote	0.8	0.6	0.5	0.7	0.7	0.8	0.3	0.3	0.6
Sustane	0.8	0.5	0.5	0.7	0.5	0.7	0.2	0.3	0.5

Date	Oct23	Ct26	Oct28						
GreensKote	1.0	0.65	1.1						
Sustane	0.9	0.6	1.0						

Turf clipping weights were similar.

The Simplot GreensKote treatment exhibited mottled (non-uniform) turf color from particle separation and irregular release of nitrogen components similar to the Hon-course.

Root lengths are as follows:

Sample from Sustane area; 46mm

Sample from GreensKote area; 38mm


Sustane
GreensKote

Enlargement of GreensKote area – note mottled appearance

Enlargement of Sustane area – note uniform color distribution

Conclusion Oct30

GreensKote®： treated 60mm、45 areas were more mottled than Sustane treated areas.

GreensKote color was variable and may have resulted from varied N release from particle separation.
Samples of Sustane area showed longer root lengths than the one from GreensKote® areas.
NX-PRO showed little difference compared with Simplot products.

Leaf blade analysis

Following is the leaf blade analysis.
TG (Toyo Green) is the third party who performed leaf tissue analysis.
TORO is the turf management company.

Daiatsugi CC Sakura-course
Leaf blade analysis 9/21mowed 9/28analyzed

	N	P	K	S	Ca	Mg	Fe		
Sustane	5.30	0.84	2.98	0.58	0.67	0.31	0.03		
GreensKote	5.43	0.80	3.04	0.58	0.64	0.29	0.03		
TG Target	4.5～5.5	0.5～0.6	2.5～	0.2～	0.3～0.4	0.25～0.3	0.02～0.03		

9/21～9/25 sum of Toyo Green data

	N	P	K	S	Ca	Mg	Fe		
Average	5.27	0.64	2.16	0.46	0.44	0.21	0.03		
Max.	6.58	0.84	3.11	0.58	0.67	0.31	0.04		
Min.	3.91	0.50	1.33	0.32	0.33	0.17	0.01		
TORO Target	4.5~6.0	0.3~0.6	2.2~2.6	0.25~0.5	0.5~0.8	0.25~0.3	0.01~0.03		

Leaf blade analysis　10/9mowed　10/12 analyzed

	N	P	K	S	Ca	Mg	Fe		
Sustane	4.18	0.62	2.46	0.40	0.43	0.22	0.03		
GK	4.32	0.63	2.45	0.41	0.45	0.22	0.03		
TG Target	4.5～5.5	0.5～0.6	2.5～	0.2～	0.3～0.4	0.25～0.3	0.02～0.03		

10/5～10/9 sum of TG analyzed data

	N	P	K	S	Ca	Mg	Fe		
Average	5.33	0.68	2.59	0.44	0.44	0.21	0.03		
Max.	6.41	0.85	3.21	0.63	0.61	0.28	0.04		
Min.	4.18	0.56	1.65	0.38	0.33	0.18	0.02		
TORO Target	4.5~6.0	0.3~0.6	2.2~2.6	0.25~0.5	0.5~0.8	0.25~0.3	0.01~0.03		

Leaf blade analysis　10/23mowed　10/26 analyzed

	N	P	K	S	Ca	Mg	Fe		
Sustane	6.10	0.67	2.61	0.52	0.35	0.20	0.02		
GK	5.99	0.66	2.59	0.54	0.34	0.20	0.02		
TG Target	4.5～5.5	0.5～0.6	2.5～	0.2～	0.3～0.4	0.25～0.3	0.02～0.03		

10/18～10/23 sum of TG analyzed data

	N	P	K	S	Ca	Mg	Fe		
Average	5.36	0.61	2.47	0.43	0.37	0.20	0.03		
Max.	7.32	0.79	3.48	0.63	0.54	0.27	0.05		
Min.	3.78	0.32	1.66	0.25	0.14	0.15	0.02		
TORO Target	4.5~6.0	0.3~0.6	2.2~2.6	0.25~0.5	0.5~0.8	0.25~0.3	0.01~0.03		

Daiatsugi CC Hon-course

Leaf blade analysis　9/25 mowed　9/28 analyzed

	N	P	K	S	Ca	Mg	Fe		
Sustane	3.91	0.66	2.11	0.37	0.46	0.20	0.02		
GK	4.08	0.69	2.19	0.38	0.48	0.19	0.02		
TG Target	4.5～5.5	0.5～0.6	2.5～	0.2～	0.3～0.4	0.25～0.3	0.02～0.03		

9/21～9/25 sum of Toyo Green leaf tissue data

	N	P	K	S	Ca	Mg	Fe		
Average	5.27	0.64	2.16	0.46	0.44	0.21	0.03		
Max.	6.58	0.84	3.11	0.58	0.67	0.31	0.04		
Min.	3.91	0.50	1.33	0.32	0.33	0.17	0.01		
TORO Target	4.5~6.0	0.3~0.6	2.2~2.6	0.25~0.5	0.5~0.8	0.25~0.3	0.01~0.03		