

Use of Compost in the Fertilization of Golf Greens

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Introduction

Portugal has very good climatic and landscape conditions for the golf practice. Nevertheless the maintenance of the greens required high inputs of fertilizers. The aim of the present work was to evaluate the replacement of the conventional fertilizers by an organic compost in the fertilization of golf greens.

We evaluated the following parameters

- Seed germination phytotoxicity (Abad et al.1993; Zucconi et al. 1981);
- Soil fertility (pH, OM, P, K, exchangeable bases);
- Presence of *Dollar Spot*;
- Green speed.



Material and methods

Site: Golf of “Bom Sucesso-Portugal” (accordingly with USGA specifications).

Cultivar: Penn-A4; Topdress: 0.09 m³/100m².

Experimental period: February to July of 2011.

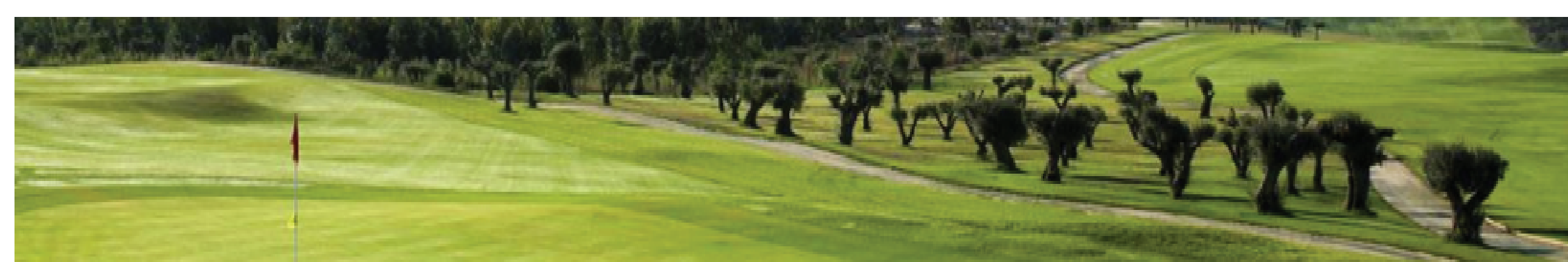
Compost characterization: obtained by composting the mixture of sawdust + sweage sludge + ashes from biomass incineration + fruit pulp from agro-industry.

Parameters	Units	Compost	Input of nutrients/ topdress* (kg/ha)
Humidity 80°C	%	34	
Humidity 105°C	%	71	
Density	m/v	0.48	
pH		6.3	
EC	dS.m ⁻¹	1.34	
OM	%	41.2	
C/N		10	
N-Total	%	1.53	22.03
N-Org.	%	1.40	20.16
N-NH ₄ ⁺	%	n.d.	
P	%	0.57	8.20
K	%	0.64	9.22
Ca	%	0.15	2.16
Mg	%	0.02	0.29
Na	%	0.09	1.30
Cl	mg.100g ⁻¹	0.75	
Fe	mg.kg ⁻¹	0.72	10.37
Mn	mg.kg ⁻¹	45.7	0.66
Zn	mg.kg ⁻¹	199	0.29
Cu	mg.kg ⁻¹	961	1.38
Pb	mg.kg ⁻¹	24.5	0.035
Cd	mg.kg ⁻¹	n.d.	
Ni	mg.kg ⁻¹	26.1	0.038
Cr	mg.kg ⁻¹	34.4	0.050

*During the experiment 4 topdresses were done.

Experimental design

Treatment - Control (3 repetitions)	Treatment - Compost (3 repetitions)
Topdress: Sand	Topdress: Sand : Compost (2:1) (4 topdress)
Fertilization: 22g/m ² of a commercial fertilizer - 13:0:46 (6 weeks). In total: 86 kg N/ha and 252 kg K/ha.	Fertilization: Not applied
Foliar treatment: 4L/ha Clortalonil + 2L/ha (Mn)	Foliar treatment: Not applied



Conclusions

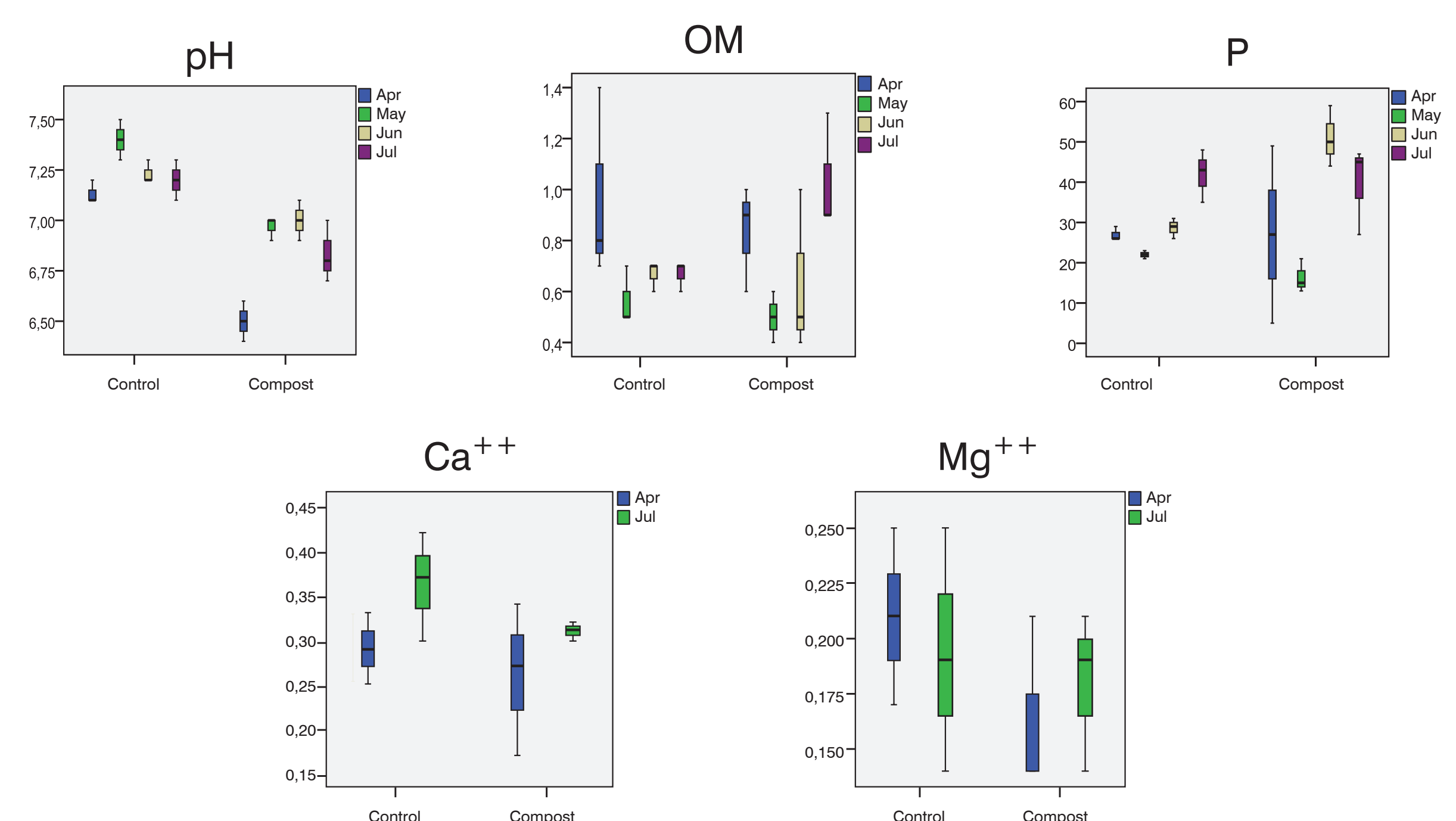
The compost application to golf greens replaces the use of conventional fertilizers and maintained a play quality identical to the ones fertilized conventionally. The compost must have a size grain < 2mm and a low level of humidity. It can be used in greens where Topdressing is usually done.

References

Abad, M., Martinez, P., Martinez, M., Martinez, J., 1993. Evaluacion agronomica de los substratos de cultivo. Actas de Horticultura 11:141-154.
 Zucconi, F., Peram, A., Forte, M., De Bertolidi, M., 1981. Evaluating toxicity of immature compost. BioCycle 22:54-56.

Results and discussion

- The germination test 96% ± 3% indicates an ideal maturity degree of the compost.
- The results obtained about soil fertility properties, exception to the extractable K, were always identical or better on the greens treated with the compost:



- During the time trial there were no signs of the presence of *Dollar Spot* in the greens with compost application.
- The green speed in the greens treated with the compost was at first similar to the control group, but after the second application of compost topdress, the results were better.

