



**XVII<sup>th</sup> World Congress of the International  
Commission of Agricultural and Biosystems  
Engineering (CIGR)**



Hosted by the Canadian Society for Bioengineering (CSBE/SCGAB)  
Québec City, Canada June 13-17, 2010

**IMPROVING THE PERFORMANCE OF LANDSCAPE SPRINKLER  
IRRIGATION THROUGH FIELD EVALUATIONS AND MODELLING**

GONÇALO CALEIA RODRIGUES<sup>1</sup>, PAULA PAREDES, MARIA ISABEL VALÍN,  
CRISTINA HENRIQUES, LUIS SANTOS PEREIRA

<sup>1</sup> CEER-Biosystems Engineering, Institute of Agronomy, Technical University of Lisbon, Portugal,  
gc.rodrigues@live.com.pt

**CSBE101153 – Presented at Section I: Land and Water Engineering (including  
EnviroWater 2010)**

**ABSTRACT** Field evaluations of sprinkler irrigation in a garden landscape were performed in Ponte de Lima, North Portugal, show a low average system uniformity ( $CU = 74\%$  and  $UD = 67\%$ ). Field evaluations of sprinkler irrigation systems in a golf course at Oeiras have shown a variable distribution uniformity, from very low  $DU = 33\%$  to high  $DU = 80\%$ . Results are highly impacted by wind speed and by quality of sprinkler system design. Aimed at improving the performance of sprinkler systems using field evaluation data the model ProAsper was used. The model allows identifying appropriate improvement measures and provides information that supports design. It is a user friendly decision support tool that is able to simulate various design alternatives for sprinkler set systems and to manage data from field evaluations. The model supports searching solutions that satisfy target performance indicators and allows the user to analyze and select the alternatives that better satisfy his(her) objectives. In this paper, the model is presented with some detail, showing its databases, pipe sizing computations and the module for performance analysis. Results of its application to these landscapes are presented, including the search of alternative design solutions. Results show that ProAsper is a tool easy to operate and that effectively supports decision-making for design of sprinkler set systems. Further developments are being performed.

**Keywords:** performance analysis, decision support tools, simulation, field evaluation