

## Characterization of soils in an area of prescribed fire

**N. Santos<sup>1</sup>, M.J. Šmid<sup>2</sup>, A.M. Castro<sup>2</sup>, J. Espinha Marques<sup>1</sup>, J.P. Meixedo<sup>2</sup>,  
J. Góis<sup>3</sup>, H. I. Chaminé<sup>4</sup>, A. Vivas<sup>5</sup>, E. Carvalho<sup>5</sup>**

<sup>1</sup> Faculty of Sciences (DGAOT) and Centre of Geology of the University of Porto, Portugal

<sup>2</sup> School of Engineering (ISEP), Polytechnic of Porto and Centre CIGAR|UP, Portugal

<sup>3</sup> CIGAR – Faculty of Engineering, University of Porto, Portugal

<sup>4</sup> School of Engineering (ISEP), Polytechnic of Porto and Centre GeoBioTec|UA, Portugal

<sup>5</sup> AFN - Forestry Services, Portugal

The prescribed fire is a technique that is often used, it has several advantages. Pedological and hydropedological techniques were tested to assess the prescribed fire changes may cause in soils. This work was performed in Tresminas area (Vila Pouca de Aguiar, Northern Portugal), during February and March 2011.

In the present study we applied several techniques. For the field sampling was followed the ISO 10381-1<sup>[1]</sup>, ISO 10381-2<sup>[2]</sup>, and FAO rules <sup>[3]</sup>, as well as were used a grid with 17 points for measuring the soil parameters. During the fire, we have tried to check, with the assistance of the Portuguese Forestry Authority, some important parameters such as, the propagation speed, the size of the flame front and the intensity of energy emitted per unit area. Before the fire, was collected carefully soil disturbed and undisturbed samples for laboratory analysis, and measured soil water content; we also have placed four sets of thermocouples for measuring soil temperature. After the fire, were collected the thermocouples and new soil samples; the water content were measured in the soil and collected ashes.

In the laboratory, after preparing and sieving the samples, were determined the soil particle size. The soil pH and electrical conductivity in water was also determined. The total carbon (TC) and inorganic carbon (IC)<sup>[4]</sup> was measured by a Shimadzu TOC-Vcsn.

The water content in soil has not varied significantly before and after the fire, as well as soil pH and soil electrical conductivity. The TC and IC did not change, which was expected, since the fire not overcome the 200° C. Through the various parameters, we determined that the prescribed fire didn't affect the soil. The low temperature of the fire and its rapid implementation that lead to the possible adverse effects caused by the wild fire didn't occurred.

### References:

[1] ISO 10381-1:2002. Soil quality – Sampling - Guidance on the design of sampling programs

[2] ISO 10381-2:2002. Soil quality – Sampling – Guidance on sampling techniques

[3] FAO (1988). *Soil Map of the World. Revised Legend*. World Soil Resources Report 60. FAO, Rome.

[4] ISO 10694:1995. Soil quality – Determination of organic and total carbon after dry combustion