

Transnational Access Report

1. General Information

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| Project Acronym (ID): | Orgamthero |
| Project Title | Influence of organic amendments on the thermal properties of rosemary plants to estimate fire risk in Mediterranean areas |
| Name of Group Leader | Dr. Isabel Nogués/Dr. Maria Angeles Bustamante |
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2. Duration of access

| | |
|-------------------------------------|------------------------------------|
| Begin of the project | End of the project |
| First day the installation was used | Last day the installation was used |
| 07/05/2013 | 17/05/2013 |

3. Project summary (max. 250 words)

Labiata family plants, such as rosemary (*Rosmarinus officinalis*), are responsible for the start of numerous forest fires, especially in Mediterranean areas. The physical, chemical and thermal properties of vegetation have a direct effect on heat transfer, ignition, and combustion. Fire risk depends largely on cell wall composition, mainly constituted by biopolymers (cellulose, hemicellulose (mixture of cellulose and hemicellulose) and lignin). These biopolymers contain flammable volatile substances that favour the spreading of fire. A great level of terpene oil also favours the flammability risk. It seems that the use of fertilisers and/or amendments may alter vegetal cell wall content and composition. Therefore, the knowledge of the effect of the use of fertilisers and/or amendments on the contents in biopolymers in the rosemary plants and on the combustibility of the plant material can be a useful tool in the fire risk estimation. This research proposal is integrated within a research project to evaluate the efficiency of the use of organic amendments as a method of recovering and protecting Mediterranean areas prone to degradation. The research project was based on the study of the effects of the incorporation into a semiarid soil from central Italy of two composts elaborated using the solid fraction of two digestates (obtained after the anaerobic digestion of cattle and pig slurry, respectively) at different rates (30 t/ha and 60 t/ha), compared with a control treatment (the unamended soil) and a mineral fertilised soil. Additionally, in these soils, rosemary (*Rosmarinus officinalis*) plants were planted.

4. Main achievements (max. 250 words)

The thermal behaviour of the rosemary plants was studied by thermo-gravimetric analysis (TGA), which determines the changes on the weight losses of a sample depending on temperature. Samples were pyrolysed in nitrogen at a determined flow rate and using a temperature program, previously established for this specific type of samples, with the person in charge (Dr. Gordon Allison) at IBERS (Aberystwyth University). From these studies we obtained a continuous graph of mass change against temperature. Derivative thermogravimetric (DTG) curves, presenting the rate of mass change (dm/dt) as a function of temperature, were also obtained. Moreover, the thermal analysis was also used to calculate the total volatile content, and the char (ash+fixed carbon). Also, the combustibility of plant samples was also estimated. Although the obtained data are still being analysed, the initial results seem to show differences in the thermal behaviour of the rosemary plants depending on the treatment applied to the soil.