
Field demonstration experiments of post-fire erosion and its mitigation in north-central Portugal following the Pedrogão-Goís wildfire

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Following the so-called Pedrogão-Goís wildfire of June 2017 in central Portugal, with its dramatic impacts on human lives and properties, the national Institute of Nature Conservation and Forestry of Portugal (ICNF) requested the earth surface processes (esp) team of the University of Aveiro to participate in setting up a pilot station on post-fire erosion and its mitigation. To this end, the esp team first installed a field experiment in and near a mature Maritime Pine plantation near the village of Castanheira de Pêra, which was then demonstrated to a large number of stakeholders during an event organized by the State Secretary of Forestry and Rural Development on 19 September 2017. Subsequently, the esp team installed two more demonstration experiments in the same burnt area, one on forest tracks in a Eucalypt nitens area and one following post-fire logging of a Eucalypt globulus stand. The present poster, however, will be restricted to the Maritime Pine experiment.

The Maritime Pine experiment aimed to compare three erosion mitigation “measures” with doing nothing. These three measures were barriers of pine twigs, mulching with pine needles and spontaneous pine needle cast. The experimental set-up consisted of 12 erosion plots of 2 m by 8 m bounded by geotextile, divided over three blocks that were located on three distinct but nearby slopes with the same exposition. The plots with spontaneous needle cast were located at some 5-10 m distances from the plot triplets with the other treatments, coinciding with zones of partial pine crown consumption as opposed to the zones of full pine crown consumption where the plot triplets were installed. The treatments for the plot triplets were selected randomly for each block separately. Mulching with pine needles was done at a rate of 2.1 Mg ha⁻¹, to be similar to the straw application rates used in operational post-fire management in the USA and Galicia. The rates of spontaneous needle cast were also determined at the time of the treatments, varying widely from 2.5 to 5.1 and 7.1 Mg ha⁻¹.

Over the initial period from October 2017 to February 2018 with c. 600 mm of rainfall, sediment losses at the control plots varied strongly, from 311 and 412 in blocks 1 and 2 to 1,240 g m⁻² in block 3. Also the plots of block 3 with mulch produced more sediments than the plots of the other two blocks but the differences were less pronounced, at least in absolute terms due to the elevated effectiveness of both mulch treatments. Nonetheless, there was a tendency for the applied pine needle mulch to be



somewhat less effective than the spontaneous needle cast (87-95 % vs. 99 %), in line with the associated lower needle loads. The poster will look into more detail into this load-effectiveness relationship, both over the entire first post-fire year as well as for its individual data collection periods.