

# Soil erosion influenced by wildfire and pre-fire plantation method in NW Spain

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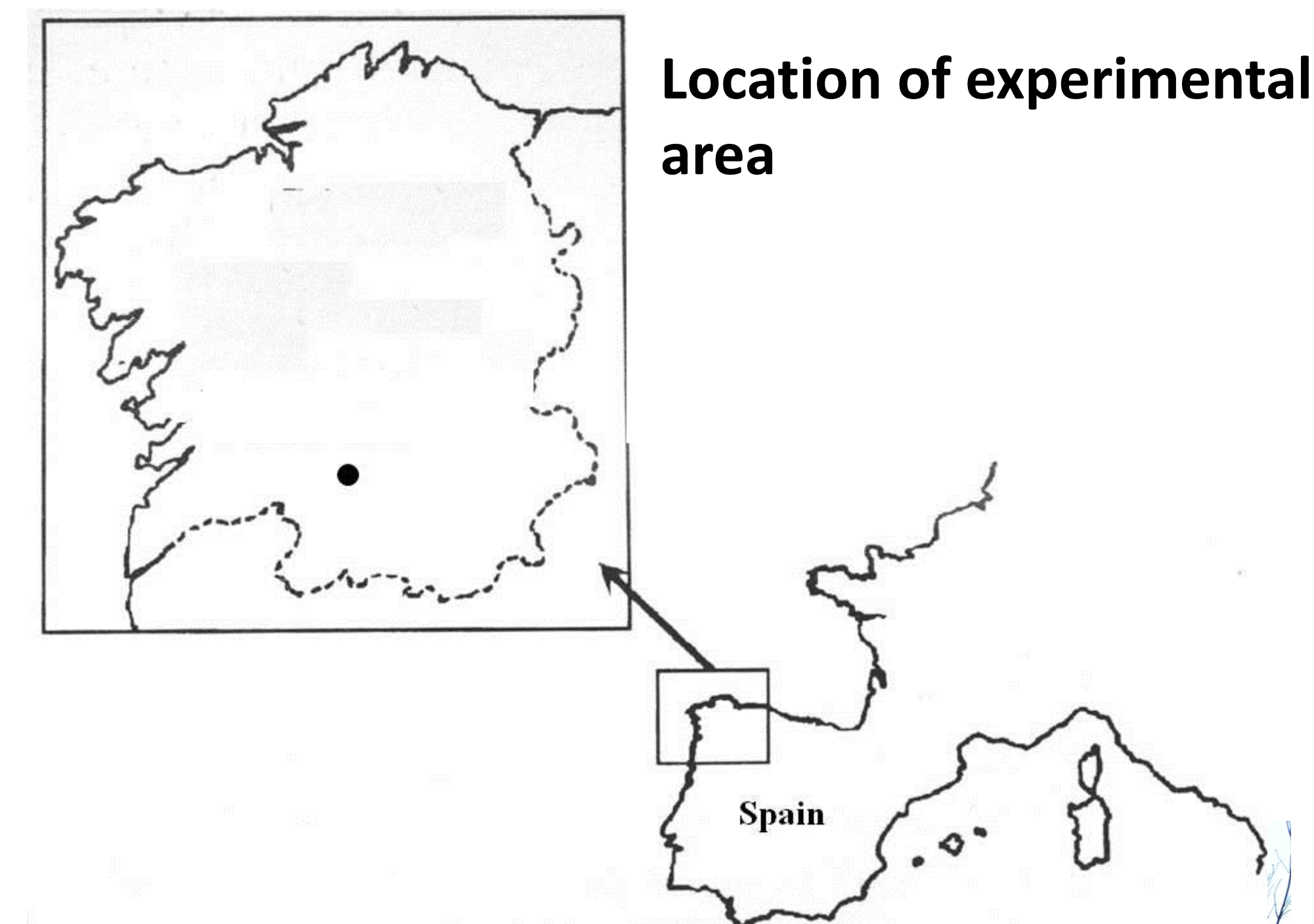
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## INTRODUCTION

Post-fire soil erosion is of major concern because of the potential effects on soil and water resources. Soil characteristics associated with past fire activity or/and agricultural and forestry management can also play a significant role in post-wildfire soil loss through increments in soil erodibility or as a result of sediment exhaustion. In areas such as NW Spain where there is a long history of intensive land use, this factor may be critical for explaining soil loss. However, information on this topic is scarce. The main aim of the present study was to compare the sediment production of two different plantation methods relative to those in control (untreated) plots after a high severity wildfire.

## MATERIALS AND METHODS

The study was carried out in the area affected by the Cualedro wildfire (Ourense, NW Spain). The wildfire burned 1478 ha of forest land in the summer of 2015. Immediately after the wildfire, 30 experimental plots (20 x 4 m each) were established with their longest dimension along the maximum slope in a *P. sylvestris* plantation. Plot slope varied between 25 and 51%. Soil burn severity was high. Treatments were as follows: ploughing + wildfire, plantation holes + wildfire and no preparation method + wildfire. Eroded soil was collected between September 2015 and September 2016, depending on rainfall events. The effect of treatment on soil erosion was tested by using a general linear mixed model. The plot was included as a random effect in the model and treatment was considered a fixed factor.



Location of experimental area



Plantation holes + wildfire treatment



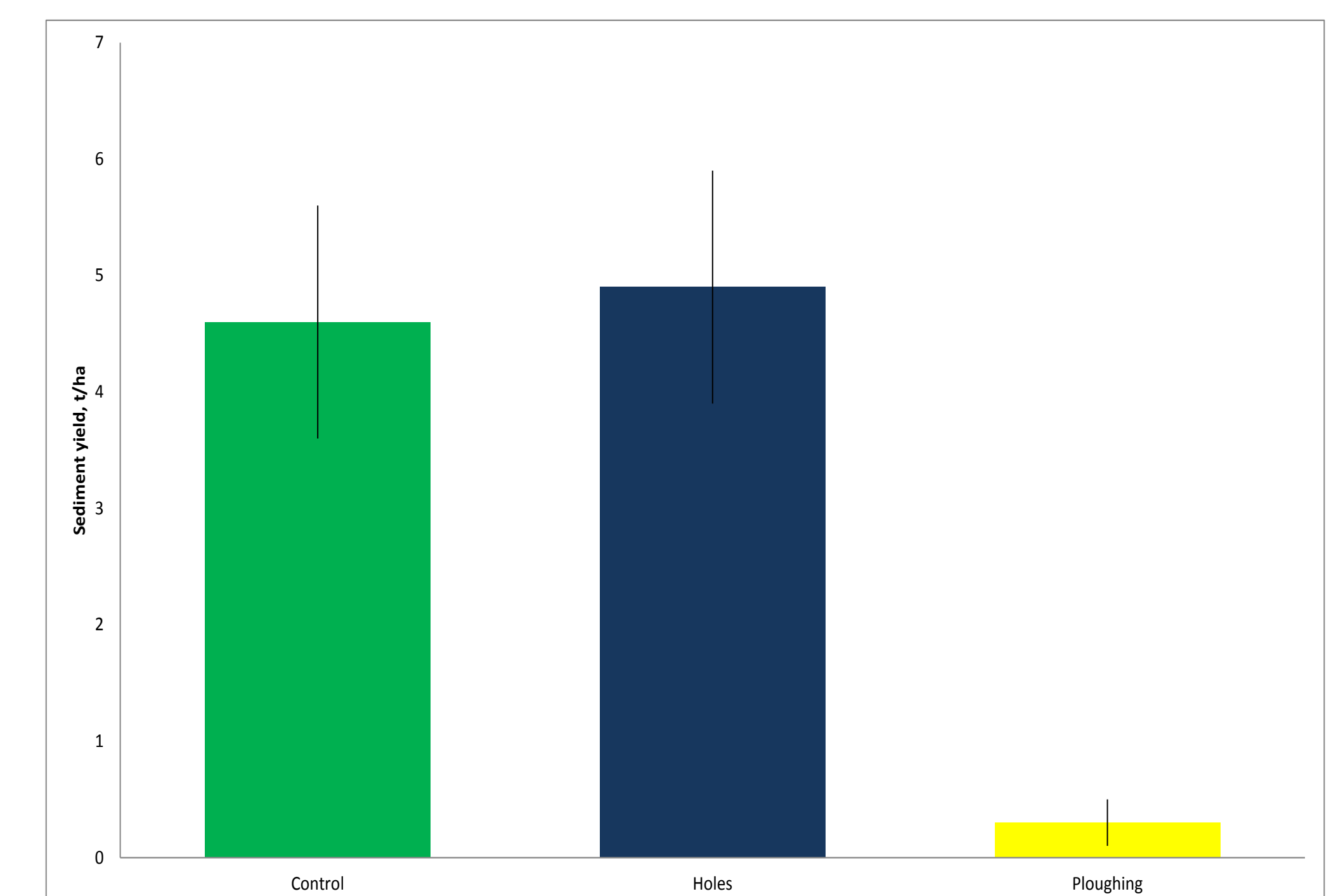
Ploughing + wildfire treatment



Partial view of sediment fences

## RESULTS AND DISCUSSION

Precipitation during the study was 771 mm, below the annual average in the area (900 mm). During the first year following fire, soil losses in the ploughed areas significantly differed from the plantation holes treatment and the treatment with no terrain preparation. These results suggest that pre-fire ploughed areas are not a priority for soil erosion risk mitigation after wildfire.



Mean soil losses the first year after wildfire.  
Vertical bars, standard error

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