



Soil erosion after *Eucalyptus globulus* clearcutting: differences between logging slash disposal treatments

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Received 31 December 2002; received in revised form 22 October 2003; accepted 20 February 2004

Abstract

The effect of different logging slash disposal techniques on soil erosion for 3 years after harvesting was evaluated in a clear-felled *Eucalyptus globulus* Labill. stand on a representative coastal site in Galicia (NW Spain). The treatments compared were: slash scattering; slash scattering + fertilization; windrowing; scattering + burning (broadcast burning) and windrowing + strip burning (windrow burning).

Accumulated soil losses were relatively small and particularly in slash scattering treatments. Both burning treatments resulted in significantly higher losses (between 7 and 110 times) than the other disposal methods. Broadcast burning generated less erosion than windrow burning in the first year after treatment but not in the second. The severe burning conditions in windrow burns reduced drastically the protective soil organic layer. Slash scattered (alone or combined with fertilization) on the ground was the most efficient treatment and gave negligible soil losses. Cover by slash or litter and duff significantly controlled soil losses. In burn treatments, remaining slash and litter + duff reduced soil losses. The duration of soil heating significantly affected the remaining soil organic cover on burned soils and this, in turn, was significantly influenced by surface soil moisture content immediately before burning. Soil moisture content just before burns was the key to constrain soil losses after slash burning.

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Keywords: *E. globulus*; Harvesting; Clearcutting; Logging slash disposal; Soil erosion; Burning

1. Introduction

Eucalyptus globulus Labill. is one of the main forestry species in Galicia (NW Spain), covering more than 200,000 ha in pure stands (Tercer Inventario Forestal Nacional, 2001). Most of these plantations

are on steep slopes and shallow and acidic soils developed on granitic bedrock, in an ocean-influenced coastal area with a mild, humid climate. These eucalypt stands, characterized by their high growth rate (the highest in western Europe forests), are managed on short rotations (10–15 years) using mechanized skidding and intensive logging slash manipulation after clearcutting.

Harvesting practices can increase the potential for sediment production through soil alteration and forest

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