Biodiversity and biomass of understory vegetation in a *Eucalyptus globulus* Labill. coppice as affected by slash management

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OBJECTIVES

- The biodiversity of understory vegetation in intensively managed forest plantations is an indicator for the preservation of overall biodiversity and sustainability of production.

- The diversity of species of the shrub and herbaceous layers may be strongly affected by the soil preparation techniques at planting and by the type of management of the soil organic matter.

- The objective of this study was to assess the effects of harvesting residue management on the biodiversity and biomass of understory vegetation, along the rotation period of a *Eucalyptus globulus* coppice stand.

SITE CHARACTERISTICS

- The experiment was installed in 1993 in a *E. globulus* plantation in West Central Portugal (39° 20' N, 9° 13' W, 30 m a. s. l.)

CLIMATE: Mediterranean type, tempered by an oceanic influence Mean annual rainfall: \simeq 600 mm Mean annual temperature: 15,2 °C **Relative humidity: 80%** LITHOLOGY: Sandstones (Jurassic) **TOPOGRAPHY: Slight Undulation to flat SOILS: Dystric Cambisols**



	11	1 W	2 R	21
	1 S	1 R	2 W	2 S
1	3	3 R	41	4 W
	3 W	3 S	4 R	4 S
V	5 R	51	5 S	5 W

TREATMENTS

The experimental design consisted of 4 treatments:

R - removal of slash without soil mobilisation

S - broadcast of slash over the soil surface without soil mobilisation

W - as in S, but concentrating the woody slash between the plantation rows

- incorporation of slash into the soil by harrowing down to 20 cm

METHODOLOGY

1. SURVEYS OF VEGETATION

From the 2nd to the 6th year (by the *quadrat method* 1×1m)



9th and 10th years (by the *line interception method* – 15m).





The understory vegetation was randomly sampled from the 2nd to the 6th year, as well as in the 9th and 10th years



3. PARAMETERS

Average number of species per treatment and year Proportion of soil cover Shannon-Wiener diversity and equitability indexes per treatment and year

Understory biomass

RESULTS

AVERAGE NUMBER OF SPECIES



PROPORTION OF SOIL COVER



R S W I

DIVERSITY INDEX (SHANNON-WIENER)



S W R

EQUITABILITY INDEX (SHANNON-WIENER)



S W R

UNDERSTORY BIOMASS (g m⁻²)



CONCLUSIONS

- Removal of slash without soil disturbance promoted the highest:

mean total number of species

proportion of understory plant cover

- The Shannon-Wiener diversity and equitability indexes were not significantly affected by treatments

- Slash broadcast on soil surface reduced understory biomass along the rotation period

- Data at the end of the experiment period suggest that the development of shrubs may be responsible for changes in the understory biomass

- Inter annual and seasonal variations are also responsible for differences in biodiversity and biomass of understory vegetation throughout the years