

## Soil erosion assessment in the coppice forests of Marganai (Sardinia, Italy)

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Natural and anthropogenic events can cause a temporary or total decrease in the protective effect of canopies on the ground. Among these, coppice represents a potential exposure of the soil to the risk of erosion and loss of organic matter. However, the regeneration dynamics of vegetation limit the potential negative impacts of the harvest in time. Furthermore, the erosive phenomena depends on the concomitance of many factors, among which the intensity of the rains, the slope, the type of soil, and silvicultural practices. The present study aim to assess the erodibility of the Marganai soils in areas undergoing cuttings and how forest management can limit soil losses. The forest parcels have been characterized from the physical and floristic point of view (slope, presence of litter, vegetation, stoniness). After that, 8 plots were identified for each particle. The tests were conducted by means of controlled rain simulation on 16 experimental plots, evaluating the response in terms of sediment quantity and organic material transported by surface runoff water. The rain simulation was made from 4 m high on a 1.5 square meter plot. The amplitude of the wetting angle was 120 °, in order to obtain a wide and uniform precipitation on the considered area (plot). For each single test two rain simulation lasting 30 minutes was conducted with an intensity of about 45 mm / h. Soil moisture was assessed at the beginning and at the end of each test, collecting an undisturbed sample each time and three disturbed samples in three different sectors immediately around the plot. The test results showed an extremely low surface runoff due to the high rate of water infiltration in the soil, despite the notable rainfall intensity to which the experimental plots were submitted. The average infiltration calculated on all the tests does not show evident differences between plots with coverage and without the forest soil does not therefore significantly modify its hydrological characteristics. Regarding the slope, variable from  $35 \pm 6\%$  and from  $49 \pm 11\%$  in the two particles, respectively, the effect on the infiltration was reduced, both in relation to the vegetation cover, and in relation to the different types of soil. The solid material carried by the surface runoff is below reference literature values.