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The contribution of mulches to control high soil erosion rates in vineyards in Eastern Spain

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Soil erosion take place in degraded ecosystem where the lack of vegetation, drought, erodible parent material and deforestation take place (Borelli et al., 2013; Haregeweyn et al., 2013; Zhao et al., 2013). Agriculture management developed new landscapes (Ore and Bruins, 2012) and use to trigger non-sustainable soil erosion rates (Zema et al., 2012). High erosion rates were measured in agriculture land (Cerdà et al., 2009), but it is also possible to develop managements that will control the soil and water losses, such as organic amendments (Marqués et al., 2005), plant cover (Marqués et al., 2007) and geotextiles (Giménez Morera et al., 2010). The most successful management to restore the structural stability and the biological activity of the agriculture soil has been the organic mulches (García Orenes et al; 2009; 2010; 2012). The straw mulch is also very successful on bare fire affected soil (Robichaud et al., 2013a; 2013b), which also contributes to a more stable soil moisture content (García-Moreno et al., 2013).

The objective of this research is to determine the impact of two mulches: wheat straw and chipped branches, on the soil erosion rates in a rainfed vineyard in Eastern Spain.

The research site is located in the Les Alcusses Valley within the Moixent municipality. The Mean annual temperature is 13 °C, and the mean annual rainfall 455 mm. Soil are sandy loam, and are developed at the foot-slope of a Cretaceous limestone range, the Serra Grossa range. The soils use to be ploughed and the features of soil erosion are found after each thunderstorm. Rills are removed by ploughing.

Thirty rainfall simulation experiments were carried out in summer 2011 during the summer drought period. The simulated rainfall lasted during 1 hour at a 45 mmh⁻¹ intensity on 1 m² plots (Cerdà and Doerr, 2010; Cerdà and Jurgensen 2011). Ten experiments were carried out on the control plots (ploughed), 10 on straw mulch covered plots, and 10 on chipped branches covered soil.

The results show that the soil erosion is reduced by 10 on straw mulch covered soils and by 4 on chipped branches covered soil.

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