Geophysical Research Abstracts
Vol. 15, EGU2013-916-1, 2013
EGU General Assembly 2013


# How much mulch? No tillage and mulching practices contribute to enhanced soil water repellency.

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INTRODUCTION
Mulching is an agricultural management technique aimed at protecting and improving soil physical properties. Mulching consists of application of crop residues and other materials to cropped soils, and may be used in combination with no tillage and other conservative practices. These techniques contribute to improved water management, increased soil fertility, crop yields and control of soil erosion risk. Conservative practices as mulching and no-tillage increase soil organic matter input in soils and contribute to reduce the soil hydrological response by improving soil structure, regulating the pore system and causing surface irregularity. In contrast, mulching and other conservative practices have been considered recently responsible of enhanced soil water repellency (WR). Soil WR reduces infiltration rates and increases soil erosion risk.

OBJECTIVES AND METHODS
In this research, we have studied the effect of no-tillage and different mulching rates (1-4, MR1; 5-8, MR2; and 9-12 Mg ha-1 year-1 wheat straw residues application, MR3) during different periods of treatment ranging between 1 and 15 years in Southern Spain. Conventionally tilled under no mulching were selected as control areas. Soil WR and organic matter content were analyzed and rainfall simulations were performed to study the impact of management in the hydrological soil response (time to ponding, Tp; time to runoff, Tr; and runoff rate).

RESULTS
Subcritical soil WR developed in MR1 soils, and slight soil WR was observed in MR2 and MR3 soils after a few years of treatment. Subcritical or light soil WR induced significant changes in Tp and Tr, which increased mainly in MR1 soils, but increased WR observed in MR2 and MR3 soils reduced the positive impact of organic matter and contributed to accelerate ponding and runoff flow.