

Effects of stubble burning on soil hydraulic, physical and chemical properties in Sistan Plain

Abstract

Crop residue management with a direct impact on physical, chemical and hydraulic soil properties have a significant role in sustainable crop production in ecosystems. The present study assesses the effect of stubble burning on physical, chemical and hydrological properties of different Sistan plain soils. To achieve these objective, different soil properties such as pH, electrical conductivity, organic carbon, available P, K and Ca, bulk density, hydraulic conductivity, infiltration, sorptivity, soil water capacity and hydrophobicity were evaluate in both burned and unburned plots of various textured soils. The results showed that pH and E_c , available P, K and Ca, bulk density values in the burned plots were increased compared to the unburned plots. Burning showed no changes on the soil organic carbon in the all investigated soils. There was a significant ($P < 0.05$) increase in hydraulic conductivity, Soil water capacity and sorptivity in the burned plots relative to unburned plots.. The soil water repellency was similar for both burned and unburned plots and the water drop penetration time was less than 5 seconds. The finding indicate that the stubble burning has detrimental effects on the physical, chemical and hydraulic properties soil which these harmful effects in light textured soils are more significant.

Key words:

Stubble burning, soil hydraulic properties, water repellency, Sistan



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