



Effects of biochar on soil infiltration, runoff and sediment production on a slopeland red soil

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Biochar has been considered as a useful amendment to ameliorate soil physical and chemical properties. This study aims to incorporate a wood biochar (WB), pyrolyzed by 400 [U+2103], into a clayey red soil with a slope gradient of 5° to improve infiltration and reduce runoff and sediment production. Field trials were conducted in four treatments including control, biochar (4%, w/w) (WB), compost (1%) + biochar (4%) (CWB) and polyacrylamide in 50 ppm (PAM) in this study. An erosion experiment was performed by a rainfall simulator in a rainfall intensity of 70 mm/hr after 12 months. The runoff and sediments were collected and weighted for each treatment. The results displayed that runoff amounts were obviously reduced by 2.3% -6.3% in treatments of WB and CWB compared with the control, but not in PAM. On contrary, the infiltration rates were obviously increased by 7.4%-18% in the treatment of WB and CWB compared with the control, but reduced by 25% in PAM treatment. After 12 months, all treatments could effectively prevent clayey soil from erosion, particularly in PAM. In conclusion, biochar could be an alternative strategy for improvement of permeability and erodibility compared with PAM practice on mild slopeland soils.