

The impact of land disturbance/restoration on runoff and sediment yield in semi-arid loess region

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Abstract: Land disturbance/restoration is a significant factor influencing runoff and sediment yield in the semi-arid loess region of China. Grey relational analysis was used to analyze the factors vegetation, rainfall, soil, and topography, and weight of the factors on runoff and sediment yield from runoff plots in five different vegetation types in preliminary stages after land disturbance in 2009 (PPS) and land disturbance during 2010 to 2012 (PLR). During the PPS, the weight of effect on runoff was topography > soil > vegetation > rainfall; the weight of effect on sediment yield was soil > rainfall > vegetation > topography > runoff. During the PLR, the weight of effect on runoff was vegetation > rainfall > topography > soil; the weight of effect on sediment yield was rainfall > soil > runoff > topography > vegetation. Also, the data show significant and important differences in runoff and sediment yield with the different vegetation types. During PPS, the order of vegetation types

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for runoff was *Pinus tabulaeformis* (P) > *Lespedeza davurica* + *Leymus secalinus* (G) > *Hippophae rhamnoides* + *Pinus tabulaeformis* (II) (RPb) > *Hippophae rhamnoides* + *Pinus tabulaeformis* (I) (RPa) > *Hippophae rhamnoides* (R) ; the order of vegetation types for sediment yield was P > RPb > G > R > RPa. During PLR, the order of vegetation types for runoff was RPb >G >P >R > RPa; the order of vegetation types for sediment yield was P > G >RPb >RPa >R.