

Role of terracing in water-balance components of *Platycladus orientalis* during normal and dry years in the Loess Plateau, China

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Abstract

Extensive ecological projects, including terracing engineering and vegetation rehabilitation, have been implemented in many water-limited mountains across the world, aiming to combat drought and control water erosion. Nevertheless, due to the complexities of climate, terracing, and vegetation types in actuality, knowledge gaps regarding the role of terracing on water balance remain. Therefore, to better understand the influence of terraces on water budget in a normal (2015) year and dry (2016) year, a field experiment was conducted in a typical dry loess hilly area of China. The effects of adverse grade tableland terraces, fish-scale pits and the natural slope on water content change were analyzed on the slope of *Platycladus orientalis* by the water-balance technique and equations. The results showed that, compared with natural slope, terraces had higher water budget benefits both in dry year (+ 1.08~12.24 mm) and normal water year (+ 15.71~27.29 mm), and adverse grade tableland terrace had the best performance. Although precipitation was the primary factor affecting water inputs, terraces can significantly increase soil water content. Evapotranspiration and runoff were the main water loss terms, but terrace also can help to reduce runoff water loss. Overall, transformation of terraced fields can optimize the forest structure and improve the eco-benefits at the slope scale.

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