

陕北子洲县典型淤地坝淤积过程和降雨关系的研究

Depositing process of check dams on loess plateau in Northern Shaanxi Province

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中文摘要:

淤地坝作为黄土丘陵沟壑区水土流失治理的重要工程措施之一, 其坝系优化布局、相对稳定性及坝地效益等受到广泛关注, 但对其淤积过程研究甚少。该文通过对黄土高原淤地坝进行调查, 典型坝淤积过程剖面的观测及取样分析, 结合库容曲线和每个淤积层的淤积厚度求出分层淤积量。根据暴雨产沙过程原理及淤积过程降雨资料, 反演淤地坝各淤积层所对应的次侵蚀性降雨, 建立层淤积量与相应次侵蚀性降雨指标的相关方程。研究表明: 坝地淤积物中层淤积量和次侵蚀性降雨的降雨侵蚀力呈幂函数关系, 层淤积量和次侵蚀性降雨的最大30 min降雨强度呈指数函数关系, 经检验结果良好。

英文摘要:

As an important engineering measure, check dam is of significance in harnessing soil and water loss in hilly and gully region on the Loess Plateau. The optimal distribution, relative stability, the warped farmland benefit of the check dam system and so on were paid much attention to in recent years, but a little on depositing process until now. By investigating check dams on the Loess Plateau, digging soil profiles of typical check dams, measuring the thickness of each layer and using reservoir storage-capacity curve, the depositing thickness of each layer for the typical check dams on Loess Plateau in North Shaanxi Province was obtained. Based on the theory of sediment yield produced by storm and the rainfall data of depositing process, the corresponding erosive rainfall of each depositing sediment layer was determined in reverse. The relationship between depositing sediment of each layer and the indexes of corresponding erosion rainfall event was established. It was shown by the analysis that the relationship between depositing sediment and rainfall erosibility (R) was in a form of power function, the relationship between sediment deposition and the maximum rainfall intensity within thirty minutes (I_{30}) was established as an exponential function. The relationships mentioned above were satisfactory, which was validated by F-test.

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