

## 不同類型人造被覆資材抑制坡地沖蝕之成效分析

陳樹群<sup>[1]</sup> 王士豪<sup>[2]</sup> 林俊岳<sup>[3]</sup> 陳駿豪<sup>[4]</sup>

**摘要** 本研究主要利用不同結構型態之人造被覆資材，探討在陡坡條件與高降雨強度抑制土壤沖蝕之成效。試驗過程首先於 300cm×100 cm 的試驗平台上鋪設南投縣鹿谷鄉之農地土壤，土壤表面鋪設人造被覆資材，並以設計之油壓控制坡度舉升平台改變坡度，以人工模擬降雨在坡度 35° 和 45° 下分別對七種人造被覆資材及無鋪設資材之對照組進行降雨延時 1hr、降雨強度 130mm/hr 的土壤沖蝕試驗。固定降雨延時 1hr、降雨強度 130mm/hr，坡度 35° 人造被覆資材其抗沖蝕率最高為編織立體網之 67.31%，最低為編織麻網之 46.55%。坡度 45° 時，麻網敷蓋於木格網之上之抗沖蝕率最高為 75.56%，最低為化纖編織肥束網帶 26.59%。綜合分析試驗數據與現象觀察發現，在坡度 35° 時人造被覆資材伏貼地表即可發揮抗沖蝕效果，因此各種人造被覆資材之抗沖蝕率均佳。隨著坡度提高，逕流速增加，人造被覆資材垂直坡面之正向應力大幅降低而呈現資材與土壤表面分離的現象，即產生蝕溝現象增加土壤沖蝕量，造成整體抗沖蝕率下降。資材欲提高抗沖蝕率，其結構要件須為高敷蓋率以減少雨滴打擊之土體面積或具均勻分散之橫向淤砂結構體以攔阻泥砂、削減逕流能量。

**關鍵詞：**人造被覆資材、土壤沖蝕、敷蓋率、抗沖蝕率、淤砂率。

## The Efficiency of Artificial Geo-Textiles for Hillslope Erosion Control

Su-Chin Chen<sup>[1]</sup> Shi-Hao Wang<sup>[2]</sup> Jun-Yue Lin<sup>[3]</sup> Chun-Hao Chen<sup>[4]</sup>

**ABSTRACT** The study focuses on soil erosion control using artificial geo-textiles on steep hillslopes and high rainfall intensity. Soil erosion experiments through soil sampling from Nantou County with rainfall intensity of 130mm/hr and 300cm×100cm test flume, was carried out using artificial rainfall equipment. The soil erosion volume was evaluated with seven types of artificial geo-textiles and reference on the 35° and 45° slope. The experiment result showed good artificial geo-textiles must be close to the soil surface to reduce runoff energy, gully erosion and sediment transport on the 35° slope. As the slope raised, the velocity of flow increased. The geo-textiles lacked weight and separated from the soil surface to hang in the air and cause gully erosion during the rainfall experiments. The best function for the runoff erosion is the artificial geo-textiles having lots of joints to touch the soil

- 
- [1] 國立中興大學水土保持學系教授  
Professor, Department of Soil and Water Conservation, National Chung-Hsing University, Taichung 402, Taiwan, R.O.C.
- [2] 國立中興大學水土保持學系碩士（通訊作者）  
Master, Department of Soil and Water Conservation, National Chung-Hsing University, Taichung 402, Taiwan, R.O.C.  
(Corresponding Author)  
E-mail: shwang@mail.nchu.edu.tw
- [3] 國立中興大學水土保持學系碩士，翰鑫企業總經理  
Master, Department of Soil and Water Conservation, National Chung-Hsing University, Taichung 402, Taiwan, R.O.C.  
General manager, Han-Xin company.
- [4] 國立中興大學水土保持學系碩士  
Master, Department of Soil and Water Conservation, National Chung-Hsing University, Taichung 402, Taiwan, R.O.C.

陳樹群、王士豪、林俊岳、陳駿豪：不同類型人造被覆資材抑制坡地沖蝕之成效分析

surface. However, the natural or chemical-fiber nets can be used to reduce the rainfall drop energy hitting the soil surface.

**Key Words:** artificial geo-textiles, soil erosion, mulch ratio, anti-erosion ratio, sediment trapping ratio.