Effectiveness of space planted trees for controlling soil slippage on pastoral hill country

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Spaced trees, predominantly species of *Populus* (poplar) and *Salix* (willow), but also species of other genera (e.g. *Eucalyptus*), have been grown to stabilise erodible pastoral hillslopes in New Zealand for more than 40 years. Despite their widespread use, there is negligible quantification of the effectiveness of different densities and sizes of trees for reducing mass movement erosion. This study determined in winter 2007 how much spaced trees reduced soil slippage at 65 sites in Manawatu (40 sites) and Wairarapa (25) following recent storms. There were 53 sites with *Populus* trees and six sites each with *Salix* and *Eucalyptus* trees. Sites had a slope of mostly 25-30°. Diameter at breast height (DBH) of all trees averaged 52 cm and ranged from 18 cm to 99 cm. Over all sites, trees reduced the extent of slippage by an average of 95% compared with slippage on nearby pasture control sites. On sites with trees, slippage (up to 11% of assessed area) occurred at 10 of the 65 sites, and the greatest extent of slippage occurred where trees had a DBH of < 30 cm. It is concluded that spaced trees dramatically reduced the incidence and severity of soil slippage on erodible slopes, and that they were even more effective when their average DBH was 30 cm or greater. Canopy cover of >55% may be a useful target for tree growth required for slope stability.