Geophysical Research Abstracts, Vol. 7, 10645, 2005
SRef-ID: 1607-7962/gra/EGU05-A-10645

PLANT ESTABLISHMENT AND SOIL EROSION IN ROAD SLOPES

E. Bochet (1), P. García-Fayos (1) and J. Tormo (1)
Centro de investigaciones sobre Desertificación-CIDE, Valencia, Spain.

Rural areas suffer worldwide the severe impacts of road and railway constructions. Such linear infrastructures give rise to steep bare slopes that are exposed, in the Mediterranean region, to intense rainfall events. The achievement of a rapid and dense vegetation cover is therefore essential for erosion control on such slopes. The objective of this study is to estimate the severity of erosion and to determine what are the main factors and ecological filters that control plant colonisation on road slopes. We examined the influence of slope characteristics on water erosion and vegetation on 71 motorway slopes near Valencia (East Spain). Specifically, we studied the effect of slope angle, type (roadfill vs roadcut) and aspect (north vs south) on water erosion, soil properties, vegetation cover and plant species composition. We also identified the ecological filters that control plant colonisation on road slopes and determined their relative importance by means of vegetation surveys in road slopes and their corresponding surrounding areas as well as sowing experiments. Results indicated that water erosion processes are important in road slopes. However, rill erosion, gully erosion and mass movement were all significantly higher on roadcuts than on roadfills. The main factors influencing vegetation variables on road slopes were the angle, type and aspect of the slope. Vegetation was almost completely lacking on roadcuts with slopes $>$ 45ž. On gentler slopes, vegetation cover was 44 - 78% on roadfills according to the aspect, whereas it did not reach 10% in any case on roadcuts. The type and aspect of the slope also determined species composition. Differences in the organic matter content, soil available P and water content existed between roadfills and roadcuts. According to the ecological filters, seed source and seed dispersal proved to highly contribute to the presence of plants on road slopes. However, the environmental conditions of the slopes were more limiting for plant colonisation. More specifically, the short duration of available water in the soil with respect to soil water potential proved to be a limiting

factor to plant germination and establishment on roadcuts and south-facing slopes, as well as the low soil fertility in the case of roadcuts.