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How can we control erosion in roadslopes of semiarid Mediterranean areas?

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Scientific awareness about roadslope ecosystems adjacent to roads, motorways, railways,... is gaining in importance. These emergent ecosystems are socio-economically relevant as they influence roadslope stability and soil erosion risk in the surroundings of communication routes. Roadslope restoration usually aims at regenerating as fast as possible a dense vegetal cover. However, in Mediterranean areas with unpredictable long droughts and short intense rain events, the traditional techniques used in Northern-Europe are usually unsuccessful.

In this study, we present the most conclusive results in terms of roadslope protection against erosion of several studies carried out on semiarid roadslopes of East Spain since 2000. We aim at improving our understanding about the factors and processes that control soil erosion and plant colonisation on semiarid roadslopes, by determining the influence of the slope type, angle and aspect, and of the use of topsoil on soil erosion and vegetal cover. We also aim at developing a method of native species selection based on the plant ability to germinate under water-stress conditions, to penetrate compacted soils and to resist runoff, that could minimise erosion risks and improve the efficiency of future restoration plans.

Erosion and vegetal cover estimations, vegetation surveys, hydroseeding experiments with commercial and native species on roadslopes, and seed germination and root penetration experiments under controlled conditions were performed to achieve these objectives.

Our results indicate that slope type and angle are the main factors controlling soil

erosion and plant colonisation on semiarid roadslopes. Soil erosion risk is reduced when topsoil is added to the slope. The use of selected native species in hydroseeding is more successful than the use of standard ones. These results allow to discuss and review the situation of roadslope ecosystems in semiarid conditions in the perspective of a more appropriate management of these expanding anthropic slopes.