Geophysical Research Abstracts
Vol. 13, EGU2011-1874, 2011
EGU General Assembly 2011

Linking the morphology of Salix tillers barriers to sediment trapping efficiency in marly gully floors

Amandine Erktan and Freddy Rey
France (amandine.erktan@cemagref.fr)

The strong hydric erosion occurring within the Durance catchment in France has lead to high sediment yields at the exit of marly gullies (small catchments of less than one hectare). It is commonly acknowledge that the presence of vegetation interacts with the sediment yield, especially in the gully floor. A minimal promising approach used to decrease the sediment yield at the gully exit consists implanting vegetation barriers to trap sediment in gully floors. Here, vegetation barriers are made of a linear of Salix tillers, resprouting from cuttings arranged perpendicularly to the flow, on a dead-wood sill. In seeking to assess the efficiency of rehabilitation strategies using vegetative barriers, many previous and current works are devoted to the study of the potential of plants to trap sediment. Therefore our objective is to link the morphology of Salix tillers barriers to sediment trapping efficiency in marly gully floors. The stem diameters, densities and branching and the trapped sediment heights were measured once on 49 barriers aged from 8 to 2 years-old. The historical follow-up of trapped sediment heights was also conducted on a broader sample of 77 barriers since their implantation. Results show that the majority of tillers become able to trap sediment since their 3rd vegetation season. Data suggests that the increase in tillers diameters is responsible for crossing this threshold. Focusing on barriers of similar age, results show that stem branching is the main plant morphological variable to explain sediment trapping efficiency. In this case, other variables such as the barriers' continuity, the layering capacity of Salix or sometimes the order of the barriers along the longitudinal axe of the gully were highlighted as also being of potential key importance to explain sediment trapping variability. This study provides insightful results to better understand and predict the efficiency of eroded gullies restoration strategies with bioengineering works.