



The influence of grazing and browsing on soil and runoff in revegetated erosion-areas

G. Markart (1), B. Kohl (1), R. Starnberger (2), and W. Gallmetzer (3)

(1) Department of Natural Hazards and Alpine Timberline, Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW), Rennweg 1 – Hofburg, A-6020 Innsbruck, Austria, (Gerhard.Markart@uibk.ac.at), (2) GeoVille GmbH, Museumstraße 9-11, A-6020 Innsbruck, Austria, (3) Department of Hydraulic Engineering, Autonomous Province of Bolzano, Cesare Battisti Road 23, I-39100 Bolzano, Italy, (Willigis.Gallmetzer@provinz.bz.it)

Intensive land use by grazing over centuries led to severe erosion at the steep slopes of the Tanaser Berg, in the community of Eysrs (South Tyrol – Italy). At the end of the 1970ies grazing was abandoned in the clearly eroded parts of the catchment above the actual timberline and an intensive program for revegetation of the slopes was started by the Department of Hydraulic Engineering, from the Autonomous Province of Bolzano, and the area covered by greening measures divided from the surrounding pastures by a solid fence. In 1999 partial opening for agricultural use by cattle for short term grazing (14 days a year) was planned in the interest of the land owners.

Consequentially impact by cattle on the greened areas and alpine lawns still under long term grazing was investigated by use of a transportable spray irrigation for large plots (50 m² size) supplemented by additional investigations (documentation of soil physical properties, characterization of vegetation, changes in plant biomass, etc.). Each plot was irrigated twice: One time before opening the fenced site for short time grazing by cattle again at the End of June and the beginning of July 1999 and a second time five years later, after restart of short time grazing at the beginning of August 2004. In total seven plots were irrigated. 5 plots within the revegetated area, four of them greened, the fifth a carex sempervirens stand, formerly not eroded. 2 of the greened plots were fenced and kept free from grazing over the next five years. In addition 2 carex sempervirens stands with calluna outside which had been grazed at least for several decades, one of them partially eroded, were investigated as reference plots.

The four revegetated plots did not show significant changes in surface runoff development. High content of skeleton (stones and blocs) reduced runoff and erosion potential. In addition high slope-inclination made these plots unloved by cattle. On the contrary the natural carex sempervirens-plot within the revegetated area and permanently grazed calluna heath with carex sempervirens outside of the revegetated area, more rich in fine soil, showed a significant increase of surface runoff in torrential rain within the five years. Possible causes for the higher runoff coefficients can be seen in

- hydrophobic effects of plant cover and upper humic layer due to very dry antecedent soil moisture conditions in 2004
- Seasonal impact - more intensive loss of plant cover and mechanical impact by cattle (compaction, luting of soil crust) in August 2004.

Pasturing in the revegetated areas holds the danger that runoff potential of the not greened / natural plots (carex sempervirens stands) will increase considerably and the concentrated runoff out of these parts will endanger stability of the lower located greened areas.