



Example of BSc thesis related to the Soil-water interaction Research Line of the Wageningen University Soil Science cluster

The Effectiveness of Geotubes as an Erosion Mitigation Measure



(Source photo: Personal communication with Machado, 04-2020)

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Abstract

Between 2009 and 2018, an average of 141,000 ha of forest land was burned yearly in Portugal. After the fire season, heavy rainstorms often occur. As fire mainly removes the protecting vegetation cover, the soil is left very susceptible to erosion. Erosion mitigation strategies are important as the Portuguese soils are thin and erosion takes the nutrient rich ash layer, which aid ecosystem recovery, in-situ, and can cause environmental problem off-site, in adjacent water bodies. The LIFE REFOREST project tackles this problem by creating a new erosion mitigation treatment, called geotubes, which contain a technosol based on organic waste and inoculated with fungal species (mycotechnosol), which aims to aid ecosystem restoration. This technosol is lined with a tube-shaped biodegradable net, which is designed to act as an erosion barrier until it breaks open and spreads its fertile insides. To test their effectiveness as an erosion mitigation treatment, an experiment has been established in a recently burned eucalypt forest in North Central Portugal. For six months, plots (2x8m) were treated with geotubes and the sediment losses were compared to those of plots treated with mulch and untreated plots. The geotubes showed to be more effective than the mulch. The geotubes reduced the total erosion with 75% from 0.88 Mg/ha/half-a-year of erosion in the untreated plots, to 0.22 Mg/ha/half a year. However, the biodegradable net of the geotubes did not break open like it was supposed to. This, and the over-all low erosion rates in the pilot plot caused by the quick increase in ground cover, made their efficacy hard to evaluate.