

Effect of recycled organic materials on the substrate properties of green roofs: A field study

Michal Novotný¹, Mihajlo Marković², Jakub Raček¹, Milan Šipka², Tomáš Chorazy¹, Petr Hlavínek¹

¹Brno University of Technology, Faculty of Civil Engineering, AdMaS, Purkyňova 651/139, 612 00 Brno, Czech Republic, E-mail address: petr.hlavinek@vut.cz

²University of Banja Luka, Faculty of Agriculture, Bulevar Vojvode Petra Bojovica 1A, Banja Luka 78000, RS, Bosnia and Herzegovina

Abstract:

Green roofs have great potential for managing urban runoff. However, the effects of green roofs on the quality of infiltrating water are highly variable. Unfortunately, in some cases, green roofs may contain high concentrations of nutrient pollutants and heavy metals. In this study, we constructed six modules of green roof and analyzed the effects that the green roof substrate amended with biochar and other organic materials on the pollution load by simulating rainfall experiment. The study found that leachate concentrations from several green roof media exceeded receiving water standards for arsenic. This is concerning, as it could lead to potential environmental damage if these pollutants are allowed to enter the water supply. As such, it is important to ensure that green roof media is designed in a way that minimizes leaching of pollutants while still providing a suitable environment for plant growth. Various strategies can be employed to reduce leaching from green roof media. For example, the use of other organic materials can help to reduce the amount of pollutants that are leached into the environment.

Keywords: Green roof, growing medium, biochar, rainwater runoff quality, nutrient leaching, heavy metals leaching