

Title: Building multifunctional and sustainable green roofs with biochar

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Abstract

Green roofs, which are roofs with vegetation planted on engineered growth media, have been increasingly implemented in cities globally to enhance ecosystem services and urban sustainability. However, green roof degradation or failures have been recently observed, highlighting the need for sustainable green roof designs. Amendment of biochar, a carbon-rich, porous material produced from pyrolyzed biomass, has been promoted as a promising means to improve ecosystem functions on green roofs due to its favorable physicochemical properties. Nevertheless, green roofs are often highly exposed and thus biochar is susceptible to wind and water erosion, which may result in biochar loss and negative environmental impacts. Post-processing biochar into large particles or granulated forms may alleviate biochar erosion loss, yet research on the properties of processed biochar and the effects on ecosystem functions, in particular on green roofs, is lacking. This presentation will discuss the generality of biochar benefits to urban green infrastructure and delve into the pioneer research that explores the potential of post-processed biochars as a sustainable solution for enhancing the ecosystem functions of green roofs. The transdisciplinary work will provide a comprehensive insight into biochar physicochemical properties, soil and plant health, stormwater management, system erosion control, and emerging environmental challenges such as greenhouse gas emissions.