



Differential stemflow yield from European beech saplings: the role and respective importance of individual canopy structure metrics

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Stemflow yield from individual trees varies as a function of both meteorological conditions and canopy structure. The importance and differential effects of various metrics of canopy structure in relation to stemflow yield is inadequately understood and the subject of debate among forest hydrologists. It is possible to evaluate the role and respective importance of individual canopy structure metrics by holding meteorological conditions constant. Twelve isolated experimental European beech (*Fagus sylvatica* L.) saplings in Jena, Germany were exposed to identical meteorological conditions to examine the effects of canopy structure on stemflow production during the 2012 growing season. The canopy structure metrics being evaluated include: trunk diameter, trunk lean, tree height, projected crown area, branch inclination angle, branch count, and biomass (foliar and woody). Principal components analysis and multiple regression are utilized to determine the relative importance of different canopy structure metrics on stemflow yield. Experimental results will provide insight as to which metrics of canopy structure most strongly govern stemflow production. Ultimately, with a more thorough understanding of the unique contributions of various canopy structural metrics to stemflow yield, a useful conceptual guide of stemflow generation can be formulated on the basis of canopy structure for management purposes.

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