

Influence of canopy architecture on stemflow in agroforestry trees in Western Himalayas

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Rainfall event on a tree can be partitioned into throughfall, interception loss and stemflow. In this study, stemflow was measured for 39 rainfall events in 5-year-old plantations of 3 trees each, belonging to *Morus alba* and *Grewia optiva* in Dehradun, India. Diameter of selected *Morus* and *Grewia* trees varies from 7 to 9.3 and 8.12 to 10 cm respectively, whereas height varies from 4 to 4.5 and 5.5 to 6.5 m respectively. The minimum and maximum rainfall events recorded during the study period were 1.01 and 121.70 mm per day respectively. When the rainfall magnitude was less than or equal to 50 mm and more than 50 mm, stemflow volume from *Morus* was approximately 2.72 and 1.85 fold higher respectively, compared to *Grewia*. Maximum stemflow volume recorded for *Morus* and *Grewia* was 48,065 and 30,633 ml with respect to rainfall magnitude of 109.58 and 121.70 mm respectively. The generation of higher stemflow volume in case of *Morus* is due to concave orientation of branches and leaves. Results showed that a significant amount of nutrients leached from *Grewia* and *Morus* through stemflow process.

and run-off depends on the rainfall amount, duration and intensity. Apart from the stemflow and throughfall, the rest of the rainfall is termed as interception loss which is held by the canopy and gradually lost by the process of evaporation². Among the rainfall components, the major portion of rainfall in forest ecosystem is throughfall, which varies from 70% to 80% among different forest tree species³. Proportion of the rainfall partitioned components depends on climatic factors and canopy properties⁴⁻⁶. The climatic factors include rainfall amount, intensity, duration, wind speed and its temporal distribution, whereas canopy properties are canopy structure, leaf area index (LAI), leaf branch properties, etc. Interception loss has a reciprocal relationship with rainfall intensity. Levia *et al.*⁷ showed that SF volume depends on tree species, crown size, leaf shape and orientation, branch angle and bark roughness. Rainfall amount is an important factor for increasing stemflow volume^{8,9}. Stemflow yield increases with precipitation and reaches its maximum level for a particular rainfall intensity until all stemflow contributing areas take part in stemflow yielding process. After a particular rainfall intensity, stemflow yield or