

Characteristics of tree canopy affecting throughfall and interception of rainfall in a stand of silver oak (*Grevilia robusta*)

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■ **ABSTRACT** : The importance of forestry systems as a source of water storage has been recognized due to need for climate change mitigation. The volume of water which is caught by the vegetation and subsequently evaporated is called interception loss. Some interception values are determined from silver oak tree in the Cauvery catchment, Karnataka. Both net rainfall and pattern of throughfall are correlated with a number of factors such as climatic factors, type of rainfall, wind and vegetation factors. Individual storm appears to be the main factor in the determination of throughfall and interception loss. Over the six months period, a total rainfall of 1600 mm was measured in the open field. Of this total, on an average, only 48 per cent (768mm) reached the ground as throughfall; 49 per cent (775 mm) being attributed to the average interception loss.

■ **KEY WORDS** : Forestry, Water, Climate, Catchment, Throughfall

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World-wide there is a mounting interest in the relationship between land use and water resources. This has come about mainly because most developing (and developed) countries are experiencing a degradation of land and water resources, whereas the need for these resources is increasing .

To the hydrologist and the soil conservator the interception of precipitation by trees is an important factor in the hydrological cycle. Removal of the vegetative cover, especially the forest cover, may result in a higher frequency of flooding and accelerated soil erosion. Forest canopies can also 'slow down' the speed of raindrops before they hit the soil, thus reducing the soil water pressure.

For a given precipitation, the evapotranspiration, initial loss, infiltration and detention storage requirements will have to be first satisfied before the commencement of runoff. When it rains over a catchment not all the rainwater over a catchment directly reaches the ground . A part of it might be caught by the vegetation and subsequently evaporated. The volume of water so caught is called interception. The intercepted precipitation may follow one of the three possible routes:

- It may be retained by the vegetation as a surface storage and returned to the atmosphere by evaporation: a process termed as interception loss.
- It can drip-off the plant leaves to join the ground surface

or the surface fall; this is known as throughfall and – The rainwater may run along the leaves and branches and down the stem to reach the ground surface. This part is called stem fall.

The amount of water intercepted in a given area is extremely difficult to measure. It depends on the species compositions of vegetation, its density and also on the storm characteristics. It is found that coniferous trees have more interception loss than deciduous ones. Agricultural crops in their growing season also contribute high interception losses (Subramanya, 2007).

The objective of the study is to present interception loss and throughfall data with respect to characteristics of tree canopy. *Grevillea robusta*, an exotic species which occupied major portion of the coffee estates in Kodagu district, Karnataka was considered for the study.

■ METHODOLOGY

Kodagu district with an area of 4,102 Km² is the smallest district in the state of Karnataka. Located in the South-Western part of Karnataka state between North latitude 11° 56' and 11° 52' and East longitude 75°22' and 76°12', it falls in the high precipitation zone with picturesque topography occupying the Eastern and Western slopes of the Western Ghats (Anonymous, 2007). Closed with primeval forest or glassy