



Leaf Litter Fall and Decomposition of Poplar (*Populus deltoides*) under Intensively Managed Wheat Based Agroforestry System

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ABSTRACT

Leaf litter decomposition is a fundamental process of ecosystem functioning which is closely linked to the nutrient recycling for plant growth. Leaf litter fall and decomposition pattern was studied in 3 and 4 years old poplar (*Populus deltoides*) planted as boundary plantation in wheat based intensively managed agroforestry system. Litter bags were randomly placed within 3m, 3 to 6m, 6 to 9m and beyond 15 m distance from tree base line. Litter bags were removed after 30 days (at crown root initiation stage of wheat), 90 days (at reproductive stage of wheat), 140 days (at maturity of wheat), and after one year of placement (before sowing of next wheat crop) respectively for determining decomposition rate of leaf litter. Litter fall was restricted up to a distance of 9 m from the tree line and total amount of 913.8 and 1291.8 kg ha⁻¹ was recorded with 3 and 4 years old plantation. Fifty seven per cent of total leaf fall was recorded near the tree line (0-3m) with 3 years old plantation which came down to 46 per cent with advancement of plantation age to 4 years. Loss in weight revealed that 19.3 to 18.4 per cent loss in dry mass of leaf litter was observed in control during first 30 days after placement, whereas, loss in mass varied between 18.8 to 23.5 per cent under the tree influence area during same period in both the years. It was found that irrespective of distances 47 to 52.9 per cent mass of leaf litter was lost up to harvesting of wheat. Maximum mass loss was recorded near tree line (0-3 m distance) before harvesting of wheat. Overall, the highest values (1.823 and 1.754) of decomposition constant (k) were obtained in control in both 3 and 4 years old plantation, respectively.

Keywords:

Agroforestry, decomposition, litter, poplar, wheat