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49. Rural landscapes and ES in Tropical countries (OPEN)

Nutritional contribution of leaf litter to a surrounding area as a function of distance from forest fragment

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Leaf litter deposition is the main mechanism for sustaining forest ecosystems. Besides nutrient cycling and carbon sequestration, there are other ecosystem services related to leaf litter such as the contribution of its drift to neighboring areas in the maintenance of soil fertility, which is the objective of this work. Nets for receiving leaf litter were installed, starting at the edges of adjacent forest fragments. After three months the material was collected every five meters with begin from edge. The leaf litter was collected and weighed, grounded and mixed for foliar analysis of macro and micronutrients. In order to estimate the deposition of this material in one year, we used data of wind speed and direction, and the monitoring of leaf shedding within the fragment. Six frequency tables, three for wind speed (m/s), and three for wind direction were generated, considering the UTC times, 12, 18, 24 h, and leaf litter deposition monitoring periods. To calculate the dry weight at the distances $d = 5, 10, 15, 20, 25, 30, 35$ m for each period, dry weight as a function of distance was used, estimated using data collected for the period, for the proportions of d.w. at each distance. The amounts of nutrients deposited in the soil were compared with data on nutrient export by a maize crop at two productivity levels, low and high input use. With an estimated d.w. ($\text{g}/\text{m}^2/\text{year}$), an equation was adjusted, that from the distance of the fragment generated in GIS map, it was possible to estimate the expected annual deposition of leaf litter material formed in the study area. Using maize as a reference crop, of broad spectrum in agricultural activity, using nutrient export data at harvest according to its productivity, we calculated the proportion of nutrients that the fragment of semideciduous forest can offer for the replacement of these nutrients, disregarding the factors that interfere in the mineralization of organic matter. The results show that the contribution to the soil fertility maintenance in the surroundings of forest fragments is not negligible, especially in the management with low input use. For productivities around 3.65 ton/ha, the replacement of Ca only by leaf litter deposition can reach 45% at a distance of 20 meters and at 15 meters, the replacement

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of 20% of Mn is possible.

Keywords: ecosystem services; spatial modeling; agricultural cultivation.