Extended Abstract
Volume 9:8, 2021

Biodiversity & Endangered species

Open Access

Note on Input and Production of Nutrients in an Agroforestry Environment

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Abstract

Agroforestry systems, which combine production and environmental protection, are now being researched as alternatives to traditional agricultural farming practises. The goal of this study was to determine the impact of trees to nutrient input and production in crops grown in the agrosilvopastoral system in Sobral, Ceará Province, Brazil. In the rainy and dry seasons, nutrient concentrations were quantified in Cordia oncocalyx Allemão (called pau-branco) trees in shade and sun leaves and at harvest time in maize leaves. Concentrations of nutrients in various soil layers (0-10, 10-20 and 20-40cm) were also quantified from the trunk of C at 0.4 and 4.0 m. Oncocalyx trees with trees. Also measured was the contribution of the trees to the nutrient input to the scheme and the nutrient production due to the elimination of maize plants. The land under the canopy of C. The maximum concentrations of total N, K, P, Fe, Cu, Zn and Mn were seen by oncocalyx. In the concentrations of maize leaf nutrients, however, few variations were noted as a result of the distance from the trunk. The trees will produce up to 35 kg ha1 Ca, 19 kg ha-1 N and 15 kg ha-1 K, while roughly 2.3 kg N, 5.6 kg K and 0.2 kg Ca leave the maize plant shoot removal method. The conservation of trees in processing systems thus contributes greatly to the replenishment of the nutrients depleted from seed harvesting.

Mineral nutrients are required because deficiencies prevent plants from completing or improving their life cycles, and they enter the soil through weathering, organic matter mineralization, atmospheric deposition, runoff from precipitation that leaches minerals into leaves and stems, and fertilisation. Explosions, flooding, leaching, and plant devastation are some of the factors that cause soil to lack mineral nutrients. Thus, an effective compromise of inputs and outputs should be included in the management of agricultural systems, where losses are small and are restricted to the marketable product's harvest in order to preserve soil fertility. Agroforestry systems (AFS) have arisen as an alternative agricultural activity because they allow indigenous or exotic shrub species to be maintained in cultivated areas and are based on the assumption that structurally and technically more complex land-use systems than monocultures are ncreased productivity in the selection and usage of natural resources results in (nutrients, light and water)..

AFS has been proven to reduce N leaching and increase C immobilisation, as well as pH, cation exchange capacity (CEC), exchangeable bases, N, P, and K levels, and soil organic C concentrations, according to studies (SOC).

The components of AFS include plants, crops and livestock, and literature has documented the impact of AFS on the growth of trees or crops. There is evidence that the management of agroforestry may have positive effects on crops relative to monocultural crops. In comparison, the management of agroforestry can have a detrimental effect on the production of trees due to crop rivalry. Management schemes that involve the elimination of vegetation are considered to modify an area's nutrient dynamics since bare soils tend to lose nutrients by surface runoff, creating less litter from a diminished amount of tree plants, which decreases soil nutrients, lowering plant nutrients by exporting extracted plant parts. In comparison, the influence of agroforestry management on the system's nutrient dynamics is not well understood, especially in the Brazilian semi-arid zone. The goal of this analysis was therefore to measure the contribution of trees to soil nutrient input and production by crop harvesting and to evaluate the impact of trees on crop nutrient concentrations.

Higher nutrient concentrations under the Cordia oncocalyx canopy illustrate how trees in the agrosilvopastoral setting help to protect the chemical richness of the soil. While these increased soil concentrations have no effect on maize plant nutrient levels, the quantity of nutrients that return to the environment with the collapse of C does. Oncocalyx leaves are sufficient to compensate for the losses caused by the partial eradication of maize. Trees have a significant role in nutrient cycling and soil fertility conservation, and their presence may lessen the requirement for external inputs to improve agricultural practises.