

Intercropping of Banana and Pineapple in Rubber Smallholding and its Effect on Soil Sustainability on Sloping Land



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Experiments on intercropping of banana and pineapple and intercropping of immature rubber with banana and pineapple consisting of standard erosion plots and on-farm research respectively were carried out. The objectives of this study were to evaluate the effect of intercropping and slope positions on soil structure attributes and soil erosion. The experiments focused on evaluating some soil properties that were closely related to soil structure such as bulk density, soil aggregate stability, soil organic matter and its effect on runoff, and soil loss. The influence of root biomass on the above properties was also studied.

Results indicated that banana when intercropped with pineapple showed optimum performance in improving soil structure attributes particularly in increasing soil organic matter and aggregate stability. Due to better and thicker canopy coverage and as well as the role of their root network in building good soil structure, the combination of banana and pineapple is more effective in reducing runoff since this system provided a better protection for soil surface against impact of raindrops and improved soil infiltrability. It was found that the low soil erosion occurred under pineapple, and banana-pineapple intercropped whilst the high soil erosion occurred under rubber. Soil loss was closely related to root biomass, soil organic matter, and aggregate stability of the soil. In terms of slope position, results showed that, middle slope had lowest bulk density and highest soil organic matter content and percent soil aggregation indicating the convex nature of the landscape. As indicated by the results, higher deterioration of soil properties occurred on the upper slope compared to other slope positions and high soil erosion observed to be on the upper slope position.

In conclusion, it was shown that the combination of pineapple and banana during rubber replanting is highly recommended for soil and economic sustainability in farmers' smallholding in the sloping areas.

Reader Enquiry

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