Effect of different mulches on physical and chemical properties of cocoa (*Theobroma cacao*) and black pepper (*Pipper nigrum* L.) growing soils

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A green manure is a plant material incorporated into soil while green, for soil improvement. The objective of this study is to investigate the effect of Gliricidia green manure and cocoa pod husk mulching on physical and chemical properties of pepper and cocoa growing soils.

This experiment was conducted at the Export Agriculture Research station, Matale in the wet zone mid country (WM3). Soil samples were collected at a depth of 0–20 cm from two on-going experiments. Treatments were:- no mulch, *Gliricidia* mulch (10 kg/plant/year) and dried cocoa pod husk mulch (10 kg/plant/year) in cocoa growing soils and no mulch and *Gliricidia* mulch (10 kg/plant/ year) in pepper growing soils. Treatments were arranged in a RCBD in three replicates. Samples were analyzed for pH, organic matter, total nitrogen, available phosphorous, exchangeable Mg and K. Physical properties such as aggregate stability, bulk density and porosity were determined.

Gliricidia mulching on cocoa growing soils showed the highest organic matter contents of 3.35% while lower values were found under no mulch i.e. 1.47% and 1.38% in cocoa and pepper growing soils, respectively. The highest total N% was observed with *Gliricidia* mulch treatment in cocoa field (0.22%) and cocoa husk mulch treatment in cocoa field (0.22%). The values were significantly different from no mulch cocoa (0.14%) and no mulch pepper (0.11%). Mulching improved the soil structure by aggregate formation. The highest Mean Weight Diameter (MWD) of aggregates was found in *Gliricidia* mulching on cocoa growing soils (2.43) and the lowest was found under no mulching pepper field (1.47). The lowest bulk density was found under cocoa husk mulching cocoa field (1.23 g/cm^3) compared with no mulch cocoa field (1.53 g/cm^3) and no mulch pepper field (1.65 g/cm^3). According to the results Cocoa pod husk 10 kg/plant/year and Gliricidia 10 kg/plant/year is sufficient to improve chemical properties as well as physical properties of soil.