

SOIL MODULUS OF RUPTURE AS AFFECTED BY
DIFFERENT ALLEY CROPPING SYSTEMS
AND ORGANIC MATTER CONTENT

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Soil crusts that are formed on seed bed following planting often limit the stands obtainable for crops. A rapid physical method for measuring soil crusting has obvious advantage for evaluating soil treatments, amendments and management practices.

Modulus of rupture is widely used as a parameter for assessing susceptibility of soils to crusting under field conditions. The determination of modulus of rupture often involves pre-wetting of disturbed soil samples, molding them in to briquets or cylinders, drying and measuring the force required for rupturing them.

There is very little information on formation of soil crust on seed bed in different alley cropping systems. The objective of the present study was to investigate the influence of different alley cropping on the formation of soil crust by modulus of rupture measurements.

Soil samples were collected from five alley cropping field experiments established at the Dodangolla University Experimental Station: Gliricidia formed alley (while cropped), Gliricidia formed alley (control), Leucaena formed alley (while cropped), Leucaena alley (control) and two year old Gliricidia fallow, and bare land soils as the overall control. Modulus of rupture was measured by the method described by Richards (1953).

Modulus of rupture of the soils ranged from 1.95 to 7.31 kPa. Gliricidia fallow soils showed the lowest modulus of rupture. The highest modulus of rupture was (7.31 kPa) shown by uncultivated bare soils, which had the lowest organic matter content. The modulus of rupture was related to organic matter content of the soils; the higher the organic matter, the lower the modulus of rupture value.

References: 1. Richards, L.A., (1953) Modulus of rupture as an index of crusting of soil. Soil Sci. of Amer. Proc. 17(4): 321-324.