

Effect of tea waste biochar on soil acidity amelioration on acidic tea growing soils of Sri Lanka

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Soil acidification is a major constraint that reduces productivity in tea lands. Therefore, regular liming has been recommended for tea cultivations to maintain the optimum pH range in soils. Biochar has been considered as an ameliorant for soil acidity because of its alkaline nature. Biochar (BC) made from tea factory wastes was evaluated for their potential to reduce acidity in two tea growing Red Yellow Podsollic (RYP) soils of Sri Lanka. Biochar produced at 300°C was applied to Mattakelle series (MK) and Pallegoda series (PG) soils at rates of 0% and 2% (w/w). Changes in soil pH over 56 days were measured. Changes in the pH buffering capacity of BC amended soils were also measured. Soon after BC addition, soil pH increased in both soils and the increase was greater in PG soil. The soil pH decreased with time, thereafter. At the end of the incubation period, soil pH increase over the control treatment were 0.11 units in MK soil while 0.67 in PG soil due to the differences in the pH buffer capacities of the two soils. Soil pH buffering capacity was high in MK than that in PG soils. This was further increased ($p < 0.01$) due to Biochar application. The increase in buffering capacity was greater in PG soil (54%) than in MK soil (11%). We conclude that low temperature BC made from tea factory wastes is an effective ameliorant for countering acidification of tea growing RYP soils in Sri Lanka, particularly for soils having low pH buffer capacity.