

ELEMENTAL SULPHUR AND BRACKEN FERN LITTER TO AMELIORATE pH OF ORGANIC AND BIODYNAMIC TEA SOILS

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Conventional agriculture which heavily depends on intensive use of synthetic agrochemicals causes negative effects on the environment. In tea, growing concern on pesticide residues in made tea and other ecological and social aspects demands more environmental friendly management such as organic and biodynamic tea cultivation. Acidic soil pH prevailing in tea growing areas provides an optimum condition for tea growth. However, organic and biodynamic tea fields show an increasing level of pH (> 6.00) resulting in diminishing productivity. Therefore, the present study was conducted to find a suitable natural soil amendment for ameliorating organic and biodynamic tea soils. An incubation study was conducted using different doses of elemental sulphur (500, 300, and 200 g/m³ of soil) and bracken fern litter (4 and 8 kg/m³ of soil) to treat the soils. Further, effects of elemental sulphur on microbial activity and phyto-toxic effects were evaluated.

Elemental sulphur reduced the soil pH significantly over the control ($P > 0.0001$) with time and the efficacy of pH reduction was related to the dosage. Bracken fern litter also reduced the soil pH significantly over control. However, there was no significant differences ($P > 0.0001$) among dosages. Both elemental sulphur and bracken fern litter had no negative effect on soil microbial activity. Elemental sulphur did not show significant influence on plant performance.

In conclusion, elemental sulphur was found to be the most effective soil amendment in correcting pH of organic and biodynamic tea fields. For confirmation, a series of field trials in different regions are envisaged. Further, a combination of low dosage of elemental sulphur with bracken fern litter may offer the best solution by reducing the cost.

Key words: Soil pH, Elemental sulphur, Bracken fern litter, Organic tea, Biodynamic tea