

Effects of Natural and Synthetic Soil Conditioners on Soil Moisture Retention and Maize Yield

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Abstract

The efficacy of a natural soil conditioner, Coco-Peat (C-P), and synthetic soil conditioners, Terawet (T-200) and Teraflow (T-F), in improving soil moisture content were examined on five Ghanaian soil series (*Akroso*, *Akuse*, *Amo*, *Hake* and *Oyarifa*). In general, the water retention of T-200 and C-P treated soils were similar but significantly higher ($p < 0.001$) than that of T-F and the control (C-T) treated soils, which were also similar on all the test soils. The dry matter yields of the test crop (maize) were 5.4, 5.2, 4.5 t ha⁻¹ on T-200, C-P and T-F treated soils, respectively, on *Akroso series*. These yields were 36%, 31% and 5%, respectively, more than those of the control treatment. On *Akuse series* even though T-200 and T-F gave higher dry matter yields than the control, the differences were not significant, only C-P treatment gave significantly higher ($p < 0.001$) yield than the control. On *Amo series*, dry matter yields of 6.1, 5.8 and 4.9 t ha⁻¹ on T-200, C-P and T-F treated soils, respectively, were 38%, 31% and 10% more than the control treatment. On *Hake series*, T-200, C-P and T-F treatments improved dry matter yields by 45%, 32% and 12%, respectively, over that of the control. The greatest effect of the polymeric absorbents was observed on the sandy/clay/loam *Oyarifa series*. The treatments T-200, C-P and T-F improved dry matter yields by 92%, 81% and 4%, respectively, over the control treatment. The results indicate that the differences in yields over the control were due to the improved water retention ability of the soils amended with the polymeric absorbents.