EFFECT OF SOIL COMPACTION ON GROWTH AND YIELD OF COWPEA (*Vigna unguiculata* (L.) Walp)

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ABSTRACT

Soil compaction is a worldwide problem in modern agriculture and has been recognized as the main form of soil degradation. Soil compaction may increase soil strength and compacted soil layers can affect growth and yield of crops. The aim of this research was to investigate the effect of soil compaction on growth and yield of cowpea (*Vigna unguiculata* (L.) Walp). This experiment was conducted during *maha* season in 2015 at crop farm, Eastern university of Srilanka. This experiment was a pot experiment and there were four treatments based on different bulk density levels ($1.33gcm^{-3}$, $1.60gcm^{-3}$, $1.80gcm^{-3}$, and $2.00gcm^{-3}$) arranged in a completely randomized design (CRD) with nine replicates. Wijaya, a variety of Cowpea was used for the experiment. All agronomic practices were followed as recommended by department of agriculture. Finally growth and yield parameters were taken by destructive sampling method.

The results revealed that soil compaction has significantly influenced on growth and yield of cowpea and the highest growth and yield parameters were recorded at treatment $1.33gcm^{-3}$(control) among all treatments and there was a strong negative correlation between these parameters and level of soil compaction. The lowest yield (37.10tons/ha) was recorded at soil compaction level 2.00 g cm^{-3}, while the maximum yield (70.31tons/ha) was obtained at soil compaction level 1.33 g cm^{-3}.It can be concluded from the result of this study that significant adverse effects of soil compaction on growth and yield of cowpea was well noticed.

Keywords: Bulk density, Root growth, Soil strength, Hydraulic conductivity, Pore space

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