

BEARING CAPACITY MODELS OF A LATOSSOL (OXISOL) SUBMITTED TO DIFFERENT WEED MANAGEMENT SYSTEM IN COFFEE CROP

SUMMARY

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The determination of the pressures that can be applied to the soils submitted to different weed management systems is important to adapt the coffee crop management in a sustainable way. The objectives of this study were: a) to develop the bearing capacity models for a Red-Yellow Latossol (LVA)-(Oxisol) cultivated with coffee and submitted to different weed management systems; b) to determine through the use of these models the pressures that can be applied to the soils to avoid the soil compaction; c) to identify the weed management system more resistant or susceptible to soil compaction. This study was carried out in the experimental farm of Epamig in the Patrocínio County, MG, in a farming planted with Ruby 1192 coffee variety in 3,8 x 0,7 m spacing. The weed management systems studied were in the inter rows: without hoeing (WH), hand hoeing (HH), post-emergence herbicide (HPOS) and pre-emergence herbicide (HPRE) and in the under canopy of the coffee plant: roçacarpa (RÇ), hand hoeing (HH), post-emergence herbicide (HPOS) and pre-emergence herbicide (HPRE). In each management system 15 undisturbed soil samples, were collected randomly at 0–3, 10–13 and 25–28 cm depth, totaling 900 soil samples [15 samples x 3 depths x 20 (4 weed management systems in the inter rows + 16 under canopy of the coffee plant)]. The undisturbed soil samples were used in the uniaxial compression test to obtain the preconsolidation pressure (σ_p) at different moisture content and initial bulk density (D_{si}). Texture, organic matter (MO), particle density, total porosity (VTP), field capacity (CC), permanent wilting point (PMP) and oxides were also determined. The results suggest that soil under the weed management system HPRE at 25–28 cm depth in the inter rows was more susceptible to soil compaction while the soil under HPRE at 0–3 cm depth was the most resistant. Under the canopy the RÇ was more susceptible to soil compaction at of 0–3 cm depth and the HPOS and the HPRE, the most resistant. At 10–13 cm depth under the canopy the soil under HPRE was more resistant to compaction and the the soil under RÇ and the CM and the HPOS the most susceptible to soil compaction. Under the canopy at 25–28 cm depth, the weed management system studied not affect the bearing capacity models showing no effect of the weed management at this depth. To estimate the bulk density above which the soil is compacted, the following equation was obtained: $D_s\sigma_p = 1,12 \times D_{si}$. For the conditions that this work was developed it is recommended as an ideal weed management the use of the HPOS in of the inter rows associated with the HPRE and the HPOS in the canopy of the coffee plant.

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