

Evaluating Pedestrial Compaction Variation & Soil Organic C Content Over Different Ground Covers in Calloway County, Kentucky

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Over time, playing fields are monitored by overall appearance. However, pedestrian compaction is not evenly distributed throughout the entire surface. The objectives of this study were to determine the spatial variation of soil compaction in a field of a 50 m square area using 425 measurements using a penetrometer (1st study) and to compare soil compaction, soil bulk density, total porosity, soil water content and soil organic matter of different grassland areas in Calloway county (2nd study). The 1st study was conducted at The Quad of Murray State University at the soil depth of 15 cm. The 2nd study utilized 5 different land use systems including the Soccer Field, Intramural Field, University Quad, Prairie, and The Pullen Farm Recreation Area at depth of 15 cm. The 1st study shows the highest soil compaction is 300 psi and the lowest is 50 psi with the average of 202 psi. The spatial variability in a 50 m², of similar cover ground is 36% as indicated by the coefficient of variation. The results from the 2nd study reveals the highest soil compaction (270 Psi) was found in The University Quad and The Intramural Recreation Area, with the lowest being found in The Soccer Field (150 Psi). The highest soil water content during sampling was found in The Prairie (16%) and the lowest was observed in The Soccer Field (0.64%). In addition, the 2nd study shows there is a correlation between soil compaction with other soil properties, such as organic carbon, bulk density, and total porosity.

Key Words: Turf, Soil, Compaction, Murray State, Sidewalk, Traffic, Agriculture, Organic Matter, Recreation