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Evaluation of the Mechanical Strength of Disturbed Military Training Areas based on the Physical and Chemical Parameters of Soil

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Military training areas have to sustain the intensive usage of tracked and wheeled vehicles and the dismounted movement of soldiers. The periodic nature of training activities causes heavy loads, including a high number of loading repetitions on the soil; this makes the mechanical strength and recovery of soil a consequential issue. In many cases, the preparation of new training areas involves field preparations, e.g. earthmoving or deforestation activities that lead to serious disturbance of soil, especially its natural mechanical strength. The goal of this study was to investigate the potential methods to determine the conditions of previously disturbed military training areas. Soil measurements were carried out two years after deforestation works. Within this study, soil samples were collected and the mechanical strength of soil was determined in July and November 2020, with the aim to characterize soil conditions during dry and wet periods. Soil bulk density as well as cone penetrometer and dynamic cone penetrometer measurements were carried out. In chemical parameters of soil, the total carbon content was measured as an indicator of uniformity by mixing organic matter in the soil surface (25 cm) layer. As the development of plant cover and especially its tight root system is very important for increasing the mechanical strength of soil, the content of plant available nutrients (P, K, Mg and Ca) was also measured. To evaluate the uniformity of blended upper soil layer, the soil was divided into 5 different layers of 5 cm thick each. The bulk density was determined for each layer. The chemical parameters of soil were determined for each layer separately and a diagram of element content in profile was created according to obtained results. This presentation will address the preliminary results of field measurements.