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Mechanical Soil: Effects of the Passage of Tractors on Agricultural Land

Authors : Anis Eloud, Ben Salah Nahla, Sayed Chehaibi

Abstract : In order to improve and develop the Tunisian agriculture, the government has encouraged the introduction of modern technologies and has also promoted the adoption of innovative practices cultures. Indeed, the extensive use of mechanization can increase crop productivity but its inadequate application also has a negative impact on the ground caused by the phenomenon of compaction. Which will cause the loss of soil fertility and increased production costs. This problem is accentuated with increase the stress on contact wheel / ground. For this reason, the objective of this study is to simulate the footprint of the ground contact / tire two types of tractor after their passage. The method of this work is based on a simulation including passages from two different tractors on soil with similar characteristics. Simulation parameters were based on the choice of two tractors masses of 6500 kg and 4400 kg of soil and sandy loam in nature. The analysis was performed using specific software. The main results showed that the heaviest tractor caused a constraint wheel / rear floor exceeding 100 kPa. For cons, the second tractor has caused stress wheel / rear floor of 50 kPa. The comparison of the two results showed that 6500 kg tractor made a serious and excessive compaction which generated a negative impact on soil quality and crop yields.

Keywords : compaction, soil, resistance to penetration, crop yields
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