FILED STUDY ON THE DROUGHT FORCE OF THE COMPOUND SUBSOILER PLOW WITH MOLDBOARD AND AREA OF SOIL DISINTEGRATION IN A SILTY CLAY SOIL.

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ABSTRACT

A study was carried out on the compound subsoil plow with moldboard which designed at the department of Agricultural machines and equipment, College of Agriculture, University of Basrah by adding the mold board plow to the subsoil plow to operate co-ordinately within the compound subsoil plow.

Two types of plows were used , subsoil plow alone after removal of moldboard plow with three singular treatments for tillage depths S_{30} , S_{40} and S_{50} and subsoil plow with six double treatments for tillage depths $S_{30}M_{20}$, $S_{40}M_{20}$, $S_{40}M_{30}$, $S_{50}M_{20}$, $S_{50}M_{30}$ and $S_{50}M_{40}$ into silty clay soil with two moisture levels. Soil moistures were (1) 18.01% and (2) 27.34%, to study the drag force that the plow requires and the area of disintegrated soil to evaluate the field performance.

Results showed a significant increase in drag force which reached 44.29 and 71.07% for both plows respectively, when tillage depth increased from 30 to 50 cm. Soil moisture 2 was superior on 1 in drag force. The double combinations of compound subsoil plow ($S_{30}M_{20}$, $S_{40}M_{20}$, $S_{40}M_{30}$, $S_{50}M_{20}$, $S_{50}M_{30}$ and $S_{50}M_{40}$) surpassed the singular treatments ($S_{30,}$ S_{40} and S_{50}) in the area of disintegrated soil for all tillage depth and both soil moistures. The area of integrated soil was higher with the lower soil moisture. To obtain better mechanical assembly for plow, the compound subsoil plow gave the best field performance with deeper tillage depths with soils of lower moisture contents.

Key words: combined subsoil plow with moldboard, double treatments, drought force, disturbed area.

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