Evaluation of the Field Performance of the Developed Combined Lines Seeder

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Abstract. The field experiment was conducted in Maysan Governorate / Al-Batira in a Silty clay soil, with the aim of evaluating the efficiency of the performance of the developed combined lines seeder used for planting on lines with equal distances and appropriate depths, with covering the seeds and appropriate disintegration of the soil using spring needles, fertilizing at the same time, and opening the furrows. The experiment was carried out using two machine configurations: the seeder (B) alone and the seeder with the furrows opener (BZ), which is equivalent to the basin irrigation system and the furrows irrigation, and two tractor speeds (4 and 6) kmh^{-1}, with the aim of knowing its effect on (pulling force, percentage of slippage, and fuel consumption). The same two factors above were also used with three seed rates (25, 30 and 35) kg $dunum^{-1}$ in order to determine their effect on seed germination percentage. The results showed the following, the seeder with the furrow opener (BZ) gave the highest averages of pulling force, reaching (7.942) kN a slip percentage of (10.115)%, and fuel consumption (19.138) $litres.h^{-1}$, a decrease in the average germination rate (81.344)%. The seeder -only (B) gave an increase in the average germination rate of (89.138)%. The seeding rate (35) kg $dunum^{-1}$ gave the highest average germination rate (89.054)%. The tractor speed (6) kmh^{-1} gave the highest averages in pulling force, reaching (6.993) kN and (9.518)% in slippage, while it gave a decrease in average fuel consumption, reaching (17.502) $litres.h^{-1}$, and a highest average germination rate (85.639%).

Keywords. Barley, Fuel consumption, Furrows opener, Germination percentage, Pulling force, Seed rate.

1. Introduction

The productivity of agricultural crops is affected by several factors, including: planting date, soil preparation before planting, soil fertility, and the efficiency of the mechanical farming process.

Manual farming still occupies a large space in the field of agriculture despite the availability of many agricultural equipment. The reason for this may be due to the adoption of the manual method due to the area of the holding, the method of exploiting the land and the capabilities of the farmer using modern methods. Automated methods have become a scientific and practical fact that has a direct