






Manufacturing and evaluating a machine for cutting and raking alfalfa and barley harvest into rows

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Abstract

A machine was manufactured to belt-rake the fodder harvest with a moving finger bar. The harvest collecting machine was installed with a two-wheeled sickle mower, thus the machine group becomes a four-wheeled vehicle that performs two functions at the same time (cutting and harvesting the harvest). The study aims to reduce the effort, time, and fuel consumption required to cut the fodder crop and assemble it into rows in preparation for its subsequent transportation or treatment with silage making machines or hay. A two-factor factorial experiment with a completely randomized block design was conducted to evaluate the combined instrument. The forward speed of the compound machine has three levels: 1.19, 2.67, and 3.42 km/h, and the type of crop has two levels: barley and alfalfa. The results showed a direct relationship between the forward speed and the productivity of the machine, as it reached 0.215 ha/h with the third speed. The efficiency of harvesting and collecting the harvest reached 100% in the barley crop for all forward speeds, while the third speed failed to rake the alfalfa harvest. The cutting efficiency of the sickle mower was not affected, which was 99% when the combined machine was connected to it in cutting barley and jet crops, and the level of cutting height remained stable, as the cutting deviation reached only 1 cm, while the combine machine affected the increase in the slip rate of the combined machine.

Words key: Belt-rake, sickle mower, tedder.

I. Introduction

The two-wheel sickle mower is widely used in small farms because it reduces the effort and time of harvesting fodder, as well as being available at reasonable prices. It is preferable to use the sickle cutter for cutting crops such as barley and jet, which do not require harsh treatment when making silage,