PERFORMANCE EVALUATION OF A PLASTIC MULCH LAYING IMPLEMENT

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ABSTRACT

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The study was carried out to evaluate the performance of a plastic mulch laying implement attached to a hand tractor. Specifically, varying tilt angle (15°, 25°, 35°) of the wheel mulcher for laying the plastic mulch was done to determine the optimum mulching efficiency, draft force, power requirement, field capacity wheel slippage and bed height.

Results of the study showed that setting the tilt angle of the wheel mulcher at 35°, field efficiency of 82.70%, and field capacity of 0.2691 ha/hr were recorded the highest compared to the results obtained from 15°and 25° tilt angles. On the other hand, the lowest draft force of 110.89 kg and power requirement of 63.74 kW were also obtained using the tilt angle of 35°. Results also revealed that setting the tilt angle of the wheel mulcher at 15°, it was found out that a 161.61 kg draft force and 69.95 kW power requirement, was the highest observed values compared to the values obtained from using 25° and 35° tilt angles. In terms of the bed height, results revealed that at 35° tilt angle, the lowest bed height was observed at 13.03 cm and the highest bed height of 19.03 cm was attained at tilt angle of 15°. In terms of width and thickness of soil cover, it shows that the tilt angle (35°) produced the lowest values at 20.47 cm and 7.23 cm and the highest values were attained using a tilt angle of 15° observed at 35.10 cm and 14.50 cm, respectively.

Keyword: Plastic Mulch; Fabrication; Efficiency

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