Analysis of Fuel Consumption Rate of A Rotary Power Tiller on Various Tillage Patterns

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Abstract	Data about the relationship between various tillage patterns and fuel consumption rate remains scarce. Thus, this study aimed to investigate the effect of five tillage patterns on fuel consumption rate. The five tillage patterns applied were 1) gathering pattern, 2) casting pattern, 3) one way pattern, 4) spiral pattern, and 5) alpha pattern. While, rotary power tiller operation was set for a) with-no implement and b) with implement. During the rotary power tiller operation, total time consumed (t) and fuel consumption rate (FCR) were measured. As the result, different tillage pattern gave different t and FCR values for the both conditions of rotary power tiller operation namely with-no implement and with implement conditions. The alpha pattern gave the highest values, for which t values were 11.77 and 13.67 minutes, respectively, and FCR values were 10.77 and 14.87 liters/ha, respectively. On the other hand, the one way pattern was found to be the most efficient after giving the lowest values, for which t values were 5.86 and 8.60 minutes, respectively, and FCR values were 4.27 and 5.04 liters/ha, respectively. The data further confirmed a positive correlation between t and FCR. This result suggested that tillage patterns affect t, by which FCR could be altered. In this case, the number of turning passage was thought as the property of tillage pattern that affects t. The higher values of t and FCR for the rotary power tiller operation with implement than those of the tractor operation with-no implement were probably due to the greater engine power required for dealing with the operated implement and tillage draft.Ã‚Â Keywords: Fuel consumption, Rotary power tiller, Tillage pattern, Time consumption
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