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Ergonomic evaluation of a power weeder for homestead gardens

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ABSTRACT : Weeding is an important agricultural unit operation. Delay and negligence in weeding operation affect the crop yield up to 30 to 60%. With regard this, the existing power weeder available in the market was tested in the farm to assess their performance. It works well in sandy loam soil. In lateritc soil, the performance of the machine was not satisfactory. Hence modification was done by attaching a rear wheel behind the weeder so as to improve the penetration in the soil and there by removing the weeds effectively. Additional wheels were also fabricated and fitted in the unit for easy transport of the machine. The cardiac cost involved in operation of power weeder was found out and the mean working heart rate value of the subject was 128 beats min^{-1} before modification. The corresponding value of energy expenditure was 22.44 kJ $min^{-1.}$ Based on the mean working heart rate, the operation was graded as " heavy". After modification, the average heart rate was reduced to 116 beats min^{-1}. The corresponding value of energy expenditure was 16.94 kJ $min^{-1.}$ The human energy expenditure was reduced to the tune of 25% and the operation was graded as " moderately heavy". Mean overall discomfort rating on a 10 point visual analogue discomfort scale (0- no discomfort, 10-extreme discomfort) was 5.0 and scaled as "moderate discomfort" before modification where as ODR was 4.0 and scaled as "more than light discomfort" during operation of modified power weeder. Shoulder and arm wrist regions are concerned areas of discomfort for operating power weeder.

KEY WORDS : Power weeder, Heart rate, Energy expenditure, Overall discomfort, Body part discomfort

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