

## **Mechanization status based on machinery utilization and worker's workload in sweet corn cultivation in Malaysia**

### **ABSTRACT**

Agricultural machinery utilization in Malaysia still very low, especially in sweet corn cultivation, compared with the other crop production systems. In this study was estimated two methods to evaluate the mechanization status of the respective field operations in sweet corn cultivation in Malaysia. The first method was used the PCL-HRL-EGL Cartesian plot based on Production capacity, Heartbeat rate, and Energy expenditures of human labor. The second method was used mechanization index based on energy expenditures of machinery and human labor. The study aim of was to assess the mechanization status in sweet corn cultivation in Malaysia. This paper described the overall mechanization status in the cultivation of sweet corn in Malaysia, and the machinery energy, worker's energy expenditure, and heart rate for various field operations that were involved in cultivation. The field operations include tillage, planting, fertilizing, spraying, harvesting, and cutting plants. Field capacity, and machinery energy for each of the operations were calculated. The calculated mechanization index was used in the study to describe the mechanization status in sweet corn cultivation. A mean overall mechanization index of 36.49% and aggregate machinery energy of  $340.67 \pm 41.99$  MJ/ha were registered for the crop. Highest mechanization index, and machinery energy were acquired in the tillage operation of 94.09% and  $105.35 \pm 9.37$  MJ/ha while the lowest mechanization index, and machinery energy were in the harvesting operation with bags of 0.83%, and  $0.42 \pm 0.09$  MJ/ha. These calculated mechanization indexes, and PCL-HRL-EGL Cartesian Plot were used for ranking the field operations based on their priority for mechanization. The outcome of this research could be contributed to lightening human energy expenditures and improving the mechanization status ultimately.

**Keyword:** Mechanization status; Machinery energy; Production capacity; Sweet corn