# Design and Test a Plowing Appearance Measurement Device


## Abstract

Plowing appearance device was designed to calculate the number of colds per area after the tillage operation. This device is mechanical-electronic equipment. This can be done by calculating tillage view using mechanical equipment through the generation of electrical impulses that are sent to an accurate control unit. That will compute the number of clods under required space and shows the results on the screen in order to see the tillage view per area. The device was designed and fabricated and then, an experiment was carried out by considering three factors: The first factor represents the forward speed of tractor at three levels (3.5, 4.5, 5.5 km/h) and the second factor represent soil moisture content at two levels (14, 20%) and the third factor denote tillage depth of three levels (10, 15, 20 cm) to the clay loam in Wasit cities in Iraq. A split-split plot design technique with three replications was used in this research. The results were shown, that significant differences in the forward speed of the tractor on tillage view for more than 10 cm clod size. The forward speed of 5.5 km/h recorded the less number of clods more 10 cm clod size, while not significant effect shown for the forward speed on the tillage view used in the traditional method of clod numbers computing. Additionally, the tillage depth of 10 cm shown at least the number of clods (Which has more than 10 cm diameter) at 6.753, 6.9633 mass/$m^2$ by using the plowing view device and traditional method respectively, while the results recorded that the plowing at depth 20 cm shown a highest clods number at 11.000, 10.920 mass/$m^2$ for plowing view device and calculate the number of clods using the traditional methods respectively. The overall results showed, that the device can be providing a significant difference in the results compared with the traditional methods and it will be more accurate.