Abstract

A field evaluation of the technical performance of centre pivot sprinkler irrigation system was carried out during the maize crop growing season and when operating with different working speeds: $S_1 – 40\%$, $S_2 – 60\%$ and $S_3 – 80\%$. For this goal, four uniformity measurements are to be considered in the evaluation; coefficient of uniformity ($CU$), distribution uniformity ($DU$), potential efficiency of low quarter application ($PELQ$) and actual efficiency of low quarter application ($AELQ$). The first step of evaluation of the sprinkler irrigation system is to compare the measured uniformity values with the standard values, $DU \geq 75\%$, $CU \geq 85\%$, $AELQ$ and $PELQ \geq 90\%$. Effect of variation of speed produced $CU$ values of 80.3, 82.7 and 86% for $S_1$, $S_2$, and $S_3$ speed, respectively. Furthermore, $DU$ standard value was obtained at $S_3$ speed of 82%. Moreover, $AELQ$ and $PELQ$ were below the acceptable standard level of 90% for all speeds. Non-uniform water application leads to over or under irrigation in various parts of the field which can result in wasted water and energy. Therefore, regular evaluation of the irrigation equipments is needed to efficiently and effectively manage irrigation.

Key words: centre pivot system, distribution uniformity, irrigation, uniformity coefficients