Influence of different operating conditions on irrigation uniformity with microperforated tapes

María Alejandra Moreno Pizani and Asdrúbal Jesús Farías Ramírez
Central University of Venezuela (UCV), Institute of Agricultural Engineering, Agricultural Engineering, Maracay, Bolivarian Republic of Venezuela

Irrigated agriculture is a safe alternative to meet the growing demand for food. Numerous studies show that proper management of localized irrigation can increase crop yields and reduce soil salinization. Therefore, periodic field systems irrigation assessments are needed in order to optimize the use efficiency of irrigation water, as well as, to increase the agricultural area covered by the same amount of water and to reduce the environmental impact.

It was assessed the behavior of micro perforated tapes under different operating conditions, crops and regions of Venezuela. Evaluations were made on irrigated areas using Santeno $^{®}$ Type I tape with the following crops: Banana (Musa sp), lettuce (Lactuca sativa L.), carrot (Daucus carota L) and forage sugar cane (Saccharum officinarum). In the other hand, Santeno $^{®}$ Type II tape was used with papaya (Carica papaya L.) and melon (Cucumis melo L.) crops (the last crop using inverted irrigation tape). The procedures used for sampling and determining the uniformity indices of the system were performed using a series of adjustments to the methodology proposed by Keller and Karmeli (1975), Deniculi (1980) and De Santa and De Juan (1993), in order to increase the number of observations as a function of irrigation time. The calculated irrigation uniformity indices were as follow: Distribution Coefficient (UD), Uniformity Coefficient (CUC), Coefficient of Variation of Flows (CV) and Statistical Uniformity Coefficient (Us). The indices characterization was made according to Merrian and Keller (1978); Bralts (1986); Pizarro (1990) y ASAE (1996), respectively. The results showed that the irrigation uniformity for the evaluated systems varied from excellent to unacceptable, mainly due to the lack of maintenance and the absent of manometric connectors. Among the findings, it is possible to highlight the need for technical support to farmers, both in the installation, management and maintenance of irrigation systems. In this sense, it is proposed to establish a simple and reliable procedure to evaluate the irrigation uniformity in the field, which should be available for farmers and feasible for researchers.