

Uniformity of different low cost emitters in trickle irrigation

Mikunthan, T., Kalki, P and Vijayaratnam, R.

Faculty of Agriculture, University of Jaffna, Jaffna.

Abstract

The demand for irrigation water is overcome by increasing, water use efficiency through drip irrigation, which applies water to the base of the plants frequent low volumes, to the plants. The emitter flow variation and the uniformity of water distribution are the two most important parameters used to rectify uneven application of water. Emission uniformity, Statistical uniformity and Christiansen's uniformity were analyzed for locally available low cost emitters. The objective of the computation was to present an analytical expression of flow variation within the lateral lines. Assembly parts of the drip system, tank filter, delivery tube, laterals and different type of low cost emitters were fabricated. Eight type of emitters were selected namely; 5% cement sand emitter, 30% and 50% clay sand emitter, pure sand emitter, plastic thread screw number 20 and 24, micro tube and coral. The field evaluation of uniformity was made from emitter discharge taken from six locations along the lateral lines at 4 times for 550 cm water pressure. The same measurements were repeated for different type of emitters.

Statistical uniformity and Emission uniformity values for plastic thread screw 20 and 24, micro tube and coral emitters were more than recommended value of 90%. The 50% clay sand emitter was nearer to 90% in emission uniformity (88.67%) and exceeded 90% in statistical uniformity. Other emitters were not satisfied the requirement. In Christiansen's uniformity, the values ranged between 100 – 90% are considered as good for new emitters. The plastic thread screw 20 showed the photo finished value as good (89.2%). Plastic thread screw 24 (87.96%) and micro tube emitter (88.9%) was nearest to acceptable range. Hence, these computations could be used in drip irrigation to obtain high uniform application efficiency.

Key words: Trickle irrigation, Emitters, Emission uniformity, Statistical uniformity

Mikunthan, T., Kalki, P. and Vijayaratnam, R. (2001).Uniformity of different low cost emitters in trickle irrigation, Sri Lanka Association for the Advancement of Science (SLAAS).

Proceedings of the 57th Annual Session, Part I – Abstracts. 26 November – 01 December, 2001. Colombo. Pp.152.