

Water Distribution Uniformity of Solid-Set Sprinkler Irrigation under Low Operating Pressure

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Abstract : Sprinkler irrigation system became more popular to reduce water consumption and increase irrigation efficiency. The water distribution uniformity plays an important role in the performance of the sprinkler irrigation system. The use of low operating pressure instead of high operating pressure can be achieved many benefits including energy and water saving. An experimental study was performed to investigate the water distribution uniformity of the solid-set sprinkler irrigation system under low operating pressure. Different low operating pressures (62, 82, 102 and 122 kPa) were selected. The range of operating pressure was lower than the recommended in the previous studies to investigate the effect of low pressure on the water distribution uniformity. Different nozzle diameters (4, 5, 6 and 7 mm) were used. The outdoor single sprinkler test was performed. The water distribution of single sprinkler, the coefficients of uniformity such as coefficient of uniformity (CU), distribution uniformity of low quarter (DU_{lq}), distribution uniformity of low half (DU_{lh}), coefficient of variation (CV) and the distribution characteristics like rotation speed, throw radius and overlapping distance are presented in this paper.

Keywords : low operating pressure, sprinkler irrigation system, water distribution uniformity

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