


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## Determination of Hydraulic Performance of Trickle Irrigation Emitters used in Irrigation Systems in the Harran Plain

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**Abstract:** Trickle irrigation systems' efficiency depends on system uniformity, which is determined by water discharge uniformity from emitters. It is impossible to produce 2 identical emitters due to manufacturing variations. The manufacturer's coefficient of variance is used as a measure of discharge variations of emitters. In this study, manufacturers' reported discharge rates and coefficients of manufacturing variation (C<sub>Vm</sub>) values were compared with test results for various types of in-line emitters manufactured by 4 different companies in Turkey. A total of 9 drip irrigation lines, comprising 7 non-compensating and 2 compensating emitters, were tested at 50, 100, 150, 200 and 250 kPa pressures. Non-compensating emitter types were not tested at 250 kPa. Compensating emitter exponents ranged from 0.02 to 0.05 while non-compensating emitters' values varied between 0.60 and 0.85. Test results showed that only 1 of the 7 non-compensating emitters and both compensating emitters had flow rates within  $\pm 10\%$  of manufacturers' reported values. The t-test between manufacturers' reported and measured mean flow rates at manufacturers' reported nominal operating heads showed that there was no significant statistical difference at the  $\alpha < 0.05$  level. According to ASAE standards, the measured coefficients of manufacturing variation values for non-compensating emitters were not acceptable, although compensating emitters were in the excellent class.

**Key Words:** Drip irrigation, in-line emitters, manufacturers' coefficient of variance, emitter exponent.

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