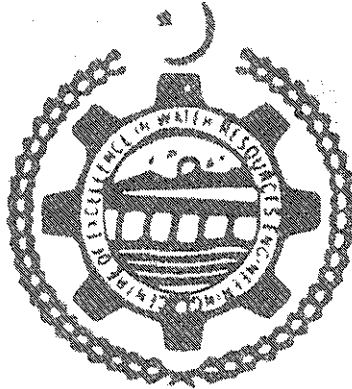


THESIS

**HYDRAULIC PERFORMANCE OF A TRICKLE IRRIGATION
SYSTEM WITH SPECIAL REFERENCE TO EMITTERS AND
ENERGY LOSS ALONG LATERALS**



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By

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ABSTRACT

This research study was conducted on one acre of land at Phularwan Farm in Sargodha district. Drip irrigation system was installed in recently planted citrus field in November 2007. Eight subsurface lateral lines were laid down, fitted with different type of emitters. Length of each lateral line was 57.92 m (190 ft). The designed discharge of all the emitters were 8L/hr (2gph) and same type of emitters were installed on two adjacent lateral lines. The system was operated at three different pressures i.e. 10, 15, and 20 psi.

It was observed that the emission uniformity (EU) of turbo (imported) and turbo (local) emitters were found maximum (90.8 and 90.6 % respectively) at 15 psi operating pressure. The EU of turbo (imported) was found 61.9 and 60.7 % respectively at 10 and 20 psi. The same values of turbo (local) were 46.8 and 73.4 %. The EU of bubbler type of emitters was 65.7 % at 15 psi, 59.5 and 39.8 % at 10 and 20 psi respectively. In spiral type of emitters the emission uniformity was found as 45.4, 44.2 and 49.4 % respectively at 10, 15 and 20 psi.

Local pressure loss of emitters ranged from 0.005 to 0.0013 m and it varied with discharge. Almost same local pressure loss of 0.009 m was found in turbo (imported) emitters. The total minor head loss values were less than local pressure loss values and it ranged from 0.003 to 0.005 m. At 15 psi more losses were observed than at 10 and 20 psi pressures. The average total energy loss along the laterals was observed 0.006 m and it was nearly same at all the pressures in all kind of emitters. The average friction loss percentage ranged from 0.44 to 0.88 percent.