

THESIS

**TESTING THE PERFORMANCE OF HOSE REEL SPRINKLER
IRRIGATION SYSTEM FOR VARIOUS OPERATING CONDITIONS**



**BY
SARFRAZ HASHIM
2009-PG-WRM-25**

**FOR THE DEGREE OF
MASTER OF SCIENCE
IN**

WATER RESOURCES MANAGEMENT

**CENTRE OF EXCELLENCE IN WATER RESOURCES ENGINEERING
University of Engineering and Technology, Lahore**

2012

ABSTRACT

Field study was conducted to evaluate the performance of Hose-reel Machine for wheat crop growth at traveler speed of 45 cm/min of the cart gun. The machine was operated at 55 psi to 67 psi pressure and the data regarding application rate was measured with the help of catch cans placed at the center of the different sized plots. The application depth was measured for each plot using volumetric method and used in estimating application efficiency. Results of the study revealed that the cart gun covered a maximum wetted radius of 40.8 m at 62 psi. The application efficiency of the system was found maximum as 75.65% at the base pressure of 60 psi and the distribution uniformity was maximum to the tune of 73.85% at 62 psi. Further it was noted that the application rate decreased with increasing pressure.

The water losses from runoff, evaporation and wind were also measured during different irrigations. The runoff losses occurred at the pressure of 62 psi as the excess amount of water discharged per sprinkler on the machine operated plots. The evaporation losses found to be slightly higher from the controlled experiment due to high temperature. The disturbance in the spraying of water was observed due to wind speed.

The wheat crop yield per unit area found to vary from 25% to 30% higher with the Hose-reel Sprinkler system (HRSS) compared with flooded irrigation system. The crop yield of wheat crop can be improved by planning properly and wisely similar research studies.