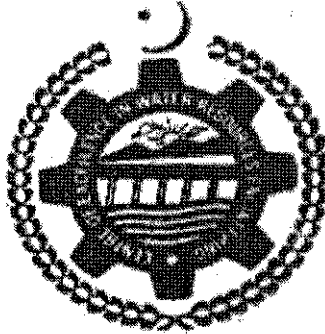


THESIS

**TESTING THE PERFORMANCE OF MICRO SPRINKLE  
IRRIGATION IN TUNNEL FARMING SYSTEM**



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## ABSTRACT

A field study was conducted to analyze the performance of micro sprinklers in tunnel compared with its application in open area. Four different operating pressures were applied on 15 F and 15 H nozzle types and the application rate, coefficient of uniformity, distribution uniformity and application efficiency were measured. Results from the study revealed that the application rate was 7% to 8% higher in tunnel compared to open area. The results further indicate that the distribution uniformity was 12% to 19% higher in tunnel contrast to open area under similar operating conditions. However, the application efficiency was found 5% to 9% higher in tunnel. It was noted that application rate, coefficient of uniformity, distribution uniformity and application efficiency decreases as the pressure increases.

To test the performance of sprinkling, the water losses from runoff, evaporation and wind were measured both in tunnel and open area during experimentation. The runoff losses were same but evaporation losses were found to be slightly higher in tunnel due to temperature differences in the tunnel and open area. No affect of wind in the tunnel as expected but wind drastically affects the working of micro sprinkler in open area and shares upto a maximum of 66% losses in total.

The cost analysis indicated that the initial and installation cost of micro sprinkler was same in open area but operating cost of micro sprinkling was found 12% higher in open area. Finally, it was concluded safely that 5% to 8% water and 10% to 12% energy was saved to operate the micro sprinkler in tunnel and can be improved by planning properly and wisely similar research studies.