IMPACT OF PORTABLE RAINGUN SPRINKLER FOR IMPROVING IRRIGATION EFFICIENCY AT FARMER'S FIELDS

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92-PG-WRM-06

A thesis submitted

in partial fulfilment of the requirement for the degree

of

Master of Science

in

WATER RESOURCES MANAGEMENT

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University of Engineering and Technology, Lahore
March, 1994

ABSTRACT

Experimental studies were conducted to evaluate the locally manufactured portable raingun sprinkler systems, PY_1-30 and PY_1-50 with different diameter nozzles at two different farmers field at Sialkot and Narowal. Field tests were conducted under three operating pressures for each diameter of the nozzles. The application uniformities and application rate for both the systems with three meters can spacing were measured. The distribution uniformity and coefficient of uniformity for each type of sprinkler system were calculated. The affect of wind on application uniformity were also determined. The results indicate that uniformity of application were strongly influenced by the average wind velocity and direction. The average coefficient of uniformity and distribution uniformity for PY_1-30 system were 79.6 and 71.1 percent and for PY_1-50 system, these were 76.5 and 70.7 percent, respectively.

The covered area and application rate for both the systems were also determined. The average covered area for PY_1-30 and PY_1-50 systems were 1778 m^2 and 1505 m^2, respectively (80% of wetted diameter). The average application rate for PY_1-30 system was 6.4 mm/h and for PY_1-50 system it was 10.1 mm/h.

The coefficient of uniformity and distribution uniformity for 60 to 80 percent of wetted diameter were calculated. Spacing up to 80 percent of wetted diameter gave acceptable

value of the coefficient of uniformity and 70 percent of wetted diameter gave acceptable value of distribution uniformity for both the systems with maximum wind velocity of 9.7 km/h.

The application efficiency and application losses of both the systems were determined as well. The average application efficiency of raingun sprinkler system, PY_1-30 was 82 percent and for PY_1-50 system this value was 75 percent. The average evaporation and drift loss for PY_1-30 system was 18 percent and for PY_1-50 system it was 25 percent.

The average application efficiency of border irrigation of the adjoining fields at both the sites were also determined and it was found 57.5 percent. The average water saving from both the sprinkler systems as compared to border irrigation was 21 percent.