Introduction of family drip system for improving livelihood of small-scale farmers, north Kassala, Sudan

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Abstract

Drip irrigation is one of the most efficient methods of water use for crop production. Family drip systems are suitable for small land areas ranging from 10-2000 m^2 to irrigate horticultural and other valuables crops. The system is a complete drip irrigation unit; it operates by gravity from a tank placed at a one meter high. It is a closed pipe-gravity system, and solid seasonal installation, for growing vegetables, flowers and other horticultural crops on flat or minor slope land. Two experiments were conducted; first experiment was established to evaluate a family drip system in comparison with local surface irrigation methods. The second experiment was carried out to evaluate the emission uniformity and efficiency of family drip system which were designed and installed to irrigate different areas of 10, 100, 500, 1000, 1500 and 2000m^2, with varying sizes of tanks of 20, 200, 500, 750, 1000 and 1500 litres, respectively. The results indicate that family drip system saved irrigation water by 67% and 59%, and increased the total yield of onion by 43% and 34% respectively as compared to local surface irrigation. The highest water productivity (2.98 and 2.73 kg/m^3) was obtained under family drip system and the lowest values were (1.25 and 1.26 kg/m^3) under surface irrigation. The results revealed that the highest economic water productivity (8.9 and 8.2 SDG /m^3) was obtained under family drip system and the lowest values were (3.8 SDG/m^3) under surface irrigation. Moreover, the family drip system scored higher net return and benefit cost ratio compared to the surface irrigation system.

Keywords: Family drip system, small-scale farmers, irrigation efficiency, water productivity.