

Introduction

water scarcity

Irrigated agriculture consumes more than 80% of annual groundwater abstracted Because most of irrigated areas still depend on traditional methods of low efficiency (35%), One of imporand

Objectives

This study aims to assess the effect of applying modern agricultural techniques such as improved conveyance irrigation systems, drip irrigation systems, greenhouses, and plastic mulching cover on tomatoes and potatoes yields and sustainability of groundwater aquifer compared with average irrigation water requirement and crop yield under traditional irrigation systems in Dhamar

Research Approach

The approach of this research is built upon calculating the amount of groundwater that could be saved by using moderThe approach of this research is built upon calculating the amount of groundwater that could be saved by using modern irrigation techniques such as improved conveyance irrigation system, drip irrigation system, greenhouse, aThe approach of this research is built upon calculating the amount of groundwater that could be saved by using modern irrigation techniques such as improved conveyance irrigation system, drip irrigation system, greenhouse, and mulching techniques. Comparing the obtained results with the traditional furrow irrigation system mostly used in Dhamar depending on its average irrigation water requirement and average crop yield per hectare nd mulching techniques. Comparing the obtained results with the traditional furrow irrigation system mostly used in Dhamar depending on its average irrigation water requirement and average crop yield per hectare n irrigation techniques such as improved conveyance irrigation system, drip irrigation system, greenhouse, and mulching techniques. Comparing the obtained results with the traditional furrow irrigation system mostly used in Dhamar depending on its average irrigation water requirement and average crop yield per hectare



Results

The cultivation of the crops used the following experimental treatments: tomatoes crop under drip irrigation and greenhouse (DG); tomatoes crop under drip irrigation system and plastic mulch (DP); potatoes crop under drip irrigation system (DI); and potatoes crop under conveyance pipes irrigation system (SI).

- **Results indicate that the combination of applying drip irrigation under greenhouse DG recorded the highest saving percentage in irrigation water required (IWR) by (95.66%). DG recorded (20.97) increasing times in tomatoes yield.**
- **Drip irrigation technique recorded the highest saving percentage in IWR for the production of potatoes by (75.17%) with (2.63) increasing times in potatoes yield.**
- **When depending on DG plus DI for producing their actual annual average yields, the predicted reduction in GW abstraction from Dhamar aquifer is estimated of (63.17 mcm) which represent saving percentages (34.83%) from total annual groundwater abstraction from Dhamar aquifer.**