

EVALUATION OF WATER SAVING TECHNOLOGIES AT ESTIDAMAH RESEARCH CENTER IN SAUDI ARABIA

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ABSTRACT

Water saving is crucial for the survival of agriculture in Saudi Arabia. Natural ground water resources are depleting by the extensive water use for agriculture. At the Estidamah Research Center in Riyadh, water saving technologies for protected horticulture are evaluated under the harsh climatic conditions. Different levels of technology, (low-, mid- and high-tech) are evaluated based on water use, energy consumption and production. The low-tech greenhouse is a plastic tunnel greenhouse which is cooled using a pad and fan system. This type of greenhouse is normally used for year-round production. The mid-tech greenhouse has a glass covering and is also cooled using the pad and fan system though in this type of greenhouses, the required amount of ventilation can be regulated using frequency-controlled fans. Finally, the high-tech greenhouse is considered as a closed greenhouse, where cooling and dehumidification are done using coolers. Since Estidamah Center is now in operation for more than two years, the level of water use over the year for the various types can be evaluated. The water use for cooling in the Mid-tech greenhouse is 30% lesser than the water used in the low-tech greenhouses. The water saving in the high-tech is more than 95%.

KEYWORDS: Cooling, condensation, dehumidification, energy use