

# Effect of greenhouse technology, nutrient solution salinity, and root cooling on yield and water use efficiency of different cherry tomato cultivars

## BACKGROUND:

Cherry tomatoes are a type of tomato that is characterized by the small size fruits,. The weight of cherry fruit ranges between 14-20 grams, depending on the variety.

Cherry tomatoes are one of high market value crops, the price in the local markets for the consumer ranges from 24 SAR / kg to 80 SAR / kg or more for the imported cherry. The average local production ranges between 12 to 14 kg/m<sup>2</sup>, while the average global production ranges between 30-35 kg/m<sup>2</sup> under controlled greenhouse

## OBJECTIVES:

- Studying the effect of greenhouse technology on fruit yield of three cherry tomato cultivars.
- Study the effect of greenhouse technology on water use efficiency for cherry tomato in hot dry regions.
- Studying the effect of salinity levels of nutrient solution on yield of the tested three cultivars
- Studying the effect of root cooling cherry tomato yield.

## TREATMENTS:

1. Two greenhouse technologies (Hi- tech with AC cooling, and Mid-tech with pad & Fan cooling systems).
2. Three cherry tomato cultivars (Pearl, Jorita, and Akaneori)
3. Two nutrient salinity levels (2.5 and 3.5 dS/m)
4. Root cooling in Hi-tech compartment

## RESULTS:

- In total, the closed Greenhouse produced 33.6 kg/m<sup>2</sup> of good quality cherry tomato and the Pad& Fan greenhouse 25.7 kg/m<sup>2</sup>. This difference amounts to 30%.
- The good quality production of Pearl was 38.6 kg/m<sup>2</sup> per year in the closed greenhouse and 29.9 kg/m<sup>2</sup> in the Pad& Fan greenhouse. Jorita showed the lowest production, namely 30.6 kg/m<sup>2</sup> in the closed greenhouse and 21.1 kg/m<sup>2</sup> in the Pad& Fan cooled greenhouse.
- EC level and root cooling did not show significant differences. The tomatoes grown at the average EC level of 3.5 mS/cm were growing at practically the same pace as the tomatoes grown on 2.7 mS/cm.



- Growing this type of tomato is very well possible despite the hot arid outside climate conditions as long as sufficient cooling is provided.
- In closed Greenhouse needed 456 liter/m<sup>2</sup> per year with 12/kg water use efficiency. liter of fresh water per kg fresh product. While in Mid-tech (Pad& Fan) greenhouse uses 4950 liters of fresh water per m<sup>2</sup> per year and 165 liter/kg WUE.

## CONCLUSIONS