Irrigation water use efficiency in the context of climate change - Case of citrus in Souss region - Morocco

Hicham ElOMAR
Ibn Zohr University – Agadir - Morocco

I authorize the use and reproduction of any content, data and digital images in this presentation by CIHEAM, or anyone authorized by CIHEAM
Context and Objectives

- The Souss Massa region manifested on one hand an increased competitiveness in agricultural produce, on the other hand, it is marked by the scarcity of water resources and their over-exploitation,

- Controversy was opened on water valorization and improvement of the water use efficiency.

- Consequently, the objectives of this work are to determine the water productivity and the irrigation performance for citrus crop in Souss Massa region (Morocco), to diagnose the impact of several production factors on the water use efficiency.

- To achieve the objectives, data collection was done by a survey using a detailed questionnaire.

- The use of stratified sampling was necessary. The surveys were done along the Souss Valley by examining a sample of 125 farms.
Main Results: Water applied with surface irrigation

- the volume of water applied for citrus with surface irrigation in the Souss region is not very excessive compared to the volume of water applied to trees with traditional irrigation method (10000 to 18000 m³/ha)

- the average water applied within drip irrigation is 9127.7 m³/ha/year. This means a reduction of about 25% of irrigation water volume compared to surface irrigation in the same conditions.
Main Results: yield and Agronomic water use efficiency (AWUE)

- drip irrigation gives 57% of additional yield while it uses minus 33% of irrigation water.
- Drip irrigation allowed an increase in efficiency of 223.7% compared to the surface irrigation.
- In addition to the effect of drip irrigation, the use of monitoring tools showed an increase of 24.5% of AWUE.
- Another factor, which can affect the AWUE is the technical level of farmers. For that, we classified three technical levels:
  
  Technical level 1: Farms without technical team and without advice;
  Technical level 2: Farms without technical team but with external advice;
  Technical level 3: Farms with technical team.
Main Results: Effect of the technical level of the manager on the AWUE

- There is an important effect of technical level of farmers on AWUE. The AWUE is threefold if there is an external supervision and fivefold if the farm has its own technical team. In addition, if we pass from external supervision to internal technical team we will have 69% of increase in AWUE.
Conclusion, Impact and Prospectum

- We have the confirmation that (even all constrains) the transition from surface irrigation to drip irrigation ensures a minimum of gain in AWUE.

- With the drip irrigation system, we find several levels in AWUE due to many factors (technical level, monitoring technics...)

- In light of this, we recommend to generalize drip irrigation for all the citrus area and meanly a lot of effort to improve the technical level of farmers and the good use of irrigation monitoring tools.

- These results can clarify stakeholder vision in defining actions to improve water productivity

For the next research, themes recommended to study the other factors that might affect AWUE like the crop itself (the varieties groups as oranges and mandarins, ages, densities...).
Thank You

Get in Touch
Hicham Elomari,
PhD, MSc, Ing