ARIMNet2 Young Researchers Seminar

“How to better involve end-users throughout the research process to foster innovation-driven research for a sustainable Mediterranean agriculture at the farm and local scales.”

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Effect of partial root-zone drying on grafted tomato

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Institute for Adriatic Crops and Karst Reclamation, Croatia
Institute: - 120 years old – public institute
- 53 employees
- Interdisciplinary research - aim of increasing efficiency, quality and competitiveness of agro and forest ecosystems, biodiversity and environmental quality, and protection and management of land and water
CONTEXT & CHALLENGES
(Based on literature review)

Partial root-zone drying (PRD)
- Shortage of freshwater resources in arid and semiarid regions → water saving irrigation techniques
- PRD – half of the roots dry while the other part is kept irrigated → ABA signalling, stomatal conductance, leaf expansion?
- Improvement of deficit irrigation

Grating
- Abiotic and biotic stressors → vegetable production losses → rootstocks for alleviating stresses
- Rootstocks – increased water and nutrient uptake by vigorous root system
PRD scheme

Plants

PRD - 1
50%

PRD - 2
100%
Grafting
OBJECTIVE & HYPOTHESES

Objective(s) / Research question(s)
- To characterize the possible differences in tomato vegetative and generative growth and development
- To determine grafting effectiveness on water and nutrient uptake

Hypotheses
- Grafting under PRD will promote tomato growth and yield compared to ungrafted plants
- Better nutrient and water-use efficiency

Conceptual framework

- Water + Tomato Grafting
METHODOLOGY

Plant material
- One tomato cultivar
- 2+ tomato rootstocks
- Ungrafted, self-grafted and grafted plants ("splice grafting")

Irrigation
- Full - 100 % ETo
- PRD – 50 % of Full (swapping root side)
- DI – 50% of Full (on whole root)

INvolvement of Stakeholders
- Institute of Adriatic Crops - leader
- Farmer – greenhouse facility
- Private company – irrigation and equipment
EXPECTED RESULTS / IMPACT (INNOVATION)

**Grafting**
- Use of „new „ technology

**Water**
- Better water use efficiency – less leaching
- Yield maintenance

**Fertilizers**
- Better nutrient use efficiency – less leaching
PROPOSED PARTNERSHIP

Partner 1:
- Farmers

Partner 2:
- Extension service
Thank you for your attention!