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Challenges and solutions in horticultural water management: insights from FERTINNOWA

Eleftheria Stavridou

Fruit tree Crop REsponses to Water deficit and decision support Systems applications

cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Funded by the European Union

Background

2012-2013: Benchmark study on behalf of the Flemish Land Agency revealed that:

- Growers struggle to
  - achieve sufficient and qualitative irrigation water
  - use irrigation water in an efficient way
  - avoid run-off leaching and to manage waste fertigated water.

- Knowledge & innovative technologies are available but are not implemented by the growers

Transfer of INNOvative techniques for sustainable WAter use in FERtigated crops

Objectives of FERTINNOWA

To collect, exchange, showcase and transfer innovative water management solutions and best practices in order to:

- improve input water quality
- improve water use efficiency
- reduce environmental impact

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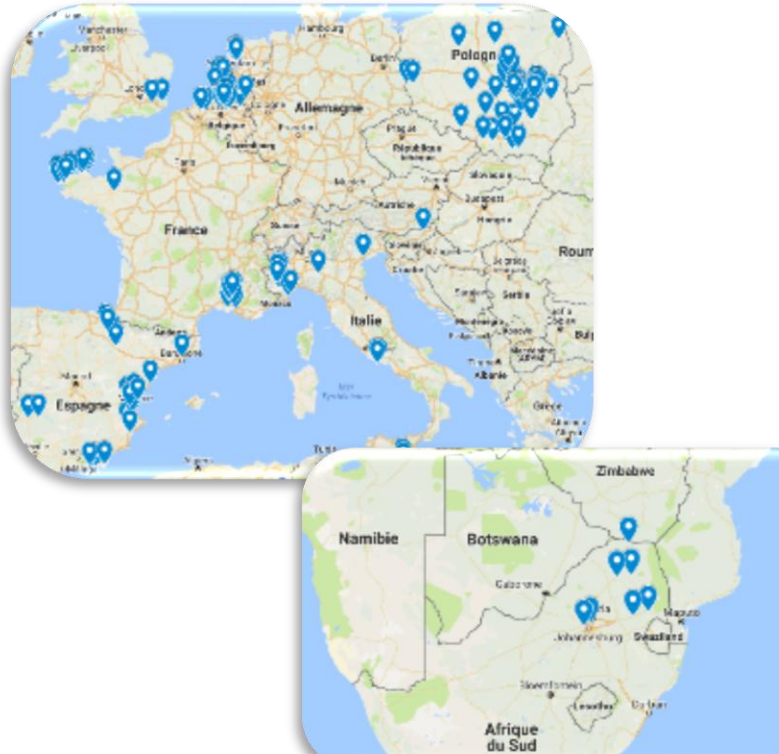
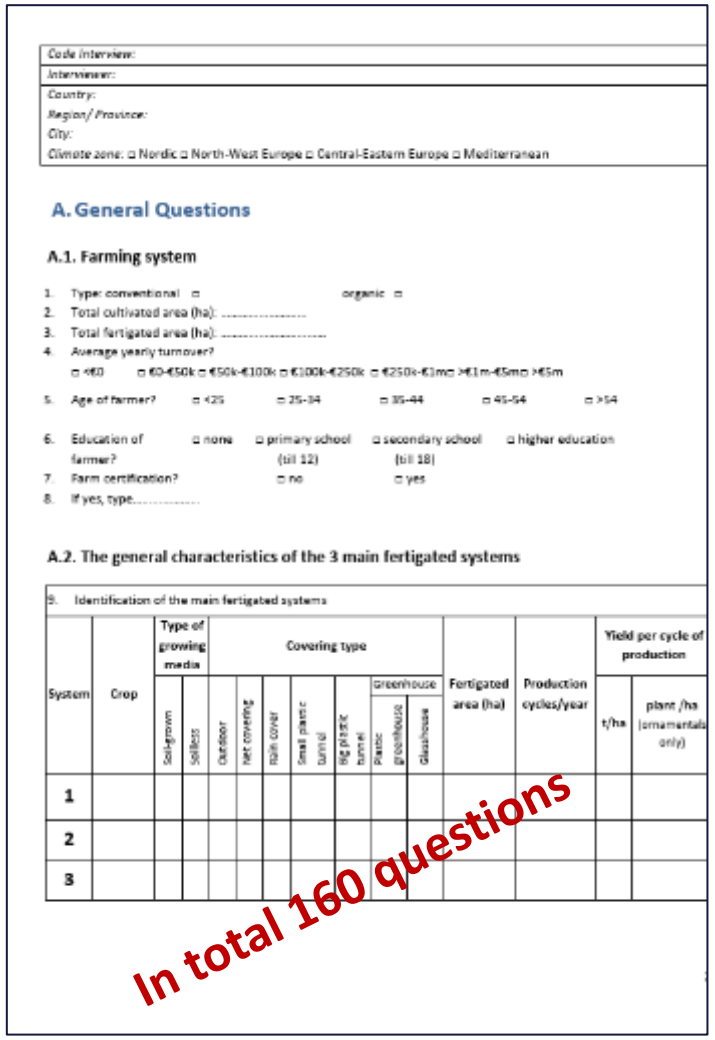
Survey Overview

Survey Methodology

- Interviews were carried out in 9 EU countries and South Africa
- The sample size varied across countries
- In total, 371 farms participated in the survey covering a total of 531 cropping systems
- Both soil and soilless cropping systems were examined including mainly vegetables (leafy and fruit), fruit trees, soft fruit, ornamentals
- Participating farms were found through opportunistic and critical case sampling



Survey structure



Code interview:
Interviewer:
Country:
Region/Province:
City:
Climate zone: ◻ Nordic ◻ North-West Europe ◻ Central-Eastern Europe ◻ Mediterranean

A. General Questions

A.1. Farming system

1. Type: conventional ◻ organic ◻
2. Total cultivated area (ha): .....
3. Total fertigated area (ha): .....
4. Average yearly turnover?
   ◻ <€0 ◻ €0-€50k ◻ €50k-€100k ◻ €100k-€250k ◻ €250k-€1mo ◻ >€1m-€5mo ◻ >€5m
5. Age of farmer? ◻ <25 ◻ 25-34 ◻ 35-44 ◻ 45-54 ◻ >54
6. Education of farmer? ◻ none ◻ primary school (till 12) ◻ secondary school (till 18) ◻ higher education
7. Farm certification? ◻ no ◻ yes
8. If yes, type.....

A.2. The general characteristics of the 3 main fertigated systems

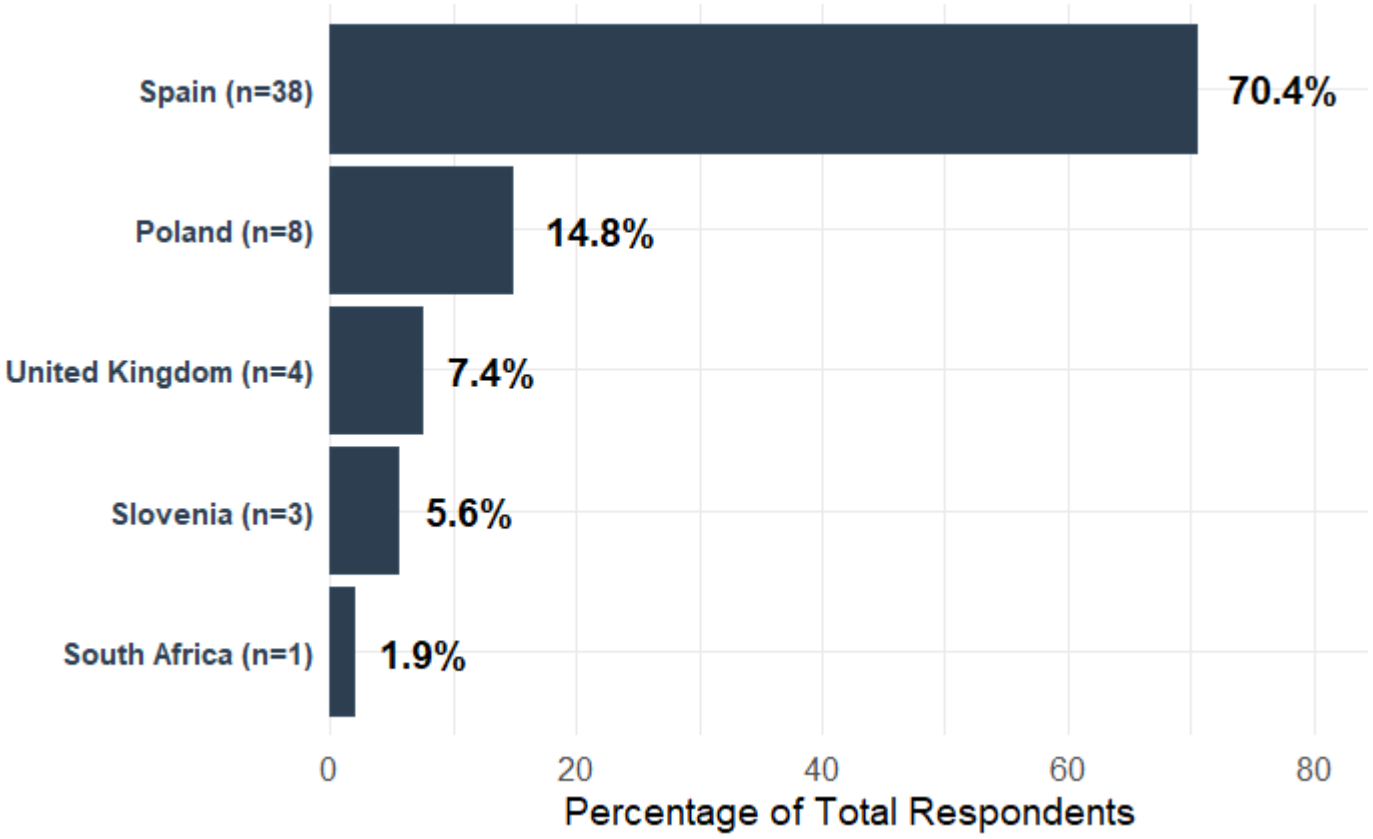
9. Identification of the main fertigated systems

System	Crop	Type of growing media		Covering type							Fertigated area (ha)	Production cycles/year	Yield per cycle of production	
									Greenhouse					
		Soil-grown	Soilless	Outdoor	Net covering	Rain cover	Small plastic tunnel	Big plastic tunnel	Plastic greenhouse	Glasshouse			t/ha	plant /ha (ornamentals only)
1														
2														
3														

In total 160 questions

- Background information
- Perception about the water source management
- Agriculture practices related to irrigation and nutrient management
- Agricultural practices and perception toward minimising the environmental impact (focused on emissions of nutrient wastewater)

Country Breakdown of Survey Respondents



Spain

Poland

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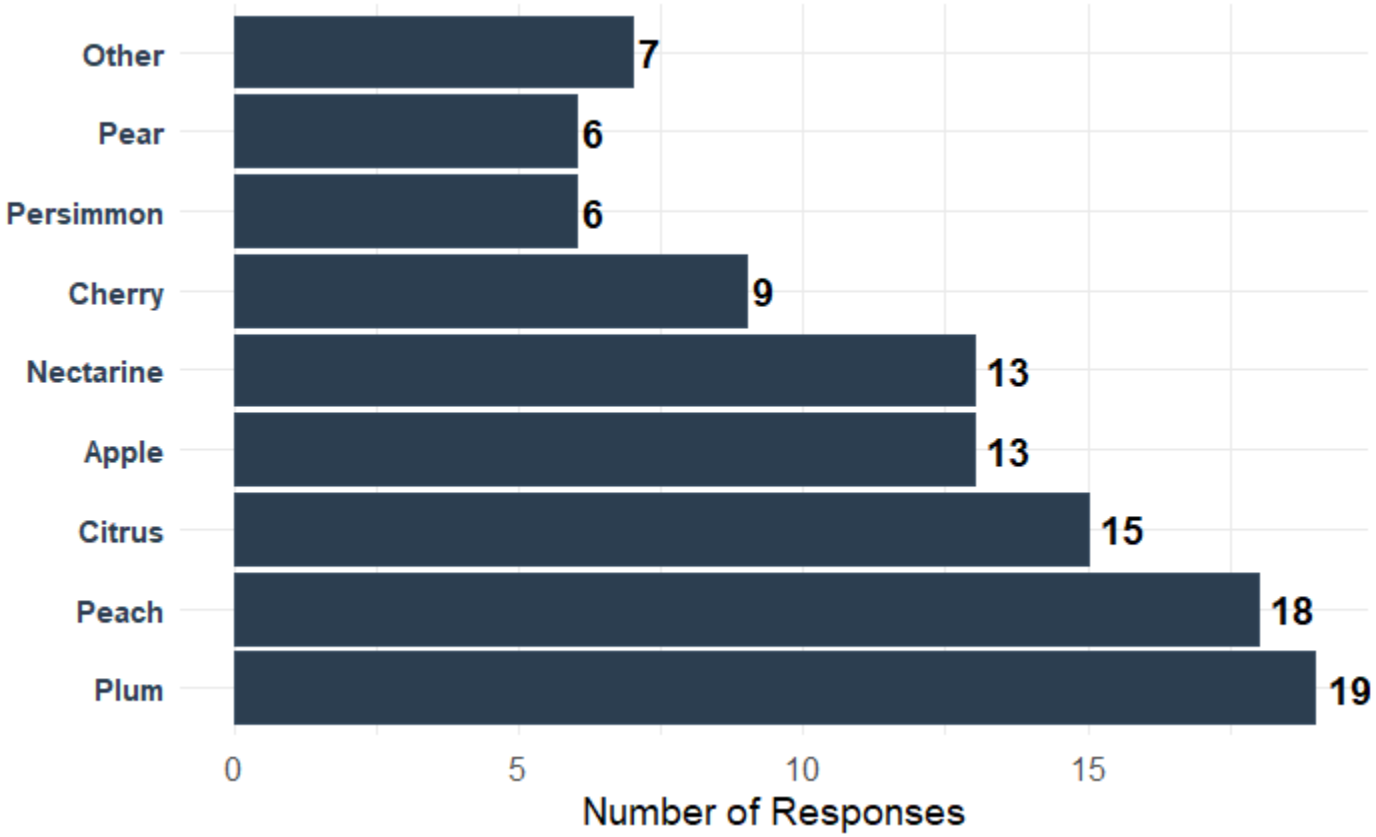
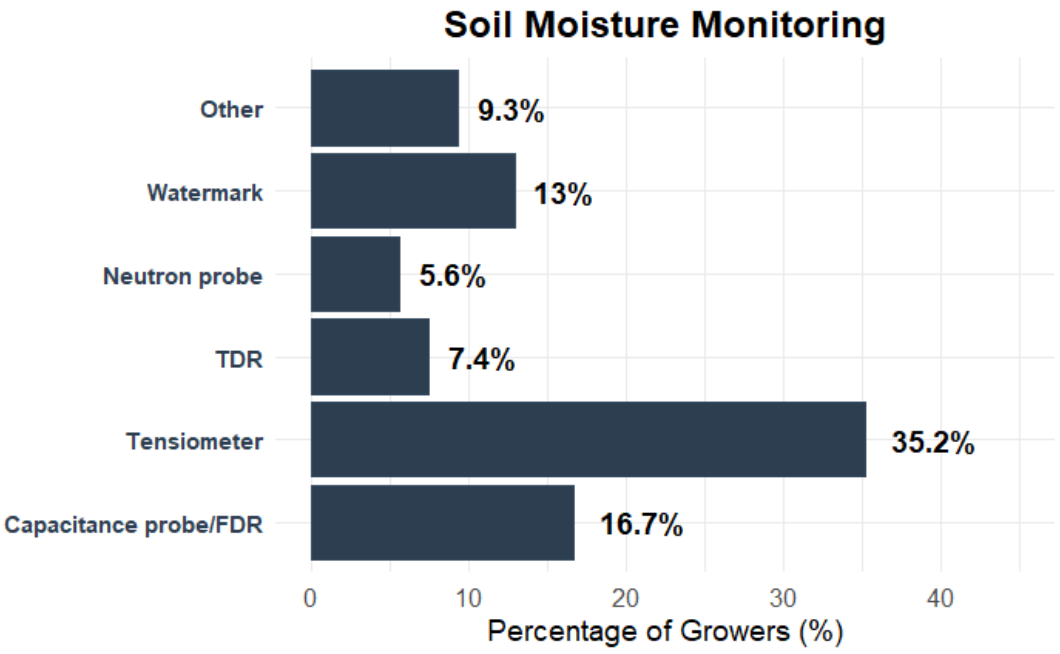
Key Findings

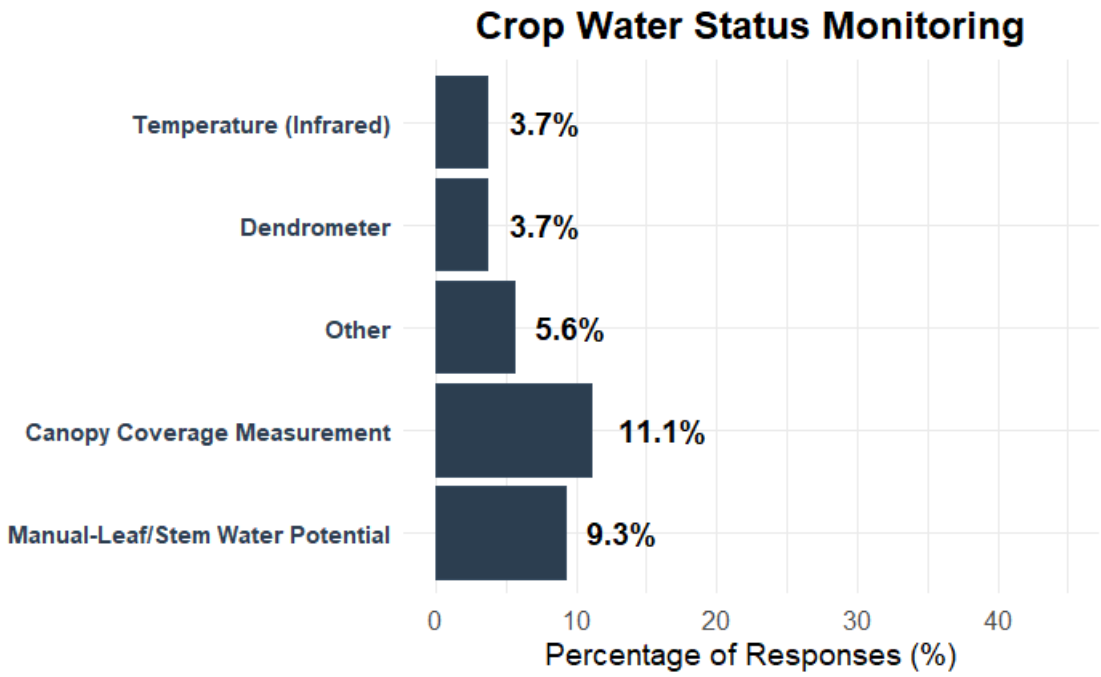
A Crop Frequency Overview



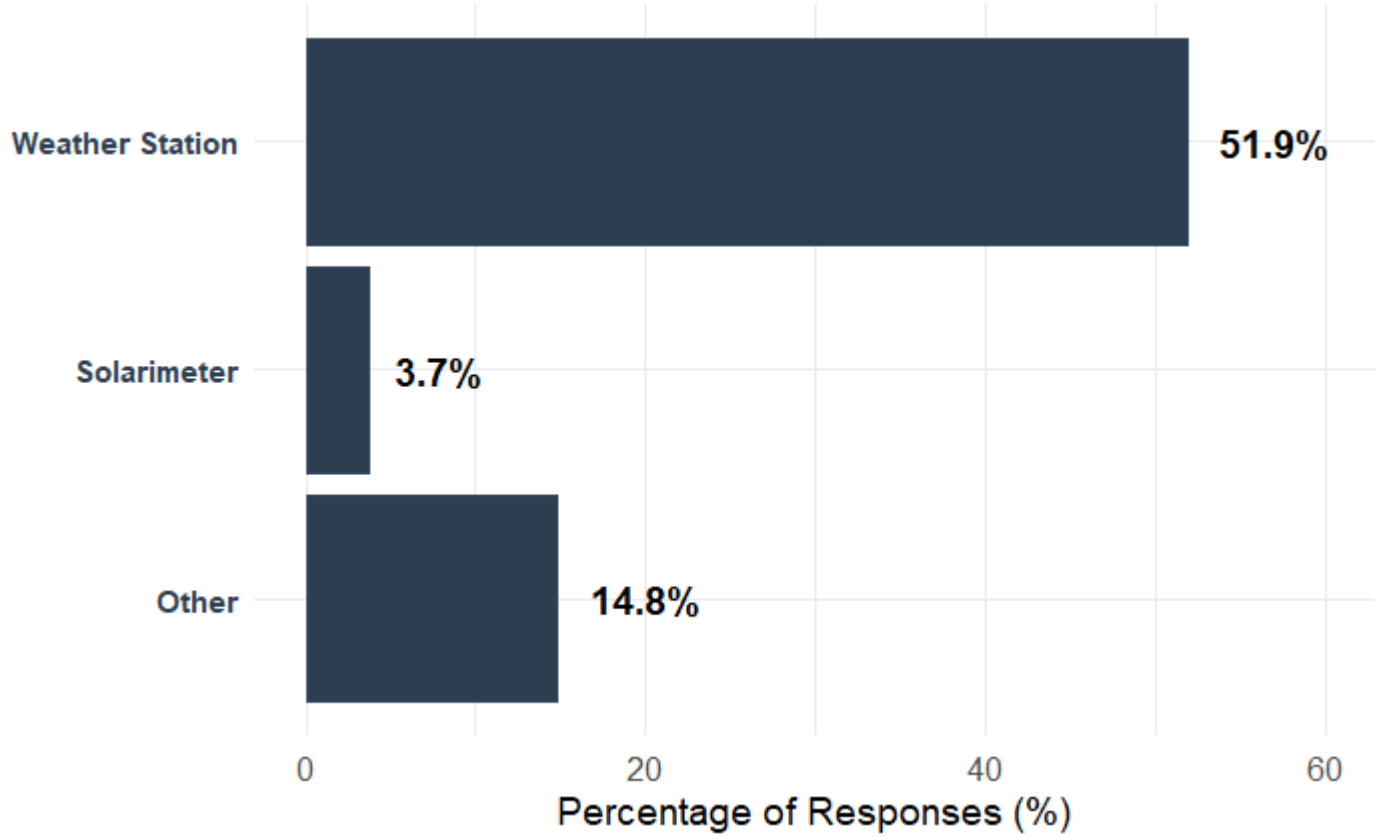
Other Category: Kiwi, Almond, Grapes, Mango, Olive, Apricot

Soil & Crop Water Monitoring: Tools and Methods Used by Growers

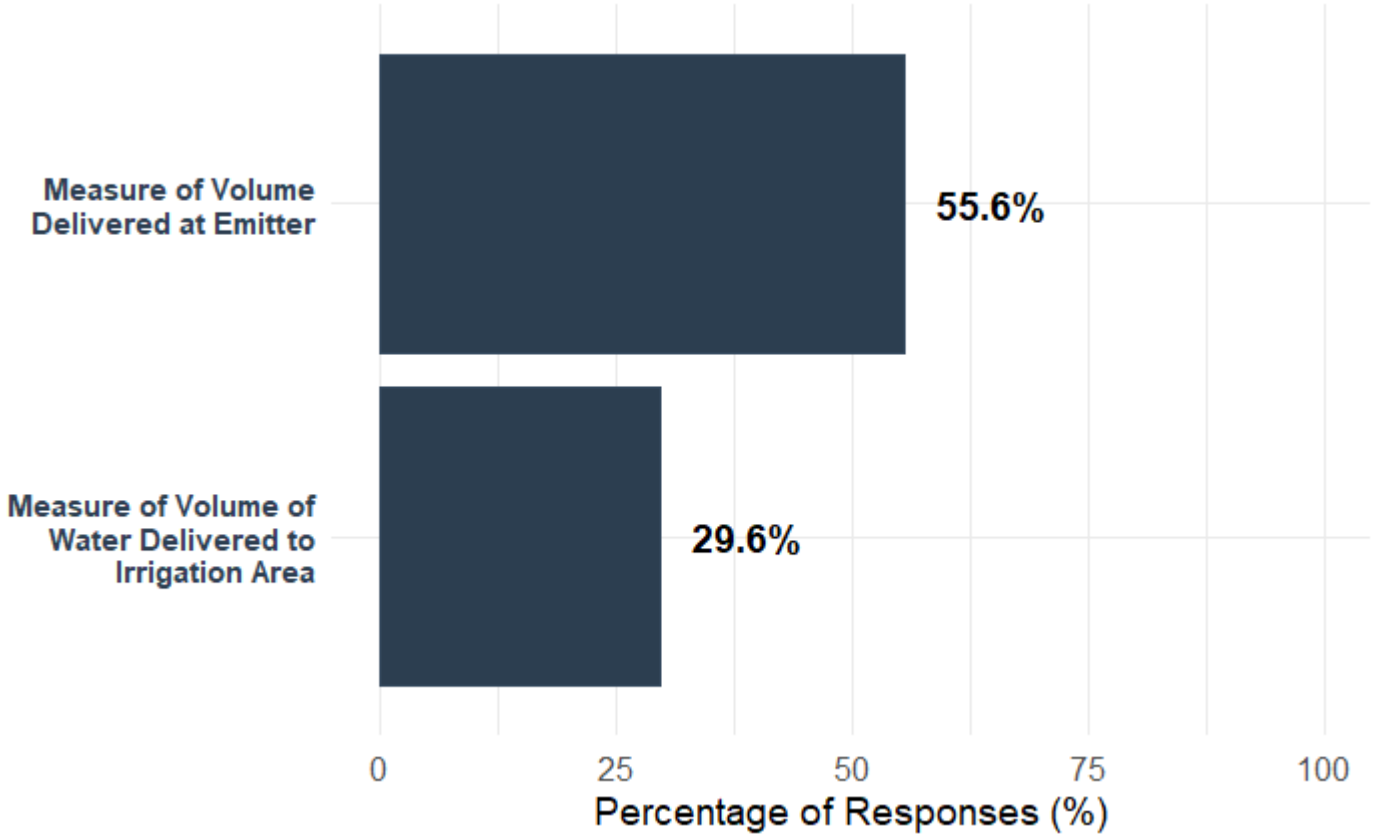




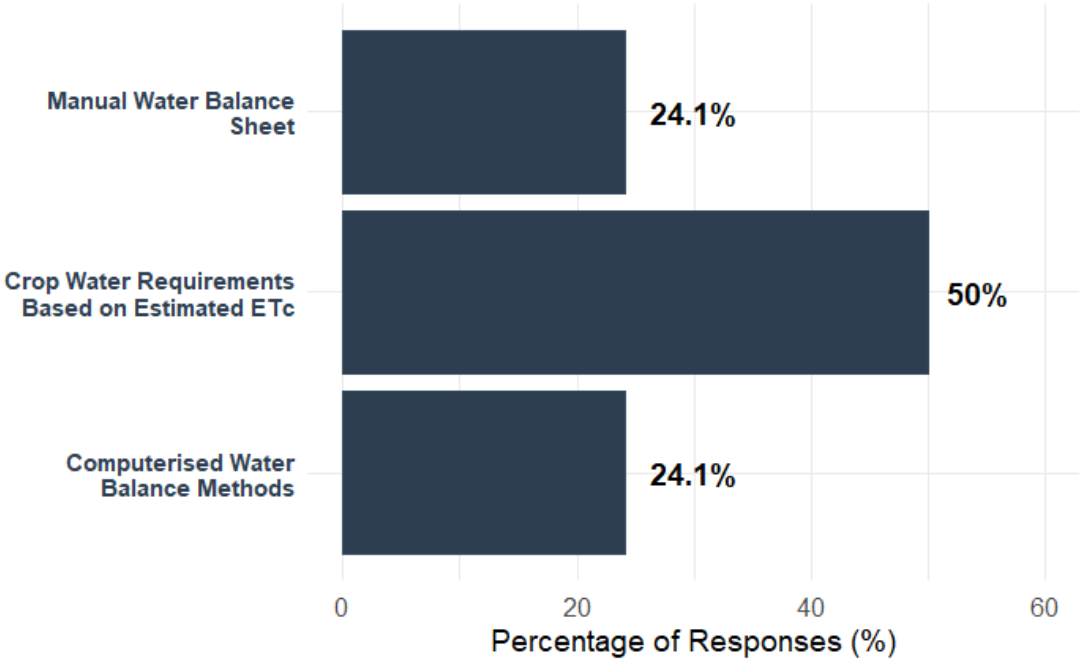
Climate-Based Irrigation Scheduling: Growers' Monitoring Methods

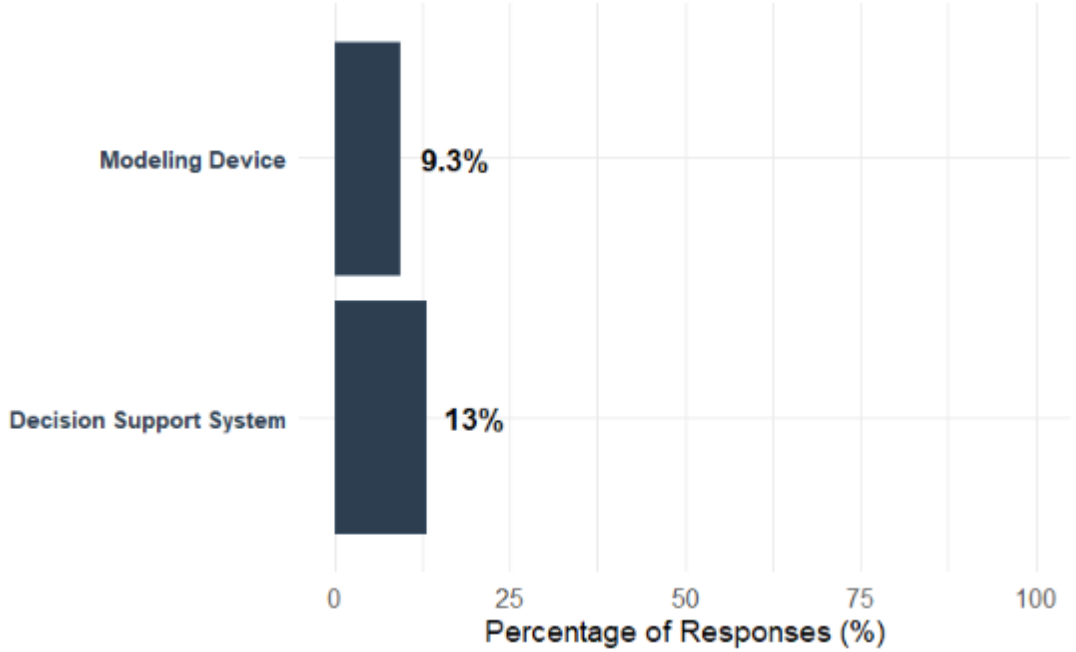


Grower Tools for Irrigation Scheduling: Measuring Water at Emitter and Field Scale



Growers' Approaches to Water Balance and Irrigation Planning





Growers' Desired Improvements in Irrigation Systems

- Full Automation of irrigation and fertigation systems
- Improved Monitoring of:
  - Soil moisture, pH, salinity, and nutrients
  - Weather data integration
- Enhanced Control:
  - More control points
  - Real-time application feedback
- Computerized Management:
  - Software tools for precise irrigation/fertilizer scheduling
  - Centralized control via digital platforms

Useful tools to help growers to adopt new practices

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- Workshops
- Nutrient management decision support system for portable devices (tablet, smartphone)
  Updated nutriment recommendation guides
- Document about technologies-comparisons of systems
- Affordable remotely accessed automatic sensor-activated system
- Financial support/subsides
- Affordable real time nutrient diagnostic tools

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Thank you!!

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 689687