



Horticultural Complex of Agadir



Boosting Nexus Framework
Implementation in the Mediterranean



Essai's Synthesis

Pr.Khadija KHOUYA. Pr.Houda Taimourya Pr.Asmae Alaoui Pr.Mounia Ennami Pr.Yasmina Imani Pr.Ouiam Lahlou

2023-2024 / 2024-2025

Opportunities and impacts of the use of desalinated water
and other technological innovations for sustainable agriculture



This project is part of the
PRIMA programme supported
by the European Union.





Horticultural Complex of Agadir



BONEX
Boosting Nexus Framework
Implementation in the Mediterranean



Évaluation de effet des mélanges eau de puits et eau de dessalement sur irrigation de la courgette (*Cucurbita pepo*): Une étude basée sur approche NEXUS WEFEE (Water-Energy-Food-Ecosystems)

Improving the efficiency of desalinated water for the production of under controlled conditions integrating magnetic treatment, solar energy, and biofertilisers: A NEXUS WEFEE (Water-Energy-Food-Ecosystems) approach

Evaluation of the effects of different doses of gypsum and irrigation with desalinated seawater on growth parameters and yield of green beans (*Phaseolus vulgaris*) conducted in a greenhouse

2023-2024 / 2024-2025

Opportunities and impacts of the use of desalinated water and other technological innovations for sustainable agriculture



This project is part of the PRIMA programme supported by the European Union.



Facteurs et dispositif expérimental

Irrigation water source

- Wells (CHA)
- Desalination water

Dose of gypsum

0T/ha

- 5T/ha
- 10T/ha

Soil Type

- Control (CHA)
- Sodic



Experimental green house



March to June 2024



Complexe Horticole d'Agadir.
Institut Agronomique et Vétérinaire
HASSAN II

Water ratios

- 50% WW – 50% DW
- 75% WW-25% DW
- 100% WW



Complementary solutions

- Magnetic treatment
- Biofertilisers (Vermisol)
- Solar Energy

Treatments	
T1	50%W - 50%D; SM; SB
T2	50%W - 50%D; SM; AB
T3	50%W - 50%D; AM; SB
T4	50%W - 50%D; AM; AB
T5	75%W - 25%D; SM; SB
T6	75%W - 25%D; SM; AB
T7	75%W - 25%D; AM; SB
T8	75%W - 25%D; AM; AB
Control	100%W; SB
Control	100%W; AB

W: underground water; **D:** Desalinated water;
AM: with magnetic treatment; **SM:** without magnetic treatment;
AB: with biofertilizer; **SB:** without biofertilizer.



Table 7: Properties of the Vermisol **biofertilizer**.

Property	Value	Unit
C/N Ratio	12.6	
Organic matter	40.5	%
pH	8.3	





Agromorphological parameters



Number of leaves



Stem height



Fresh weight and dry weight



Yield



Paramètres de qualité



Brix degree



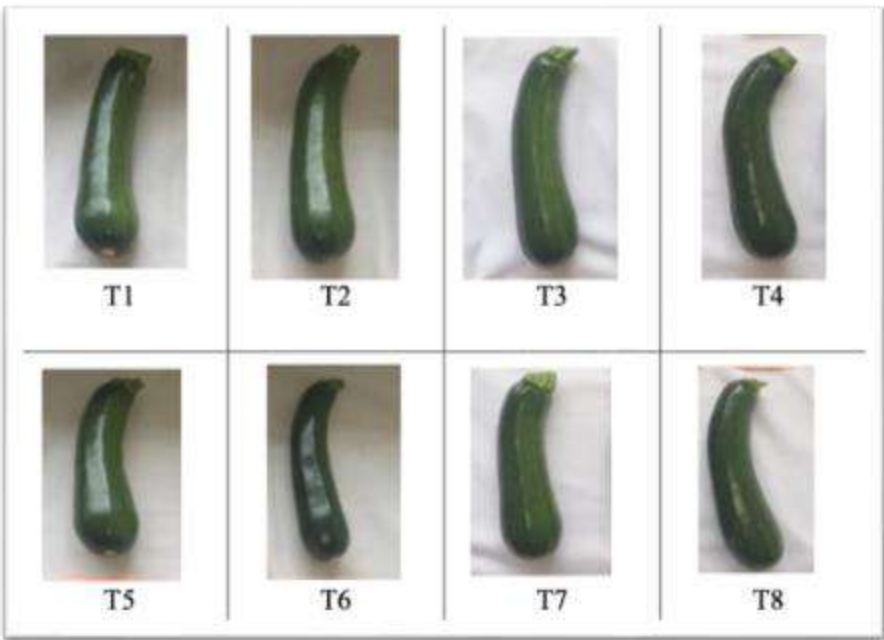
Calibre



Colour



Firmness



Factors and experimental design

Irrigation water source

Irrigation water source

- Wells (CHA)
- Desalination water

Soil Type

- Control (CHA)
- Sodic

Dose of gypsum 0T/ha

- 5T/ha
- 10T/ha

Espèce: *Phaseolus vulgaris* L.

Variété: Augusta

Conditionnement: Enrobage

Seeding and transplanting

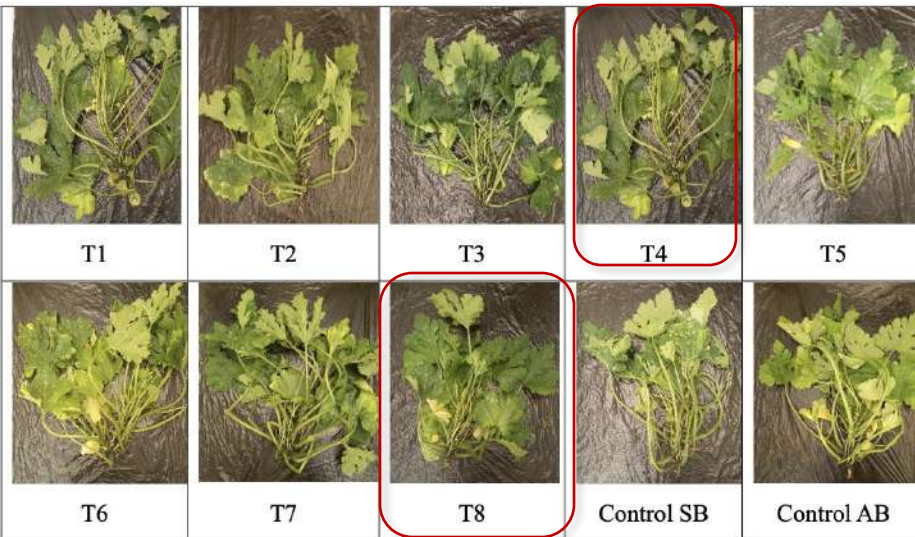
29/04/2024

12/05/2024

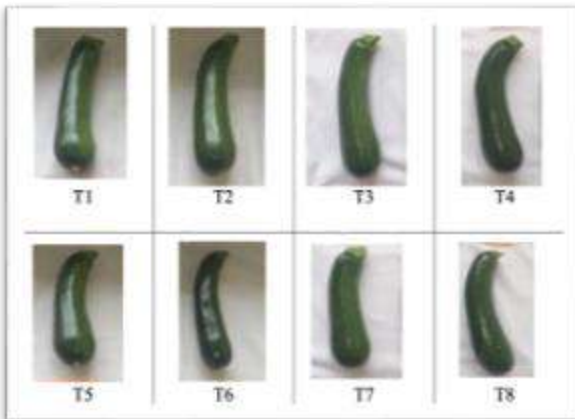


Horticultural Complex of Agadir

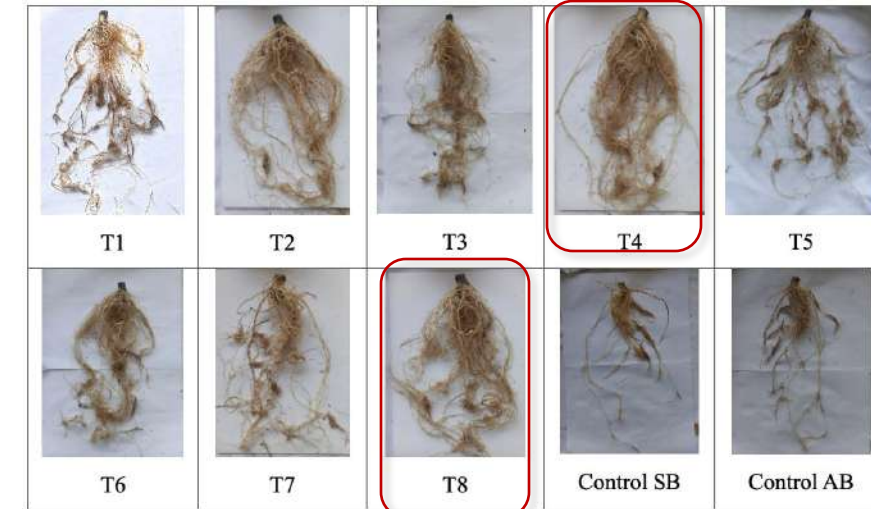
Boosting Nexus Framework Implementation in the Mediterranean



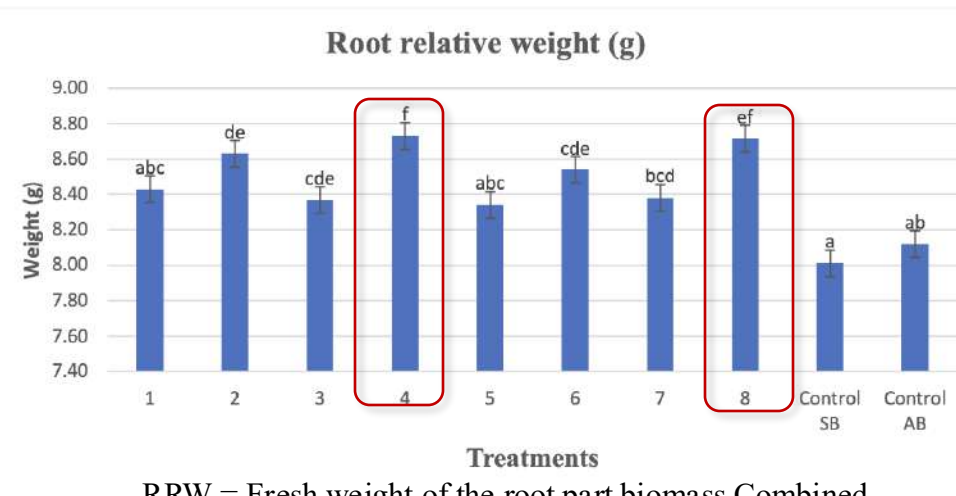
The aerial part of the zucchini after harvest.



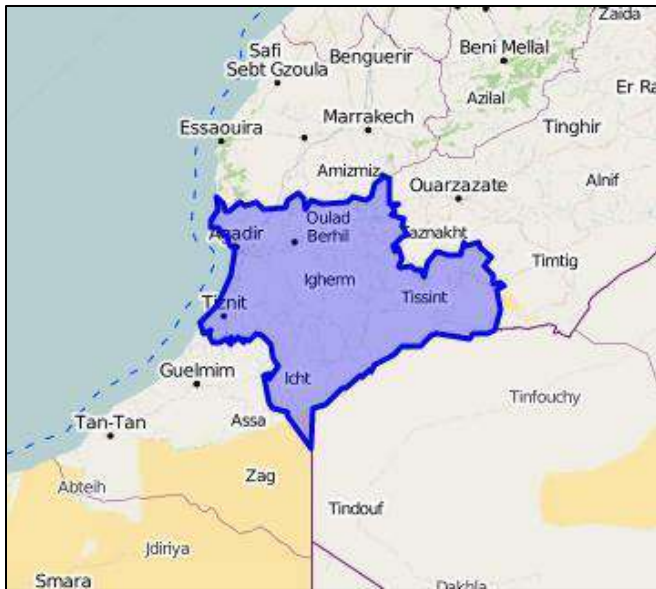
Treatments	
T1	50%W - 50%D; SM; SB
T2	50%W - 50%D; SM; AB
T3	50%W - 50%D; AM; SB
T4	50%W - 50%D; AM; AB
T5	75%W - 25%D; SM; SB
T6	75%W - 25%D; SM; AB
T7	75%W - 25%D; AM; SB
T8	75%W - 25%D; AM; AB
Control	100%W; SB
Control	100%W; AB



The structure of the roots for each treatment



water requirements



- **Tomato**

Around 85% of total tomatoes destined for export are produced in the Souss-Massa region

- **Raspberries**

In the 2023/24 season, Souss Massa saw a 17% increase in raspberry exports.

- **Pepper**

Generated approximately \$30 million in revenue in 2022

- **Cucumber**

Morocco exported over 20,000 tons of cucumbers



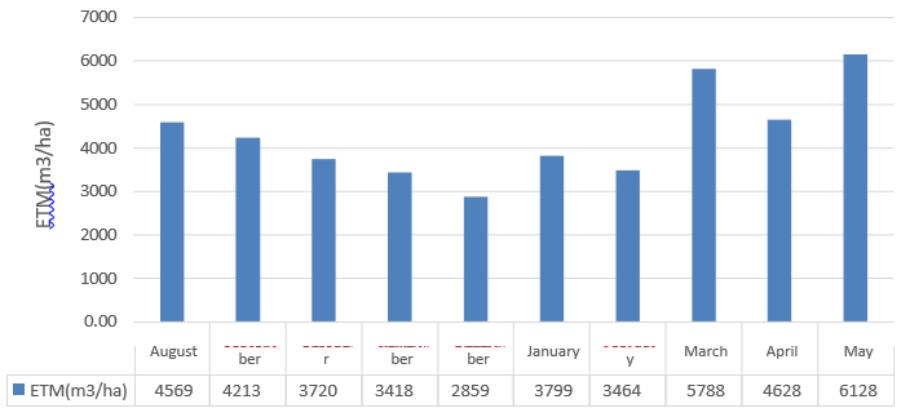
Horticultural Complex of Agadir



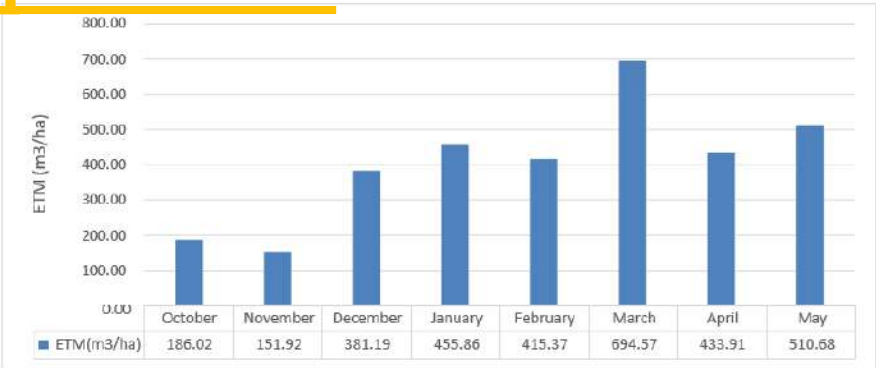
Boosting Nexus Framework
Implementation in the Mediterranean



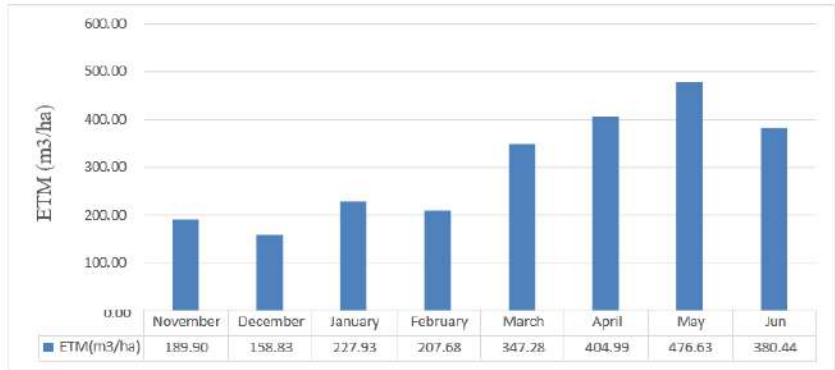
water requirements



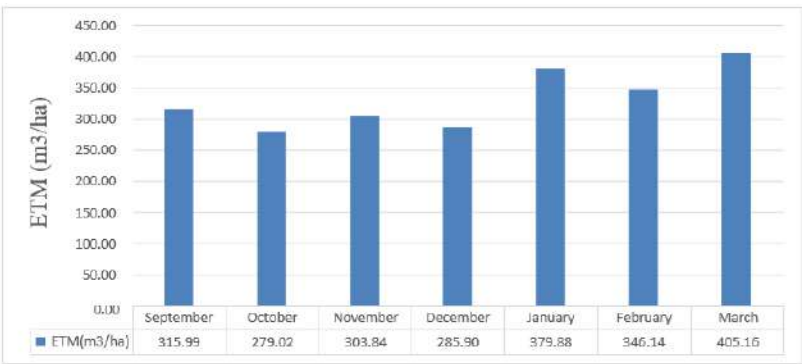
Tomato water requirements



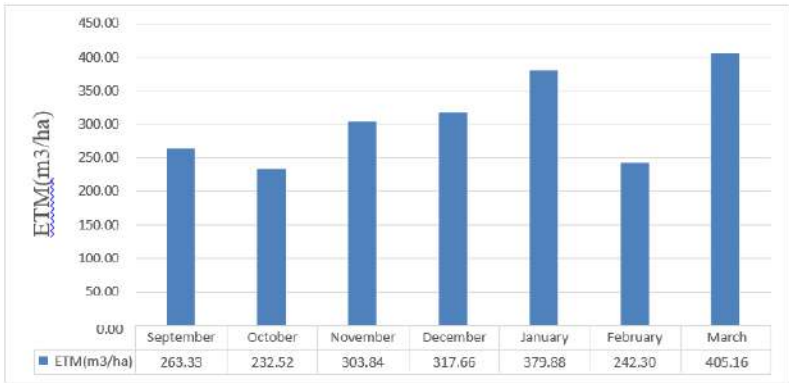
Raspberry water requirements



Pepper water requirements



Cucumber water requirements



Zucchini water requirements



Horticultural Complex of Agadir



Boosting Nexus Framework Implementation in the Mediterranean



Suggested ratios and their estimated cost for tomato

Suggested Ratios	Estimated cost (DH)
59% DW - 21% WW – 20% SW	17953.65
83.6% DW + 16.4% WW	22157.19
25% DW + 75% SW	8112.34
50% DW+25% WW 25% SW	16757.01

Suggested ratios and their estimated cost for raspberry

Suggested Ratios	Estimated cost (DH)
64.78% DW/ 35.22%SW	12138.9
10% DW, 10% WW, 80% SW	5012.21

Suggested ratios and their estimated cost for pepper

Suggested Ratios	Estimated cost (DH)
25%DW,25%WW,50% SW	5576.67
50%WW, 25% DW,25% SW	7318.12
75%WW, 15% DW,10% SW	8121.37
75%WW, 10% DW, 15% SW	7652.29

Suggested ratios and their estimated cost for Cucumber

Suggested Ratios	Estimated cost (DH)
75% DW 25% WW	11811.246
25% DW 75% SW	4411.132
50%DW 25%SW 25%WW	9113.1992

Suggested ratios and their estimated cost for Zucchini

Suggested Ratios	Estimated cost (DH)
75% DW 25% WW	10937.97
25% DW 75% SW	4085.65
50%DW 25%SW 25%WW	8439.39



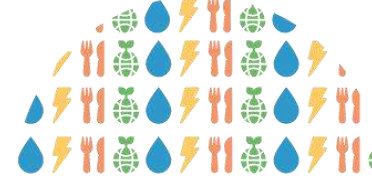
جميع المحاصيل

المحاصيل





Horticultural Complex of Agadir



BONEX

Boosting Nexus Framework
Implementation in the Mediterranean



Merci pour votre attention