Date Palm as a Water and Climate-Smart Option for Dry Environments

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Average (a-c) and absolute maximum (d-f) Heat Wave Magnitude Index daily (HWMId) values for the control reference period (CTL: 1981–2010), the near future (21C1: 2021–2050) and the end of the 21st century (21C2: 2071–2100) based on pathway RCP8.5.

Water & climate Smart agriculture

What do we mean by smart?

- Another promotion term
- Productive, resilient, tolerant, environmentally friendly, sustainable



Mitigation

Reduce/remove where possible GHGs emissions

and

Smart Water & climate for agriculture

What do we mean b smart?

- Another promotion term
- Productive, resilient, tolerant, environmentally friendly, sustainable
- Why smart-water?
 - management should be smart -Water scarcity, Share of agriculture
- Why smart-climate?
 - impact of climate change (less rain, more requirements)by

Annual water resources per capita



Renewable water resources (m3/per capita) till 2050



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Why climate-smart? CC impacts in dry areas



Increased temperature and CO₂ levels

Increase crop water requirements, reduce soil water, more stress on plants, shorter growing periods, and reduced yields



 Longer drought spells will expose crops to moisture stress, and reduce rainfed yields and quality.

Impacts on pests and diseases. Needs more research Impact on crop suitability:

 Plant physiology ... suitability of some crops to changed conditions may reduce in some locations

Date palm crop water requirements

Varies depending on:

- 1. Climate energy received by the tree
- 2. Water availability and time (yield vs water)
- 3. Irrigation method (surface/subsurface)
- 4. Tree size and health (pruning/diseases)
- 5. Water and soil salinity/leaching requirements





14/11/2023

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Low High

Source: FAO

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Date palm water uptake

- Mostly from in top 1 meter
- 40-50 % allowable depletion
 - Heavy soil 7-15 days interval
 - Medium soil 5-10 days interval
 - Light soils 3-7 days
- Over irrigation is common
- Salinity tolerance
 - ET reduction
 - yield reduction



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Water productivity: Super indicator for Climate-smart agriculture

Return for water consumed (ET)

- Biophysical
- Economic
- Nutritional
- Energy





Improving date palm water productivity

- Reducing irrigation evaporation losses (mulches, subsurface, etc
- Deficit irrigation
- Planting high producing & quality varieties & replace otherwise producing
- Agronomy (fertility, pruning etc.)
- Pests and disease control
- Added value and marketing



Is date palm a Water and climate-smart crop?



- Can produce up to 10 US\$/m3
- Highly resistant to extreme weather and tolerant to intense heat, droughts, and floods
- Date palm tree is able to absorb about 200 kilograms of CO₂ annually

Gas emission (tCO2-eq) neutrality in 20 years of 100 ha date palm vs vegetables cultivation



Thank you theib.y.oweis@gmail.com

The Message:

It is not only how much water a date palm tree consumes, it is also how much return it gives in income, resilience, and environmental benefits. Considering all this, date palm is one of the most water and climate-smart crops in waterscarce dry regions

