



Utilizing New technology Packages for Water Conservation in the  
Middle East and North Africa

# WLI Socioeconomic Research at the Community Scale in Tunisia

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# Context and the adopted technologies

<b>Crop</b>	<b>Wheat</b>	<b>Citrus</b>
<b>Target area</b>	Cereal region of Tunisia	North East of Tunisia (Cap Bon)
<b>Context</b>	Irregularity of precipitation and yields	Water scarcity Water resource degradation
<b>Technology adopted</b>	Supplemental Irrigation	Regulated Deficit Irrigation

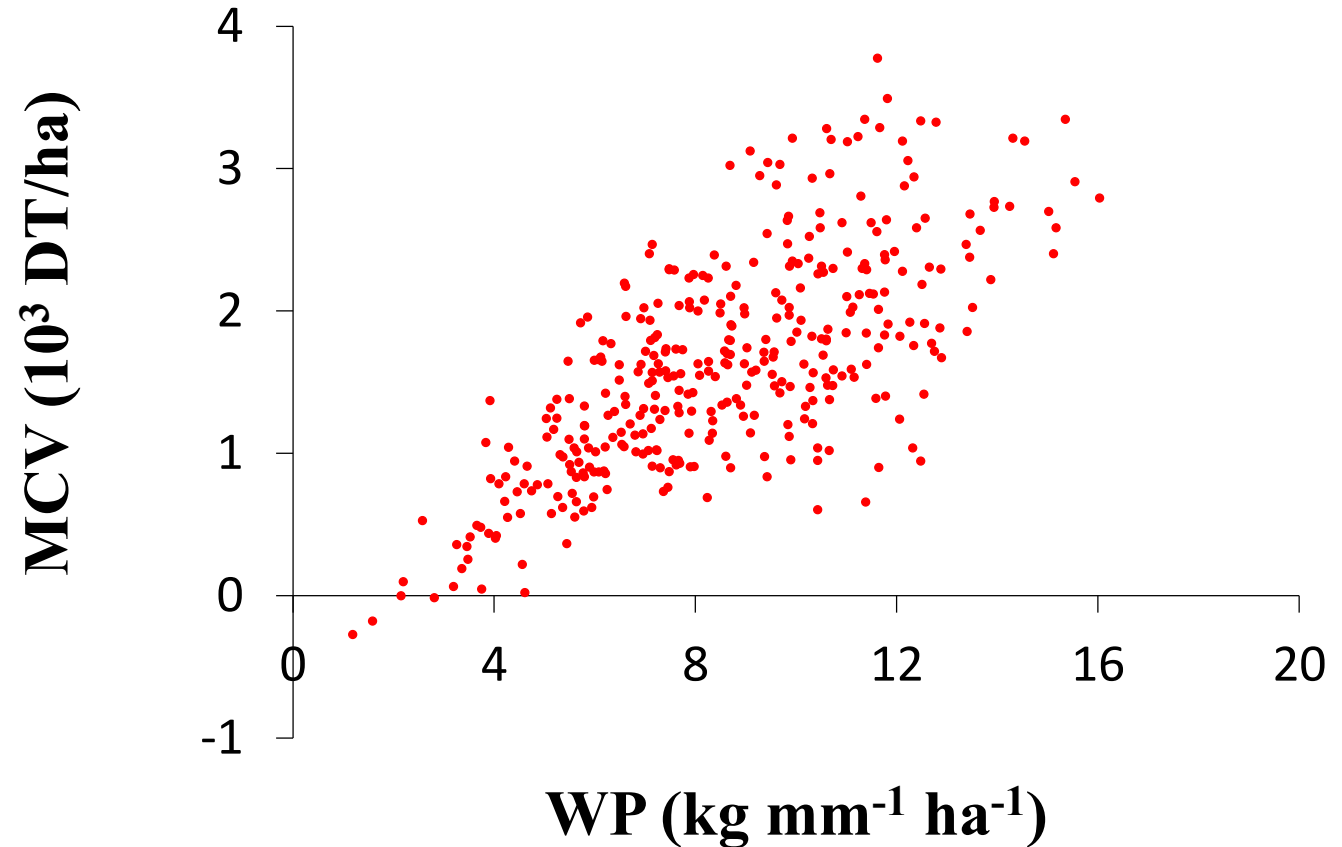
# Methodology and goal

<b>Crop</b>	<b>Wheat</b>	<b>Citrus</b>
<b>Strategy adopted</b>	Supplemental Irrigation	Regulated Deficit Irrigation
<b>Study objective</b>	Technical efficiency The contribution margins	Farmer willingness
<b>Methodology</b>	Data enveloppement Analysis (373 surveyed farmers)	Binary regression (70 surveyed farmers)
<b>Out come</b>	Quantifying technical gaps and farmer benefit	Improve dissemination of technology strategies
<b>Impact</b>	National wheat production stability	Citrus agro-system sustainability

# Assessing Farmers' wheat water productivity and the contribution margin

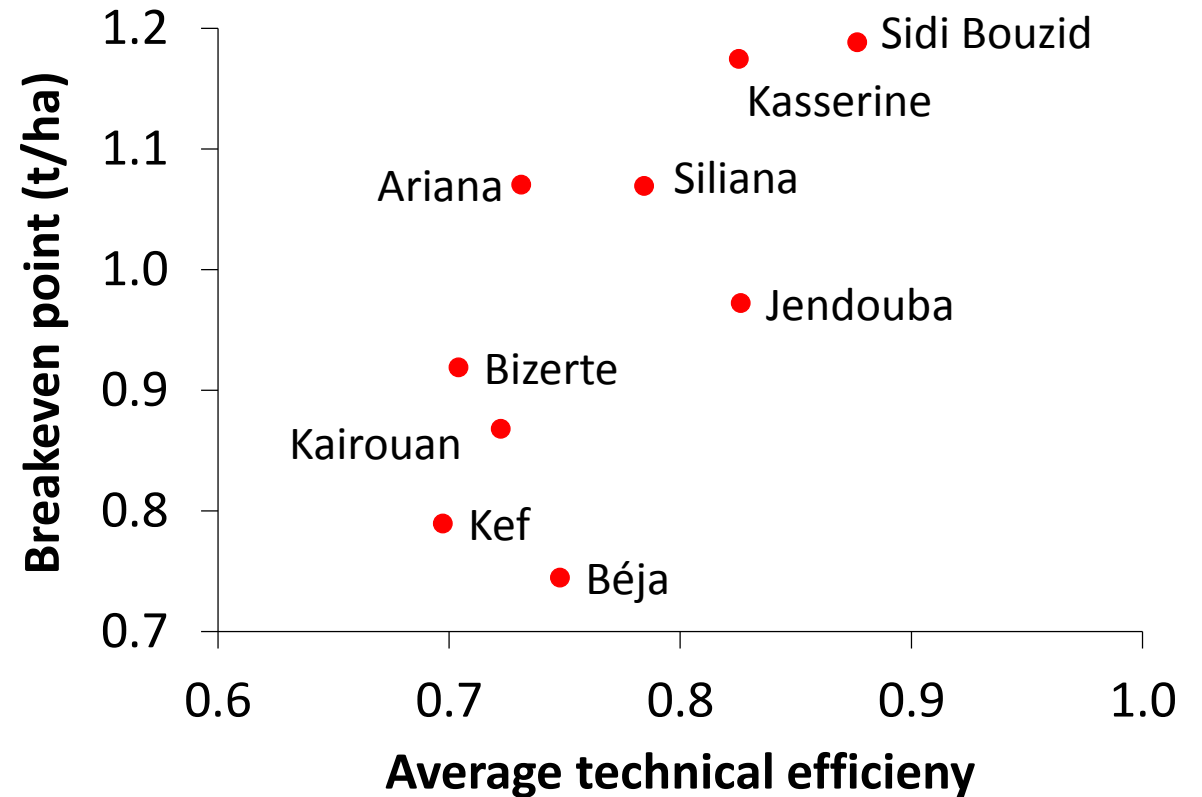
The contribution margins increase by 360DT/ha for any unit increase of WP till  $12\text{kg ha}^{-1}\text{mm}^{-1}$

1DT(Tunisian Dinar)=0,63\$ (Tunisian central Bank, 11 Février 2014)



# Assessing the regional breakeven point and the technical efficiency

The breakeven points calculated relatively to variable costs increase by 0.2t/ha if the regional efficiency is increased by 0.1 unit



# Assessing Farmers' Willingness to Adopt RDI

The binary regression fits well with the data used at an acceptable level :

- Nagelkerke R Square=0.67
- p-value of HL=0.67
- Percentage of correct predictions=87%

	B	S.E.	Sig.	Exp(B)
DELEGATION**	3.013	1.309	.021	20.348
AGE*	2.439	1.290	.059	11.463
EDUC	-1.253	.774	.106	.286
TENUR	.466	1.742	.789	1.594
OFFA	-.657	1.025	.521	.518
SIZE (ha)	.360	.331	.276	1.433
RESOUR	-.659	1.868	.724	.517
SALT	-.219	1.608	.892	.803
YIELD (t/ha)	.013	.040	.743	1.013
SYST**	2.628	1.328	.048	13.841
FREQ (number/month)**	.129	.054	.017	1.138
SUPL**	2.983	1.503	.047	19.750
MANU*	2.370	1.239	.056	10.696
TRAI	-1.561	1.071	.145	.210
CTV	.527	1.218	.665	1.693
APPRi***	2.764	.963	.004	15.867
APPRr	.441	1.173	.707	1.555
Constant	-6.860	4.414	.120	.001

# Insights

- **Effect of water cuts and regional management on farmer attitude**
  - ✓ Water management seems better in Beni Khalled region
  - ✓ Farmers who believed that regional water resources were insufficient were more likely to over irrigate
  - ✓ Farmers using surface irrigation methods will more likely agree on the adoption of deficit irrigation, because, irrigating less frequently, they were more affected by the irregularity in water supply
- **Effect of farmer awareness about the water scarcity and environmental problems**
  - ✓ 70% of the farmers believe that the regional water resources are sufficient (over-irrigation, surface irrigation...)
  - ✓ half of the farmers who used less than 5000m<sup>3</sup>/ha disagree on the adoption of deficit irrigation and want to have more water supply, although 66% of them have relatively significant yields (25t/ha to 60t/ha).



# Insights

- Effect of Farmer knowledge about citrus water requirements
  - ✓ Insufficient knowledge: the actual supply and the farmer's appreciation (APPRI) were significantly independent (p-value of Chi square test= 0.02)
- Effect of the socio-economic characteristic
  - ✓ significant with farmer age (at 10% level)
  - ✓ No significant effect for the other explanatory variables
- Effect of the level of the relationship between the farmers and the extension institutions
  - ✓ No significant effect (training and CTV contact)

# Conclusions

## Wheat: WP and technical efficiency

- Irrigation associated with good management cultural practices can ensure a level of WP around 12-13 kg mm<sup>-1</sup> ha<sup>-1</sup> and contribution margin around 3000DT / ha.

## Citrus: farmer willingness

- Farmer acceptance seems to be linked to their concern by water supply reliability
- Irrigation and agricultural management practices influenced the farmer's attitude
- No significant effect of the extension institutions on the farmer acceptance

# Recommendations for enhancing the adoption of RDI

- Increase farmer stakeholders awareness about the environmental situation
  - ✓ Workshop explaining the RDI strategy to stakeholders and AQUACROP use to help them in irrigation management decisions (GDA, CTV and CRDA)
- Increase farmer knowledge and enhance their contact with extension institutes (CTV)
  - ✓ Demonstration site carried out by CTV (need of water sensors for irrigation management and extension technicians motivation to have efficient field days )

Thank you