Demonstration site factsheet

Sidi Bouzid – Tunisia

Description

- SUPROMED Tunisian demonstration site is located in Sidi Bouzid governorate.
- The irrigated area covers more than 50,000 ha, of which 88% belongs to private farmers while the rest is managed by Water Users Associations.
- The average annual rainfall is 250 mm, which is characterized by with significant annual fluctuations. This region is classified as arid with cold and humid winters and hot and dry summers.
- The average annual evaporation is 1,470 mm. Therefore, agriculture is primarily based on irrigation using groundwater.

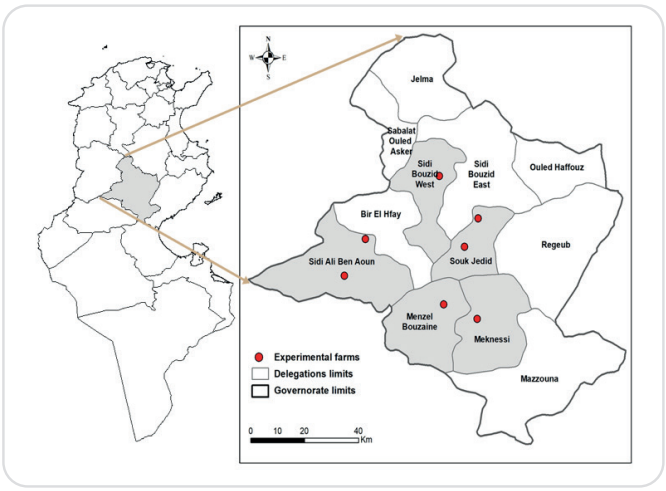
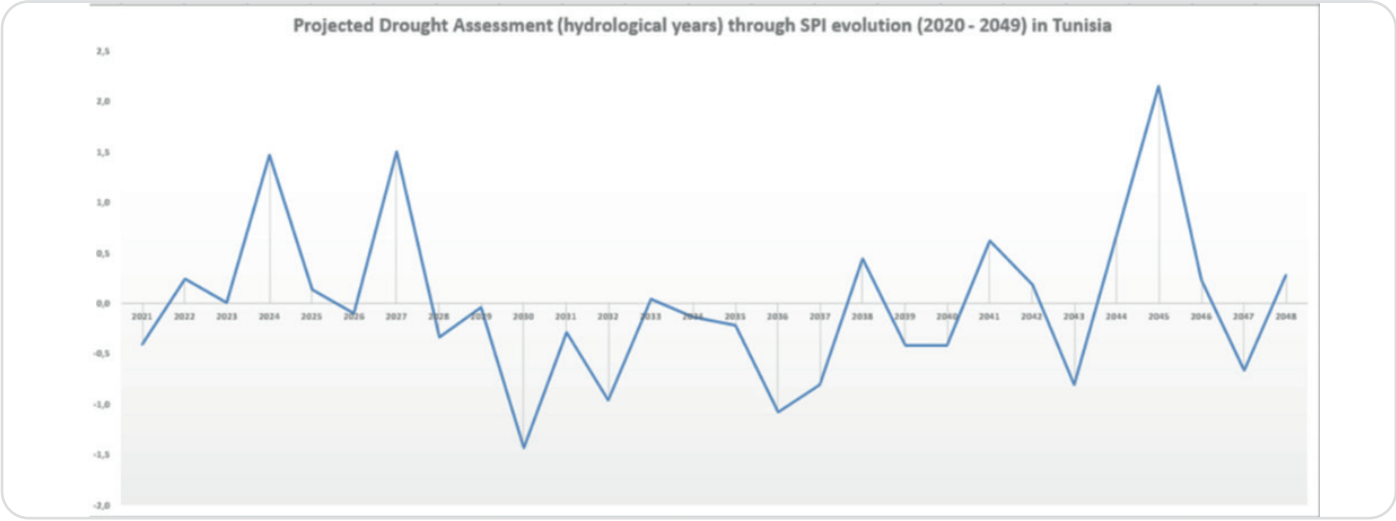


Figure1 : Sidi Bouzid demosite

Specific problems

- **Lack of water resources:** Given the aridity of climate, rainfall and surface water are both scare and random. Groundwater is the only source of irrigation.
- **Groundwater shortage and increasing pumping cost:** The rapid expansion of irrigated areas combined with small natural recharge of the aquifer, have led to a quickly falling of groundwater at an average rate of 1 m per year and it can reach to 2 m in some zones. Due to this decline in water table depth, farmers have to deepen their wells regularly requiring thus additional investment and increasing the energy needed to pump one meter cubic which has a direct additional impact on pumping cost.
- **Low integration of ICT** in the agricultural sector.

Drought forecast 2021 – 2050, Sidi Bouzid, Tunisia



- Positive SPI values are indicating drought severity

Methodology

- During the first year (2019-2020), several plots were monitored which corresponded to each studied crop. One plot of the best-trained and highest producing farmers was selected and divided in two parts to make a comparison between SUPROMED (SUP) research team and LEADER (LEA) management. Another group of farmers was selected which is AVERAGE farmers (AVE) this group has a training level and management practices of farms representative of the area.
- LEA farmers used SUPROMED tools (Irey, MOPECO irrigation scheduling tool, MOPECO crop distribution, weather forecast and agroclimatic zones based on remote sensing) to manage the plot and compare the results with the previous year. To monitor the real amount of water applied in each irrigation event and the evolution of soil moisture, a pressure transducer and a soil moisture probe were installed at each plot in a representative area. In addition, weather stations were used to obtain the agrometeorological variables to determine the irrigation requirements following the FAO56 approach.
- **Evaluation of the irrigation system** and **soil analysis** were made to determine the performance of the irrigation system and soil properties in order to make a proper irrigation scheduling and fertilization plan .

Crop monitored

Annual Crops: wheat, oat, onion maize
Fruit trees: almonds, olive and pistachios

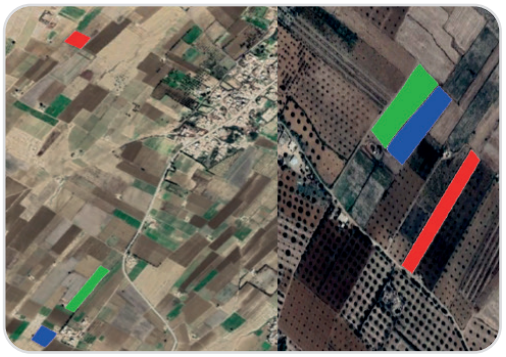


Figure 2 : Monitored plots – wheat (left) & oat (right)

Figure 3 : weather station installation

Important results

Applying SUPROMED platform recommendations improved most of the Key Performance Indicators in relation to reducing the amount of irrigation water consumption. This fact, allowed to improve the agronomic and economic indicators, and to reduce water footprint.

Indicators	Unit	SUP	Leader	AVE1	AVE2	AVE3	AVE4	AVE5
Yield	kg/ha	6500	5010	5020	4200	4500	2400	4600
Potential increase (relative to Supromed)	%	0	30 %	30 %	55 %	45 %	170 %	44 %
Season irrigation	m^3/ha	4050	4500	4300	4800	8850	6750	5900
Potential water saving	%	0 %	10 %	6 %	19 %	118 %	67 %	45 %
IWater productivity	Kg/m^3	1.561	1,113	1,167	0,875	0,508	0,356	0,780

Table 1 : Agronomic and water productivity of wheat 2020- 2021

- Table 1 illustrates the agronomic and water productivity results of wheat during the season 2020- 2021 in SUPROMED plot, LEADER farmer plot and 5 average farmers plots.

- Practices suggested by SUPROMED contribute to significantly increase the yield at the plot level

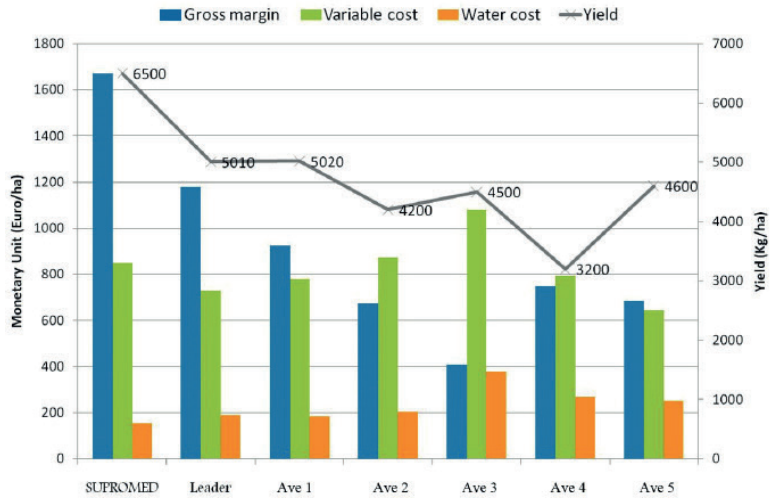


Figure 4 : Economic indicators of Wheat 2020- 2021

- The new water management practices recommended by SUPROMED platform contributes to limit the risk of economic losses linked to prices fluctuations.
- For SUPROMED plot, even with the fall of price by 60%, the Gross Margin remains positive

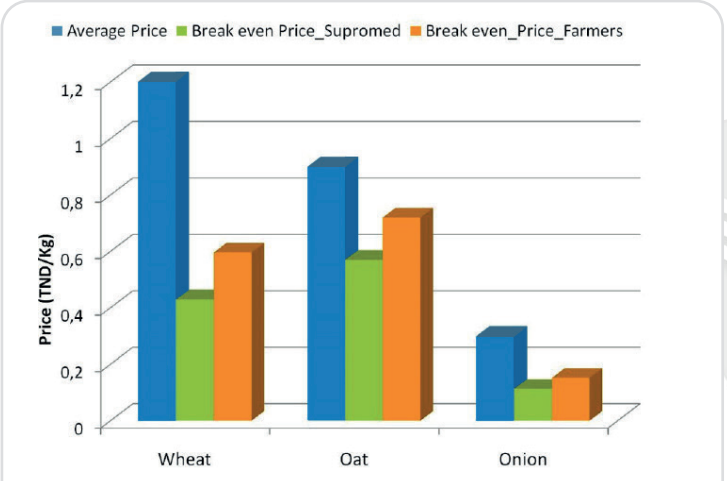


Figure 5 : Resilience towards Market prices Fluctuations

- The Specific energy (fig. 6) shows the amount of energy spent to produce a unit of marketable product (kWh/kg).
- In the case of wheat crop, it was much lower (0.122 kWh/kg) for SUPROMED plot than for others, meaning that averages' farmers have used more energy to produce one kg of wheat.
- For example, the average farmer number 4 has used 6.25 times more energy compared to the used energy in SUPROMED plot to produce the same quantity of wheat (one kg).

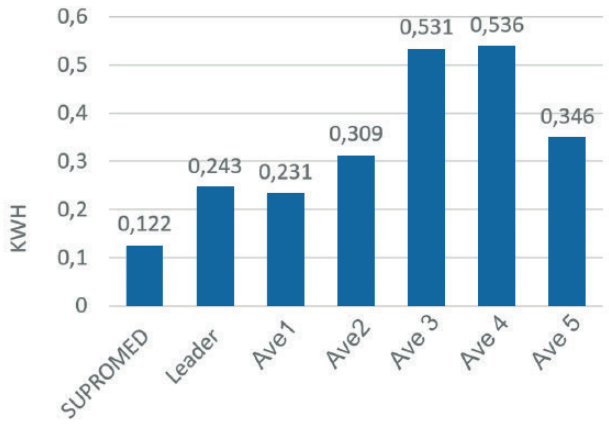


Figure 6 : Specific Energy to produce 1 Kg of Wheat

- Results of a survey conducted over a sample of 68 farmers revealed that 81% of farmers were interested in SUPROMED practices as they help them to better schedule irrigation.

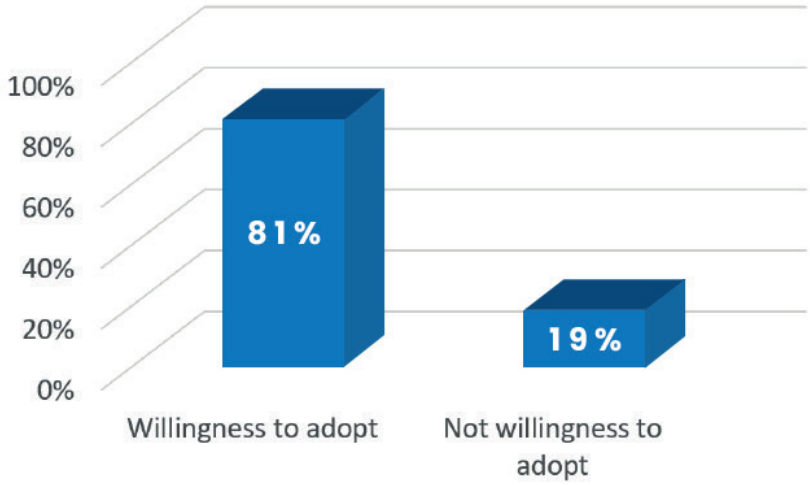


Figure 7 : Farmer's Feed-back about the adoption of SUPROMED Services

SUPROMED Website:
www.supromed.eu

SUPROMED platform:
dss.supromed.eu

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