Pathways for Sustainable Intensification of Wheat Production in the Mediterranean Region Under Current and Future Climate Change Scenarios

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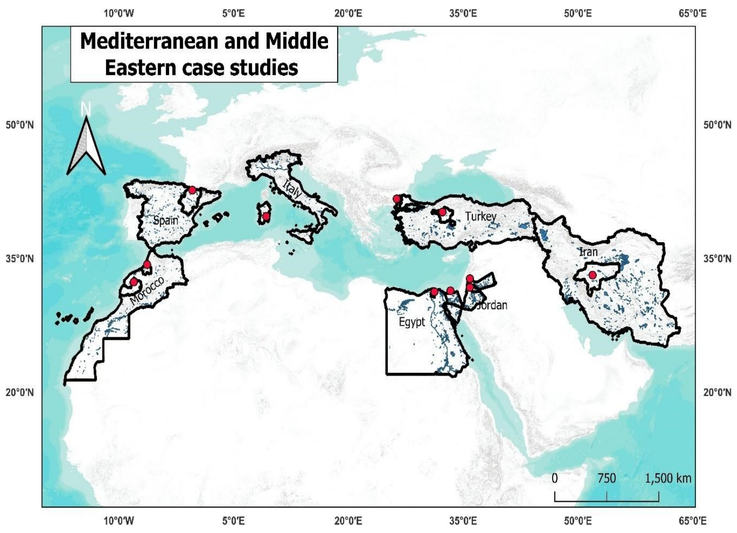
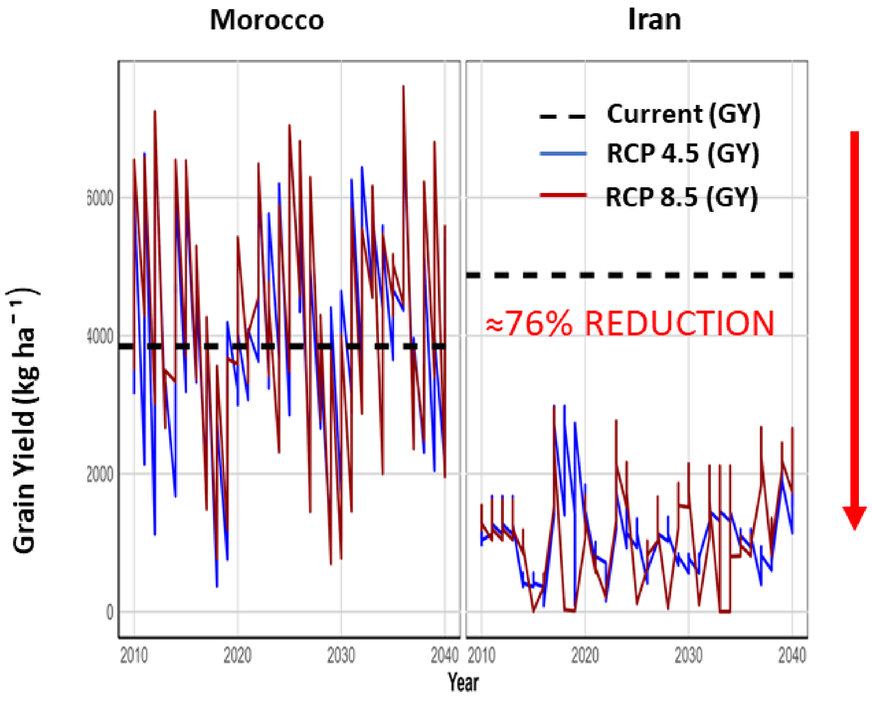
Background



Wheat is key for Mediterranean food security but faces low and variable yields. Climate and water challenges require innovative solutions to boost production and sustainability



Results and Takeaways

Highest attainable yields of over 6 t ha^{-1} were achieved with:

- Supplemental sprinkler irrigation of 100 mm .
- Nitrogen application between 60 and 120 kg N ha^{-1}.

•Climate change projections revealed substantial regional variations:

- Potential yield increases in areas like Northern Aragon.
- Yield reductions of up t 88% in Zagros by the end of the century.

•Increasing fertilization rate and irrigation level can lead to higher yields in some locations.

•However, this increase in yield is not always consistent across all areas.

•Precipitation use efficiency plays a crucial role in closing the yield gap, particularly in water-scarce or arid environments.

•Improving precipitation use efficiency can also help conserve water in these dry regions.

•Investing in water supply infrastructures (e.g., rainwater harvesting, wastewater treatment) can enhance water use efficiency.

•Localized irrigation systems, such as sprinkler irrigation, can further improve water management and efficiency in the context of this case study.