Evaluating and optimizing strategies to irrigate sugar beet

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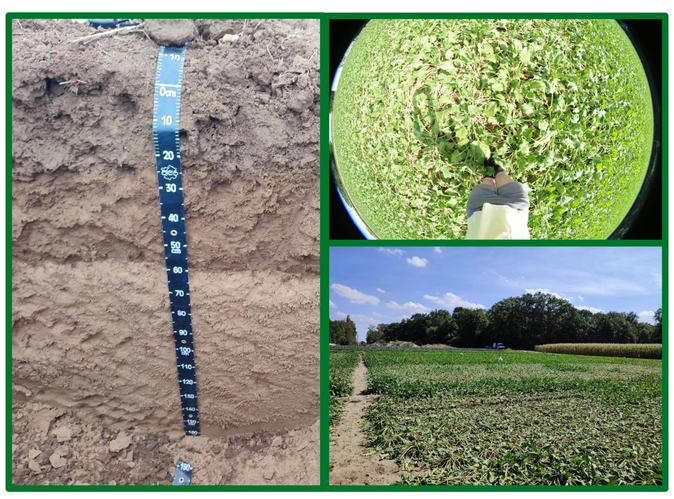
Introduction

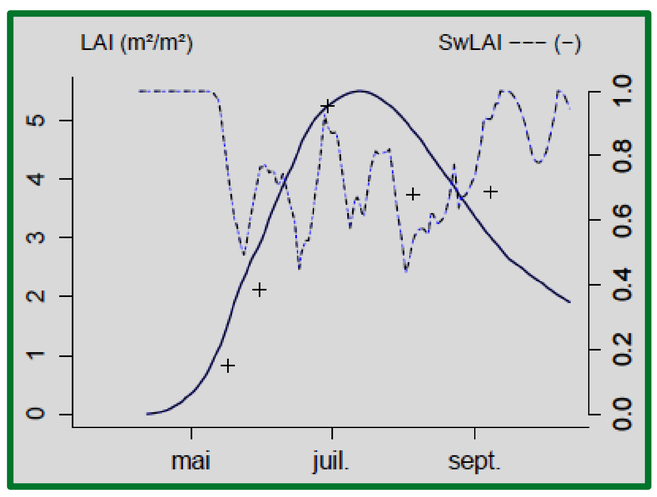
- Climate change leads to new strategies of irrigation, deployed in diversified contexts.
- The aim is to advise farmers in the diversity of encountered situations.

Method

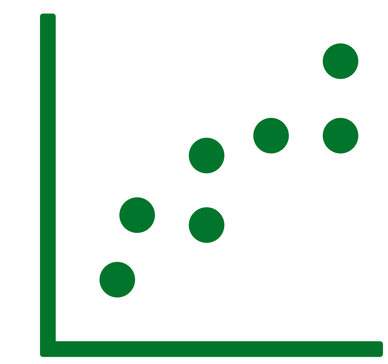
- Using Optirrig [1], a framework based on a crop model [2] for multi-objective constrained optimization of irrigation strategies.
- Improving the crop model for sugar beet:



Three trials (measurement of variables of crop development) *(2022-23)*

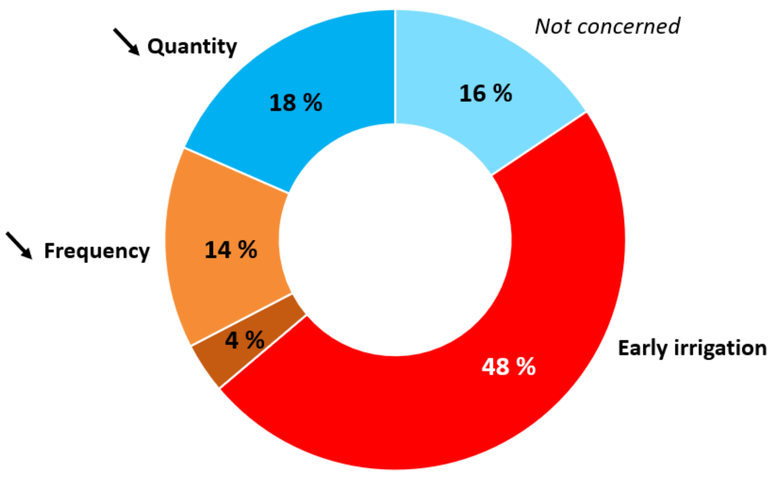


Parameterization of the crop model *(2022-24)*



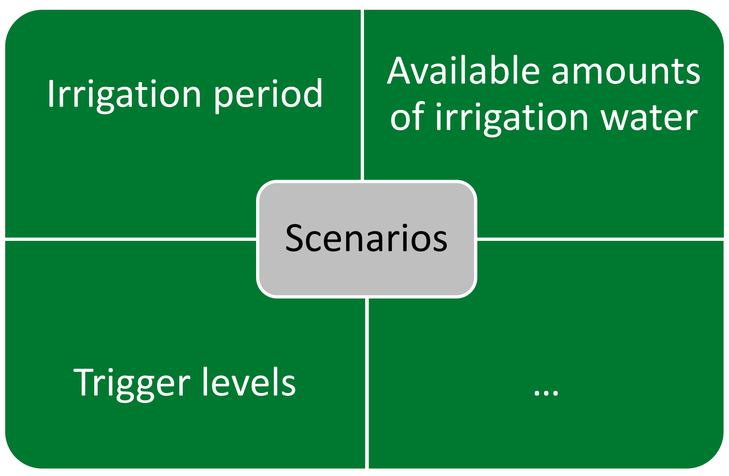
Evaluation of the performances of the crop model based on former trials *(2023-24)*

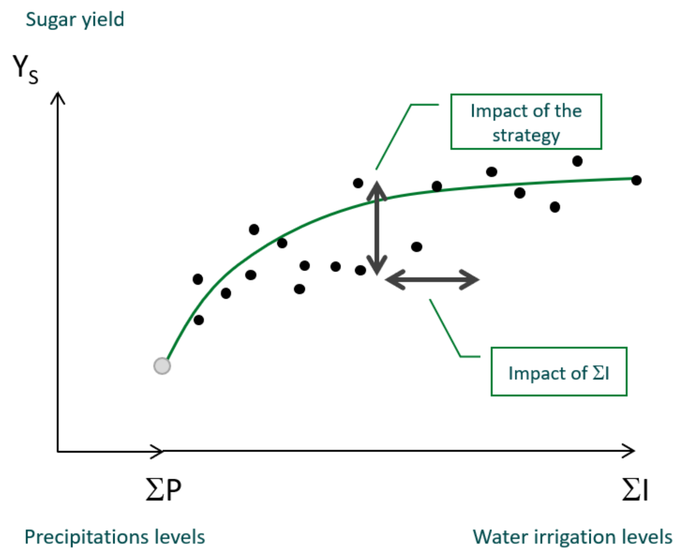
- Building a simple tool to evaluate the economical benefits of representative strategies:



Conducting a survey to identify main irrigation practices *(2023)*

Generating summary tables based on simulations (Optirrig) of main identified scenarios *(2024-…)*





Building a tool to make two by two comparisons of representative strategies *(2024)*

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[1] Cheviron, B., Vervoort, R. W., Albasha, R., Dairon, R., Le Priol, C., & Mailhol, J. C. (2016). A framework to use crop models for multi-objective constrained optimization of irrigation strategies. Environmental Modelling & Software, 86, 145-157

[2] Mailhol, J-C., Albasha, R., Cheviron, R., Lopez, J-M., Ruelle, P., Dejean, C., 2018. The PILOTE-N model for improving water and nitrogen management practices: Application in a Mediterranean context. Agricultural Water Management 204, 162-179.