

Anne CREVILLERS^{1a}, Lise LAPORTE-RIOU^{1a}, Audrey NDIAYE^{1a}, Anthony PAGE^{1a}, Pauline POUNY^{1a}, Alissia ROUSSEAU FONTAINE^{1a}, Eve-Anna. SANNER^{1a}, Emeline VAUZELLE^{1a}, Philippe DEBAEKE^{2b}, Pierre MAURY^{3c}

¹Université Toulouse, Toulouse INP- ENSAT, F-31320 Castanet-Tolosan, France,

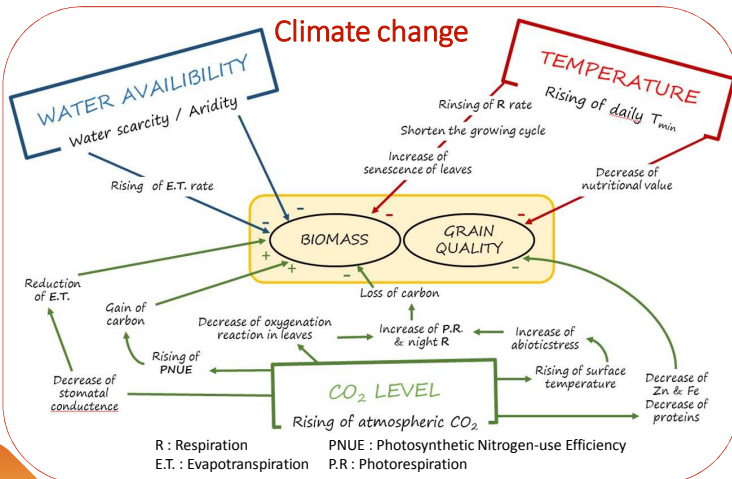
²INRA, UMR1248 AGIR, F-31320 Castanet-Tolosan, France, philippe.debaeke@inra.fr

³Université Toulouse, Toulouse INP-ENSAT, UMR1248 AGIR, F-31320 Castanet-Tolosan, France, pierre.maury@ensat.fr

^a3rd year (Master) Toulouse INP-ENSAT student "Plant biotechnologies-ABSV" / "Sustainable agriculture-AGREST" options student,

^bResearch referent, ^cTeaching referent

Sunflower is a major oilseed crop. The two characteristics of interest are oil content (OC) and oil quality (OQ) (mainly defined as the level of oleic acid concentration). In a context of climatic change, how OC and OQ can be impacted by environmental changes ?



Oil concentration and oil quality

$$\text{Oil concentration (\%)} = \frac{\text{Oil weight}}{\text{Achene weight}} \times 100$$

Sunflower oil = 87% for food

→ Oil quality driven by the needs of agri-food industry

- **Need of nutritional properties**

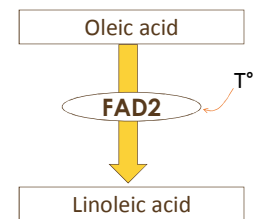
• Saturated Fatty Acid (SFA) --

• Tocopherols and phytosterols ++

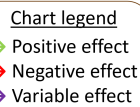
- **Need of antioxidant properties**

• Linoleic acid --

• **Oleic acid ++**



Influence of different factors on oil concentration and quality of a standard variety of sunflower

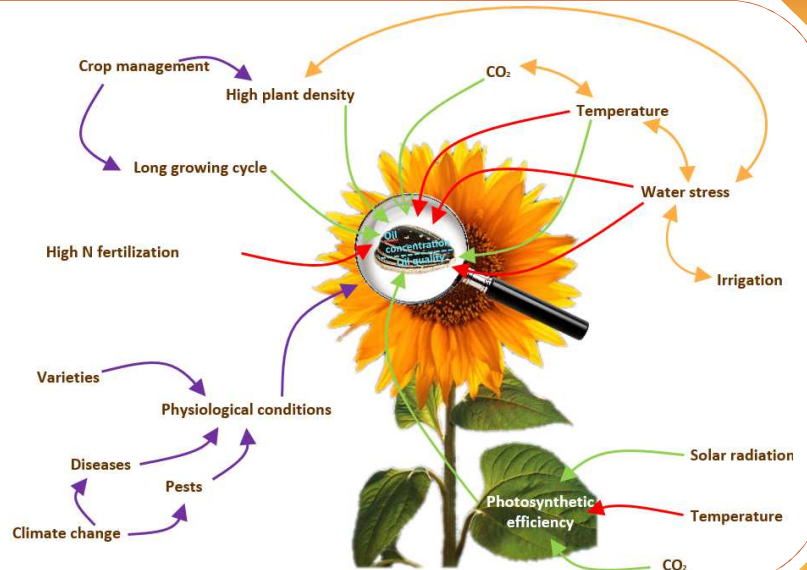


Several factors influence oil concentration and quality :

- Agronomic factors
- Environmental factors
- Genetic factors

Climate change has a strong impact on their effects

Oil concentration and quality seem to be antagonistic in their responses to climate change → necessity to favour different parameters depending on targeted outlet

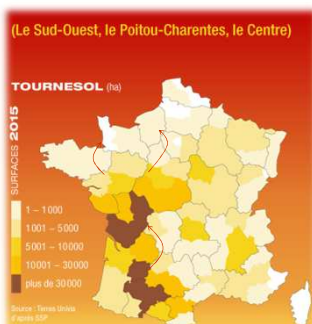


Adaptation strategies and conclusion

➤ Use of Sunflo crop model :

- To assess the impact of each factor on yield and oil %
- To help designing crop management systems and ideotypes best adapted to the growing environments and quality goals

➤ Moving crop area northward to benefit from new opportunities and more favorable conditions, and to diversify the cereal-based rotations



<http://www.terresuniviva.fr/cultures-utilisation/les-especes-cultivees/tournesol>

