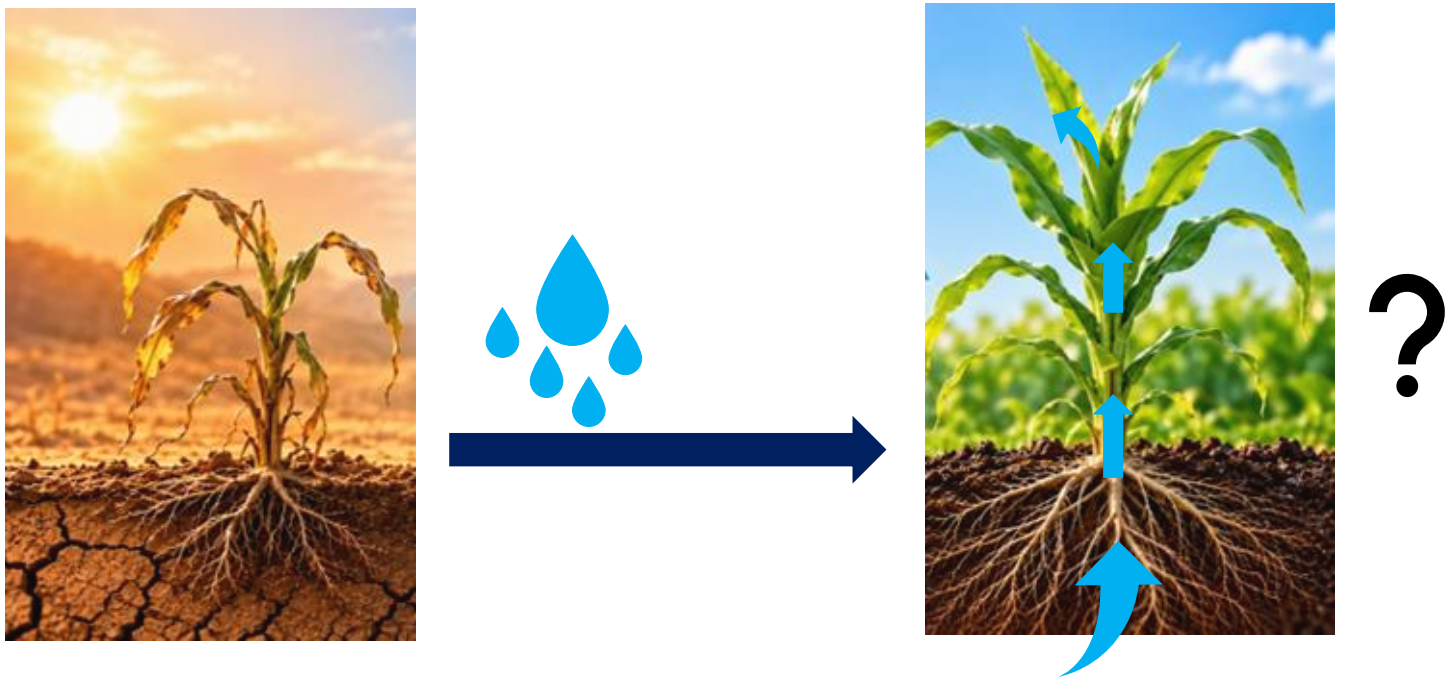
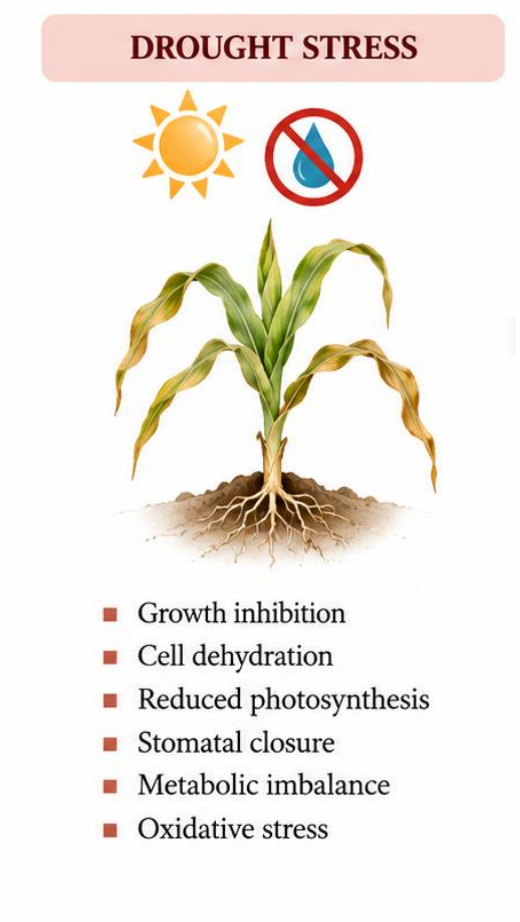
# How does Plant Growth Recover after Drought:

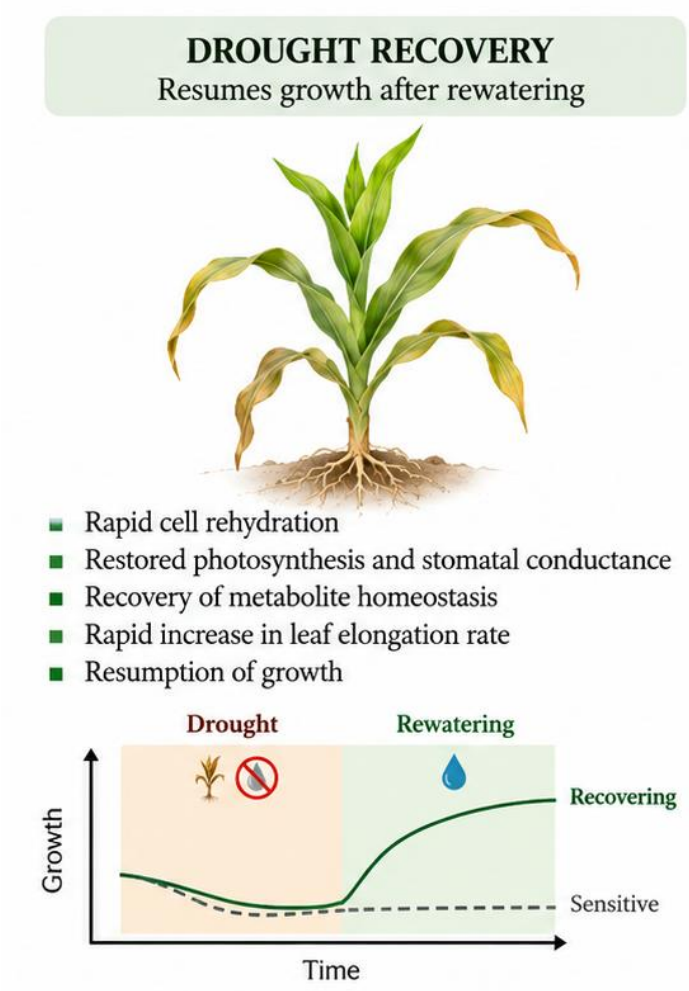
High-spatial and temporal resolution analysis of the cellular and molecular basis of maize leaf growth resilience to drought.



# Plant response to drought can differ: some plants show tolerance, resistance and avoidance

## Did you know that some plants can recover with high efficiency?

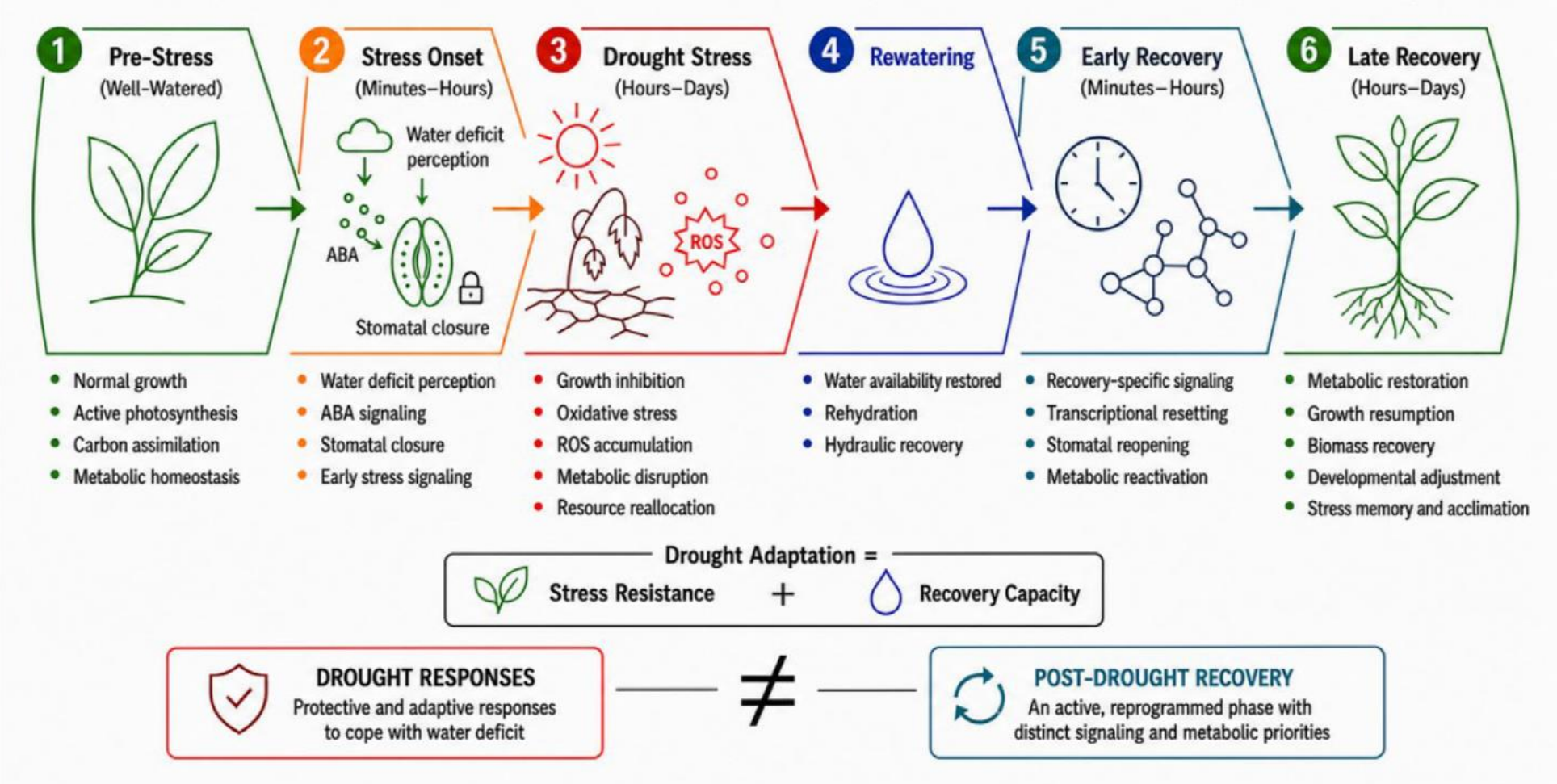



Although water deficiency is among the primary drivers of the global "yield gap", the cellular and molecular mechanisms that allow plants to effectively recover upon rewatering remain poorly understood.

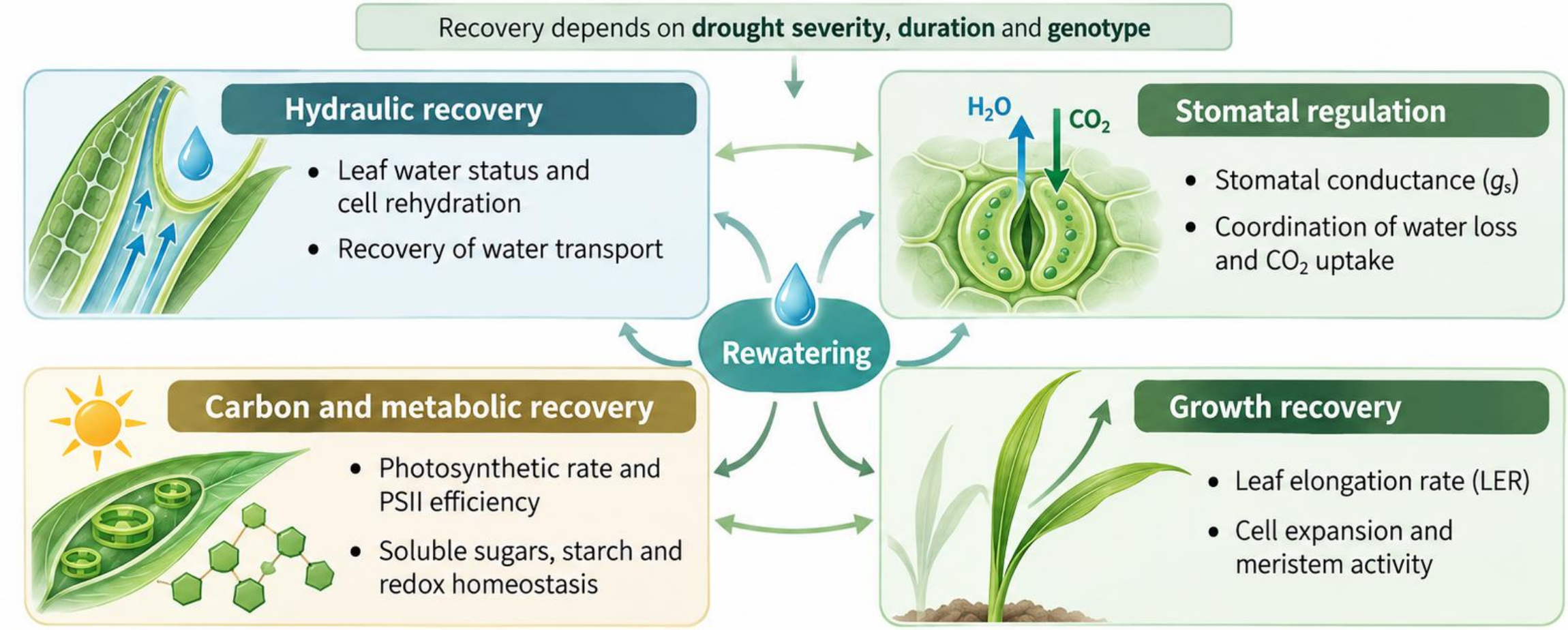
# Plant transition during drought stress and post-drought recovery

## What do we know about drought recovery?




Uğur Tan, 2026

# Key drivers of drought recovery after rewatering



## Background, aim, and hypothesis of the study

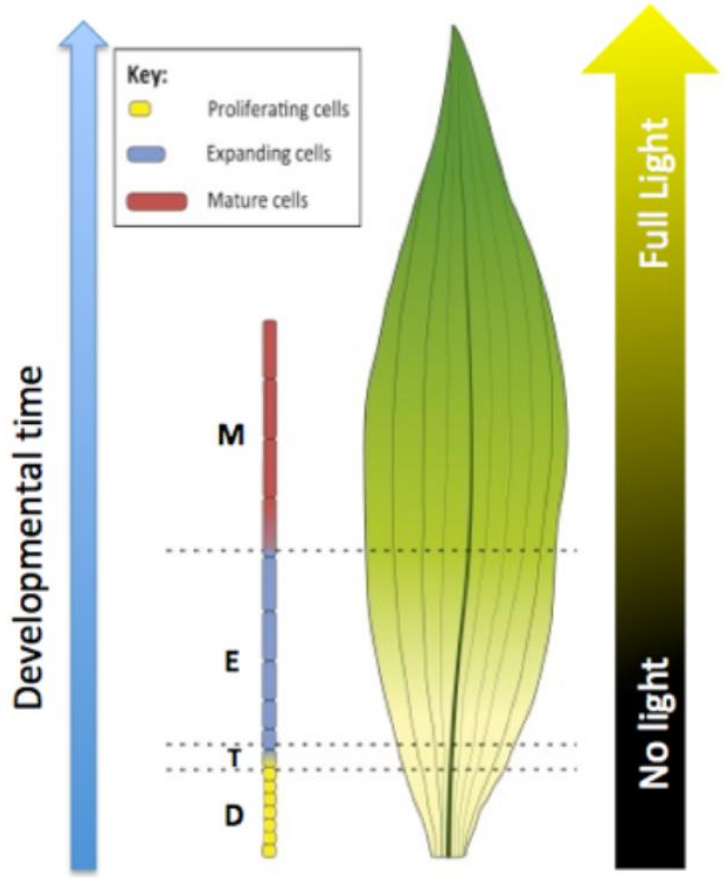
Most environmental stresses are transient. Therefore, the efficiency of plants to resume growth following stress release become vital.

**Aim**:

- To resolve the hierarchical dynamics of leaf growth recovery under drought stress
- Disentangle early-stage signaling from late-stage metabolic adaptation.

**Central hypothesis**:

- Recovery occurs in hierarchical order.
- Early recovery is controlled by hydraulic restoration and ABA response, while later recovery is controlled by sugar signaling and cell division.

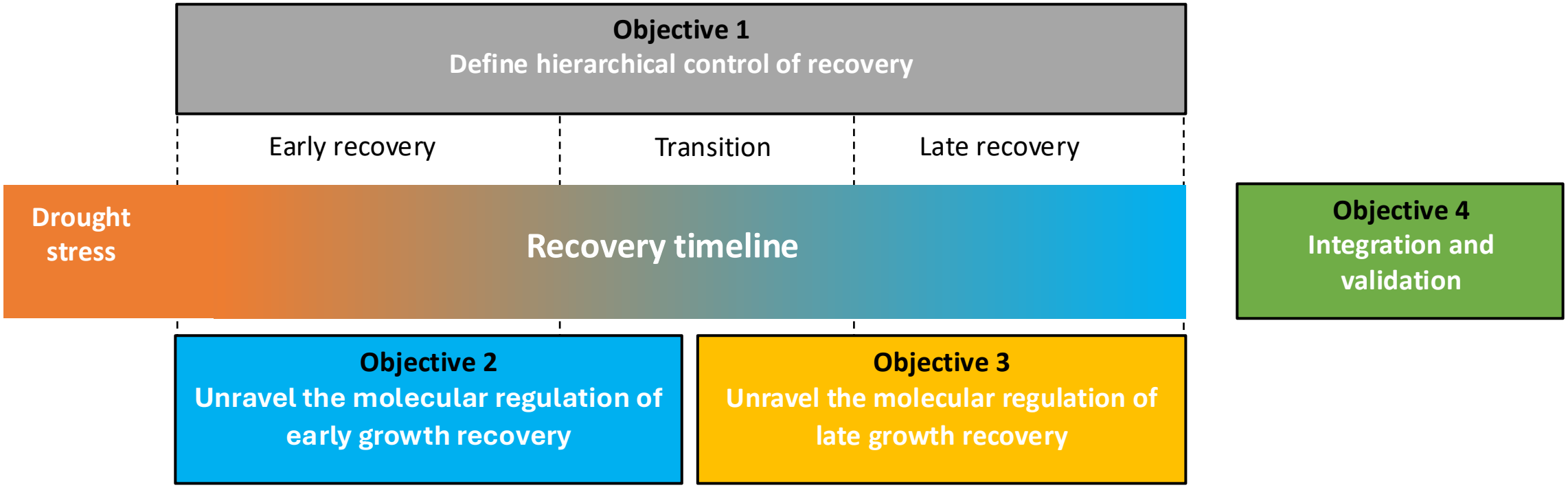



Model system: The maize leaf growth zone.

# Objectives and approach

Hydraulic (*pip1, pip2*)
ABA (*anh1, abh2, abh4, abh 124*)
Sugar (*sh1, sh2, mn1, ra3, dpl, sut-m4*)

Phenotyping the recovery of leaf growth after a drought treatment on a set of **maize mutants** at high temporal growth resolution




Dissect hydraulic–ABA regulation

Dissect of photosynthetic and sugar-mediated control

# Key analyses

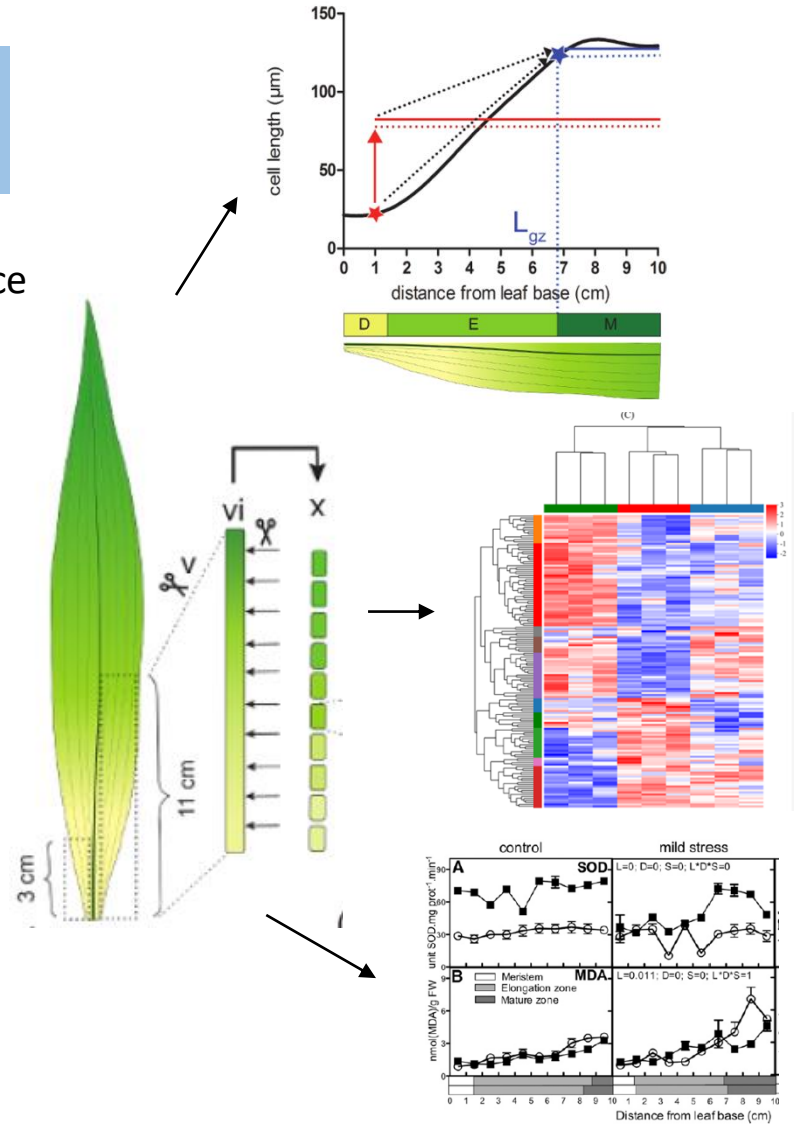
**High resolution temporal growth dynamics** of leaf growth



Leaf length tracker (LLT)

**Physiological measurements**

Photosynthetic performance
Plant water status
Plant growth dynamics
Stomatal traits
Water-use efficiency




**Kinematic analyses**

Microscopy-based measurements of cell size, meristem size to generate a spatial map of cellular growth

**Transcriptome analyses**

RNA sequencing (NGS)
Genes expression analysis
Bioinformatics

**Metabolic and biochemical analyses**

Pathway analysis
Chromatography
Spectrometry

# Did we spark your curiosity?

**Interested in learning more? Let's connect!**

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