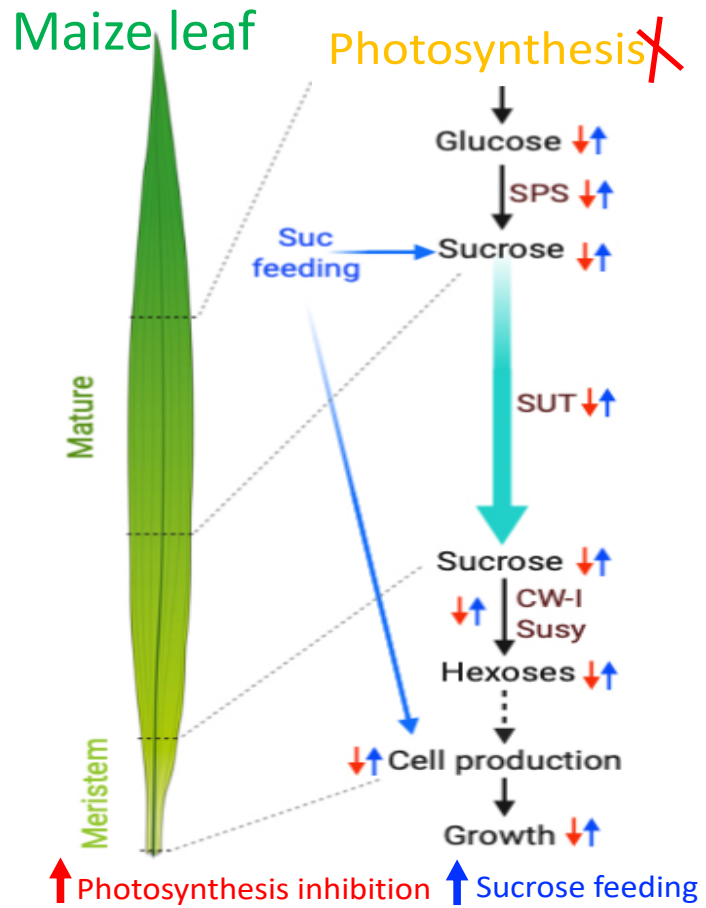
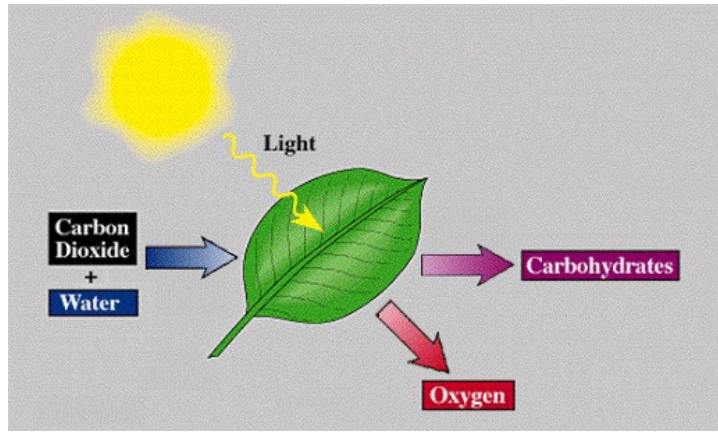


An integrated understanding of sugar transport and signalling to the growth zone during diurnal maize leaf growth

Photosynthesis in the mature part of the maize leaves produces sugars that flux to the leaf base to drive plant growth throughout the day/night cycle.

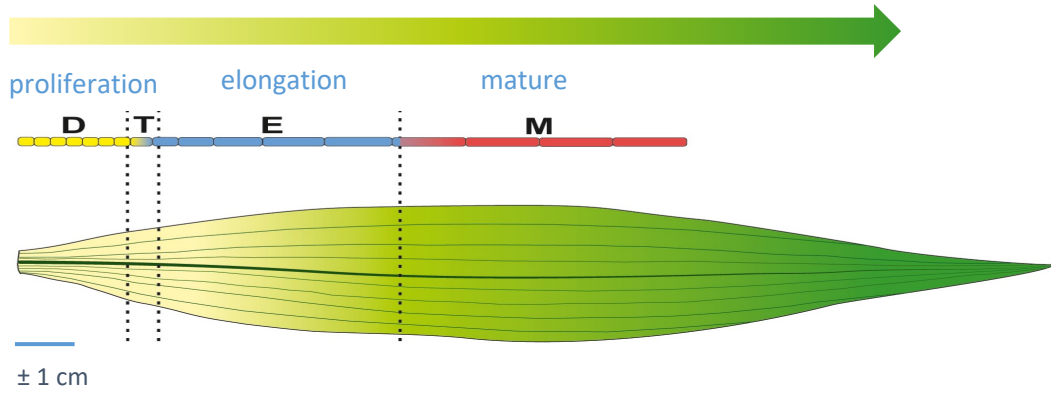
Photosynthesis



How growth is coordinated with sugar availability at the base of the maize leaf?

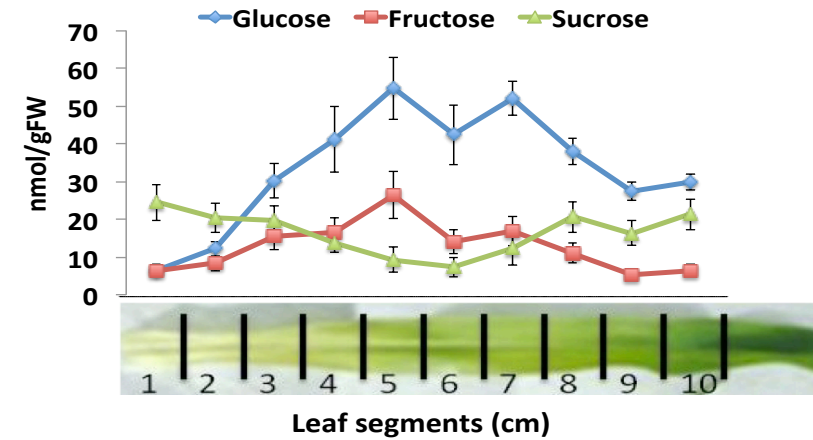
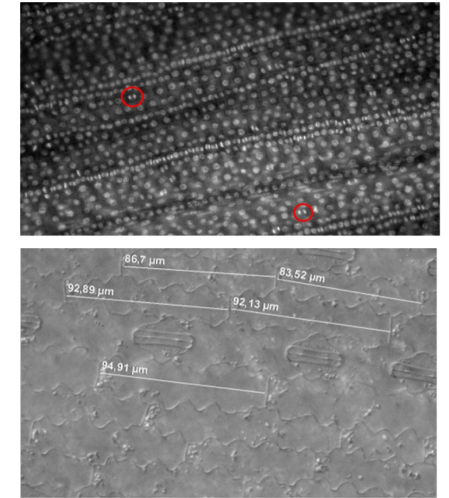
The maize leaf as model system to gain a more in depth understanding of the sub-organ regulation of sugar signaling

The maize leaf as a model system



The young maize leaf has an extensive period of steady-state growth, in which

- **Kinematic growth analysis** allows quantification of cell division and expansion
- **The size of its growth zone** allows sampling for metabolite and biochemical analyses



Sugar contents across leaf developmental gradient, from meristem (1) to mature leaf blade (10)

What is the impact of perturbation of sugar availability in the meristem on leaf growth at a high temporal regulation ?

Induces less sugar content in meristem

Mutant affected in sugar metabolism and transport :
Cell wall invertase (*mn1*)
sucrose transporter1 (*sut1*)



WT *sut1* WT *mn1*

Induces more sugar content in meristem

Supplying the plants with sugars through the cut tips of the leaves

Sucrose Supply



Diurnal Growth

Kinematics analysis

Biochemical analysis

Metabolic profiles

Transcriptional analysis

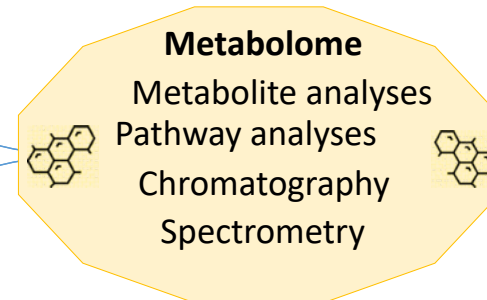
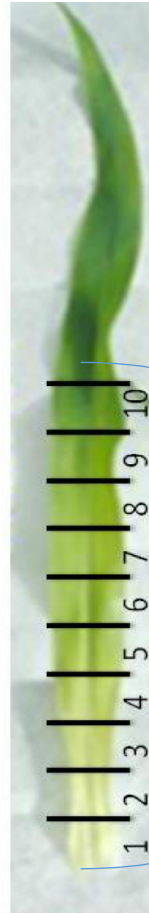
Diurnal Growth & kinematic Analysis

Diurnal leaf growth



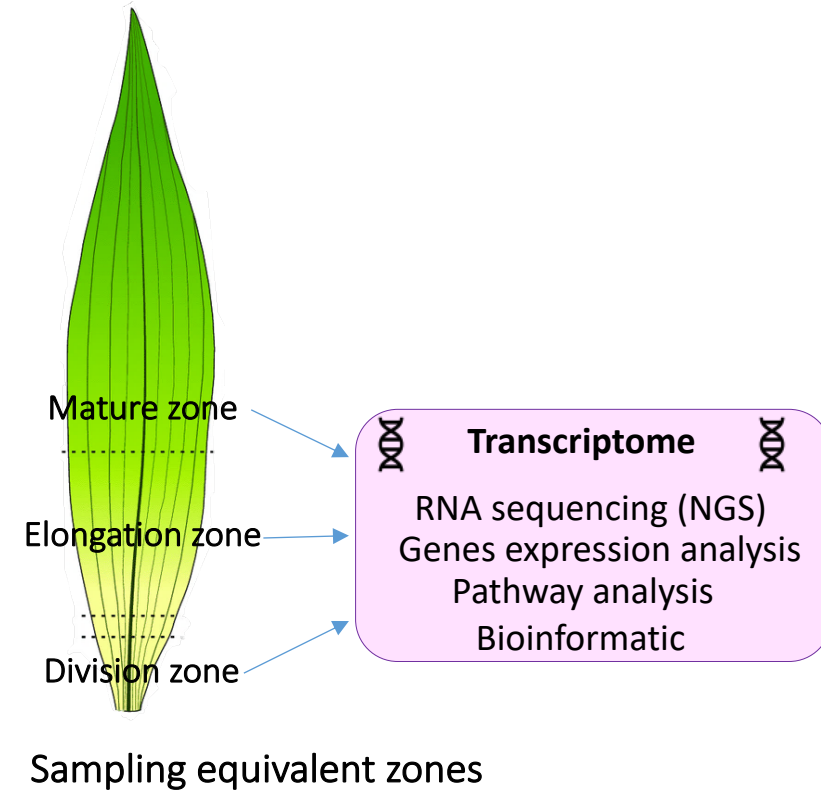
Leaf length tracker system
measures the leaf length at
a time scale of minutes

Metabolic & Biochemical Analysis



e.g., Sugar metabolites &
sugar enzymes

Transcriptional Analysis



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