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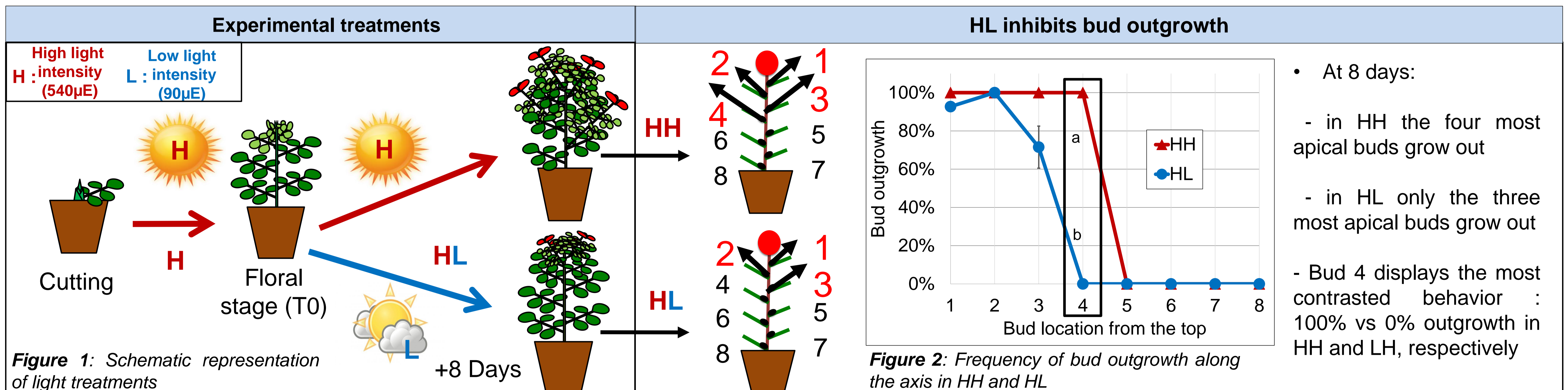
# What are the contributions of cytokinins, abscisic acid and sugars in bud outgrowth regulation by light intensity in rose?

Adrien Corot, Hanaé Roman, Jessica Bertheloot, Nathalie Leduc, Soulaïman Sakr and Sabine Demotes-Mainard

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## Introduction

In ornamentals, particularly in rose, the visual aspect of a plant is an important element of its quality. In rose bush, the visual quality depends notably on plant shape and varies with branching. Bud outgrowth is controlled by a network of interacting hormones and sugars. Light environment strongly impacts branching, notably low light intensity decreases bud outgrowth. However, the mechanisms by which the light intensity affects bud outgrowth is still poorly understood. Here we study how sugars and two hormones, cytokinins (CK) and abscisic acid (ABA), mediate the light intensity regulation of the bud outgrowth pattern along an axis in an intact plant.



### HL decreases sugar content near bud 4

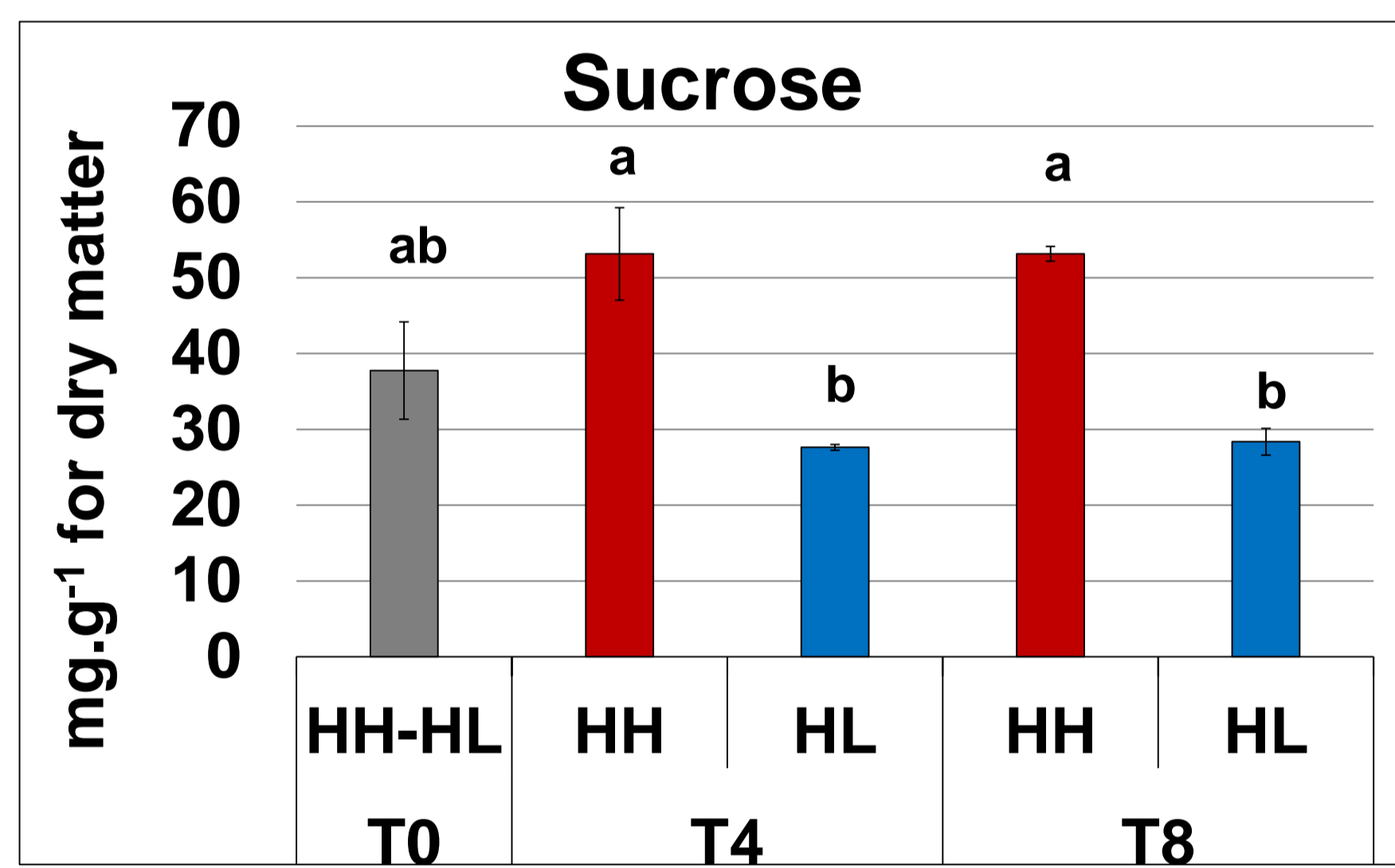
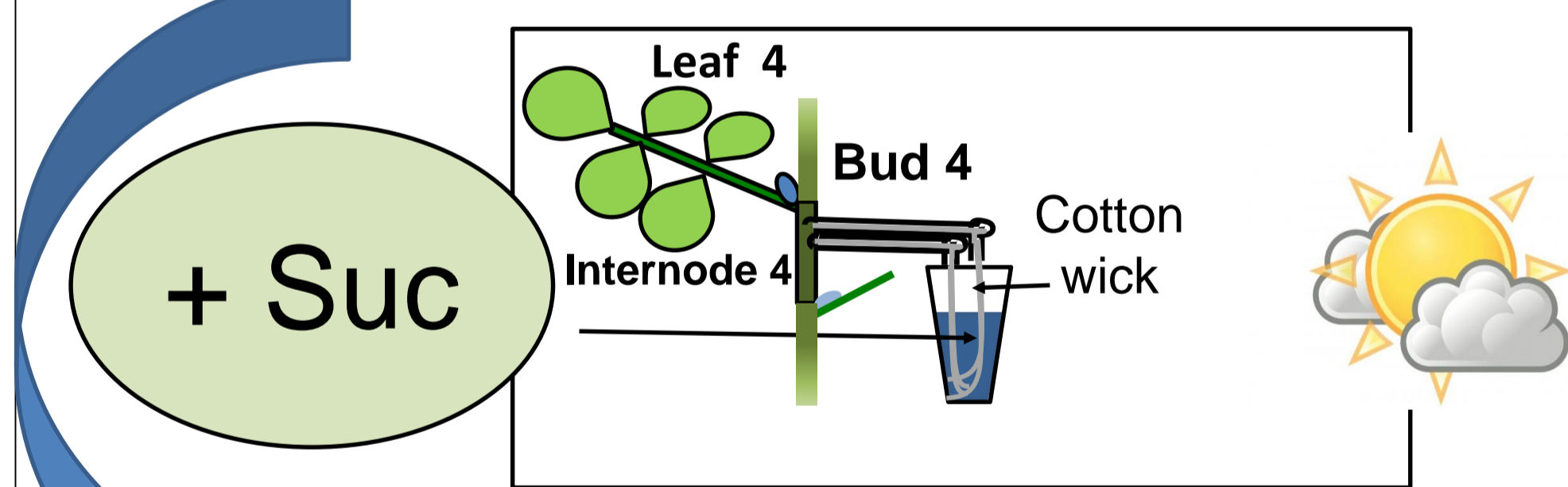


Figure 3: Sucrose content of the fourth internode at floral stage (T0), four (T4) and height (T8) days after floral stage.



### Suc. supply has no effect

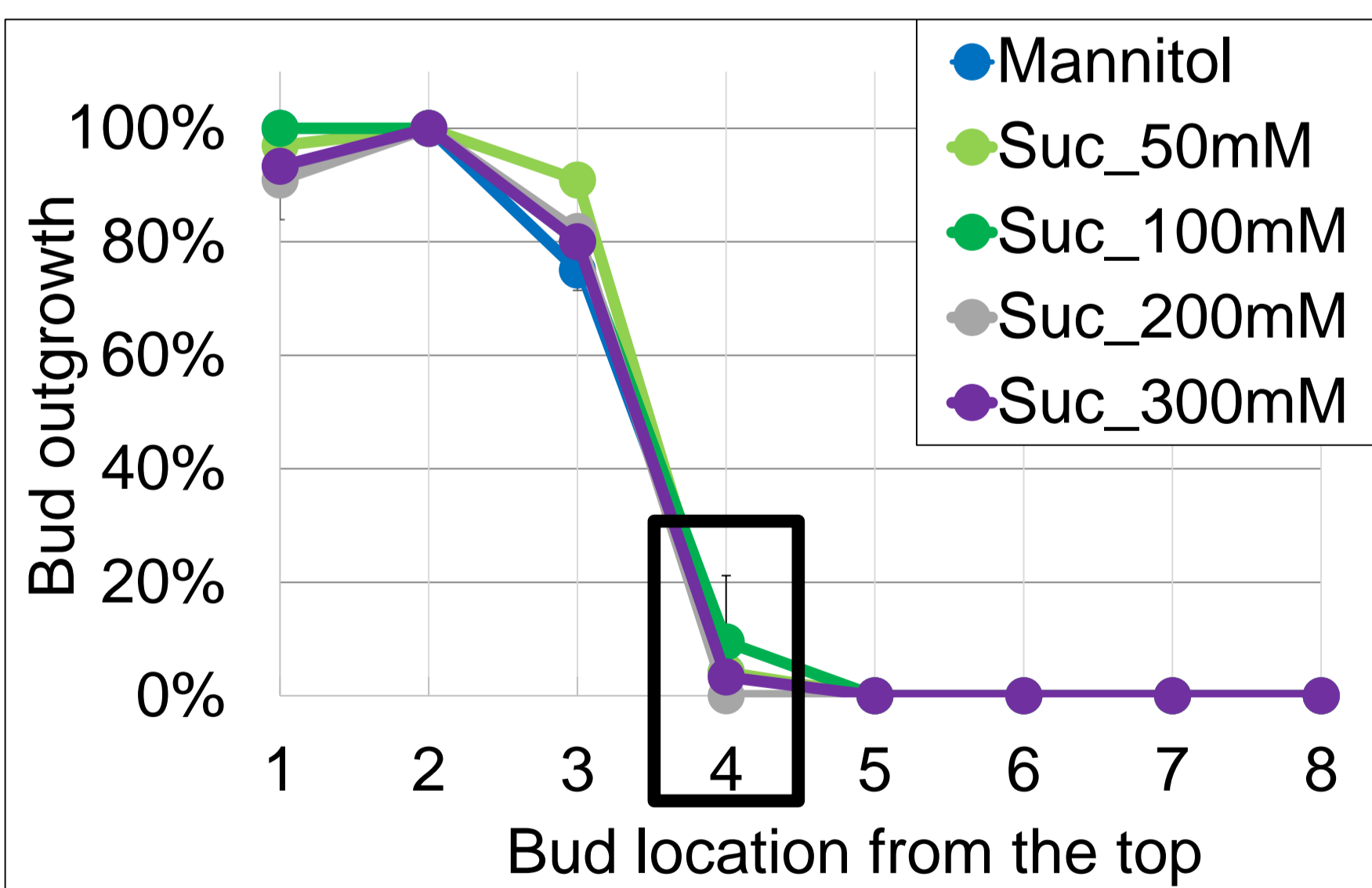


Figure 4: Bud outgrowth along the axis with sugars supplied continuously by cotton wick in HL.

### HL decreases cytokinin content near bud 4

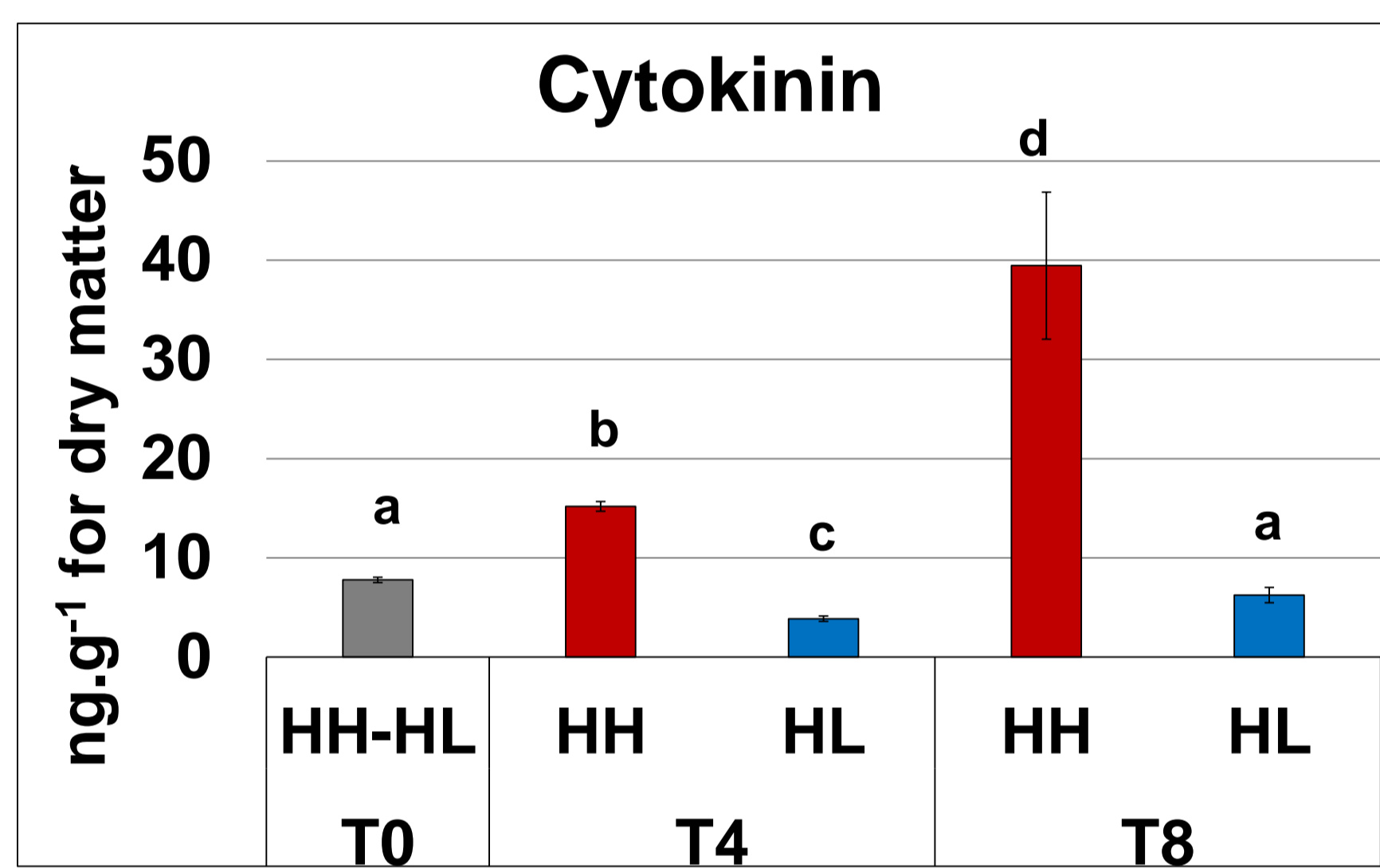
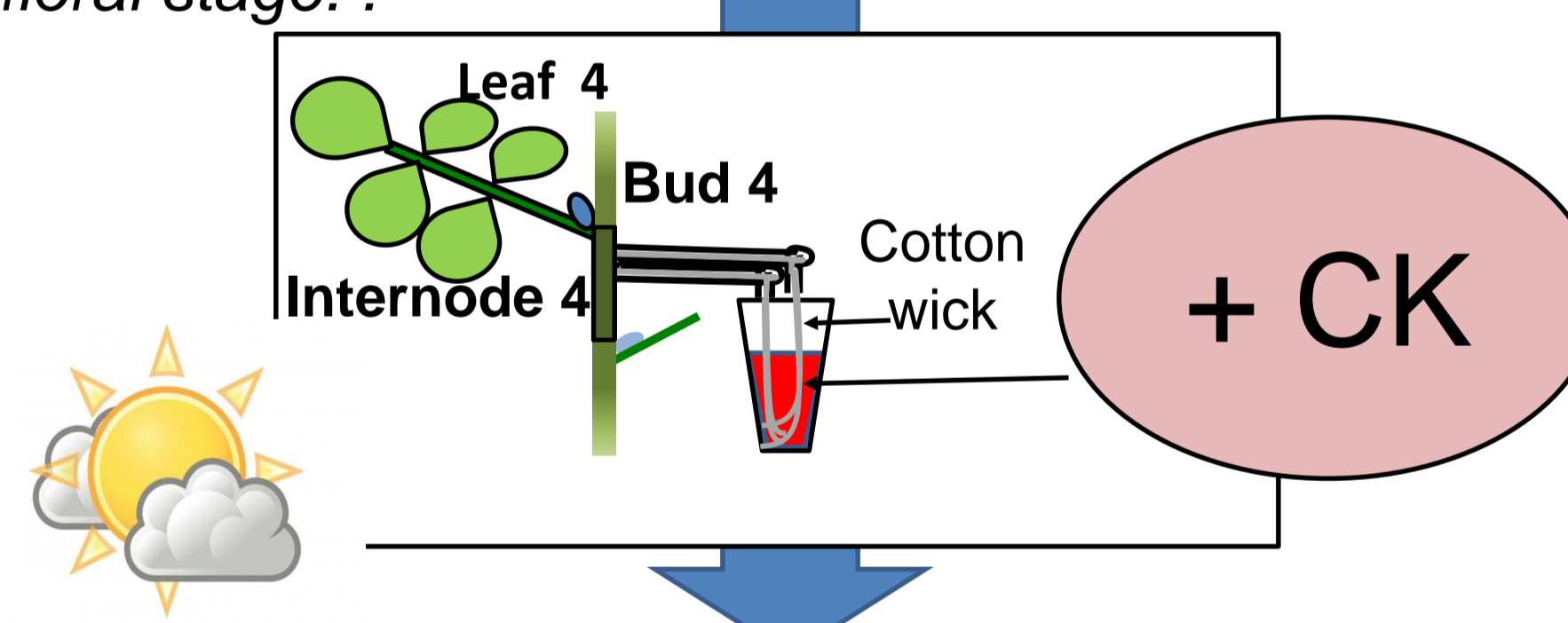


Figure 5: Cytokinin content of the fourth internode at floral stage (T0), four (T4) and height (T8) days after floral stage.



### CK supply releases the inhibition

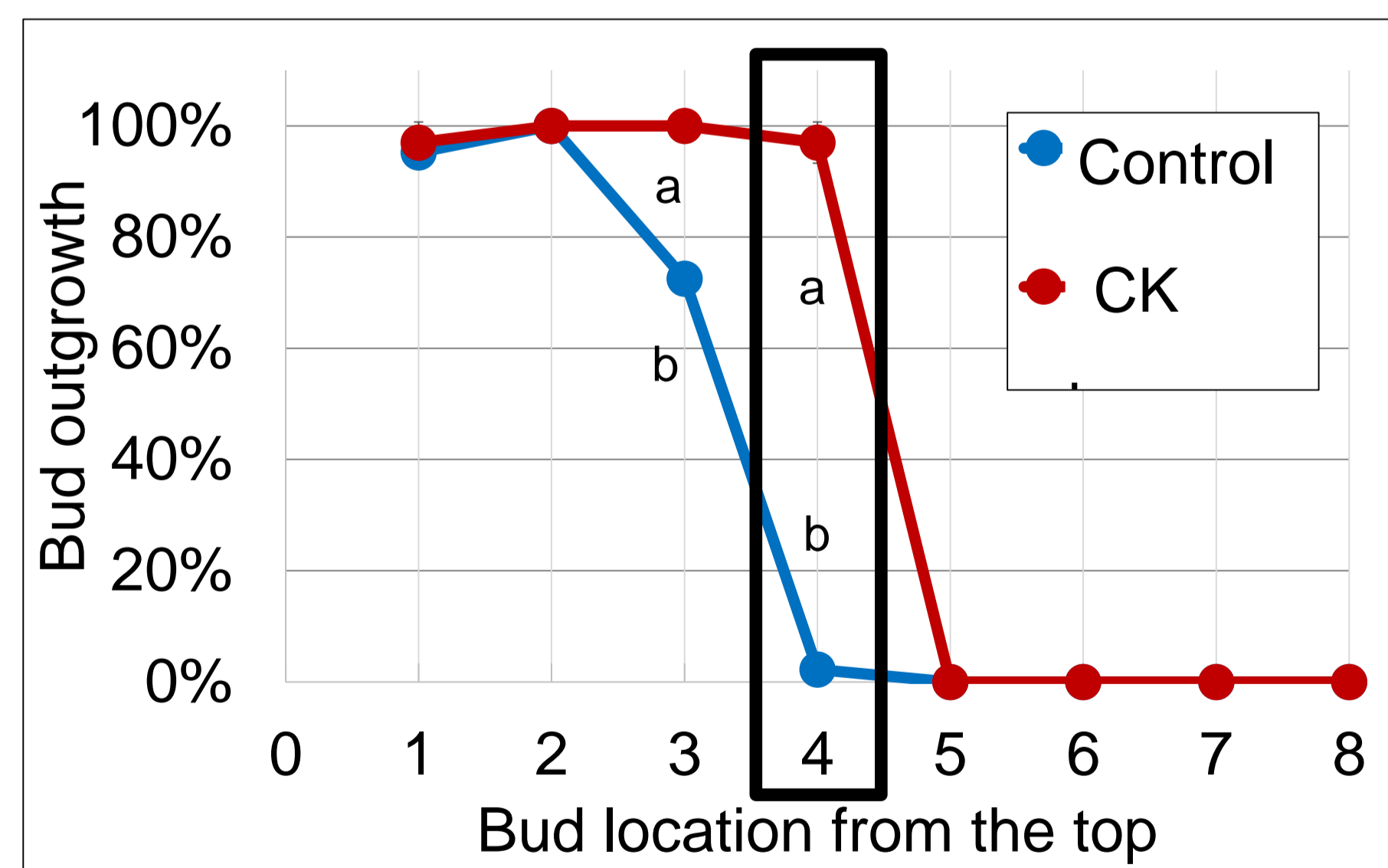


Figure 6: Bud outgrowth along the axis with synthetic cytokinins (BAP) 500µM supplied continuously by cotton wick in HL.

### HL maintains high ABA content near bud 4

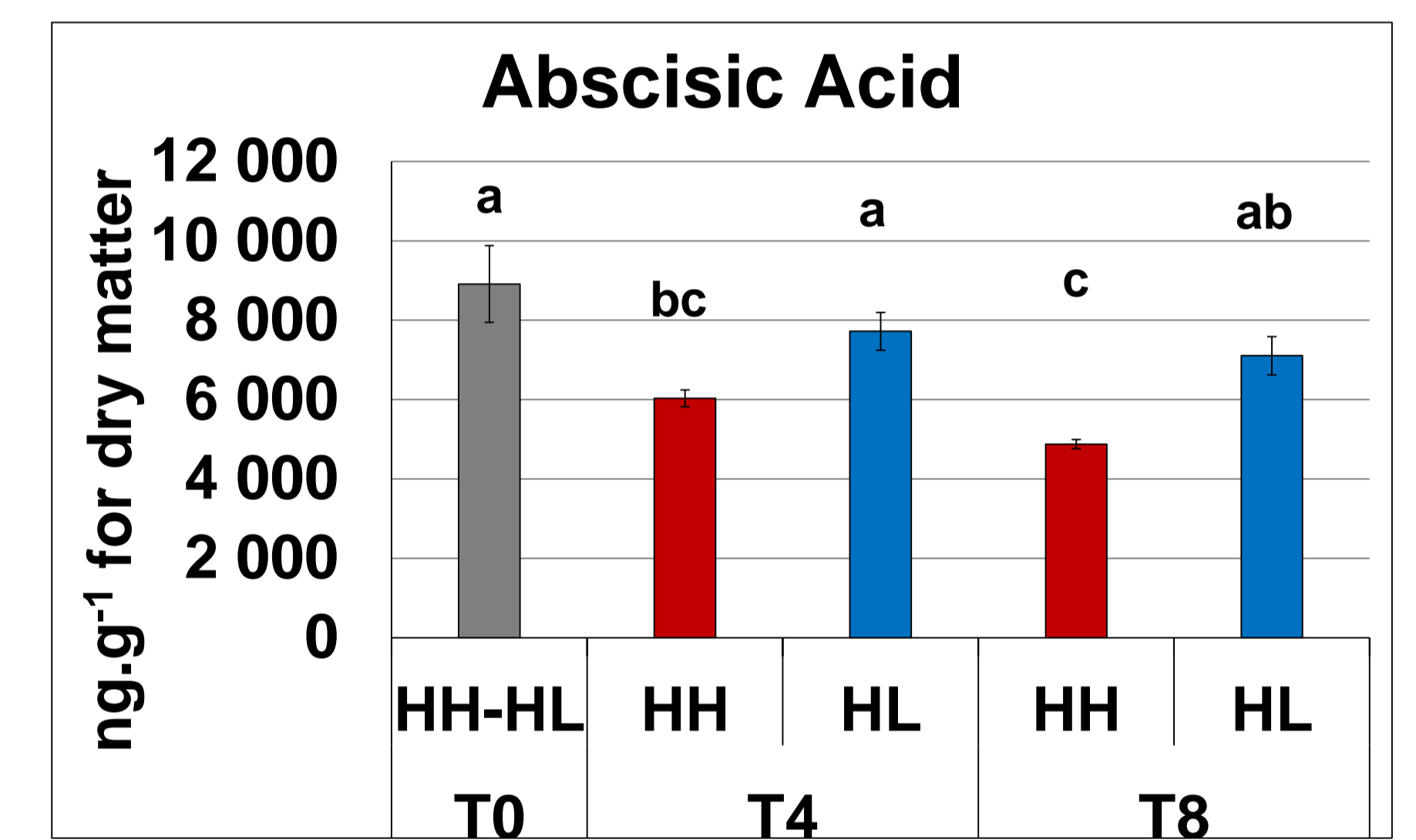
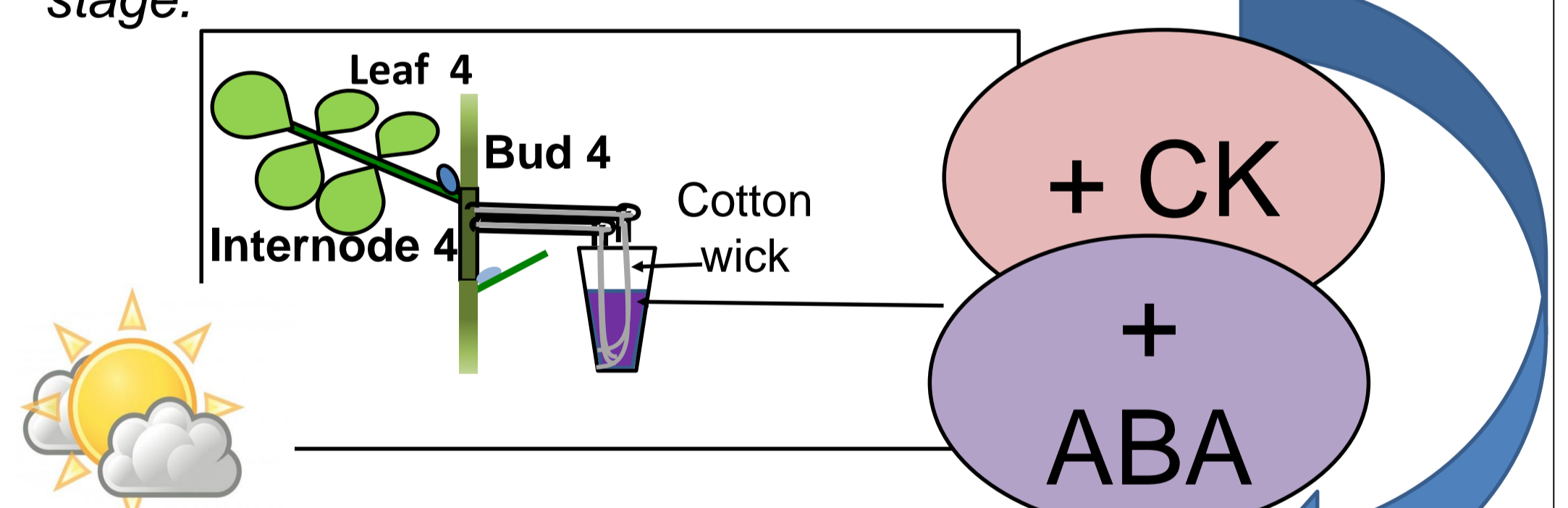


Figure 7: ABA content of the fourth internode at floral stage (T0), four (T4) and height (T8) days after floral stage.



### ABA antagonizes CK effect

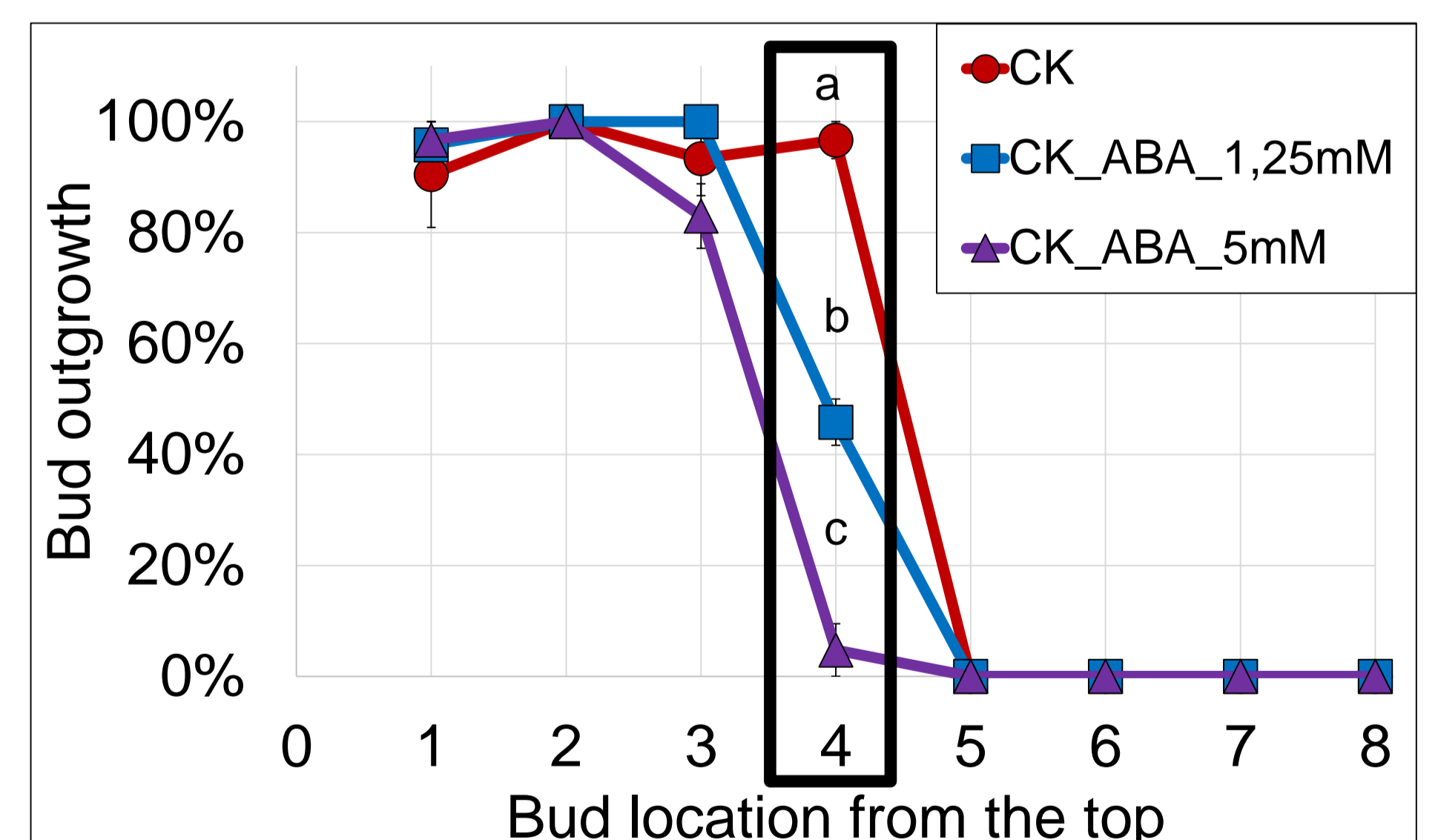


Figure 8: Bud outgrowth along the axis with CK (BAP) 500µM supplied continuously with or without ABA by cotton wick in HL.

## Conclusions

- This study provides evidence that light intensity regulates bud outgrowth pattern in intact rose plants by regulating stem CK and ABA content. Although low light intensity reduced stem sugar content, this drop does not seem to have triggered bud outgrowth inhibition.
- Prospects: Investigating at the transcriptomic level how cytokinins and abscisic acid regulate bud outgrowth pattern in response to light intensity.