THE USE OF CHLOROPHYLL FLUORESCENCE IMAGING TO EVALUATE THE EFFECT OF COLD STRESS FOR INDUSTRIAL CHICORY


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Introduction and Aim

Industrial chicory, *Chicorium intybus* L., is mainly cultivated in Belgium for its inulin production. The highest inulin quality (~ chain length) is reached in September, the maximum root biomass (~ yield), however, only a few weeks later. Sowing earlier would allow better synchronization between these two parameters. It requires the selection of varieties with a good early vigor at low temperatures and with a good tolerance to photoinhibitive conditions. Chlorophyll a fluorescence is a suitable tool to monitor non-invasively the photosynthetic activity of plant tissues (Leipner et al., 2001 and Sayed, 2003). The imaging technique is quick, inexpensive and could be used for large-scale screening (Ehlert & Hincha, 2008). It’s an alternative method to accurately determine cold tolerance of industrial chicory plants. The aim of this study is to evaluate the variation of sensitivity to cold stress in industrial chicory lines and varieties using chlorophyll fluorescence imaging. This is a preliminary study to develop a screening method to evaluate the cold sensitivity of chicory.

Physiological basic processes

The following protocol was used:

- Light intensity/temperature combination to use to evaluate the cold sensitivity of industrial chicory plants.
- The following step in the development of the screening method will be to decide which light intensity/temperature combination to use to evaluate the cold sensitivity of chicory plants.

Results and Conclusion

Light intensity and temperature had both a significant effect on NPQf and NPQs. Duncan Post-Hoc analysis revealed, however, that only NPQs was significant different for Hera at all light intensities, at temperatures up to 10°C (Devacht et al., 2008).

NPQs seems to be a valuable parameter for screening industrial chicory for cold sensitivity at temperatures lower than 10°C.

Perspective

The following step in the development of the screening method will be to decide which light intensity/temperature combination to use to evaluate the cold sensitivity of chicory plants.

References


