Potential yield of sugar beet at extended growing period*

Katharina Schnepel, Christa Hoffmann

Institut für Zuckerrübenforschung, Göttingen

Introduction

Autumn sown sugar beet (winter beet) are expected to yield markedly higher than spring sown beet. This requires a continuous growth during an extended growing period. So far, bolting resistant sugar beet cultivars are not available to test winter beet growth under field conditions in Central Europe.

The objective of this study was to analyze yield formation during an extended growing period to estimate whether sugar beet has the potential to generate the theoretically expected yield increase.

Material and Methods

- Pot experiments in the glasshouse from 2008-12
- 11 sowing dates spread over the years
- 4 sequential harvests, 5 replicates
- Oldest plants were grown for 859 days
- Analysis of root and leaf dry matter, sugar content, mark content, assimilation rate, cambium rings

Results

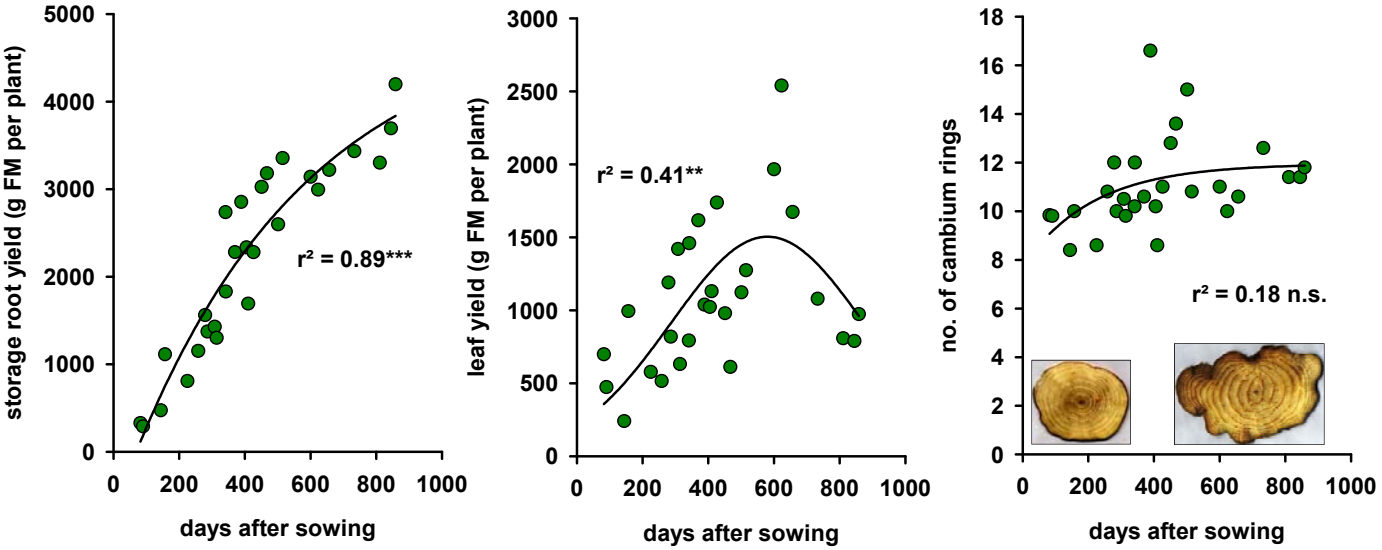

Fig. 1: Storage root yield (left), leaf yield (middle) and number of cambium rings (right) of sugar beet at extended growing period; Pot experiments in the glasshouse, 2008-12

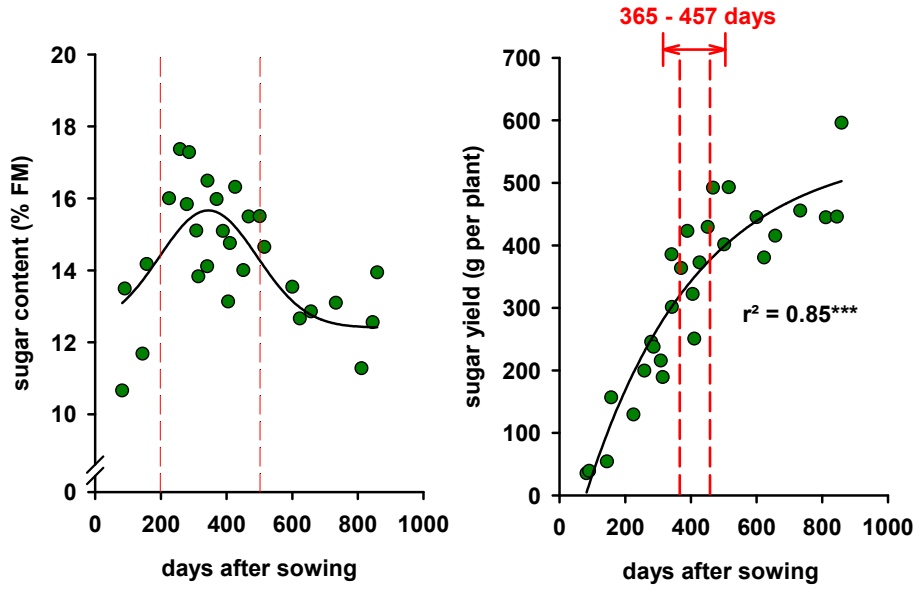

Fig. 2: Sugar content (left) and sugar yield (right) of sugar beet at extended growing period; Pot experiments in the glasshouse, 2008-12

Conclusions

- Root yield continuously increased
- Sugar content reached an optimum
- Number of cambium rings did not change indicating an early and genetically fixed determination
- Dry matter composition of the beet changed: lower sugar content and higher marc content (data not shown)
- Sugar yield still increased at a time at which winter beet will probably be harvested in practice

⇒**Theoretical yield increase in winter beet can be realized,** provided the plants show sufficient winter hardiness and bolting resistance

*Based on: Schnepel, K., Hoffmann, C.M. 2015: Effect of Extending the Growing Period on Yield Formation of Sugar Beet. J. Agron. Crop Sci. doi:10.1111/jac.12153

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