

Ontogenetic Changes of Sucrose and 'Harmful Nitrogen' in Storage Root and Crown of Different Sugar Beet Genotypes

Gisela Mäck & Christa Hoffmann

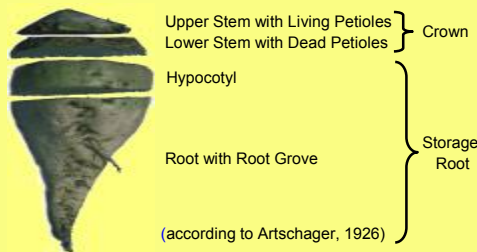
Institute of Sugar Beet Research (IfZ), Holtenser Landstr. 77, D-37079 Göttingen, Germany

Introduction

It is well known that at final harvest the crown of sugar beet contains less sugar and more molassigenic compounds than the storage root. Only little, however, is known on the ontogenetic changes especially of the components of 'Harmful Nitrogen'.

Material and Methods

Two genotypes, one with a high and the other with a low amino-N content, were grown in field trials with 4 replicates in the year 2002 at 3 sites in Germany. The beets were harvested manually at three time points and separated into storage root and crown.



Analytical Methods: Gas Chromatography (total soluble N); Spectrophotometry (amino-N); HPLC (sucrose, glutamine, betaine).

Conclusions

Storage Root versus Crown:

The differences in the sucrose concentration are fairly small compared to the large differences in the concentration of the N compounds. The latter are several-fold higher in the crown than in the storage root.

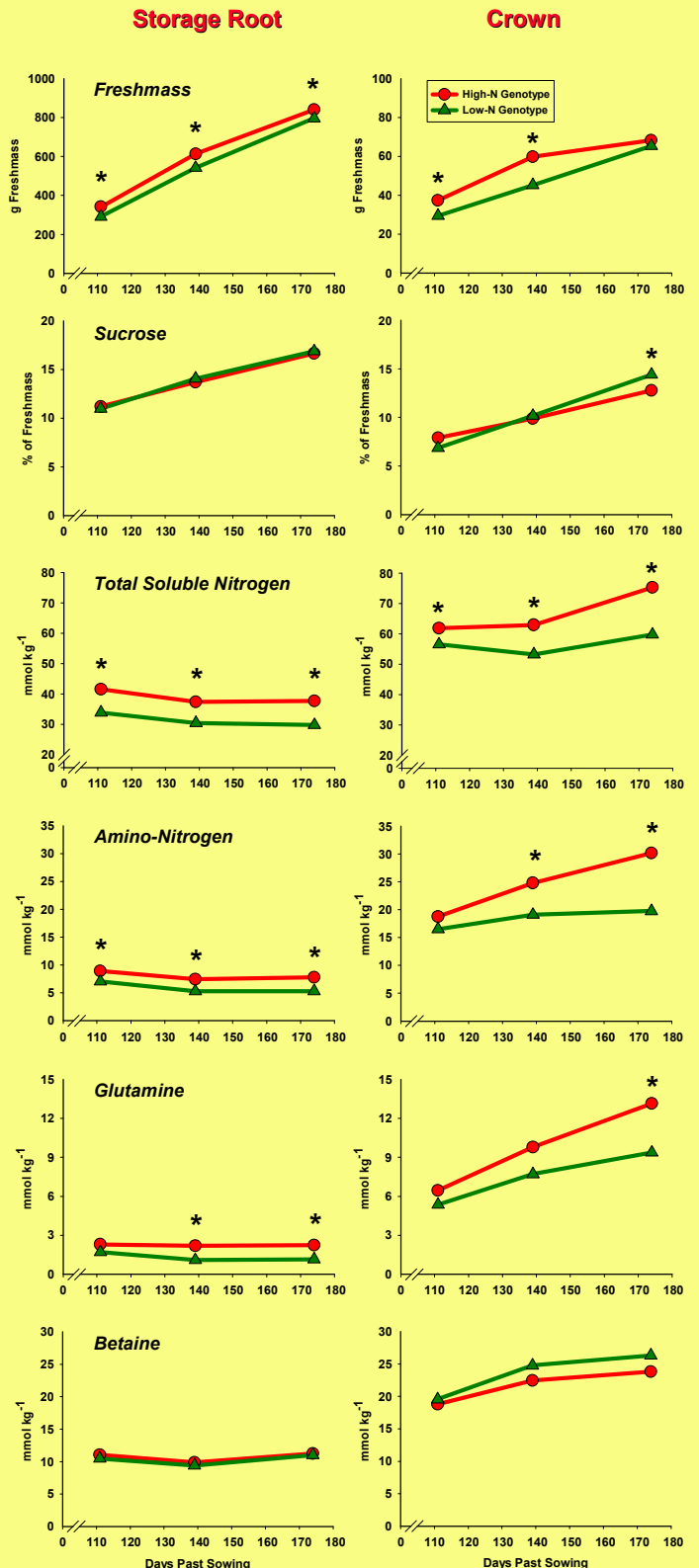
Freshmass and sucrose concentration increase in storage root and crown. This indicates that both organs are sinks for sucrose. Only the crown, however, seems to be a strong sink for 'Harmful Nitrogen'. Thus, its processing quality becomes worse with increasing plant age. The opposite holds true for the storage root.

Genotypes:

They were selected for the trials because of the differences in their amino-N content. They show these differences not only in amino-N but in all N compounds analysed, with the exception of betaine.

The genotypic differences stay rather constant in the storage root but become bigger in the crown with increasing plant age.

Results



Ontogenetic changes in two genotypes grown in 2002, mean values of 3 sites. * indicate significant differences at the respective harvest ($\alpha = 0.05$).