

Influence of agronomic measures on changes in sugar beet quality during storage

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Introduction

Efficient processing of sugar beet requires a high concentration of sucrose and low concentrations of impurities. Storing beets should keep their quality as long as possible. This will become more important when the processing campaign is prolonged to reduce fixed costs of the sugar factories. The aim of the present study was thus to identify factors affecting the storability of sugar beet in order to improve storage management to gain good processing quality.

Materials and Methods

Beets were grown in the field near Göttingen in 2004. One Z-type (A) and one E-type (B) variety were grown, variety A being the standard for the other treatments. To study the effect of *C. beticola* and *R. solani*, beets were artificially inoculated. Untopped, bruised or injured beets represented suboptimal mechanical handling during harvest. The beets were stored in the greenhouse for 56 days at 8 °C and 20 °C in open-weave potato nets. The concentrations of sucrose, amino-N, invert sugar and raffinose were measured at the onset and after storage.

Results

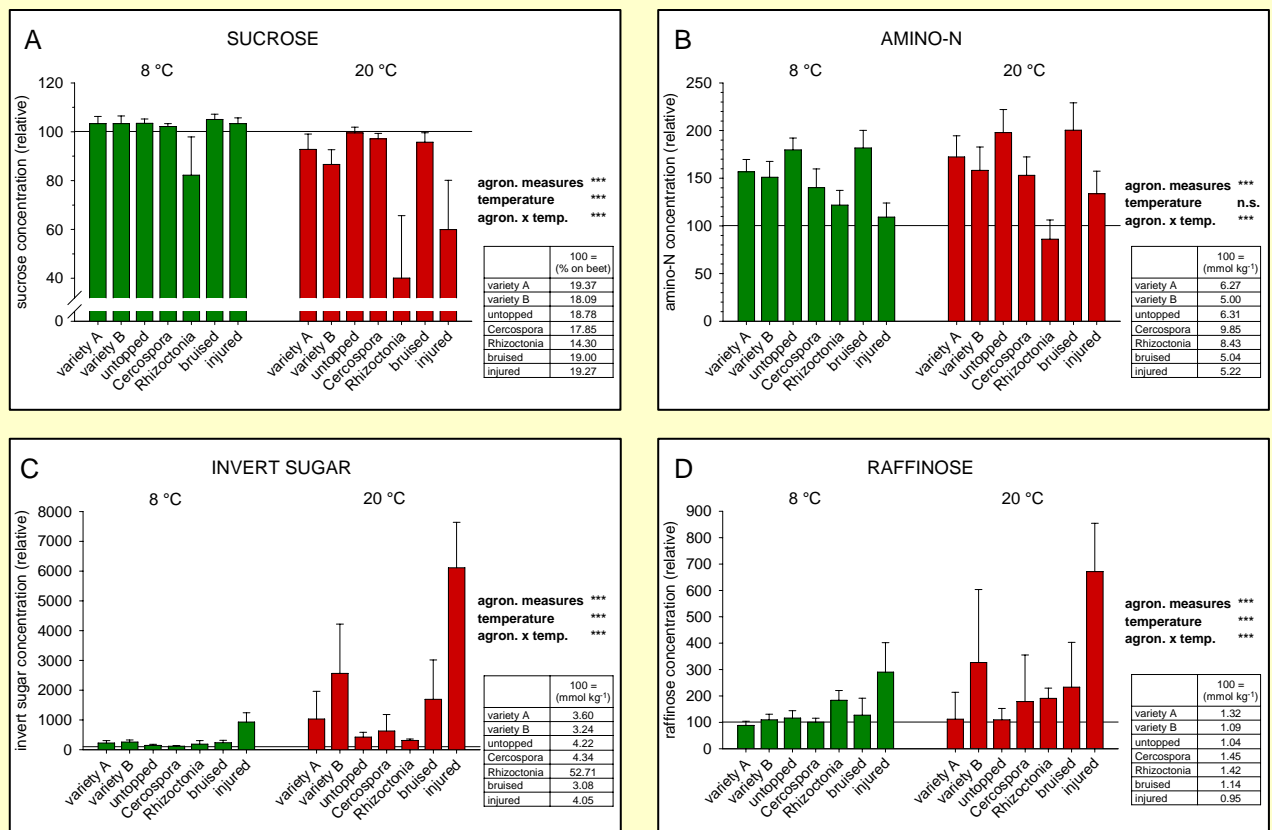


Fig. 1: Influence of agronomic measures and temperature on changes in the concentrations of sucrose (A), amino-N (B), invert sugar (C) and raffinose (D) in sugar beet during 56 days of storage, 2004. Concentration prior to storage = 100, vertical bars indicate the standard deviation, ***: significant at $p = 0.001$, n.s.: not significant

Conclusions

- Beet quality declined during storage, particularly at high temperature. The concentration of sucrose increased slightly at 8 °C because of dehydration. At 20 °C, sucrose percentage decreased due to higher respiration loss at elevated temperature. The concentrations of amino-N, invert sugar and raffinose increased.
- Agronomic measures affected the changes in beet quality significantly. Differences between the two varieties under study occurred. Storability was not affected by *C. beticola* and slightly impaired in untopped and bruised beets.
- Visible root injuries had the strongest impact on quality losses during storage apart from *R. solani*. Thus, any aggressive handling of the beets before storage should be prevented.