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ESTIMATION OF THE STORABILITY OF SUGAR BEET GENOTYPES

Evaluation de la stockabilité de géotypes de betteraves sucrières / Bewertung der Lagerungsfähigkeit von Zuckerrübengentypen

ABSTRACT

Storage losses can be lowered by the choice of a sugar beet variety with high storability (low sugar losses and accumulation of invert sugar). The aim of the present study was to identify parameters that may indicate the storability of sugar beet genotypes and to find criteria to select varieties with low storage losses without expensive and time-consuming storage trials. In two years 18 sugar beet genotypes were cultivated in field trials at four locations in Germany. After harvest the beets were stored for different storage periods (8 and 12 weeks) at 8 °C and 20 °C in climate containers. Sugar losses and invert sugar content after storage were closely correlated ($r^2 = 0.98$). Therefore, invert sugar can be used as an indicator for the degradation of sugar during storage. The accumulation of invert sugar was positively correlated with the infestation with pathogens during storage. Thus, the susceptibility to pathogens seems to be one of the main reasons for storage losses of sugar beets. Genotypes with a high marc content (insoluble cell-wall components) in fresh matter before storage also showed a lower infestation with pathogens during storage. It is assumed that the stability of the root tissue of genotypes may play an important role for their storability. Although other resistance factors could also affect the infestation, there is some evidence that the marc content before storage can be used as criterion to select for storability of sugar beet genotypes. As the genotype had a high influence on storage losses (12%), a selection for genotypes with improved storability seems promising. When glucose is analysed in the routine of a factory, the choice of a variety with low invert sugar concentrations becomes even more important. Nevertheless, further research is needed to figure out how the environment affects the storability of sugar beet. Moreover, it has to be further investigated whether the marc content, together with other parameters, can be used as a criterion for the selection of varieties with high storability.
