POSTER SESSION – SESSION POSTERS – POSTERSEKTIONEN 3 & 6

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EVALUATION OF THE BREEDING PROGRESS OF SUGAR BEET VARIETIES FROM 1964 TO 2003

Évaluation des progrès dans la sélection de variété de betteraves sucrières entre 1964 et 2003 / Bewertung des Züchtungsfortschritts bei Zuckerrübensorten zwischen 1964 und 2003

ABSTRACT

Breeding of new sugar beet varieties results in an improved performance and thus contributes to meet the global needs for plant biomass. The aim of this study was to analyse the extent of the breeding progress in sugar beet and to determine which traits were modified by breeding. Sugar beet varieties registered between 1964 and 2003 were cultivated in field trials and additionally in greenhouse experiments in 2007 and 2008, to exclude effects from changes in agronomic management and climatic conditions. Differences in white sugar yield related to the year of registration were regarded as breeding progress. The results showed an increase in white sugar yield of 0.6 to 0.9% a^{-1} due to breeding. This progress was realized by an improved biomass partitioning (higher root to leaf ratio and higher sugar to marc ratio), better technical quality (decreased standard molasses loss) and enhanced assimilation (higher chlorophyll content, higher assimilation rates). No changes were observed in leaf development and cambium ring formation. A principle component analysis pointed out that breeding aims have shifted with time from "yield" to "biomass quality". To continue the breeding progress in future it is essential to integrate multiple resistances and tolerances against biotic and abiotic stress.