SACCOMANI, MASSIMO¹, PIERGIORGIO STEVANATO², MASSIMO CAGNIN¹, GIAMPAOLO FAMA², MARCO DE BIAGGI², and ENRICO BIANCARDI², ¹Dipartimento di Biotecnologie Agrarie, Università di Padova, viale dell'Università 16, 35020 Legnaro, Padova, Italy, and ²Istituto Sperimentale per le Colture Industriali, viale Amendola 82, 45100 Rovigo, Italy. Genetic diversity for root morpho-physiological traits and productivity in sugar beet.

A better understanding of the complex interaction between plant and environment is required to improve plant yield stability over different locations. For this purpose, we studied the relationships among productivity, root architecture and its physiological function in nutrient acquisition. Root architecture parameters, glucose and fructose concentration in the root tip and sulfate uptake rate were evaluated in 18 sugar beet genotypes characterized by different sugar production ability. Significant genetic differences were observed in total root

length, surface area, number of root tips, glucose and fructose concentration in the root tip and sulfate uptake rate after deprivation. Such traits were significantly correlated with root and sugar yield. These results demonstrate the existence of a strict association between morphological and physiological root traits and their relationships with productivity. These coordinated actions at the level of the whole root system contribute to explain plant adaptation to multiple environmental stresses.

influence raffinose biosynitetic gene expression during storage. The increased galaction synthase expression in late October may be associated with decreased temperature in October when compared with beets sampled in early and mid-September. Raffinose synthase and galactical tynthase year expression were highest in roots stored for 2 wie at 2°C and year expression decreased markedly at 10 and 18 wk of storage Raffinose synthase entrying increased after 1 wk of storage, but unlike riRNA levels, enzyme activity remained clevated at 10 and 18 wk of storage, but unlike riRNA levels, enzyme activity un storage suggest that protein stebility of posttrease righten regulation legitime may have an important role between the storage of posttreases and regulation may have an important role

Carl

201