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Poster Abstract – C.18

SALT TOLERANCE OF WHEAT IS ASSOCIATED WITH THE NUMBER AND SIZE OF LEAF VESSELS

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Sustaining dry matter production in plants requires the maintenance of a favourable water balance, which is in part determined by the capacity to transport water through plants, i.e. water use. Physically, the decreased volumetric water flow under saline conditions is mostly explained by the decrease in plant growth rate and associated decreased in leaf surface area. Our objectives are to investigate the effect of salinity on the cross-sectional area and anatomy of large and small veins of leaves, measured by mean of Image Analysis connected to microscope, in contrasting wheat genotypes and to verify if the salt tolerance of wheat genotypes is associated with the number and size of leaf vessels. Two spring wheat genotypes (Kharchia and Sakha 61) with a contrasting salt tolerance were grown in a growth chamber in soils with or without 120 mM NaCl. Examination of the transverse sections of leaf 4 of each genotype revealed that salinity significantly reduced the cross-sectional area and width for both genotypes. However, there was a greater reduction for the salt sensitive genotype Sakha 61 than that for the salt tolerant genotype. The reduction in cross-sectional area was attributed to a decrease in the size and number of vascular bundles for both genotypes, suggesting that salt tolerance of wheat genotypes may be associated with the number and size of vascular bundles. Linear relationships between water use and yield have been reported in literature for various crops and climates under conditions of water deficit and salt stress. Thus, reduced number and size of vascular bundles in wheat leaves in this study may further indicate that salt tolerance may be associated with the capacity of volumetric water flow per plant. To have a better understanding of the mechanism of salt tolerance of wheat plants, we are currently examining the effect of salinity on meta- and protoxylem in vascular bundles of leaves in contrasting wheat genotypes.