

## **GENETIC VARIATION FOR RHIZOSHEATH AND ROOT MORPHOLOGICAL TRAITS IN MAIZE**

LI K., TASSINARI A., STEFANELLI S., TUBEROSA R., SALVI S.

DISTAL, University of Bologna, Viale Fanin 44, 40127 Bologna (Italy)

*exudates, maize, rhizosheath, root architecture, abiotic stress*

Abiotic stresses such as water or soil nutrient deprivation are likely to negatively affect crop yield. Changing root characteristics of newly developed cultivars by genetic improvement approaches is one way to adapt crops to severe environmental conditions. However, the genetic basis of root development in response to abiotic stresses is largely unknown. In this work, we aim to develop and implement protocols in order to test the effect of different water and nutrient availability conditions on root architectural traits including rhizosheath, and test for the presence of genetic variation across maize and barley collections for the same traits.

Sixteen maize inbred lines and four barley cultivars were first tested for variation in rhizosheath (defined as the weight of soil adhering to roots on excavation. Brown et al. 2017 Plant Soil). In a replicated experiments, plants were grown per two weeks in pots with soil. ANOVA showed a statistical significant difference in rhizosheath among maize lines, with the reference line Mo17 showing one of the largest rhizosheath, thus supporting the possibility to genetically map QTL for this trait. Results of additional experiments will be reported where root architecture and rhizosheath will be estimated and compared under different conditions of water and nutrients (N and P) availability. Experiments are being carried out both in soil pots and in rhizotrons, the latter system enabling to non-destructively visualize the root apparatus during growth.