

**PROJECT TITLE**

Characterization of Wheat gEnetic Resources with high high thrOUGHput rOot phenotyping to increase wheaT adaptation to drought

**CONSORTIUM**

P 1	Donatella Danzi		
-----	-----------------	--	--

## SUMMARY OF THE REPORT

The purpose of the project WEROOT was the characterization of root traits of selected genotypes belonging to a Single Seed Descent durum wheat landraces by using the GrowScreen-Rhizo platform. The plants were grown under two different conditions; for the drought conditions the soil was pre-dried to 35% SWC and for control soil was kept at 75% SWC. 9 selected genotypes have been used with 4 replicates for each genotype and treatment. The plants were grown under control well and low water availability for approximately 4 weeks[[figure1 doesn't exist]]. Root traits were analysed every second day. The software used for images analysis is Paint Rhizo and allows extraction of visible root traits, such as total root length, seminal root length, lateral root length, root system depth and width, root surface coverage and root length density distribution over depth. Manually morphological measurements were collected every second day for the shoot parameters, such as plant height, total leaves and tiller number and leaf elongation rate. Moreover stomatal conductance and chlorophyll content were measured before the harvest. At the end of the experiment, wheat plant were harvested and shoot fresh and dry weight [[figure2 doesn't exist]] as well as total leaf area were recorded. The root system was washed to remove the soil and then scanned using WinRhizo scanners to quantify total root length and root diameter distribution. This procedure allows to assess whether the image acquisition provided a reliable representation of the root systems under control and drought conditions. A high positive correlation ( $R^2=0.89$ ;  $P< 0.001$ ) was recorded between visible root length and total root length, validating this method as an effective root biomass predictive tool. After scanning, roots were oven dried for 48h to determine the root dry weight. Overall drought treatment reduced above and below ground part [[figure3 doesn't exist]]. The above part was more sensitive than below ground part which is evident in the ratio of root to shoot which increased under drought condition. The experiment has enabled to identify genotypes that presumably could be tolerant or sensitive to drought.