Transnational Access Report

1. General Information

Project Acronym (ID):	RootSUBSTRATE
Project Title	The role of rooting substrate on plant root system architecture
Installation used	UNOTT MicroCT
Name of Group Leader	Michal Slota
Name of organization	University of Silesia

2. Project summary (max. 250 words)

The aim of the project is to reach a more comprehensive understanding of the role of soil compaction on root system architecture. The main goal of the research is the assessment of the effect of different compaction levels of rooting substrates for artificial media (glass beads of different diameters) to sandy loam soil of different bulk densities. The plant material selected for this study consists of a spontaneous *brb* mutant (bald root barley), a chemically-induced mutant *225dv* derived from barley cv. 'Diva' developed in the Department of Genetics, University of Silesia (Poland) as well as their parental cultivars 'Diva' and 'Pallas' (parental varieties). The applied collection of root-affected mutants with altered mechanical properties of root growth would be an appropriable material for the study.
The application of the artificial substrate would be desirable to test potential for the simulation of natural soil properties. The use of soda-lime glass beads as a rooting substrate could significantly reinforce the process of image segmentation of CT scans. Artificial rooting substrate with optimal density will provide a good experimental model for testing the influence of other factors e.g. response to abiotic stresses or mineral nutrition studies.

3. Main achievements (max. 250 words)

No MicroCT scans were undertaken due to the time constraints of the single visit to the UNOTT facility, which was mostly devoted to the completion of the second EPPN project. The additional constrain was to resolve the issue of the continuous supplementation of water to plants grown using a glass beads as a substrate. Also the segmentation process of roots grown using a glass beads-filled cores can be initially an obstacle for the image segmentation process.
During the visit the extensive discussions were carried out considering the possible continuation of the project. The collaboration was initiated to launch the project in future outside the EPPN funding. The project will contribute to achieve a better understanding of the effect of altered root phenotype on plant rooting potential as well providing a detailed quantification of emerging root architecture in natural and artificial soil systems.
The aims of the project would be attained in future after establishing a further scientific cooperation.