

Transnational Access Report

1. General Information

Project Acronym (ID):	PHENO-GENO-DROUGHT
Project Title	Coping with drought-stress: high-resolution temporal mapping of drought induced physiological changes in selected <i>Brachypodium distachyon</i> genotypes
Installation used	ABER IPC
Name of Group Leader	Thomas Didion

2. Project summary (max. 250 words)

This project comprised of 4 tolerant, 4 susceptible, and 2 median *Brachypodium distachyon* genotypes with respect to their response to water-deficit stress. The objective was to obtain in-depth phenotypic data to detect drought-induced changes in aboveground growth and physiology. Another objective was to increase our understanding of physiological factors regulating plant growth recovery from drought stress as this facilitates the development of crops with superior post-drought recuperative capacity.

3. Main achievements (max. 250 words)

Based on preliminary data analysis, last year's report already mentioned the need for further analysis to better describe the temporal and ecotype dependent differences observed when visually inspecting the photographs. Data analysis has now been "finalized" and a manuscript which will include aspects of this EPPN experiment, together with data from preceding drought screens of a larger *Brachypodium* germplasm collection, as well as metabolite profiling data, is currently being prepared. One aspect worth mentioning here is the interesting correlation we found between several metabolites and grey pixels (defined as the ratio between green and blue channels being bigger than 1.15 and smaller than 2, the ratio between green and red channels smaller than 1.4 ($\text{Green/Blue} < 2$ and $\text{Green/Blue} > 1.15$ and $\text{Green/Red} < 1.4$). NPPC (National Plant Phenomics Centre) staff are involved in providing data for the manuscript. We anticipate that some more data analysis will be required but this will be outside of the EPPN remit.

While the EPPN experiment revealed some very useful outcomes, the output was somewhat negatively impacted by the fact that the design was comprised of 4 pots being placed in the same tray/cart. Watering was therefore not always equal between the 4 plants on a tray (too many outliers) and image analysis was not as accurate as we would have liked (tissue of plants other than the one being imaged is sometimes included in field of view). The experimental design to assess recovery from drought is another area that will need improvement (both in terms of timing of rewatering after drought and duration of rewatering combined with phenotyping). DLF, in collaboration with its collaborators at IBERS, is certainly interested in a potential follow-on experiment in which a reduced number of ecotypes (3-4) will be tested for drought and recovery with improved set-up/design (we would also anticipate this to include detailed metabolite profiling).

5. Publications related to the access granted, acknowledging the support by EC.

In preparation. We aim to submit this manuscript in 2017 for publication (with the acknowledgement of EPPN).