

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 focuses on 10 *Brachypodium distachyon* genotypes, selected for opposing responses to drought: comprising 4 tolerant, 4 susceptible, and 2 median (with respect to their response to water-deficit stress) accessions. The objective was to obtain in-depth phenotypic data to detect drought-induced changes in aboveground growth and physiology. Understanding physiological factors regulating plant growth recovery from drought stress is equally important as it facilitates the development of crops with superior post-drought recuperative capacity. This aspect was therefore incorporated in this project.

3. Main achievements (max. 250 words)

Projected shoot area (cm²) and maximum plant height (cm) has been calculated based on two side-view images (0° and 90° rotation) for each day of the treatments for each ecotypes. In addition, total yellow pixel count has been calculated from each of the photographs taken during the course of the experiment. At 12, 15 and 20 days after “Day 0” the aboveground biomass from 4 plants for each ecotype was harvested. Day 12 samples have been prepared for total (polar and non-polar) metabolite profiling; currently ongoing.

Based on preliminary data analysis, comparing shoot area and maximum plant height graphs with the corresponding RGB images, it became apparent that further data analysis is required to better describe the temporal and ecotype dependent differences observed when visually inspecting the photographs. Discussions between DLF-Trifolium, the associated PhD student and supervisors, and the plant phenomics team at IBERS, identified a number of areas for further data-analysis, including:

- Measurements to score for leaf curvature. These measurements have the potential to identify differential responses between the ecotypes for the various treatments.
- Measurements to score for density/compactness based on the top view images. Linked to the previous, we hypothesize that such measurements have the potential to better identify different responses to water deficit between the ecotypes.
- Total yellow pixel measurements were not very informative. Further color assessments to better define stress symptoms will be explored, including the use of color ratios.
- Pixel counts based on top-view photographs will be used to recalculate shoot area.

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

In preparation