

# Carbon-Hungry Rice and Wheat

## OBJECTIFS

CHEW's general objectives are to (i) understand traits controlling feedbacks of sources on sinks under climate change conditions and (ii) enable rice and wheat breeders to select for greater growth and yield response to eCO<sub>2</sub>, generating more productive and water-use efficient crops. This will enable effective breeding for greater yields of two world staples under rising [CO<sub>2</sub>] while saving water. Such breeding is impossible without reliable proxy traits, as costs of CO<sub>2</sub>-FACE trials are prohibitive.

Easily observable proxy traits predicting eCO<sub>2</sub> response of flooded rice and rainfed wheat will be developed and validated. Interactions with water deficit will be studied for wheat. Two types of eCO<sub>2</sub> acclimation will be studied, i) photosynthetic downregulation via sink limitation and N dilution (source); and ii) developmental and structural acclimation (sink adjustment). We will study genotypic variation for both species, and genetics of proxy traits only for rice as a model for future translational research. AGAP Institut (PHENOMEN team) will lead the work on rice and the UMR LEPSE that on wheat, involving modeling approaches that are a strength of both partners. The project's goals fall into the units' core competencies, as they address pre-breeding for crop adaptation to climate change.

## ACTIONS

Three WPs will i) identify and validate proxies in controlled environments (CE), ii) study interactions with drought in CE (wheat only), and iii) study the genetics for proxies by GWAS using existing field phenotype data. WP4 will focus on the outreach of the project through a mini-workshop with potential users. The UMR AGAP will lead the rice work and the UMR LEPSE that on wheat. CHEW plays into the strengths of both units and will generate impact via their extensive partnerships with breeders. An associated partner at WUR (NL) with whom both groups regularly collaborate will contribute to the modelling.

**Responsable :**

**Date de démarrage :** 01/01/2022

**Date de clôture :** 31/12/2023

**Montant :**

