



## Using Next Generation Genetic Approaches to Exploit Phenotypic Variation in Photosynthetic Efficiency to Increase Wheat Yield

### Project Lead

Name: Anthony Hall  
Institution: Earlham Institute, GBR

### Principal Investigators

Name: Neil Hall  
Institution: Earlham Institute, GBR

Name: Martin Parry  
Institution: Lancaster University, GBR

Name: Elizabete Carmo-Silva  
Institution: Lancaster University, GBR

Name: Matthew Reynolds  
Institution: CIMMYT, MEX

Name: Sivakumar Sukumaran  
Institution: CIMMYT, MEX

Name: Robert Furbank  
Institution: Australian National University, AUS

Name: John Evans  
Institution: Australian National University, AUS

### Abstract

Phenotyping photosynthetic characters from diverse lines of wheat will be combined with next generation genetic approaches to enable the identification of markers and genes associated with each trait. Such knowledge will enable combinations of these traits to be rapidly incorporated into

elite wheat lines to increase yields based on improved photosynthetic efficiency. Moreover, identifying the genes and mutations responsible for the traits will provide an understanding of the biology underpinning the trait and the ability to use precision genome engineering tools in the future. The project will identify wheat material, develop markers and build bioinformatics tools. All of this will be made available to the international community via CIMMYT and iPlant. The project builds upon high throughput methods and knowledge developed by the wheat yield consortium and utilises exome capture technology to discover the relevant genetic information in a cost effective manner. The project combines the diverse expertise in photosynthesis, genetics, wheat physiology and breeding from Lancaster, Liverpool, ANU and CIMMYT and leverages off related existing research.