Special Issue

Photosynthetic Capacity and Crop Productivity: Exploring Their Mechanistic and Empirical Links for Crop Improvement

Message from the Guest Editors

In recent years, there has been an increasing amount of literature focusing on the bioengineering and/or selection for higher photosynthetic capacity to increase both yield and water-use efficiency in crops.

However, clear empirical and, even more important, mechanistic evidence that establishes a link between CO2 assimilation, transpiration and overall crop productivity is still lacking. This problem partially arises from the emphasis that has been put on maximizing photosynthetic capacity under optimum conditions rather than searching for an improvement in the integrated carbon gain over a given period (daily, growing season, etc.).

This Special Issue aims to cover the gap between photosynthetic capacity and crop yield, including both modeling and experimental approaches, with a special focus on studies exploring photosynthesis, carbon gain and water-use efficiency improvement at different levels (from leaf and canopy to whole plant), with the ultimate goal to better integrate carbon and water dynamics into crop breeding programs.

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