

Elevated CO₂ and Nitrogen Supply Boost N Use Efficiency and Wheat Growth, and Differentiate Soil Microbial Communities Related to Ammonia-oxidization

Xingshui Dong ¹, Hui Lin ², Feng Wang ², Songmei Shi ¹, Sharifullah Sharifi ¹, Shuai Wang ¹, Junwei Ma ^{2*} and Xinhua He ^{1,3,4*}

- ¹ National Base of International S&T Collaboration on Water Environmental Monitoring and Simulation in the Three Gorges Reservoir Region, College of Resources and Environment and Chongqing Key Laboratory of Tree Germplasm Innovation and Utilization, School of Life Sciences, Southwest University, Chongqing 400715, China; xingshuid@outlook.com (X.D.); nsharifullah@gmail.com (S.S.); shuaiwang@swu.edu.cn (S.W.); xinhua.he@uwa.edu.au (X.H.); 2022020@ynau.edu.cn (S.S.)
 - ² State Key Laboratory for Managing Biotic and Chemical Threats to the Quality and Safety of Agro-products, Institute of Environment, Resource, Soil and Fertilizers, Zhejiang Academy of Agricultural Sciences, Hangzhou 310021, China; linhui@zaas.ac.cn (H.L.); majw@zaas.ac.cn (J.M.); wangfeng@zaas.ac.cn (F.W.)
 - ³ Department of Land, Air and Water Resources, University of California at Davis, Davis, CA 90616, USA; huah@ucdavis.edu (X.H.)
 - ⁴ School of Biological Sciences, University of Western Australia, Perth 6009, Australia; xinhua.he@uwa.edu.au (X.H.)
- * Correspondence: xinhua.he@uwa.edu.au (X.H.), Tel.: 86-18723289058 and majw@zaas.ac.cn (J.M.), Tel: 86-13857166772

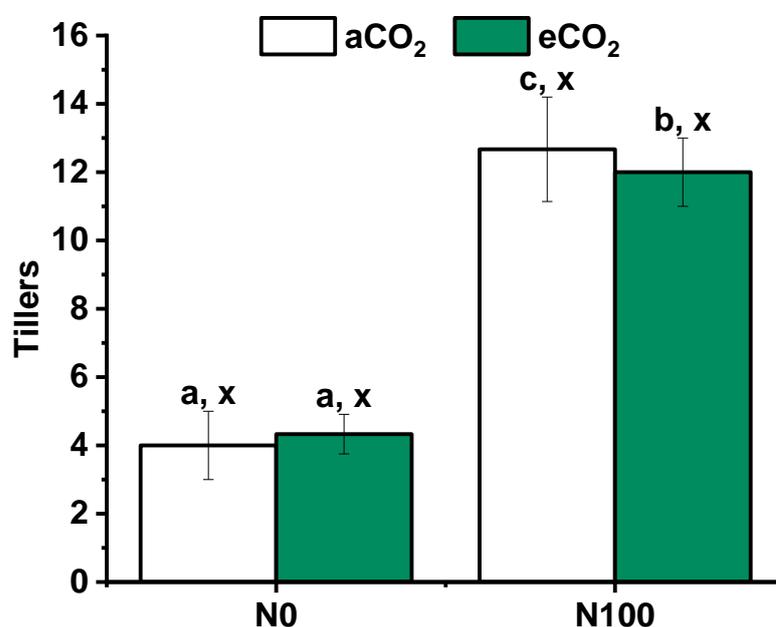


Figure S1. Effects of CO₂ and N supply on tillers of 5-month-old wheat plants at harvest. Abbreviations: aCO₂, atmospheric CO₂; eCO₂, elevated CO₂; N0, no N supply; N100, 100 mg N kg⁻¹ DW soil. Data are means ± SE (*n* = 3). Lower-case letters above the bars indicate significant differences between N supply for the same CO₂ treatment (a, b) and between CO₂ concentrations for the same N treatment (x, y) at *P* < 0.05.

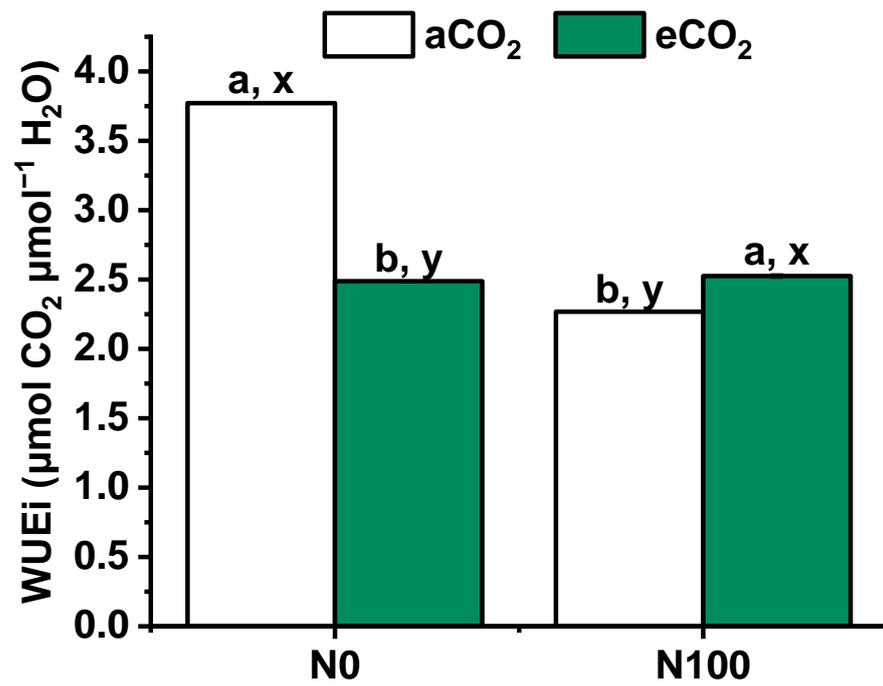


Figure S2. Effects of CO₂ and N supply on WUE_i of wheat plants at the booting stage. Abbreviations: aCO₂, atmospheric CO₂; eCO₂, elevated CO₂; N0, no N supply; N100, 100 mg N kg⁻¹ DW soil; WUE_i, the instantaneous water use efficiency at the leaf scale (µmol CO₂ µmol⁻¹ H₂O). Data are means ± SE (*n* = 3). Lower-case letters above the bars indicate significant differences between N supply for the same CO₂ treatment (a, b) and between CO₂ concentrations for the same N treatment (x, y) at *P* < 0.05.

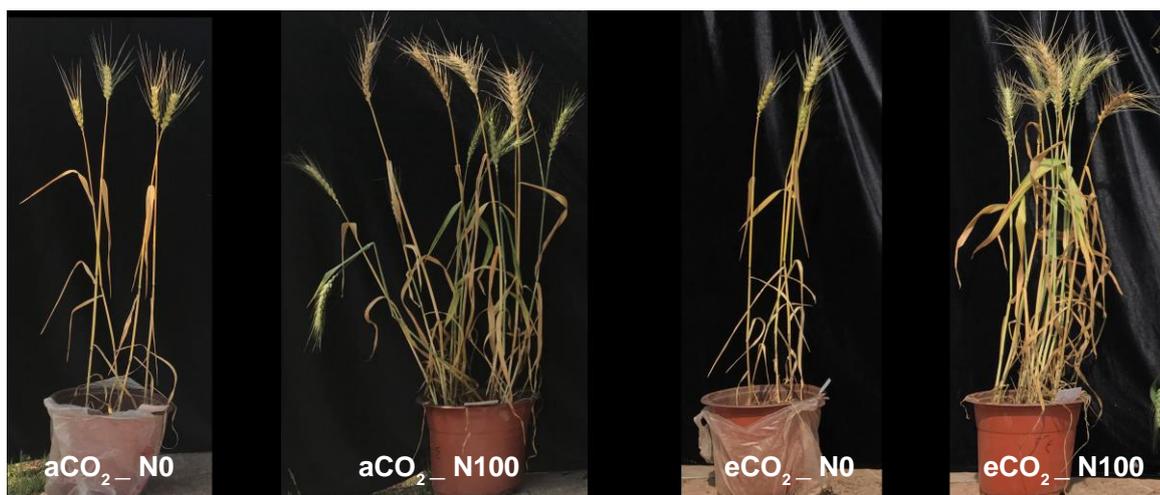


Figure S3. Effects of different CO₂ and N supply on their growth status of 5-month-old wheat plants at harvest. Abbreviations: aCO₂, atmospheric CO₂; eCO₂, elevated CO₂; N0, no N supply; N100, 100 mg N kg⁻¹ DW soil.