

Supplementary Materials

Effect of drainage practice on the emission of two carbon-based greenhouse gases (CO₂ and CH₄) from paddy system in South Korea: field pilot study

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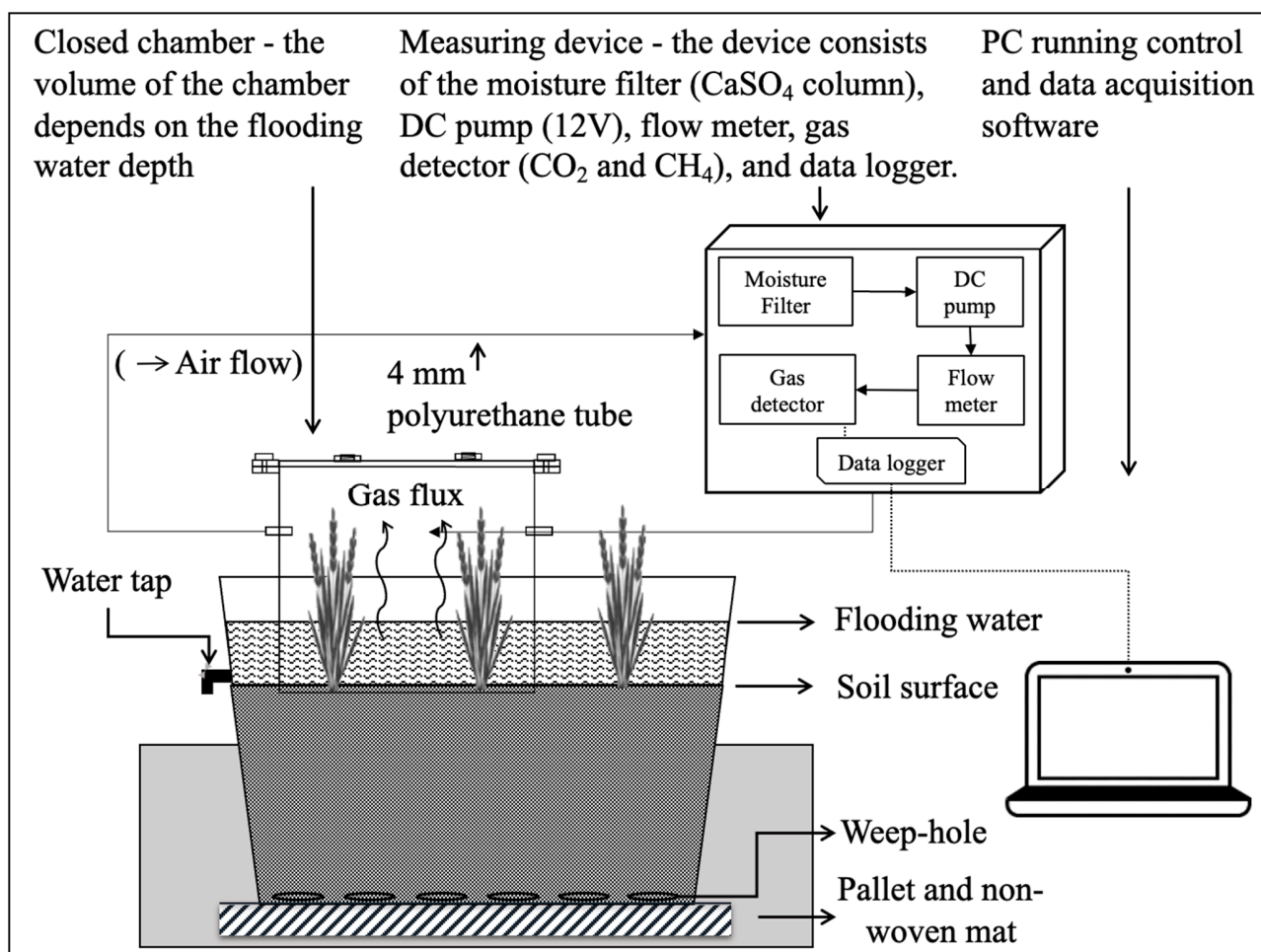
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Figure S4. Changes of soil wetness (v/v, %) measured at the in the depth of 5 cm from the soil surface. For the treatment of intermittent drainage, soil wetness at the 15 cm depth was also determined.

Table S1. Method and timing of farming practices in the experiment field under continuous flooding and intermittent drainage.

Farming Practices \ Irrigation Methods	Continuous Flooding	Intermittent Drainage
Fertilizer Application	70 kg N ha ⁻¹ at May 12 th	
Irrigation Period	May 12 th to August 10 th	
Rice Transplanting	Thirty-day old seedlings (3–4 plants per hill) of rice (<i>Oryza sativa</i> L., Japonica) were transplanted with spacing of 25 cm × 25 cm by hand.	
Cultivation Period	May 16 th (transplant) to Sep. 17 th (harvest)	
Flooding and Drainage	Paddy pot was flooded with 1–2 cm water until the rice plant attains the three-leaf stage (May 30 th); and then, the pot was continuously flooded with 5–7 cm water depth; the pot was permanently drained 38 days prior to harvest.	Paddy pot was flooded with 1–2 cm water until the rice plant attains the three-leaf stage (May 30 th); and then, the pot was flooded with 5–7 cm water depth and drained after 11 days. The practice was repeated three times. The pot was permanently drained 38 days prior to harvest.



Note: The detector unit is composed of a CO₂ sensor (Soha-Tech, South Korea), with a detection range of 1 – 3,000 $\mu\text{mol mol}^{-1}$, and a CH₄ sensor (Axetris, Switzerland), with a detection range of 1 – 100 $\mu\text{mol mol}^{-1}$. Prior to the field measurements, the system was calibrated using CO₂ and CH₄ standard gas (N₂ balance, 11.0 MPa) at 500, 1000, and 2000 $\mu\text{mol mol}^{-1}$ for CO₂ and 5, 10, and 50 $\mu\text{mol mol}^{-1}$ for CH₄. The coefficients of determination were 0.999 and 0.991 for the CO₂ and CH₄ calibration curves, respectively.

Figure S1.

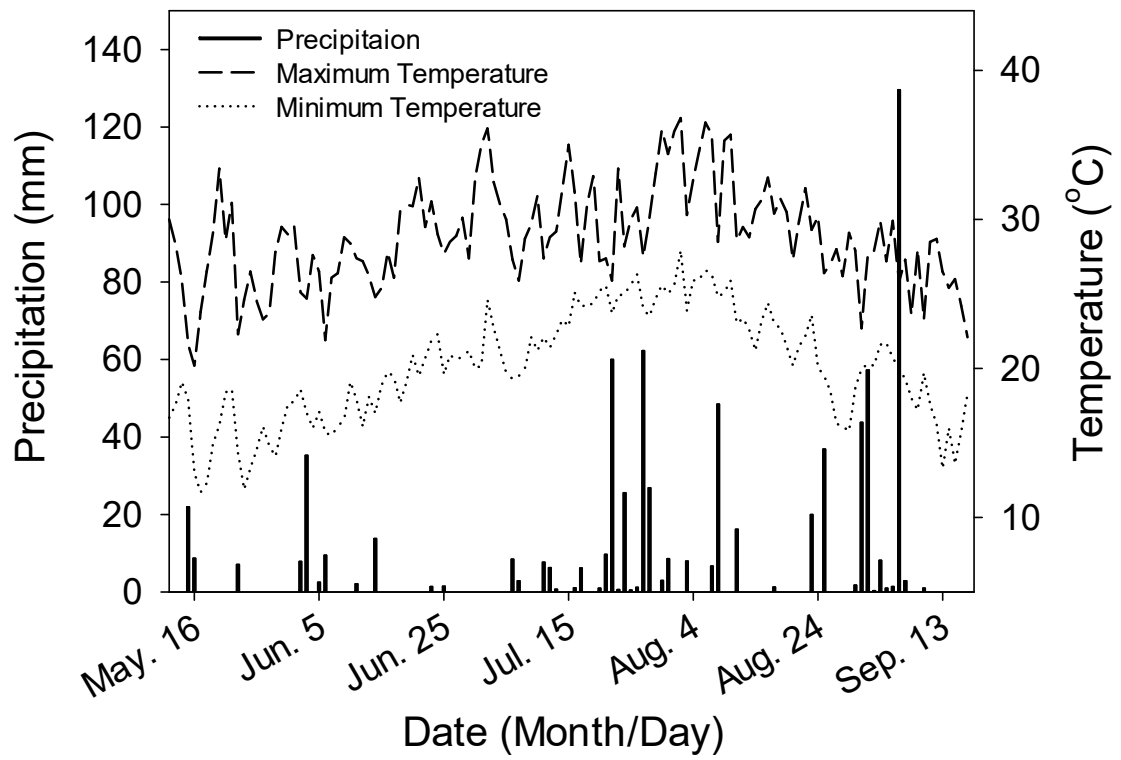


Figure S2.

Eh-pH Diagram

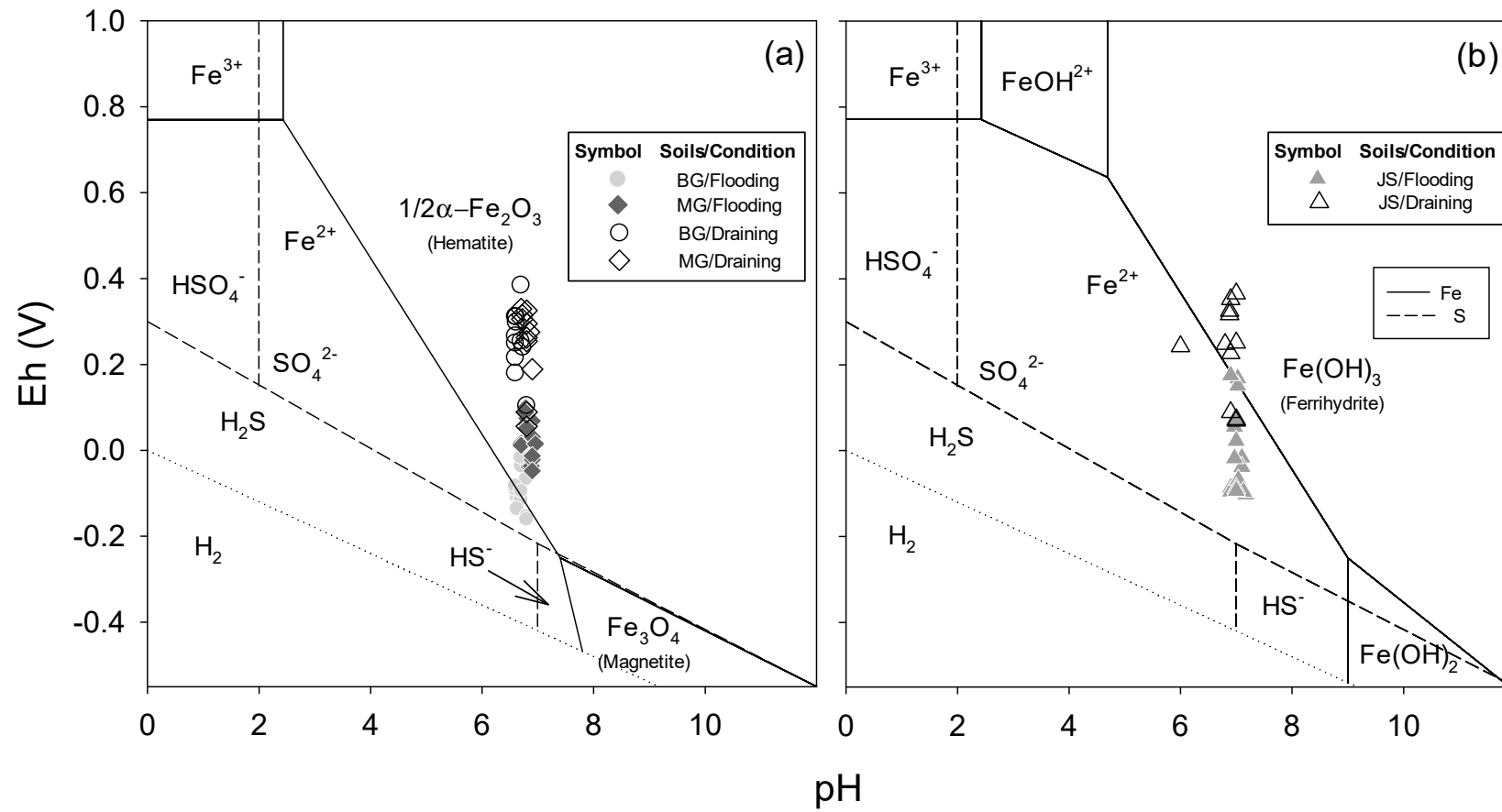


Figure S3

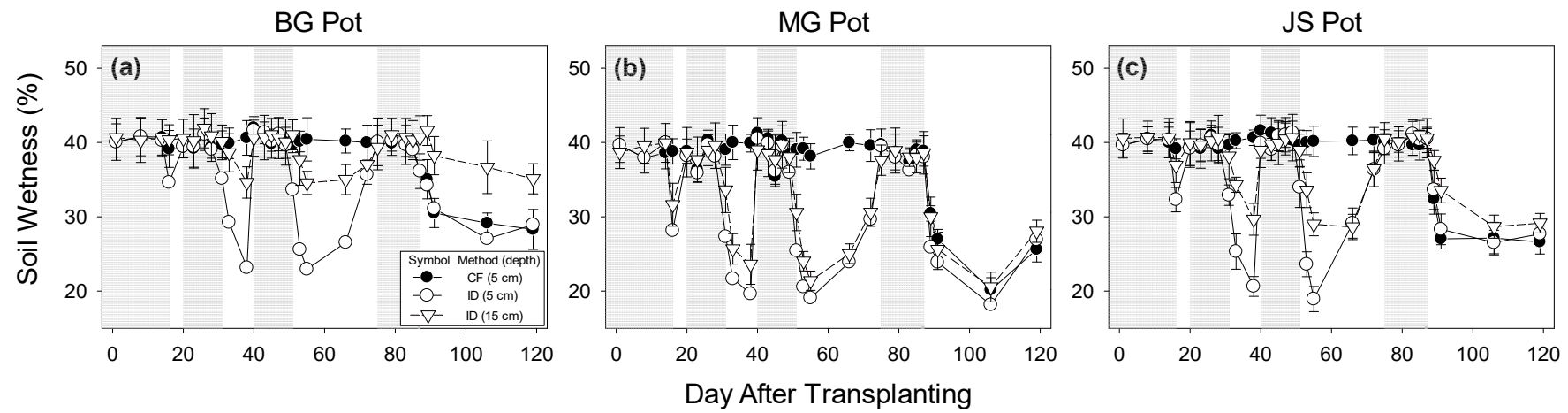


Figure S4