SIMULATION OF CARBON FLUXES AND EVAPOTRANSPIRATION IN RICE FIELDS

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Quantification of the canopy photosynthesis and evapotranspiration (ET) of crops is essential to determine the effects of environmental changes on CO_2 fluxes and ET in agricultural ecosystems and crop productivity. This study was conducted to simulate the CO_2 fluxes and ET of paddy rice (*Oryza sativa*) based on the development of photosynthesis and ET models. We also projected spatiotemporal variations in CO_2 assimilation and ET using a crop model based on remotely sensed information to identify a link of CO_2 and water balances with the accumulation of plant biomass. The photosynthesis and ET models that were developed simulated CO_2 assimilation and ET that had statistically acceptable agreements with the corresponding experimental measurements. Also, projections of spatiotemporal variations in absorption of CO_2 and ET were established using the GRAMI- rice model using remote sensing data. These results indicate that CO_2 and water fluxes in paddy rice could be well quantified based on simulation projecting spatiotemporal assimilation of CO_2 and ET. Our results would highlight the need to partition water and carbon fluxes to improve our mechanistic understanding of primary productivity and water use efficiency of rice and environmental impact of agricultural practices. Further efforts should be made to seek ecological implications through a fusion between at-ground measurements and remote sensing observations via model improvement.

Biography

Jonghan Ko is an Associate Professor position at Chonnam National University, Gwangju, South Korea. He is a crop modeler and agricultural remote sensing researcher. His research fields include agronomic applications of crop modeling techniques, quantitative agricultural remote sensing and environmental crop ecology. He was awarded a PhD degree in Agronomy at Texas Tech University, Lubbock, Texas, The USA, with a dissertation topic of "Development of a cotton crop model that uses remote sensing data" in 2004. He received both Bachelor's and Master's degrees in agronomy at Kangwon National University, Chuncheon, South Korea in 1995 and 1998 respectively.

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