A global simulation of bioenergy crop yield

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Large-scale development of bioenergy is considered as an effective pathway to achieve the 2 degrees target of the Paris Agreement. To avoid the competition with food crops, so-called the second-generation bioenergy crops such as miscanthus and switchgrass are regarded as potential dedicated biomass crop. However, the models to estimate the yield of miscanthus and switchgrass at a global scale which enable analyzing the effects of irrigation water application are seldom seen as of today. Here, we firstly updated the crop module in the global hydrological model H08 for miscanthus and switchgrass. Then, we conducted a global simulation and validation of the yield for miscanthus and switchgrass at 0.5 degree. The results indicated that the updated H08 have a good ability in simulating the yield of perennial bioenergy crops, which provides a good foundation for further integrated assessment of the impacts of bioenergy crop production on water sector.

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