

Comparison of simulated nitrate leaching by the DNDC model and the EU-Rotate_N model on greenhouse vegetable cultivation

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Abstract: Two different models, the DNDC model and the EU-Rotate_N model, were used to simulate the nitrate leaching, water drainage and water and nitrogen dynamics on greenhouse vegetable cultivation. The DNDC model was developed to simulate the greenhouse gases emission and also could simulate nitrate leaching and water drainage. The EU-Rotate_N model was widely used to simulate water movement and the fate of nitrogen for vegetables under different water and fertilizer management. The DNDC model could simulate justly the water and nitrogen dynamics in 0-50 cm soil profile. Relatively, the maximum depth where EU-Rotate_N model could simulate water and nitrogen movements in was 200 cm. However, the EU-Rotate_N model has the limitation on estimating N₂O and NH₃ separately. In the research we compared the performances of simulated results of the DNDC model and the EU-Rotate_N model under the same field experiment conditions, which was to further improving and applying DNDC model in China vegetable cultivation.

Keywords: water drainage, nitrate leaching, greenhouse vegetable, DNDC model, EU-Rotate_N model.