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Assessing Denitrification-Disintegration Model’s Efficacy in Simulating Greenhouse Gas Emissions, Crop Growth, Yield, and Soil Biochemical Processes in Moroccan Context

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Abstract : Accurate modeling of greenhouse gas (GHG) emissions, crop growth, soil productivity, and biochemical processes is crucial considering escalating global concerns about climate change and the urgent need to improve agricultural sustainability. The application of the denitrification-disintegration (DNDC) model in the context of Morocco's unique agro-climate is thoroughly investigated in this study. Our main research hypothesis is that the DNDC model offers an effective and powerful tool for precisely simulating a wide range of significant parameters, including greenhouse gas emissions, crop growth, yield potential, and complex soil biogeochemical processes, all consistent with the intricate features of environmental Moroccan agriculture. In order to verify these hypotheses, a vast amount of field data covering Morocco's various agricultural regions and encompassing a range of soil types, climatic factors, and crop varieties had to be gathered. These experimental data sets will serve as the foundation for careful model calibration and subsequent validation, ensuring the accuracy of simulation results. In conclusion, the prospective research findings add to the global conversation on climate-resilient agricultural practices while encouraging the promotion of sustainable agricultural models in Morocco. A policy architect's and an agricultural actor's ability to make informed decisions that not only advance food security but also environmental stability may be strengthened by the impending recognition of the DNDC model as a potent simulation tool tailored to Moroccan conditions.

Keywords : greenhouse gas emissions, DNDC model, sustainable agriculture, Moroccan cropping systems
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