



Impacts of crop growth dynamics on soil erosion at the regional scale

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Agricultural land use and crop growth dynamics can greatly affect the amount of soil lost from erosion by water. Using a crop rotation geo-database, we developed a framework for modelling the impacts of crop growth dynamics on soil erosion at the regional scale with test case Flanders. Soil erosion mainly occurs in the southern part of Flanders, where silty to loamy soils and a hilly topography are responsible for soil loss rates up to 40 t/ha. In order to simulate the impact of crop cover dynamics on soil erosion at the regional scale, a dynamic crop cover model was coupled to the PESERA soil erosion model (Kirkby et al., 2009). PESERA is a process-based and spatially distributed model intended as a regional diagnostic tool. The model was combined with crop cover and vegetation growth simulations from REGCROP (Gobin, 2010) in order to simulate the effects of both seasonal and year-to-year crop dynamics on soil erosion. A crop rotation geo-database was constructed covering 10 years of crop rotation in Flanders using the IACS parcel registration (Integrated Administration and Control System). The coupled REGCROP-PESERA model was subsequently run for 10 years and for the most soil erosion prone area of Flanders, i.e. the loess belt, using the crop rotation database as input. Results indicate that crop growth dynamics influence soil erosion for a very large percentage. This implies that agricultural policies that impact on agricultural land management influence soil erosion for a large percentage. The framework is therefore suited for further scenario analysis and impact assessment.