



Data driven nutrient management maximizing environmental performance?

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Nutrient management in the Netherlands is strictly regulated in order to guarantee soil fertility, water quality and biodiversity. The Dutch government therefore introduced an array of legislation with regard to the production, transport and application of nitrogen (N) and phosphate (P) on arable land. However, compliance and effectiveness is currently a topic of public debate and economic costs for enforcement and monitoring strongly increased. Recently, a team of scientists, policy makers, farmers and advisors developed a new innovative concept evolving the current manuring practice and policy into a new era where the ecological capacity of the landscape controls land use and fertilization. This concept is called MaxiMi, an abbreviation for Maximum environmental performance with Minimal public effort. Combining existing data from public monitoring networks (with chemical and ecological properties of water bodies) with private sensor data from soil and farm management makes it possible to bridge the gap between water, soil and agronomic sciences over multiple spatial scales. Building machine learning algorithms (and adaptive models) using these data enables us to connect individual soil properties and field activities to nitrogen and phosphorus fluxes on catchment scale. Developing these models subsequently enables water authorities and farmers to select right management options to minimize environmental impact. The advantages of this data driven approach include i) a fact based underpinning of site specific management options, ii) increased responsibility by agricultural entrepreneurs, iii) less regulation and control by governmental organisations and iv) more environmental awareness among farmers and public accountability of their role in optimizing water quality. Our talk presents the underlying concept of MaxiMi, describes the transition needed and shows a proof of principle for the peat meadow area in the western part of the Netherlands.

Profile

Gerard Ros is senior researcher at the Nutrient Management Institute in Wageningen and involved in applied research of sustainable farm practices and precision farming. He also works as researcher at the Environmental System Analysis Group of Wageningen University and as policy advisor for water board Amstel, Gooi en Vecht. He is primarily involved in research bridging the gap between science and agricultural practices by developing innovative solutions for on-farm application. Combining knowledge of soil processes and simple measurements within DSS tools, he aims to optimize sustainability and economic gain in agro-ecosystems.

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