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HIGHLIGHTS FROM 25 YEARS WITH THE DANISH AGRICULTURAL MONITORING PROGRAM

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ABSTRACT

In the past 30 years a wide range of measures to reduce the agricultural load of nutrients to surface and coastal waters has been implemented in various Action Plans for the Aquatic Environment. The effectiveness of which is being followed in a specific agricultural monitoring program carried out in 5 small agricultural dominated catchments. The catchments represent the main soil types and the variation in livestock density, crops and climatic conditions found within Denmark. The monitoring encompasses intensive collection of information on agricultural practice at field and farm level by interviews. Further it employs direct measurements of nutrients in soil water, drainage water, upper groundwater and stream water. Due to investments in longer manure storage capacity, improved manure application techniques and the implementation of N-quota system Danish farmers have been able to increase the utilisation of nitrogen in manure. Together with an increased use of catch crops the implemented measures contributed to a decreased nitrate leaching from the root zone and a significant ($P < 0.01$) lower nitrogen transport in four out of five monitored streams. The experience gained from the Danish Action Plans for the Aquatic Environment clearly demonstrates that regulation of fertilizer utilization and utilization of animal manure is an effective measure to reduce diffuse nitrogen emissions from agriculture. However, it also demonstrates the complexity of defining an efficient regulatory system and confirms the need for effective control measures, and a continuous monitoring and evaluation program. The Danish program has given scientist and legislators a sound basis to determine effects, implementation and evaluation both before and after implementation of regulatory measures. Demands for catch crops which was implemented in 1998 and revised in both 2003 2009, as well as restriction on soil tillage in autumn implemented in 2012 are good examples on this.



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