



Soil Management for Water Quality

New experimental study demonstrates that preventing at source by soil management that reduces soil erosion and loss of phosphorus to surface waters will be an efficient way to achieve Water Framework Directive targets.

The ambition of WFD is to achieve 'good ecological status' of water systems by 2015. Since Phosphorus (P) is the main nutrient that causes eutrophication, thus "bad ecological status", measures will have to be taken in order to reduce the losses and transport of sediment and sediment-associated phosphorus from catchments to receiving lakes.

A recent experimental study was carried out in a Sweden-based catchment area dominated by cereals agriculture with very visible erosion and eutrophication of the recipient lake. From 1993 to 2001, researchers tested various practices for reducing surface run-off erosion and P losses from the catchment to the lake in order to identify the most efficient measures for improving the lake water quality.

The results from the experiments demonstrated that measures taken in the catchment area had much more significant impact than measures taken in the lake and the stream.

In particular, compared to conventional soil treatments, treatments without or with less frequent tillage significantly reduced erosion and phosphorous losses by increasing soil stability and fertility.

Spring ploughing was demonstrated to reduce erosion by 50% and yet deliver similar crop yields as after conventional autumn ploughing.

An annual reduction of 3% in P concentrations in the lake was observed. These results are probably due to a combined result of the tested and previously taken actions.

The scientists also highlighted that more attention should be directed to single household wastewater treatments since the sewage water is particularly charged in available P. They suggest more investment in new wastewater treatment systems that could also be used for demonstration purposes.

This study shows that preventing at source, by adequate soil management, will be an efficient way to achieve the 2015 WFD targets. But, the authors recall that most measures with the potential to improve the ecological status of European water bodies are yet without any scientific proof and highlight the need for more natural research on the subject.

Source: B. M. Ulen & T. Kalisky (2005) "Water erosion and phosphorus problems in an agricultural catchment—Need for natural research for implementation of the EU Water Framework Directive", *Environmental Science & Policy* in press

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