



FAIRWAY

POLICY MAKERS AT EUROPEAN AND AT LOCAL SCALE

Decisions often have to be made about mitigation measures to improve drinking water quality. It is important for policy makers, farmers, and drinking water companies to take into account the fact that there can be a considerable lag time between implementing a measure and seeing its effect on the water quality.

CONTACT

WEBSITE: <https://fairway-is.eu>
EMAIL: fairway@wur.nl

FURTHER DETAILS

[Hansen, B. et al. \(2021\). Evaluation of ADWIs: agri-drinking water quality indicators in three case studies \(FAIRWAY Project Deliverable 3.2\)](#)

[Kim, H. et al. \(2020\). Lag Time as an Indicator of the Link between Agricultural Pressure and Drinking Water Quality State. Water 2020, 12, 2385.](#)

[Summary leaflet](#)

ACKNOWLEDGEMENT



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KEY MESSAGE

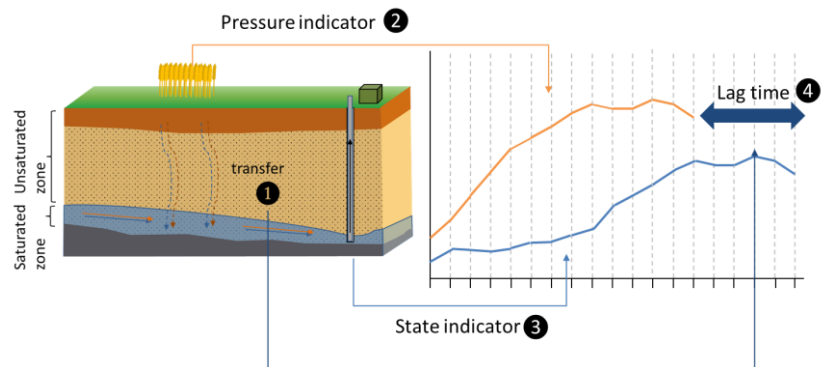
Water and nitrate transfer through geological material is not instantaneous. There is a lag time between agricultural nitrogen leaching from the fields and its impact on water quality in aquifers, and wells. This time lag should be taken into account when developing drinking-water protection strategies.

EXPLANATION

Water and nitrate can take several years to transfer through one meter of subsurface material, depending on the type of hydrogeological layers. In some European geological settings, the distance between surface (where the mitigation measures are applied) and the aquifer (where the concentration level is measured) can vary by many meters.

EVIDENCE

Using data from FAIRWAY case studies with deep aquifers in France (La Voulzie) and Denmark (Island Tunø and Aalborg), correlation analyses were performed between N fertilization, N surplus (pressure indicators) and N concentration in groundwater (state indicator). Using water age measurements, lag times of more than 10 years were estimated between indicators of measures made on the surface and detected groundwater concentrations.



Flow paths **1** determine how long it takes for the effect of drinking water protection measures to be detected in the groundwater quality.

The long-term effects of mitigation measures can be studied by monitoring State indicators (concentrations) **2** and Pressure indicators **3** over several years to decades. Pressure indicators and State indicators can be linked by taking lag time into account **4**.