

Is Swedish drinking water analysed for all relevant pesticides?

We conclude that:

- 23 substances with significant use during 1985-2014 should be analysed more often, due to at least one of the following criteria:
 - long half-life and low adsorption to soil
 - high detection frequency but few samples analyzed
 - frequently detected or detected in concentrations above 0.1 µg/l in the national monitoring program
- However, several substances sold in large amounts 1985-2014 have been included in a large number of analyses which makes existing data suitable for assessment of general trends of pesticides in drinking water.
- A relatively large part of the pesticide analyses do not meet the regulatory demands for analytical quality (DWD 98/83/EC), regarding detection limits and measurement uncertainty.

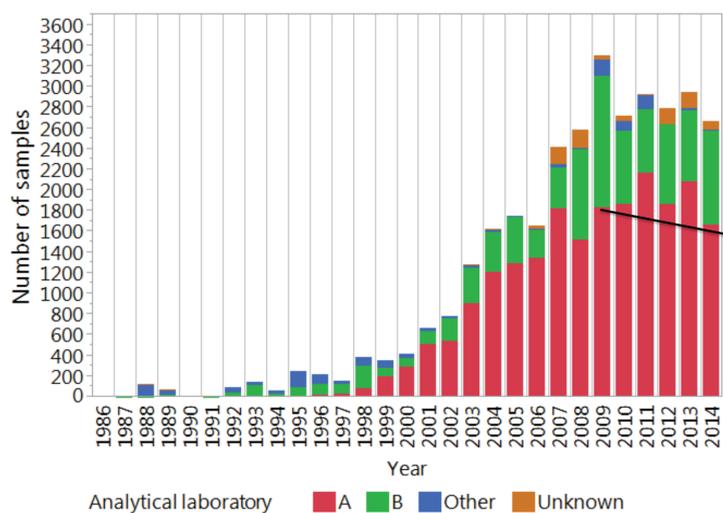
Aims of study

- Review if analyses of pesticides in raw and drinking water offered by Swedish laboratories, and the analyses actually performed, cover all relevant substances likely to be present in the water.
- Review the technical quality of the analyses offered by the laboratories (detection limits and measurement uncertainty), compared to regulatory demands.

Method

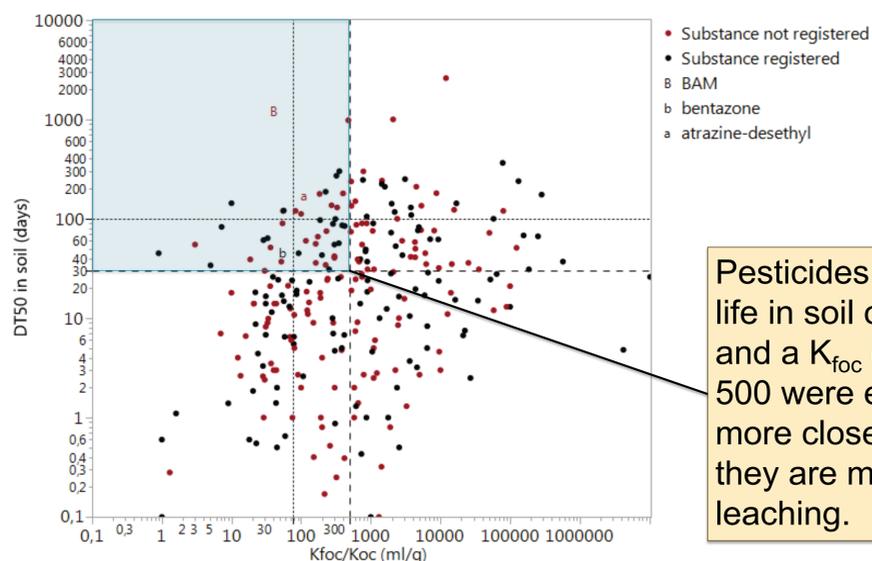
National databases containing results from pesticide analysis in raw and drinking water 1985-2015, in total 33 316 samples, were compiled. Comparisons were made between this data and;

- analyses offered by commercial laboratories in Sweden during 2016
- substances frequently detected in national monitoring of pesticides in surface water and groundwater
- substances sold in high amounts according to sales statistics 1985-2014
- substances prone to leaching based on half-life and adsorption to soil



Pesticide analyses in drinking water have increased since the early 2000's because of new legislation.
Most analyses are done by two commercial laboratories.

Fig 1. Number of samples per year analyzed by different laboratories.



Pesticides with a half-life in soil over 30 days and a K_{foc} or K_{oc} below 500 were examined more closely since they are more prone to leaching.

Fig 3. Half-life (DT_{50}) in soil and adsorption to soil (K_{foc}/K_{oc}) for pesticides registered for sale in Sweden at some point between 1985-2014. Black dots for substances still registered 2016 and red dots for substances not registered 2016.

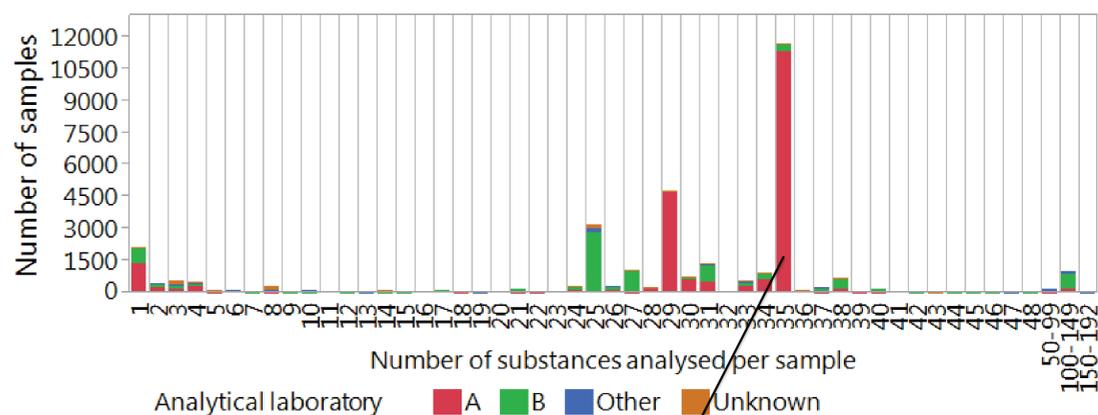


Fig 2. Number of substances analyzed per sample during 1985-2015 and by which analytical laboratory.

Most samples have been analysed for 25, 29 or 35 substances. This shows that a few analysis "packages" are used for the majority of analyses.

These analytical "packages" are based on old instructions from authorities and with focus only on groundwater. This shows the importance of relevant and up-to-date guidance.