PESTICIDES AND PROTECTION OF DRINKING WATER IN THE NETHERLANDS

Johannes B.H.J. Linders

National Institute for Public Health and the Environment, Bilthoven, The Netherlands,

Jan.Linders@RIVM.NL

Up to now the methodology the evaluate the drinking water criterion in the EU-Directive 91/414/EC is lacking in the guidance on the evaluation of scientific topics playing an important role in the registration decision to place Plant Protection Products on the market. Below a proposal is presented developed by the Netherlands to take into account the drinking water criterion in the decision making process. The proposal has two aspects: plant protection products (PPP) applied in agriculture and applied in amenity use. For both applications a methodology has been developed and is explained. The main purpose of the study was to use the information available to regional surface water authorities that PPPs are exceeding local standards and therefore threaten the intake of water, in the registration decision. It is recommended to use the results obtained in a process of "learning by doing" and to adjust the methodology where needed. In addition the method should be submitted to the European Commission for potential future use in the revised Plant Protection Products Directive of the European Union.

Purpose of the Study

Since the European Union Directive on the placing of Plant Protection Products on the market had entered into force in 1991 [1] (91/414/EC), many details on the methodology of the evaluation of scientific topics were left undefined. These topics were filled in later by the Members States as the methodologies evolved. These topics were for instance the guidance on residual amounts of pesticides in crops, the establishment of Predicted Environmental Concentrations (PEC) in several environmental compartments, the worker exposure, etc. One topic was up to now never subject to a proposal in the evaluation process, although especially in the Netherlands as a country situated downstream of three major rivers it has received attention due to the local experience that concentrations determined in surface waters exceeded the guidance values for abstraction of water for the drinking water production. It is the view of local water authorities and the drinking water producing companies to signal increased pollution if the concentration of PPPs exceed a level of 0.1 µg/L. When, however in 2005, the national government and the Dutch registration authorities were forced by the judge to take into account established concentrations into consideration at the moment of re-registration of some PPPs, real progress was made on the development of a potential successful methodology.

Therefore, the purpose of this study was to fill in the gap in the risk assessment methodology in the Netherlands and successively potentially also in the European Union on the evaluation methods for plant protection products with respect to the risks to surface water intended for the abstraction of drinking water. The intension was first to develop a methodology suitable for the situation n the Netherlands and then promote the method in the EU taking into account that at the European level specific topics in the method could be changed.

Methods

It was decided that the methodology of the risk assessment should be split into two main topics: 1) the application of PPP in agriculture and 2) the application of PPP in amenity use. Both methods

should be based on the same principles and leading to a decision tree approach with several (at least 2) tiers and also take into account the available monitoring data of the water authorities. A final requirement was that the methods should be compatible with the starting points of the Water Framework Directive of the European Union [2] (WFD).

1) Agriculture

The water authorities and the drinking water companies have carried out monitoring campaigns to establish the state of the pollution in Dutch surface waters at drinking water abstraction points and at the borders with the neighbouring countries, Belgium and Germany. Therefore, a thorough analysis was carried out of all the data in the period 2000 – 2006 concerning the most relevant active substances in the PPPs, a list of which was prepared by the drinking water companies and the registration authorities. Only data were taken into account that indicated a contribution of agriculture in the Netherlands and concerning substances that showed exceeding the limits at least in two consecutive years. In addition a hypothetical calculation was carried out with the relevant substances using the FOCUS-scenario D3 [3] (FOCUS SWS). This result represented the PEC at the edge of field that should be transformed using additional assumptions to a PEC at the location of the abstraction point for the production of drinking water. Aspects that were taken into consideration were amongst others: the area of cropping in the catchment areas of the abstraction points, an estimation of the market share of the PPP, the potential degradation during the estimated travelling time to the abstraction points, differences in timing of applications and possibly additional dilution. [4] Adriaanse et al.)

2) Amenity use

As an extensive part of the discharge of pesticides applied in amenity use, mainly hard surfaces, is taking place through the sewage water treatment plant it was decided that the approach with the same scenario as for agriculture would not be suitable. Therefore, a more integral mass balance approach was taken based on an estimation of total use of the substance. [5] (Linders et al.) An estimation of the area treated based on the total paved area in the Netherlands, the market share and the number of application days. The way monitoring data were taken into consideration did not differ from the agricultural approach. In this case the substance glyphosate was used as reference substance as it is almost exclusively use in amenity use in the Netherlands.

Results

1) Agriculture

Due to the criteria put on the substances and the measurement by monitoring programmes not all results of the calculations using the model defined were useful. The results were divided into two groups: 1) the calculations – measurement concentration combination positive and negative cases. The positive cases were achieved where the result of the calculation and the measurement were in agreement with each other that the limit concentration of 0.1 µg/L was exceeded. The negative cases were defined by the results not showing that the concentration of 0.1 µg/L was exceeded although the measurements were higher than the concentration of 0.1 µg/L. It showed that only 3 positive cases could be established and 6 negative cases. Six extra negative cases could be achieved by defining an additional dilution factor taking into account the huge water body of the IJsselmeer in between the discharging river and the abstraction point.

2) Amenity use

For amenity use only one substance was available to test the methodology, which a quite weak situation. It was, however, not possible to use other substances and so it was decided that this approach should be used as an example in the coming future and the whether other substances would become available.

Conclusions

A methodology to be used in the risk assessment process to register plant protection products was developed for application of these products in agriculture and in amenity use. In the area of agriculture some data were available to test the method proposed but the number of relevant cases was too small to decide whether the method would be suitable for the use proposed. For the application in amenity use only one substance was available to test the method. So, in this case it was not possible to even draw a conclusion on the applicability. Therefore, more experience is needed with both approaches before a final decision can be taken on the methods to be used. Most certainly, the methods would have to be revised if more data become available.

References:

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