

# Quantifying point source entries of pesticides in surface waters

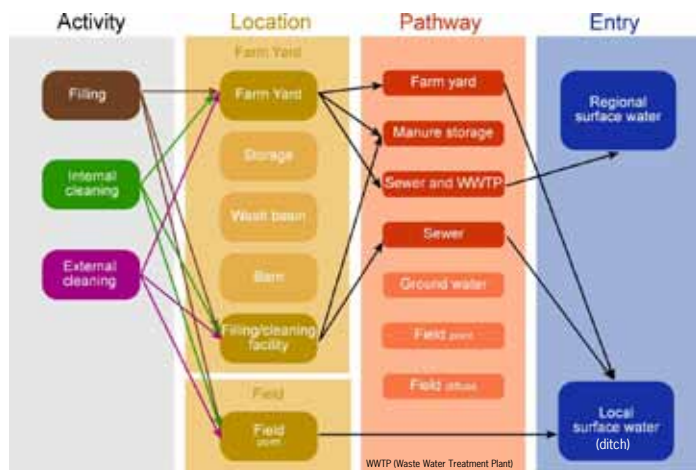
Wim H.J. Beltman<sup>1</sup>, Marcel Wenneker<sup>2</sup>, Marieke G. van Zeeland<sup>2</sup>, Arie van der Lans<sup>2</sup>, Rommie Y. van der Weide<sup>2</sup> and Rik (H.)A.E. de Werd<sup>2</sup>

## Problem

Activities at the farm yard may initiate point sources. Which activity contributes most to contamination of surface waters? Case: terbutylazin for weed control in maize.

## Analysis of farm situations and activities

Scheme for activities with sprayers based on a survey with 36 farmers.



Relative number of deposition events at a farm in one year.

Activity	Filling spray tank	Internal cleaning	External cleaning
a Occurrence of activity	4	2	1
b Occurrence of deposition	0.05	1	1
c Number of events (= a x b)	0.2	2	1

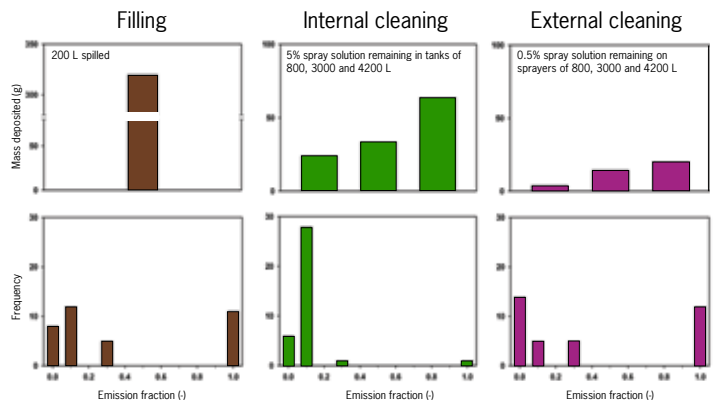
## Pesticide concentration

$$C = \frac{M \cdot E}{V}$$

$C$  = Concentration in water ( $\mu\text{g/L}$ )  
 $M$  = Mass of pesticide deposited ( $\mu\text{g}$ )  
 $E$  = Emission fraction (-)  
 $V$  = Volume of ditch (= 21 000 L)

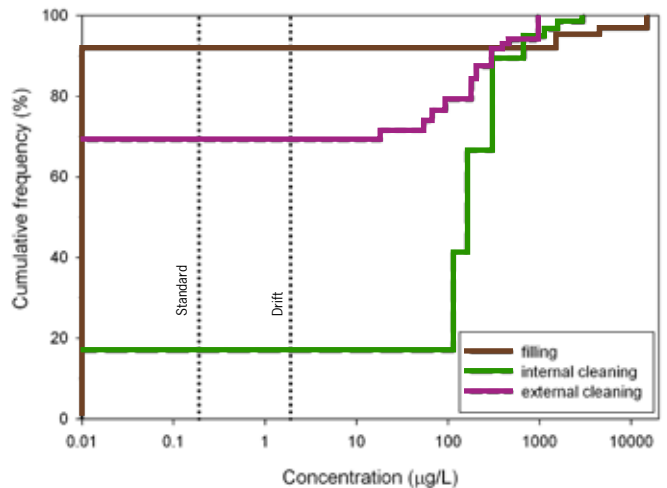
## Mass deposited and emission fractions

Terbutylazin concentration in tank is 0.1 g/L. Emission fractions derived from location and pathway on 36 farms.



## Calculated concentrations

10 000 Calculations with relative number of deposition events and random values of mass depositions and of emission fractions.



## Conclusions

- Internal cleaning of sprayers contributes most to emission to surface water.
- Focus on internal cleaning for reduction of losses and appropriate cleaning methods.

<sup>1</sup> **Alterra, Wageningen UR**  
P.O. Box 47, 6700 AA, Wageningen, The Netherlands

<sup>2</sup> **Applied Plant Research, Wageningen UR**  
P.O. Box 200, 6670 AE, Zetten, The Netherlands  
wim.beltman@wur.nl