

Pesticide Indicators Based on Sales Data, Exposure, Ecotoxicity and Risk Mitigation Measures

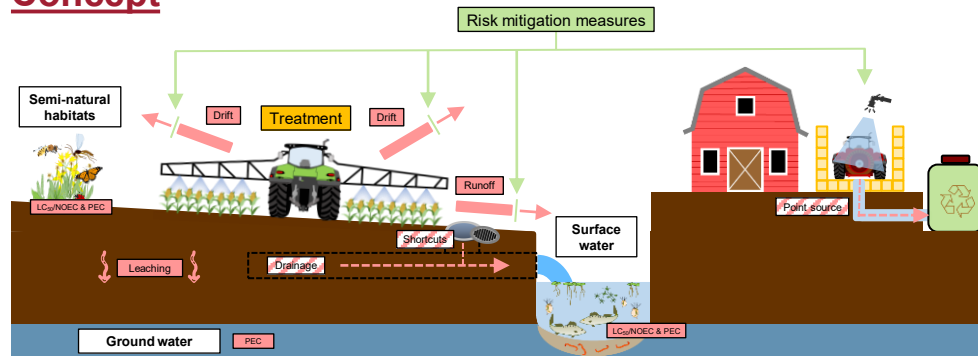
L. Boualit*, J. Ranke, M. Mathis, T. Poiger, M.E. Balmer, J.F. Blom
Agroscope, 8820 Wädenswil, Switzerland; www.agroscope.ch

* Corresponding author: laurent.boualit@agroscope.admin.ch

Introduction

In order to counteract the potential environmental impact of plant protection, the Federal Council has passed the "Federal Act on the Reduction of Risks from the Use of Plant Protection Products (PPPs)", which aims to reduce the environmental risks of PPPs by 50% by 2027 compared to the reference period 2012-2015. The national risk indicators that were developed^{1,2} to monitor the achievement of this goal are presented here.

Concept



Treated area

Area that can be treated with the amount of an active substance sold annually, assuming an average approved application rate.


Risk score

Risk potential calculated for a single, standardized use of an active substance.

Exposure factor

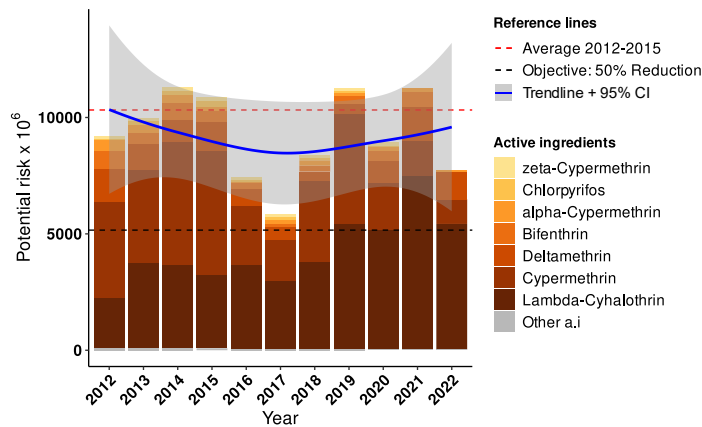
Exposure reduction through mitigation measures and their level of implementation.

$$\text{Risk indicator} = \sum_i (\text{Treated area}_i \times \text{Risk score}_i \times \text{Exposure factor}_i)$$

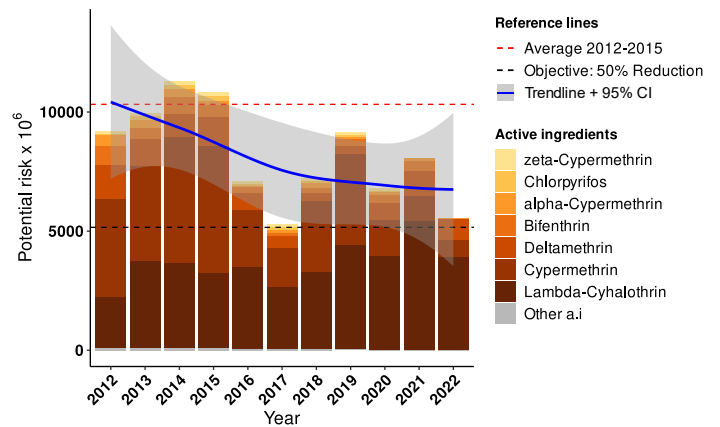
 Only entry into surface water via drift and runoff/erosion is explicitly considered in the risk score calculations. Regarding the risk reduction factors, the fact that no risk mitigation measures were in effect for drainage and shortcuts is explicitly considered.

Surface water risk indicator

Risk indicator without risk mitigation measures



Risk indicator with risk mitigation measures



The surface water risk indicator is primarily influenced by insecticides, notably with pyrethroids making the greatest contribution. A large part of the fluctuations can be attributed to annual changes in the sales of lambda-cyhalothrin and cypermethrin.

Conclusions

The risk indicators can be used to examine the variations in the overall risk potentials for "surface waters", "seminatural habitats", and "groundwater" over time, derived from the annual quantities of PPPs sold across Switzerland. These indicators offer insights into the primary active substances driving the total risk potential, while also considering legal measures for risk mitigation. Consequently, they are important tools for monitoring progress toward meeting the legally stipulated risk reduction objectives.

¹ Korkaric et al. (2022) ² Korkaric et al. (2023)

