ISAC, an unbiased indicator based on active substances for evaluating PPP use.

Durenne B.(1), Weickmans B.(1), Malice E.(2), Huyghebaert B.(1) and Henriet F.(2)

(1) *Unité sols, eaux et productions intégrées, Département Durabilité, Systèmes et prospectives, Centre wallon de Recherches agronomiques (CRA-W), 5030 Gembloux, Belgique ; b.durenne@cra.wallonie.be; b.weickmans@cra.wallonie.be; b.huyghebaert@cra.wallonie.be*

(2) *Unité santé des plantes et forêts, Département Sciences du vivant, Centre wallon de Recherches agronomiques (CRA-W), 5030 Gembloux, Belgique ; e.malice@cra.wallonie.be; f.henriet@cra.wallonie.be*

Session: Herbology for a poster

Keywords: Pesticide reduction, TFI, ISAC, herbicides

Abstract:

Plant protection products (PPP), especially herbicides, are still widely used to control weeds and therefore to prevent crops such as cereals, potatoes or sugar beet from yield losses. In the same time, conserving agricultural productivity with strong sustainability expectations remains nowadays one of the greatest challenges for farming sector [1]. Then, for environmental reasons, agricultural accounting or monitoring of practices at farm level, several indicators have been investigated. It is also agreed that applied pesticide quantities (kg ha^{-1}) obtained from farmers surveys or after recording in a database, reflects more significantly the field reality that extrapolations from national sales data. A widespread indicator is the TFI (Treatment Frequency Index), derived initially from Danish research and after largely developed within "ECOPHYTO", the national action plan to reduce pesticide use in France. This index complies with the requirements of European Directive 2009/128 but implies a systematic bias in the evaluation of active substances used. In fact, it takes into account the number of national recommended doses of commercial products applied to each unit of cropped area and averaged across the crop sequence. Therefore the use of commercial products containing several active substances lets believe to be more sustainable than the use of an equivalent combination of each mono-substance commercial product. Moreover, it can clearly lead to artificial decreases of TFI associated to a truncated evaluation of potential pesticide reduction [2]. In order to quantify and compare farming practices related to weeds control through herbicides use, a derived unbiased indicator called ISAC (Index of Active Substance per Crop) has been developed. ISAC is based on TFI methodology but dedicated to the totality of active substances contained in each pesticide formulations for avoiding the pitfall of commercial products. Then both ISAC and TFI have been calculated for a several set of data and scenario from a Walloon farmers network and related to herbicide applications performed on winter wheat. As expected the results showed that TFI presents a bias and does not allow proper estimation of the active substances load and therefore reduction of use. Conversely, ISAC data fit much more to the different strategies used for weeds control and provide more realistic results based on active substances reduction. Finally, this indicator could clearly be used to quantify all active substance types applied at farm level.

[1]DOI: 10.1038/nplants.2017.8
[2]DOI: 10.1051/cagri/2017004