EUROPEAN SOCIETY FOR AGRONOMY

18th Congress of the European Society for Agronomy

“Synergies for a resilient future: from knowledge to action”

Book of Abstracts

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Rennes, France

The Couvent des Jacobins

L’INSTITUT agro Rennes Angers

INRAE

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WELCOME MESSAGE

The European Society for Agronomy is a scientific society that aims to build bridges between scientists, not only agronomists, but also colleagues from different disciplines to address the major societal and environmental issues related to agriculture, and to promote the science of agronomy and its use in agriculture and rural development throughout Europe.

If the main audience remains European, with this new edition of ESA 2024, we were 310 participants, coming from 28 different countries worldwide, highlighting the international importance of the ESA network.

The last Congress in Potsdam (Germany; 2022) was dedicated to digitalization for the transformation of agriculture. This edition extended the discussions with synergies between technologies to face an uncertain future. For the new edition, we chose resilience to echo with the ability of agricultural systems to recover from unpredictable, sometimes extreme events, and to highlight the inventiveness of human management to build resilience in its many applications and definitions. At this point of rapid expansion and related promises of technological innovations, the Scientific Committee of ESA 2024 wanted to create a momentum to pause the rapid expansion of technical innovations in soil and crop management and to embed them with more social issues, such as the well-being of farmers and their social connectedness to society at large, over the long-term.

This is the essence of the science of agronomy, nourished by transdisciplinarity but transcending it to become an independent discipline with its own concepts and approaches to meet the challenges of the transformational change we need for a viable future.

The word synergy was also used to encapsulate the idea, perhaps idealistic, but certainly humanistic, of the supreme value of diversity.

We hope that the 18th ESA Congress inspired you to initiate or strengthen synergies. Together, we could promote the role of scientific voices for building a better world for next generation, represented during our conference by the numerous young researchers, PhD and Master students.

Prof. Dr. Edith Le Cadre

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Matthieu Carof, L'Institut Agro Rennes-Angers

Olivier Godinot, L'Institut Agro Rennes-Angers

Other members

Audrey Alignier, INRAE

Karine Derrien, INRAE

Vincent Faloya, INRAE

Blandine Lemercier, L'Institut Agro Rennes-Angers

Cendrine Mony, University of Rennes

Virginie Parnaudeau, INRAE

Antonin Pépin, INRAE

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Cendrine Mony, University of Rennes

Antonin Pépin, INRAE

Management of sanitary and environmental impact of agricultural phytosanitary practices: case of farms in the southwest of France (Poster #269)

Oussama Mghirbi, Chaima Grimene, Jean Paul Bord, Philippe Le Grusse

Presenter: Oussama Mghirbi (oussama.mghirbi@unilasalle.fr)

Keywords: pesticide impact; indicators; environmental risk; human health risk; organic farming

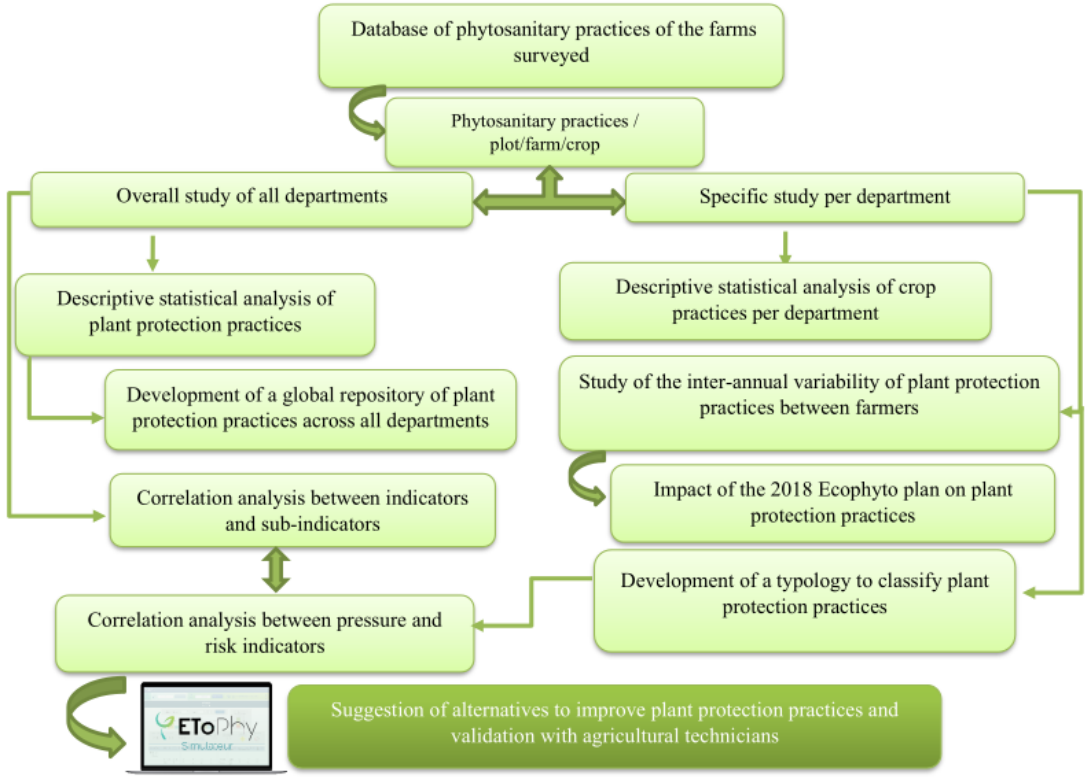

Figure 1. Conceptual model of the work process

1. Introduction

The extensive use of pesticides currently constitutes a major environmental and public health issue (Inserm, 2013; Berardi Tadié and Bonvarlet, 2019). several indicators have been used to evaluate pesticide pressure: TFI, NODU and QSA. Other generic, simple and flexible indicators are used in this context: IRSA and IRTE (Mghirbi *et al.*, 2015) to assess the potential risk of phytosanitary products and their impacts on human health and non-target organisms. The objective of this study is to analyse plant protection practices according to cropping and production systems (conventional/integrated and organic) to assess and manage the risk associated to diffuse phytosanitary pollution at field level located in the southwest of France.

2. Materials and Methods

This study aims to define a methodological framework for using and enhancing a database of agricultural phytosanitary practices collected between 2009 and 2019 in four French

departments (Gironde, Tarn-et-Garonne, Gers and Hérault) to assess the impact of these practices in terms of phytosanitary pressure (TFI), health risk (IRSA) and environmental risk (IRTE) calculated by the EToPhy software (Le Grusse *et al.*, 2014).

The impact of crop treatment practices was analysed in two stages: (1) a global correlation analysis between the different indicators and studying the variability of the indicators and sub-indicators for each crop, across all departments, (2) analysing the phytosanitary practices of crops between departments, followed by an interregional comparison of the south and southwest of France. Based on this analysis, a repository of phytosanitary practices was developed to compare the use of pesticides between crops and production systems (conventional/integrated and organic) according to a typology of phytosanitary practices which makes it possible to define 3 levels of crop treatment practices (low input, medium input, high input).

3. Results

The results of the global correlation analysis between the different indicators according to the crops show a medium or even strong correlation between phytosanitary pressure (TFI) and risk (IRSA and IRTE). Overall, the more the TFI increases, the greater the risk to human health and the environment, but at equivalent TFIs, risk levels may vary greatly depending on the products used. These results lead us to the analysis of the variability of crop protection practices and their relationship with climatic factors to justify the choice of the crop treatment practices applied at farm level in the different departments.

The crop repository shows the variability of phytosanitary practices according to the cropping and production system (conventional/integrated, organic) for each crop. The results show that arboriculture consumes the most pesticides, especially apple trees. In addition, organic farming poses a higher risk to the environment than conventional farming due to the excessive use of copper and sulphur. The analysis of crop treatment practice types makes it possible to deal with the most toxic products to human health and the environment by determining the contribution of each product to risk and pressure, and the target that it corresponds to.

4. Discussion

Agri-environmental indicators are used to build tools for the analysis and management of phytosanitary practices. These tools make it possible to study the relationship and the variability between the pressure and the potential risk of pesticides according to crops. They also help de fine priorities for the implementation of other levers to reduce the use of pesticides and improve the health and environmental performance at farm level. This work also shows the importance of developing a repository that takes stock of the difference within phytosanitary practices between crops and production systems at a regional and departmental level.

5. References

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