



## HOW TO OBJECTIFY EXPOSURE OF THE POPULATION TO SPRAY FROM PHYTOPHARMACEUTICAL PRODUCTS IN WALLONIA

**TO WHAT EXTENT ARE LOCAL RESIDENTS EXPOSED TO SPRAY FROM PHYTOPHARMACEUTICAL PRODUCTS (PPP)? WHAT MEASURES CAN BE PROPOSED TO LIMIT THIS EXPOSURE? THESE ARE THE QUESTIONS THAT THE PROPULPPP STUDY SEEKS TO ANSWER.**

When applied to an agricultural plot, some PPPs can be carried in the air (drift) to reach neighbouring sites in varying quantities depending on the weather conditions and the techniques of application. Volatile PPPs can be carried away relatively far while PPPs associated with solid particles or liquids (aerosols) settle in the nearby vicinity, on the soil surface or on objects. There is little data on actual exposure of neighbouring residents to these drifting PPPs.

The PROPULPPP study's objective is to measure the drift of PPPs near agricultural plots, to determine the risks of cutaneous and inhalation exposure by neighbouring residents using a predictive model and finally to assess the effectiveness of actions aimed at limiting the exposure of these populations to the PPPs.

Wind tunnel and on-site tests with sprayed tracers were conducted to determine the

maximum wind speed when spraying and to reducing the drifting of PPPs by using antidrift nozzles. In addition, measures for dispersion of PPPs were conducted under actual conditions between March and September 2018, in the vicinity of experimental plots, in schools and at resident's homes to check the effectiveness of recommendations aiming to reduce the risks of local resident's exposure, such as the minimum distance between the field and residents, exposure of a hedge or the time for spraying during the day.

The results of PROPULPPP confirm the usefulness of the measure taken in the Decree of the Walloon Government on June 14, 2018, aimed at better protection for the populations bordering agricultural plots. However, these measures should be refined and supplemented. In addition, creating a monitoring tool at the edge of the field and in agricultural localities would make it possible

to check compliance with recommendations and to identify, if necessary, additional prevention measures.

PROPULPPP is coordinated by the ISSEP in partnership with the CRA-W and the University of Liège Gembloux Agro-Bio Tech. The CRA-W is mainly involved in management of experimental plots, in-depth analysis of sediment drift and analysis of PPP residues on sensors. The CRA-W also provides expertise in the use and authorisation of phytopharmaceutical products.

Project financed by the SPW/DG03

More information on the project:  
<http://www.cra.wallonie.be/fr/propulppp>



Bruno Huyghebaert  
[b.huyghebaert@cra.wallonie.be](mailto:b.huyghebaert@cra.wallonie.be)  
Olivier Pigeon  
[o.pigeon@cra.wallonie.be](mailto:o.pigeon@cra.wallonie.be)

Sign up for this quarterly free on our website [www.cra.wallonie.be](http://www.cra.wallonie.be)

Walloon Agricultural Research Center | rue de Liroux, 9 | B-5030 Gembloux | Tel: +32 81 87 40 01 | Fax: +32 81 87 40 11 | [www.cra.wallonie.be](http://www.cra.wallonie.be)  
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## GAIN, INNOVATIVE MANAGEMENT OF ADVENTIVES AND A POTENTIAL SOLUTION TO POLLUTION FROM NITROGEN FERTILISERS



MANAGEMENT OF ADVENTIVES AND THE POLLUTION FROM NITROGEN FERTILISER PROCESSING ARE TWO MAJOR ISSUES IN AGRICULTURE. THE GAIN PROJECT AIMS TO RECONCILE THESE TWO ISSUES.



During the 20<sup>th</sup> century, the simplification of technical itineraries and the significant contribution of nitrogen inputs in mineral form led to the selection of wheat varieties that preferentially extract nitrogen in the form of nitrate to the detriment of the ammonium form, which is too quickly transformed in intensive farming systems. However, many adventives are nitrophilic and consequently favoured by nitrate-rich fertilisers.

In order to remedy this, the GAIN project attempts to combine different strategies allowing winter wheat to develop a competitive advantage over adventive plants, by selectively improving access to the nitrogen resources needed for its growth. One of the strategies studied consists of identifying wheat varieties

with an increased capacity to extract and then assimilate nitrogen in ammonium form. Another strategy aims to develop sustainable approaches that slow the transformation of ammonium into nitrate in the soil.

The GAIN project also includes of a survey conducted among Walloon farmers. The purpose of this survey is to establish an overview of the practices of weed control and nitrogen management for winter wheat and to highlight innovative practices in adventive management. Some 130 farmers have already responded! Still online, the questionnaire can be accessed at [the following link](#). Do not hesitate to pass it on to your networks! This exploratory survey will then be deepened by interviews on farms where the farmer has the opportunity to

explain his management method more and the problems he encounters.

This surveys and interviews may also be used to guide the research to innovative adventive management solutions and to identify actions to be implemented to better support Walloon farmers.

This multidisciplinary project is financed by Wallonia (DGO3) and results from a collaboration between the CRA-W and Gembloux Agro-Bio Tech.



Eléonore Malice  
[e.malice@cra.wallonie.be](mailto:e.malice@cra.wallonie.be)



## POTATO LATE BLIGHT: MONITORING RESISTANCE TO FUNGICIDES

**POTATO LATE BLIGHT REMAINS BY FAR THE MAIN DISEASE OF POTATO CULTIVATION. THAT'S WHY RESEARCH INTO POTATO BLIGHT AT THE CRA-W DATES BACK SEVERAL DECADES, THROUGH THE STUDY OF THE DIVERSITY AND EVOLUTION OF POPULATIONS, CHARACTERIZATION OF GENOTYPES IN TERMS OF VIRULENCE AND RESISTANCE TO FUNGICIDES, ASSESSMENT OF SENSITIVITY OF THE MAIN CULTIVATED VARIETIES, IMPROVEMENT OF TOOLS TO HELP DECISION-MAKING, ASSESSMENT OF THE EFFECTIVENESS OF CONTROL METHODS IN THE CONTEXT OF ORGANIC FARMING OR IN THE CREATION OF VARIETIES.**

Maintaining a healthy potato crop requires a large and repeated number of fungicide applications, mainly for sensitive varieties. In fact, it is not uncommon to see up to 20 fungicide treatments each year. To do this, farmers have a wide range of products with different modes of action.

Since 2013, the CRA-W has partnered with the Euroblight consortium. This European network of scientific partners and phytopharmaceutical companies each year examines the evolution and distribution of late blight strains across Europe. About 1500 specimens are collected each year in 15 countries and are genotyped. In Wallonia, the situation remained unchanged until 2016 when 3 genotypes represented 70 to 90% of the strains collected. At this time, only the family of phenilamides (active ingredient: Metalaxyl-M) showed signs of ineffectiveness

due to the presence of resistant strains of *Phytophthora infestans* (Blue-13 or 13\_A2 strain). In 2017 and 2018, a sudden change was observed and the strains of late blight, the majority 3 years ago, were replaced by two new genotypes: 36\_A2 and 37\_A2. After they appeared, cases of resistance to fluazinam were observed. Analyses then showed that all 37\_A2 genotypes were resistant to this active ingredient.

The sudden appearance of new genotypes and their rapid propagation on European territory reminds us more than ever of the importance of continuing research into potato late blight and more particularly the work of monitoring populations. This is even more true when the appearance of a new genotype is associated with phenomena of resistance to a fungicide. Creating new resistant varieties and optimising

tools to help decision-making are levers that make it possible to justify the use of fungicides and therefore reduce the risk of new resistant strains appearing.



Vincent César  
[v.cesar@cra.wallonie.be](mailto:v.cesar@cra.wallonie.be)



## PHENOTYPING TOOLS FOR BREEDERS AND FARMERS

RECENTLY, THE CRA-W HAS BEEN INVOLVED IN DEVELOPING PHENOTYPING TOOLS IN GREENHOUSE AND IN FIELD FOR CROP PLANTS.



In recent years, the CRA-W has had portable instruments for fluorimetry, spectroscopy and near-infrared imaging to characterise on-site the phenotype of different varieties of beets, potatoes and cereals. In particular, these tools are used to assess the biotic and abiotic stresses on seedlings in greenhouses or plants in the field. Various projects are currently underway at the CRA-W.

The **Beetphen** project, with federal funding (Belspo), has the goal of studying the sensitivity to powdery mildew of sugar beet varieties. Field observations are linked to ground-based data using portable fluorimeters and visible/near-infrared spectrometers as well as with data acquired by drones equipped with various sensors.

Meanwhile, the **Phenwheat** project, funded by the Walloon Region (DGO3), aims to characterise the growth dynamics of varieties of winter wheat resistant to various biotic and abiotic stresses using a platform for phenotyping by proxidetection. Various hyperspectral sensors are evaluated in it to study the sensitivity to fusarium of the ears and seeds of winter wheat varieties.

The **First** project, on internal funds of the CRA-W (Moerman), aims to develop tools that allow identification of genotypes associating resistance to pathogens and the efficiency of nitrogen use. The hyperspectral sensors are assessed in this case to study the sensitivity to late blight

and nitrogen stress of potato varieties, both in the phytotron, in the greenhouse and in the field.

In addition to these measurements of plants on the ground, aerial images taken by means of drones, airplanes or satellites are also analysed at the CRA-W. All these phenotyping activities are part of the more general framework of the Belgian Plant Phenotyping Network (**BPPN**) which forms a link with the European Plant Phenotyping Network (**EPPN**). These networks aim to make phenotyping tools available to researchers and plant breeders in order to create tomorrow's varieties that are more resistant to climatic and biotic stresses and less demanding of fertilisation and plant protection products. They will also provide farmers with the tools necessary for precision farming.



Philippe Vermeulen  
p.vermeulen@cra.wallonie.e  
Ferial Ben Abdallah  
f.benabdallah@cra.wallonie.be



## FACILITATING FINANCIAL MANAGEMENT OF YOUR FARM ONLINE

THE PROBLEM OF OVERINDEBTEDNESS IS A GROWING PHENOMENON AMONG FARMERS. ALTHOUGH PRICE VOLATILITY IS AN EXPLANATORY FACTOR, THE LACK OF MONITORING THE FARM'S FINANCIAL SITUATION IS OFTEN AN AGGRAVATING OR EVEN CENTRAL FACTOR.



Development of a simplified online management tool was initiated as part of the AGRICOGEST project which brings together four partners: the CRA-W, GroupeOne, Diversiferm and the GASAP network (Groupes d'Achat Solidaires de l'Agriculture Paysanne [Small Scale Farm Joint Buying Groups]). The software is currently being developed from two existing and complementary tools: Tresogest, an Excel management tool for diversified farms developed by the CRA-W, and EcoBox, an online simplified management tool for very small businesses developed by GroupeOne. With a wealth of experience and successes, the

project aims to promote and share the knowledge acquired from these 2 tools. In order for the new tool to best adapt to user's needs, development is part of a process of co-construction, integrating future users throughout the process:

### Identify features with future users

What features are to be integrated in the tool? To answer this question, a workshop was arranged with future beneficiaries. The workshop brought together supporting organisations (Crédal, the Mouvement d'Actions Paysannes, Accueil Champêtre de Wallonie, Créajob, Finagri, GASAP network) as well as farmers from various farms (the Ferme de Stéé, the Ferme d'Esclaye, the Ferme Crève-cœur). In all, 23 features were listed and prioritised. The tool must be a gateway to collect its figures and must be addressed to all farmers with no management tool, in activity or considering setting up.

### Designing indicators with advisers

How are indicators to be designed that answer farmers' specific questions? To address this issue, a working group was formed with financial management advisers. A schedule of

suppliers and customers to know in one click the details of supplier arrears and late paying customers, and a cash forecast table to anticipate shortfall months are among the indispensable indicators for proper control of the farm.

### Testing the prototype and diffusion model directly in the field

Can the software be easily learned and is it adapted to the realities in the field? To find out, the new tool is being tested by a GASAP network supporter with 5 farmers up until September.

At the end of this process, the tool will be disseminated more broadly to the industry while maintaining an iterative and collaborative approach in order to continuously optimise it on the basis of feedback from users and to make it compatible with other freeware.

Curious to learn more? Come and listen to the presentation of the project and learn the name of the new application at the Libramont Agricultural Fair on Friday, July 26 at 1:00 p.m. at LEC 2.



Mary Guillaume  
m.guillaume@cra.wallonie.be



## A DAIRY COW RATION WITH LESS SOYA MEAL?



PROTECOW

AS PART OF THE PROTECOW PROJECT, FIVE SOLUTIONS TO REDUCE THE PROPORTION OF SOYA MEAL IN DAIRY COW RATIONS HAVE BEEN IDENTIFIED AND TESTED ON STANDARD FARMS.



Today, the use of soya meal in the livestock feed is more than controversial. The major advantage of this product is its nutritional benefits, particularly in dairy cow rations based on corn silage. Conversely, the disadvantages are economic (high price volatility, import dependence) or environmental (deforestation, GMOs). To bring solutions to breeders, PROTECOW has been studying the levers that can be mobilised on dairy farms that allow the soya meal used to be partially or completely reduced.

REPLACING SOY BY ...	QUANTITIES OF SOY SAVED	GROWTH OF NET MARGIN
Rapeseed meal	100 %	+ 14 %
Italian Ryegrass catch crops	14 %	+ 4 %
Fodder richer in protein	23 %	+ 7 %
Toasted faba beans	22 %	+ 2 %
Switching to organic farming	64 %	+ 8 %

### Five levers: 14% to 100% of soya saved

Five solutions were selected on the basis of breeder expectations and available resources on the farms of the project area (France-Wallonia-Flanders). Their technical and economic impacts were then assessed by simulation on average representative farms in the region.

With a reduction of soya meal from 14% to 100%, the improvement of the net margin is positive (2% to 14%) for all the solutions. The results of this study have been summarised in technical data sheets available on the PROTECOW website.

To support these initial results, some of these techniques will be tested *in situ* in PROTECOW network farms during 2019.

For further information:  
[www.interreg-protecow.eu](http://www.interreg-protecow.eu)

This project is subsidised by the European funds of the INTERREG V FWFL program, Wallonia and the province of West Flanders.



Lise Boulet  
[l.boulet@cra.wallonie.be](mailto:l.boulet@cra.wallonie.be)

## AGENDA



### 26 TO 29 JULY LIBRAMONT AGRICULTURAL FAIR

The Walloon Agricultural Research Centre will be at the Libramont Agricultural Fair

Conferences at the LEC 2

Friday 26 July at 1.00 p.m.

**Tresoferme: a project aimed at improving farm management.**

Friday 26 July at 4.00 p.m.

**Managing your agricultural parcels? The BELCAM online platform can help you!**

Saturday 27 July at 10.00 a.m.

**Exposure of populations to phytopharmaceutical sprays and protective measures to limit this exposure.**

Find us at the heart of the Wallonia Agricultural Village (Hall 3), beneath the En Terre Bio tent and the Smart Farming Space.

For further information, go to:

<http://www.cra.wallonie.be/fr/foire-de-libramont>

Contact: [communication@cra.wallonie.be](mailto:communication@cra.wallonie.be)

## NEW PUBLICATION



### Poultry production in organic farming OUTDOOR RUN ENRICHMENT



More and more farmers are now recognising the importance of the outdoor run on an open-air poultry farm. Its use and optimisation provide benefits, not only for your poultry but for the whole farm and its environment. This booklet, which is based on the CRA-W cradles of knowledge approach, brings together the findings of trials and research projects carried out in Belgium and elsewhere.

You can request a hard copy of the booklet (only French version) by email, using the address below [celluleagribio@cra.wallonie.be](mailto:celluleagribio@cra.wallonie.be) or download it free of charge by visiting: [www.cra.wallonie.be](http://www.cra.wallonie.be)