

## Toxicovigilance in agriculture: the Phyt'attitude network

Phyt'attitude is a vigilance network created in 1991 by the Agricultural Mutual Insurance Scheme (MSA) and generalised to all départements of metropolitan France in 1997. It works to record and analyse all information on accidents, incidents and health effects occurring during the use of chemical products (plant protection products, biocides, veterinary medicinal products, others) by employees and operators in the agricultural sector and certain related sectors, such as plant nurseries, maintenance of green spaces, etc., in order to improve prevention by reporting information to manufacturers and public authorities. Reports are then analysed to identify the acute and subacute adverse effects of these products, in order to develop collective and individual preventive measures through recommendations to users, while taking the real working conditions into account.

The Phyt'attitude network operates on the principle of voluntary reporting of adverse events immediately after their occurrence via a freephone number, which has been in operation since 2004<sup>1</sup>; these health events can also be reported during periodic medical check-ups or company visits.

### A dense network covering the entire country

The network is based on the 35 MSA funds and particularly the occupational health and safety departments and their multidisciplinary teams (occupational physicians, nurses specialised in occupational health, prevention advisors). Symptoms suspected to be related to the handling or contact with these products are reported by occupational physicians. These reports may concern situations of acute exposure or the delayed occurrence of diseases following chronic exposure, which are dealt separately. The information collected includes anonymised medical data, the names of the suspect products and details of the exposure (industry sector, crop, task, temperature and wind conditions, equipment, etc.), including collective and individual preventive measures used (type of tractor cab, personal protective equipment, etc.). Report collection is often accompanied by a technical investigation conducted by a prevention advisor at the place of exposure.

1. 0 800 887 887

2. This method is derived from the official French method used in pharmacovigilance for determining causality, which was developed in 1978 by J. Dangoumou, J.C. Evreux and J. Jouglard and updated in 1985 by B. Bégaud, J.C. Evreux, J. Jouglard and G. Lagier. Causality is rated from I0 to I4: excluded, unlikely, plausible, likely, very likely.

Dossiers relating to "acute" diseases are then sent to a toxicology expert, who assigns causality<sup>2</sup> to each "symptom/product" pair. The findings of each investigation are sent by the toxicology expert to the reporting physician and the MSA Central Fund (CCMSA). Product causality is not assigned for chronic or delayed diseases.

All reports relating to plant protection products, biocides or veterinary medicinal products are entered into the Phyt'attitude database, which is managed by the CCMSA.

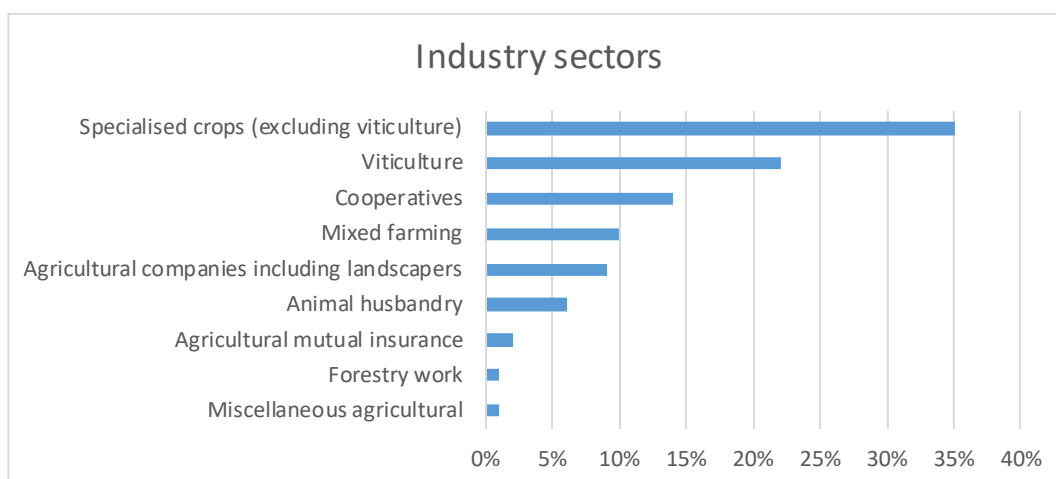
### A few figures

From when the Phyt'attitude network was rolled out across the country up to 30 December 2016, a period of almost 20 years, a total of 3,506 dossiers were transmitted. Nearly 85% of them concerned "acute" cases, while 15% were related to chronic or delayed diseases. It should be noted, however, that over the last 10 years, transmission of dossiers on chronic or delayed diseases has continued to grow, with them now accounting for 23% of all dossiers transmitted on average.

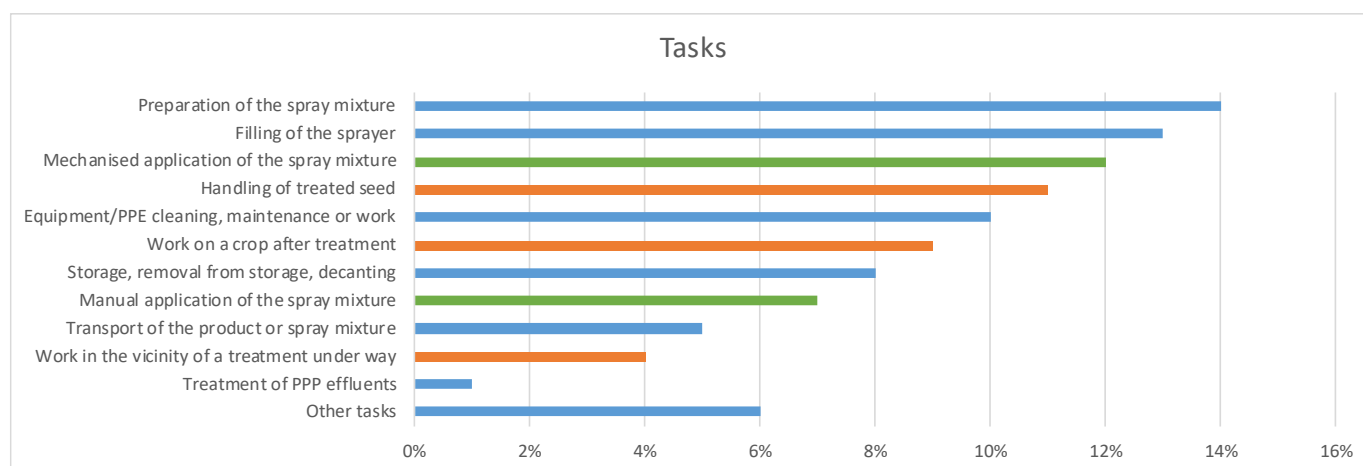
Over the period 2011-2014, 409 dossiers concerning acute diseases related to plant protection products were registered; the causality in 226 of these was higher than I1.

Men accounted for 79% of the reports, reflecting their predominance in the agricultural population of plant protection product users.

The occupational categories "Farmer" (31%) and "Agricultural employee" (66%) together accounted for 97% of attributable reports. Of these 97%, women accounted for 22% of reports and were most often agricultural employees (90%), with just 10% of them being farmers. Half of the women were indirectly exposed when working on recently treated plots, in the vicinity of ongoing treatment or when handling treated seeds. Nearly 35% of reports concerned a specialised crop sector such as cereals, floriculture, market gardening, endives, nurseries, arboriculture or mushroom farming. Viticulture alone accounted for 22% of reports (Figure 1).



**Figure 1:** Industry sectors concerned by reports



**Figure 2:** Tasks being performed at the time of the incident

Among the tasks being carried out at the time of the incident, the phases of preparing the mixture and filling equipment were the most commonly reported, along with mechanised and manual application tasks. Despite a significant decrease in this use, manual application of the mixture is still common in the flower, ornamental tree, green spaces and viticulture sectors (56%) (Figure 2).

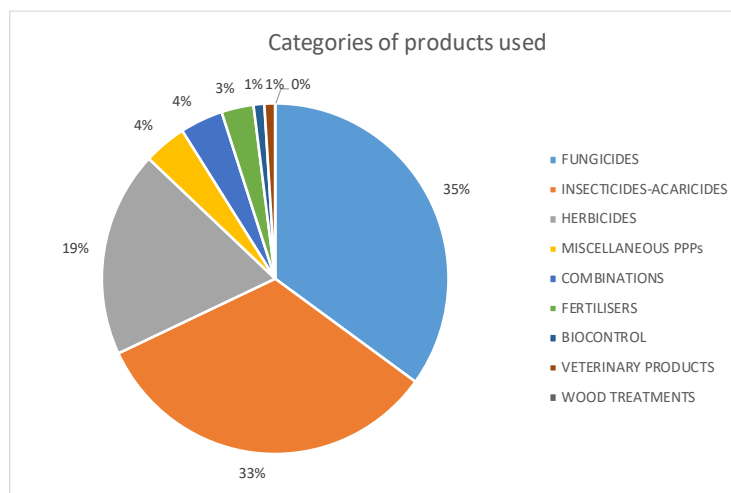
Twenty-six per cent of the dossiers reported an incident (mechanical, meteorological or related to personal protection), with 20% of them involving rupture of the equipment (cans, clamps, hoses, etc.) and 14% a fault with the personal protective equipment (tearing, soiling). Furthermore, in half of the reports, the subjects wore gloves for all tasks; if these are broken down, 77% wore gloves when preparing the mixture, 69% when applying it and 59% when filling and cleaning the equipment. Lastly, 64% said they showered at the end of the day and only 13% immediately after exposure.

There was a total of 392 products included in all dossiers in the period 2011-2014, the most common being fungicides followed by insecticide-acaricides, with 35% and 33% of all products respectively. More than 40% of the attributable reports mentioned the use of two or more plant protection products (Figure 3).

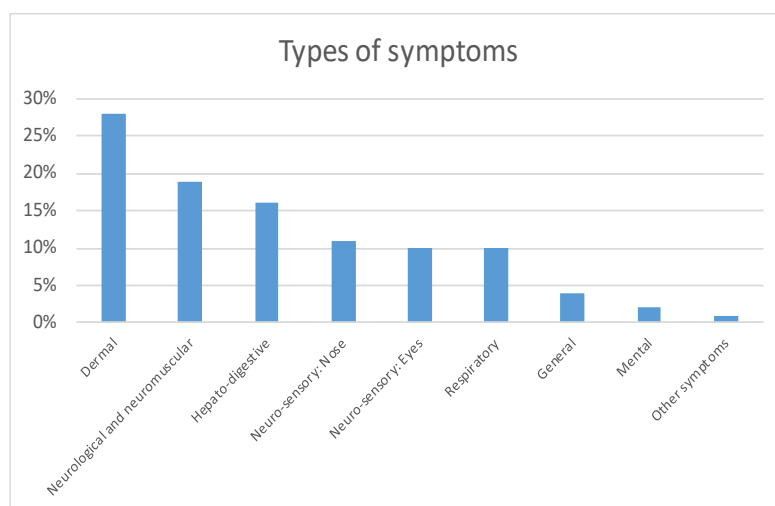
In the reported cases, the liquid form<sup>4</sup> of plant protection products was mentioned most often. For all disorders/symptoms and regardless of the formulation, skin symptoms were most commonly reported, followed by neurological/neuromuscular and hepato-digestive symptoms (Figure 4).

Fungicides and herbicides mainly induced skin symptoms, whereas insecticide-acaricides mainly generated neurological/neuromuscular disorders/symptoms. Medical intervention was required in 35% of reports, and hospitalisation in 3% of cases (6 out of 226).

4. As opposed to "wetable powder", "water-dispersible granules" and miscellaneous forms.



**Figure 3:** Categories of products used



**Figure 4:** Types of symptoms

### Phyt'attitude and ANSES

Cooperation on the use of data from the Phyt'attitude database was established between AFSSA<sup>5</sup> and the CCMSA in 2007, when the Agency was first entrusted with the assessment of plant protection products; this then continued with ANSES. Phyt'attitude data are analysed and systematically integrated into the conclusions of the plant protection product assessments conducted by ANSES.

For each active substance, the CCMSA thus extracts data from the Phyt'attitude database to identify all the reports available since 1997 involving at least one plant protection product containing the substance.

The purpose of the analysis is to identify symptoms that can be objectively attributed to the active substance and the product under assessment; another objective is to identify tasks or other potentially exposing factors that could call into question the conditions of use of a plant protection product containing this active substance in an occupational setting. In addition, data on active substances are included as far as possible in European RARs<sup>6</sup> and in the "substance" data sheets published by ANSES as part of the phytopharmacovigilance scheme. Lastly, these data provide invaluable information for ANSES's opinions in response to formal requests, such as the one on the health effects of neonicotinoids.

5. AFSSA: the French Food Safety Agency, which later became ANSES after merging with AFSSET (the French Agency for Environmental and Occupational Health Safety).

6. Renewal Assessment Report: monographs on active substances.

**Aiming for a European toxicovigilance scheme for plant protection products**

As with any vigilance scheme, the reports are neither exhaustive nor representative of every health effect, since the scheme is based on the principle of voluntary reporting. To raise awareness about this network among the farming community and encourage reporting, the CCMSA, in conjunction with the National Institute of Agricultural Medicine (INMA), has undertaken a number of initiatives, particularly with training for the Certiphyto certificate (mandatory for all users, advisors and sellers of plant protection products), during which specific information on Phyt'attitude is provided.

In spite of these limitations, the Phyt'attitude network has proved its value in the post-marketing authorisation (MA) monitoring of the effects of plant protection products in the field of occupational health, through its ability to provide accurate information based on feedback from the field that combines medical, technical and contextual data. This toxicovigilance scheme developed by the CCMSA is currently the only one in Europe to operate in the area of plant protection products, and it could be useful to replicate this example on a Eu-

ropean scale in order to increase its effectiveness, following the example of the European pharmacovigilance scheme for human and veterinary medicinal products. This is one of the recommendations contained in the recently published EFSA Opinion<sup>7</sup> on taking epidemiological studies and vigilance data into account in risk assessments of plant protection products.

**Marie-Odile RAMBOURG**

**TO FIND OUT MORE, VISIT:**

<http://www.msa.fr/lfy/sst/phyt-attitude/>

7. Scientific Opinion of the PPR Panel on the follow-up of the findings of the External Scientific Report. "Literature review of epidemiological studies linking exposure to pesticides and health effects" EFSA Journal 2017;15(10):5007 [101 pp.].