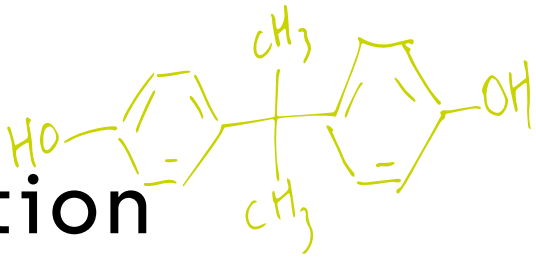
ENVIRON-MENT

2

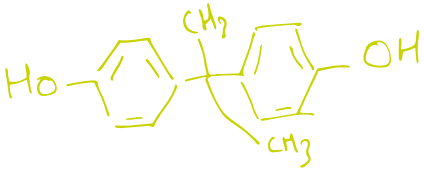
Reducing our exposure to environmental pollution

Improved knowledge and identification of endocrine disruptors



Substances identified as endocrine disruptors interfere with hormone functioning and have harmful effects on exposed humans and animals. ANSES is actively developing specific methods to identify them and better understand the hazards and risks they pose. The Agency was one of the first to warn of the health issues associated with these substances, and is heavily involved in the National Endocrine Disruptor Strategy. It is also committed to European initiatives to harmonise scientific and regulatory approaches and better characterise and prevent the health effects.

"We are heavily involved in the National Endocrine Disruptor Strategy, working on 18 of the 50 actions launched in 2019."



Three questions for…

MATTHIEU SCHULER,
RISK ASSESSMENT DIRECTOR

What is an endocrine disruptor?

→ Hormones and their regulation form part of the essential biological mechanisms of living beings. Certain substances, which may be natural or man-made, can interfere with these mechanisms. When these interferences disrupt hormone functioning and have adverse effects on human or animal health, they are known as endocrine disruptors.

What are the issues involved?

→ We are working to identify the substances that cause these effects in humans or animals and understand their mechanisms of action. This identification is complex because the mechanisms of action of endocrine disruptors, like those of hormones, may only be expressed at certain stages of development and may not be correlated with the exposure dose. ANSES studies and assesses the available scientific literature on these substances and, as part of the PNR-EST, has been funding specific research projects with an annual budget of €2 million since 2018. This enables the Agency to help advance knowledge on the identification and characterisation of these substances, and the search for alternatives. ANSES has now been working for more than ten years on characterising and assessing the risks of endocrine disruptors. We broke new ground by proposing a revision of the methodology previously in force, including in the assessment the concept of "windows of exposure", i.e. periods during which individuals were more susceptible to endocrine disruption. Their assessment has therefore become more complex, but also more precise.

What is ANSES working on?

→ In addition to our assessments of specific substances, the first National Endocrine Disruptor Strategy, supported by the Ministries of Ecology and Health, led us to identify a method for characterising endocrine disruptors that can be applied to specific substances. We will continue this work in the second National Strategy, launched at the Agency's headquarters last September. We really are heavily involved, working on 18 of the 50 actions launched in 2019. Our dedicated group of experts, the Working Group on "Endocrine disruptors", had already been looking to identify the various lists of substances of interest drawn up. It had also been working on the complex development of a method for obtaining a more detailed post-assessment classification of the substances studied according to whether their behaviour as endocrine disruptors is proven, presumed or just suspected.

At the European level, ANSES is taking part in several regulatory schemes seeking to identify substances that are endocrine disruptors in order to limit their health impact. We therefore act within the framework of the REACh Regulation by filing what are known as use restriction dossiers, and that of specific regulations for biocides and plant protection products. The latter regulation enables the detection and withdrawal of endocrine disruptors identified during the plant protection substance approval process, involving national health agencies alongside the European reference health authority, EFSA.

BISPHENOL A AND BISPHENOL B IDENTIFIED AS ENDOCRINE DISRUPTORS BY ANSES

Very early on, ANSES took an interest in the issue of bisphenol A, now identified as a substance of very high concern in the REACh Regulation. As early as 2011, the Agency published two reports on the health effects and uses of bisphenol A. It identified the priority as preventing exposure to the most vulnerable populations: infants, young children and pregnant or breastfeeding women, and recommended, among other things, replacing bisphenol A in food contact materials. Following its conclusions, in 2012 the French Parliament adopted a law suspending the manufacture, importation, exportation and marketing of all food packaging containing bisphenol A. Thus, since 1 January 2015, it has been prohibited in infant feeding bottles and other food containers. More recently, ANSES experts conducted an assessment of the endocrine-disrupting properties of bisphenol B, sometimes used as an alternative to bisphenol A, notably in the United States as an indirect additive for certain coatings and polymers in contact with food. The results of this work, published in October 2019 as a paper in the journal *Environmental Health Perspectives*, concluded that the endocrine properties of bisphenol B are similar to those of bisphenol A. Although it is not manufactured or used as a chemical in Europe, its identification as an endocrine disruptor under the REACh Regulation will prevent industry from developing its use or manufacture and will require importers of items to declare the presence of bisphenol B as soon as it exceeds 0.1 %.

10 ans

National Research Programme for Environmental and Occupational Health

For more than ten years, ANSES has been coordinating and supporting research by funding projects as part of the National Research Programme for Environmental and Occupational Health (PNR-EST). In over a decade, around 500 projects have been funded and more than €70 million have been mobilised to generate new scientific knowledge on occupational health, links between cancer and the environment, air pollution, endocrine disruptors, nanomaterials, plant protection products, etc.

This work, which is published in scientific journals, then feeds into the Agency's risk assessments. Over time, the PNR-EST has adapted to new issues arising, such as the effects of climate change, new technologies or the emergence of contaminants such as microplastics. Each year, new scientific disciplines are integrated in the teams conducting the work. This programme also contributes to the training of doctoral and post-doctoral students, providing ANSES with a pool of future experts for risk assessment. Twice a year, the Agency organises a day of scientific meetings during which researchers present their projects to all interested parties (supervisory ministries, associations, unions, the media, etc.) and exchange views and ideas.

Nearly **500** research projects have now been funded by ANSES in over a decade,

representing more than € **70** million allocated for the production of new scientific knowledge.

IN 2019

Forty projects were selected by ANSES, for a total amount of €6.5 million, including a specific budget of €2 million dedicated to the issue of endocrine disruptors. These projects relate to one or more types of environmental exposure:

- twenty projects concern **chemical agents**, including 11 on **endocrine disruptors** financed mainly by the dedicated budget allocated to this theme. Four specifically address issues of **neurodevelopment** and **neurological disorders**;
- six projects concern **physical agents**, including four on **radiofrequencies** and two on **light pollution**;
- eight projects address questions of **indoor** or **outdoor air quality**, four of which are related to **respiratory diseases**;
- four projects focus on **pathogen vectors** and **vector control**;
- three projects focus on **mineral fibres** and **nanoparticles**, including one on **co-exposure** with **endocrine disruptors**.

They will contribute knowledge in several different fields or disciplines, including:

- **occupational health** (8 projects);
- **cancer** (7 projects);
- **ecosystems** (3 projects);
- **the human and social sciences** (1 project).

↘ TEN YEARS OF ANSES,
see our selected highlights on www.anses.fr

Improving air quality

The quality of the air we breathe, both inside and outside our homes, is a major public health issue. ANSES's work advances knowledge of the hazards, exposures and risks associated with air pollutants. It provides a scientific basis for developing public policies and enabling action at the source to better protect our health.

Air pollution includes multiple pollutants (fine particulate matter, nitrogen oxides, volatile organic compounds, ozone, etc.), many of whose harmful respiratory, cardiovascular and neurological effects on health (to name but a few) are already known. While outdoor pollution, such as that caused by vehicle traffic, factories, heating or fires, is what springs to mind most readily, air pollution also affects the indoor environment of our homes and workplaces, because certain materials and human activities emit pollutants into enclosed spaces. For more than a decade, the Agency has been working on developing indoor air quality guidelines (IAQGs) for substances identified as particularly problematic in indoor environments.

IAQGs have now been proposed for 13 substances. In 2019, the IAQGs for trichloroethylene that had been established in 2009 were updated on the basis of the continuous scientific monitoring conducted by the Agency. In addition, ANSES's work in conjunction with research organisations and air monitoring stakeholders has helped improve scientific knowledge as well as public policies and regulatory texts on air quality, in particular by targeting pollutants of concern.

This year, ANSES also provided scientific and technical support for the revision of the ATMO index, designed in 1994 by the Ministry of the Environment and several approved air quality monitoring associations and used to inform the general public. The revised index will better reflect air quality, for example by including PM2.5 fine particulate matter. Lastly, the Agency has also been studying the links between outdoor and indoor air. In 2019, ANSES conducted an expert appraisal on the transfer of outdoor air pollution to the interior of buildings. Although there are many factors that can influence pollutant transfer, it does not seem possible to rank them. These aspects therefore need to be considered on a case-by-case basis with a broad integrative vision, in the context of construction, building refurbishment or land planning projects.

Focus

EXPERT APPRAISAL ON AMBIENT AIR PARTICULATE MATTER AND THE IMPACT OF ROAD TRAFFIC

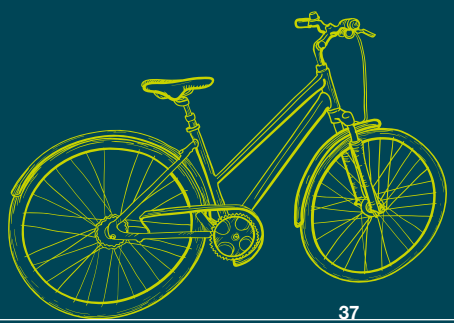
As part of its missions on air quality, ANSES conducts collective expert appraisals to analyse knowledge or assess risks associated with specific situations.

This helps advance risk assessment or monitoring, as it did in 2019 for ambient particulate matter. A systematic review of the scientific literature provided ample evidence and enabled ANSES to confirm the health effects associated with certain components of this particulate matter. The Agency recommended that ultrafine particles, black carbon and organic carbon be tracked as a priority in public policies addressing air pollution.

In the same work, ANSES also confirmed the health effects of exposure to different emission sources such as road traffic or the combustion of coal, petroleum products and biomass, and stressed the need to act on them. While the Agency highlighted technological developments in the motor vehicle fleet, it noted that these alone will not be sufficient to improve ambient air quality in large cities. According to ANSES, reducing road traffic and implementing alternative non-polluting forms of transport are therefore essential for effective action.

SCIENTIFIC MEETINGS ON AIR QUALITY

→ On 17 October 2019, ANSES co-organised a scientific symposium with ADEME to present the progress on expert appraisal of air quality achieved through the research projects it funds under the National Research Programme for Environmental and Occupational Health. The day was a testament to the complementary nature of the two agencies' work, sharing the same goal of encouraging dynamic research and productive dialogue on the issue of air quality. It provided an opportunity to discuss the work carried out on characterisation of pollutant sources and human exposure, along with studies on the health effects and societal impact.



Accidental pollution: the Lubrizol fire ↘

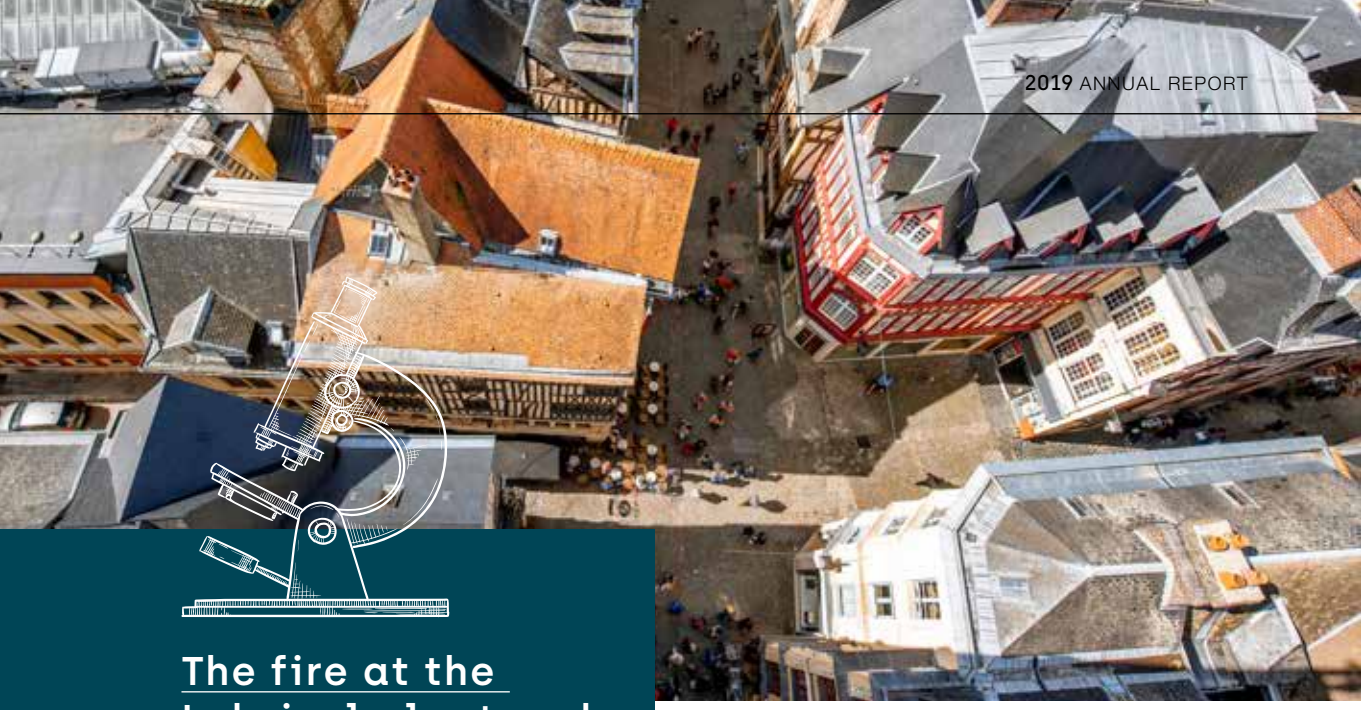
Following the fire at the Lubrizol plant in Rouen, ANSES was promptly asked to assess the potential risks associated with the substances found in the smoke plume. From September to December 2019, the Agency issued six opinions on this industrial accident and, more specifically, on its potential impacts on food safety in the short and medium term.

The large plume of smoke produced by the fire of 26 September deposited particles over a very large area. The authorities rapidly commissioned measurements and sampling in order to determine which hazardous substances may have been emitted. To supplement the emergency strategy implemented, ANSES was asked to identify the main substances likely to have health effects, according to the different routes of exposure. Its contribution complemented the work of INERIS, the reference body for industrial risks, which drew up a list of substances that may have been released into the environment, and the areas exposed following a fire of such magnitude. The Agency also gave its view on the adequacy of the specific surveillance and sampling measures taken with regard to agricultural and food production, and drinking water.

PROTECTING HUMAN HEALTH IN THE SHORT TO MEDIUM TERM

In the days following the fire, farm animals may have consumed food contaminated by particle deposition. Moreover, although soot-contaminated crop production was excluded from consumption, other crops may have been polluted by less visible particles. ANSES's work, based on the analyses received, did not find any contamination levels that could lead to increased risks of dietary exposure in the short term. Medium-term concerns related to the possible persistence in the environment of pollutants that could migrate into food, or even accumulate via water, soil, plants consumed by farm animals or directly by humans, thereby constituting sources of chronic exposure to pollution from the fire.

With a view to optimising surveillance and sampling plans over time, ANSES therefore recommended that soil, pasture and food contamination should continue to be monitored for one year, especially for open-field crops and livestock reared outdoors. Production to be monitored more closely included milk, eggs, farmed fish, root vegetables and maize silage.



The fire at the Lubrizol plant and its consequences: ANSES's six opinions in 2019

10 OCTOBER

→ Food risks associated with the fire

14 OCTOBER

→ Specific expert appraisal on milk analyses

18 OCTOBER

→ Post-accident food risks

21 OCTOBER

→ Specific expert appraisal on monitoring of drinking water

28 NOVEMBER

→ Long-term monitoring of food

18 DECEMBER

→ Monitoring of drinking water in the Hauts-de-France region

LEAD POLLUTION: VIGILANCE REGARDING EXPOSURE VIA OUTDOOR AREAS

→ Lead is toxic to health, especially for young children. It is emitted into the air from industrial or small-scale work sites, or released due to erosion from architectural features. Lead can contaminate various media, including food, and dust from outdoor or indoor air. Contamination can also be caused by accidental pollution, as was the case with the fire at the cathedral of Notre-Dame de Paris in April 2019.

→ ANSES therefore examined lead exposure via contaminated dust deposited on the surfaces of outdoor public areas such as pavements, roads, street furniture, outdoor playgrounds, etc. In its opinion issued in early 2020, the Agency concluded that it should be considered as a source of exposure, and made recommendations on reducing it, targeting mainly children and certain professionals, who are especially likely to be exposed through contact or ingestion.

Assessing and monitoring the impact of plant protection products↘

Plant protection products are part of the arsenal that can be used to combat plant pests. Because these products are not without danger, their authorisation and monitoring has been entrusted to a health authority. In 2019, ANSES granted authorisations but also withdrew products from the market, and suggested some changes to strengthen the European regulatory framework. It also continued its work to gain a better understanding of the health effects of using plant protection products on both humans and the environment, in order to improve their protection.

PROTECTING THE HEALTH OF RESIDENTS

→ Protecting populations when plant protection products are used is a European regulatory requirement. For each marketing authorisation application, ANSES therefore assesses the health risks to operators, workers and local populations, and prescribes minimum distances from residents and walkers when treating crops. Pending changes to existing marketing authorisations, in June 2019 ANSES recommended establishing minimum safety distances at values at least equal to the distances taken into account in the assessments. As a precautionary measure, it also recommended increasing these distances for products containing active substances with assumed or suspected carcinogenic, mutagenic or reprotoxic effects. In December 2019, ANSES published an additional opinion on the different ways of reducing exposure to product drift during spraying.

↘ Plant protection products, however useful they may be, are not completely harmless. They also contribute to overall exposure to chemicals from human activities. ANSES supports the principle of reasoned use of these products that is as low as possible, in order to limit the exposure of workers and the general population, as well as that of living organisms and ecosystems. Minimal use also means it is possible to protect crops from the main pests while preserving the effectiveness of plant protection products from resistance phenomena observed in pathogens, insect pests and invasive plants. ↙

→ ANSES is involved in the European process to assess and authorise plant protection active substances and products. It also closely monitors the effect of products available on the market with the help of phytopharmacovigilance, a scheme specific to France that coordinates some 20 partner organisations. This is used to collect field data (residues in soil, water, air and food, exposure levels, health effects) and also funds specific studies. These missions concern all products, including those used in organic farming.

When ANSES identifies any effects for a product or product class, through either its own studies or a careful review of the recent scientific literature, it does not hesitate to review the marketing authorisations for these products in order to restrict or even withdraw the authorisations, or just some of the authorised uses. In 2019, on the basis of the new European guidance document on the identification of endocrine disruptors, it withdrew from the market 76 products containing epoxiconazole, a fungicidal active substance widely used on cereal and beet crops, after having assessed and confirmed its endocrine-disrupting nature. This withdrawal went ahead without waiting for action to be taken by the European Union.

ANSES is also responsive to reports from whistleblowers. In early 2019, it published the results of an emergency collective expert appraisal on succinate dehydrogenase inhibitor (SDHI) fungicides. This concluded that in light of the available scientific data, there was no health alert. However, ANSES called for vigilance at European and international level and made funding available to step up research on the potential toxicological effects of these substances for humans. The phytopharmacovigilance scheme has since been used to document exposure and detect possible health effects of SDHIs in the field. In 2020, the Agency will also publish the results of its internal request on cumulative exposure to different SDHIs via food.

While ANSES's mission is to conduct scientific assessments of plant protection products with regard to the requirements of European regulations, it also regularly makes proposals for improving the methods used for assessing these products. For example, in 2019, it recommended to the regulatory authorities improvements in the methodology for assessing long-term risks to bees and other pollinators based on the guidance document proposed by the European Food Safety Authority (EFSA).

Focus

ANSES'S WORK ON GLYPHOSATE

Glyphosate is an active substance used in herbicides and approved by the European Union until December 2022. Following the controversies of recent years, in particular regarding its carcinogenic potential, the European framework for assessing products containing glyphosate was strengthened. In 2018, France initiated a national glyphosate withdrawal plan designed to phase out its main uses by late 2020. In this context, ANSES took part in a number of actions, with several highlights in 2019:

European re-assessment of the active substance glyphosate

→ ANSES took part in this re-assessment initiated on 15 December 2019 and led by a consortium of States (Hungary, Sweden, the Netherlands and France/ANSES). The Assessment Group on Glyphosate will submit its draft report to EFSA by June 2021, the first step in the European assessment needed for the decision on whether or not to renew glyphosate's approval after 2022.

Call for tenders issued to study the carcinogenic potential of glyphosate

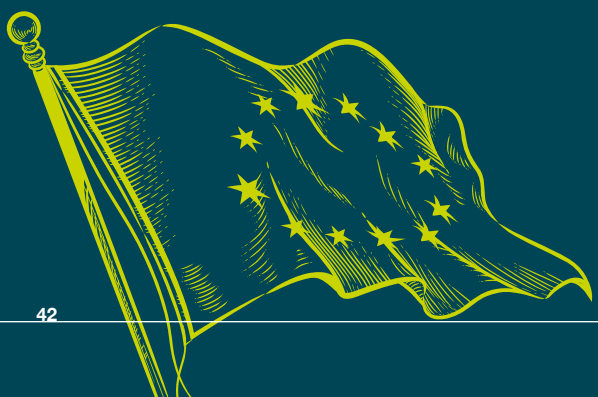
→ The specifications were developed with a group of experts convened by the Agency. The call for tenders issued in August 2019 will enable research teams to be selected to conduct independent toxicology studies. The aim is to improve knowledge of the hazard characteristics of glyphosate, and in particular its carcinogenicity. Work will start in 2020 with results expected in 2021.

Comparative assessment with non-chemical alternatives

→ As part of the implementation of Article 50.2 of the European regulation on plant protection products, ANSES re-assessed glyphosate-based products for which marketing authorisation (MA) applications had been submitted. On the basis of this article, uses of glyphosate-based products for which there are accessible alternatives may no longer be authorised. ANSES was assisted in this task by INRAE, which publishes reports that analyse non-chemical alternatives for the main agricultural uses. In addition, in December 2019 the Agency announced the withdrawal of marketing authorisations for 36 products and its refusal to authorise six new products. The reason given was that the studies provided by the MA holders to demonstrate the absence of any genotoxicity of the products as formulated were incomplete or inadmissible.

Publication of data from the phytopharmacovigilance scheme

→ In order to watch out for any possible adverse effects of plant protection products, the Agency collects data on the presence of substance residues in the environment, and on exposure and the impacts on human health and ecosystems. In October 2019, it published a summary of monitoring data on the presence of glyphosate and its main metabolite, aminomethyl-phosphonic acid (AMPA), in water and food, as well as on blood contamination levels.



ASSESSMENT AND AUTHORISATION OF PLANT PROTECTION PRODUCTS

Plant protection products must obtain authorisation before they can be placed on the market, on the basis of a scientific assessment whose criteria are laid down in specific European Union regulations. The active substances contained in these products must first go through a scientific assessment and approval process at European level.
Commercial products containing these substances are then assessed by geographical zone containing several countries, before marketing authorisation can finally be granted at the level of each Member State. In France, ANSES has been responsible for this task since 2015.

1. Before a plant protection product can be marketed in France, the active substance it contains must first have been approved at European level. If this is the case, the manufacturer must then submit a marketing authorisation application to ANSES, including the studies required by the regulations and any relevant scientific publications. The studies must have been carried out with the formulated product as it will be used, in order to take into account the effect of all the components: active substance(s) already approved by Europe as well as co-formulants.

2. The Market Authorisations Department at ANSES checks the administrative admissibility of the application dossiers, then forwards them to the department responsible for evaluating these products, for a scientific assessment of the data provided and their compliance with regulatory requirements.

3. ANSES assesses the products' effectiveness and the risks associated with their use for applicators, workers, residents and people in the vicinity of application sites, as well as for consumers, the environment, fauna and flora. To do this, the Agency calls on teams of scientific assessors specialising in different disciplines (chemistry, toxicology, ecotoxicology, etc.) and is supported by an independent expert committee. The assessment takes into account data from the scientific literature and from surveillance schemes.

4. On the basis of this assessment, which is shared with the other Member States in Europe's South zone, decisions to grant or refuse authorisation are issued for each use of the product and for a defined period of time. The decisions define the conditions of use and, if necessary, restrictions on use according to any risks identified.

5. ANSES authorises the sale and use of each product through this marketing authorisation. However, the authorisation, which allows products that have been tested for effectiveness and the absence of any harmful effects to be made available for a given use, does not constitute a prescription for use.

ANSES supports the principle of the lowest possible use of these products in circumstances where there is no alternative to their use to protect crops. Authorisations may be restricted or withdrawn at any time if justified by new scientific or surveillance data.