

# Pesticides in Europe: a daily silent Bhopal

The code of silence is starting to break. In the agricultural world, despite firmly rooted taboos, social action is increasingly being taken on behalf of victims of pesticides.

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**The European authorities emphasise the use of personal protective equipment (PPE) to reduce risks associated with the handling of pesticides but its ineffectiveness in many cases has been demonstrated by several studies.**  
Image: © Belga



This social action has changed the game as regards the recognition of occupational diseases in France. In 2012 Parkinson's disease was added to the list of occupational diseases for farmers exposed to pesticides. In March 2015 non-Hodgkin's lymphoma – a cancer of the lymphatic system that destroys the body's immune defences – was also recognised as an occupational disease caused by pesticides<sup>1</sup>. Also in March 2015, a European action day was organised for the first time to focus attention on the victims of pesticides.

New developments are also occurring internationally. In March 2015 the International Agency for Research on Cancer classified five commonly used pesticides as carcinogens. In widespread use as a herbicide, glyphosate causes cancers of the blood and lymphatic system. It is the active substance in Roundup, which is the flagship product of Monsanto. Diazinon is implicated in lung cancers and malathion causes prostate cancers. Three months later, the same Agency (which is part of the World Health Organization) classified three new substances: lindane as a Group 1 carcinogen (carcinogenic to humans), DDT as a Group 2A carcinogen (probably carcinogenic to humans) and 2,4-D in Group 2B (possibly carcinogenic to humans). 2,4-D is one of the two substances in Agent Orange, which was extensively used by the United States of America in the Vietnam War. Every year hundreds of Vietnamese children are born with serious congenital defects in those areas where Agent Orange was sprayed over 40 years ago. 2,4-D is still widely used by the pesticides industry.

### Multiple health effects

A pesticide consists of one or more active substances intended to destroy animals or plants. These active substances are mixed with solid or liquid solvents, together with additives to aid application. The active substances may persist where they break down only very slowly. As a result, chemical pollution from pesticides used thousands of kilometres away has been found in the Arctic. Pesticides can break down in the form of metabolites that themselves sometimes have a toxic effect. Among consumers, pesticide residues are absorbed through food.

For agricultural workers, pesticides have multiple health effects. The most obvious effect is acute poisoning. In the fields of Asia, suicide by ingesting pesticides has become a worrying phenomenon. According to

the British medical journal *The Lancet*, there are apparently around 300 000 cases a year<sup>2</sup>. Other pathologies have been observed for decades: respiratory, neurological and digestive disorders, skin diseases and reproductive effects.

In recent years, numerous studies have highlighted the role of pesticides in cancers. As a general rule, farmers are less affected by cancers than other social and occupational categories. This is mainly explained by two factors. A selection factor: you need to be strong and in good health to work in agriculture (termed the "healthy worker effect"). In addition, farmers are less inclined to smoke. However, for certain cancer sites, there are worrying peaks. Skin and lip cancers are mainly associated with exposure to sunlight. For other sites, the main explanation can be found in pesticides. This is particularly the case with cancers affecting the blood and also brain tumours. French researchers have found that farmers exposed to pesticides develop 100 to 1 000 times more abnormal cells in their genome, which can develop into follicular lymphoma, a form of incurable blood cancer. Cancer records in the Nordic countries indicate an increased risk of chronic leukaemia and multiple myeloma, which is a cancer of the bone marrow.

Among the active ingredients in pesticides, there are numerous endocrine disruptors. Among other reasons, this explains the increased risk of thyroid cancer among female farmers. Various studies point to the role of pesticides in breast, prostate, uterine and testicular cancers.

### Threat to future generations

There is converging evidence that the occupational exposure of female workers to endocrine disruptors during pregnancy causes multiple health problems for their descendants.

In Denmark, children whose mothers worked in greenhouses were monitored between 1997 and 2013. Most of the exposure to pesticides occurred during the first eight weeks of pregnancy. The workers were exposed to around 100 pesticides authorised under European legislation. The prevention measures were regarded as complying with the applicable rules. Among the young boys, a range of reproductive health problems were found: cryptorchidism (undescended testicles), reduced volume of the testicles and penis, and disruption of the production of reproductive hormones. Among the young girls, the risk of

1. In France occupational diseases in agriculture can be recognised among both employees and the self-employed.

2. Konradsen F. *et al.* (2007) Pesticide self-poisoning: thinking outside the box, *The Lancet*, 20 January 2007, 169-170.

early breast development was tripled. For all the children, there was an increased risk of reduced birth weight and overdevelopment of fatty tissues. Neuropsychological problems involving language and motor activity were also noted among the girls.

In the United States, a report published in 2012 by the Centers for Disease Control and Prevention (CDC) – the federal body responsible for public health – implicated endocrine disruptors in the development of autism. Other research points to harmful effects on the development of cognitive skills.

Endocrine disruptors contribute to child cancers where the mother was exposed to pesticides during pregnancy. A study conducted in the United States shows that the risk of breast cancer is multiplied by 3.7 in women whose mother was exposed to DDT during pregnancy.

### Danger to biodiversity

Added to the direct threat to human health are the harmful effects on the environment. Industrialised agriculture is significantly contributing to the environmental crisis and is playing a crucial role in water pollution.

Pesticides also threaten biodiversity as there is a potential boomerang effect on a significant number of agricultural activities. For most cultivated plants, and particularly fruit and vegetables, insects are needed for pollination, i.e. to carry pollen from the stamens (male organ) to the pistil (female organ). Only a small minority of plants can self-fertilise. Among pesticides, neonicotinoids are playing a major part in the destruction of honey bees and bumblebees. These substances affect their central nervous system with a range of consequences: loss of sense of direction, reduction in appetite. In May 2013 the European Union imposed temporary restrictions on the use of three neonicotinoids (imidacloprid, clothianidin and thiamethoxam). In August 2013 it banned the sale of seeds treated with fipronil. These measures have been challenged by the producers concerned:

## Researchers have found that farmers exposed to pesticides develop 100 to 1 000 times more abnormal cells in their genome.

**3.** The historian Jared Diamond has suggested that there have been common elements to the disasters that have wiped out various civilisations throughout the history of humanity. One of these elements is agricultural practices that have harmed the environment, combined with climate change (Diamond J. (2005) Collapse. How Societies Choose to Fail or Succeed, Viking Penguin).

**4.** Nitrogen fertilisers threaten human health due to air pollution. They also contribute to climate change and water pollution.  
**5.** The European regulation on organic farming, which is currently being discussed, will not impose a performance obligation by setting a pesticide residue threshold above which the biolabel could be withdrawn. During the meeting of the Council of Ministers in June 2015, the countries most staunchly defending the interests of pesticide manufacturers were Germany, Austria, the Netherlands, Sweden and the United Kingdom.

BASF, Bayer and Syngenta, which have been able to rely on support from the British, Italian and Hungarian governments. The measures adopted in 2013 are due to be reviewed no later than December 2015.

### Structural causes

The growing dependence of food production on toxic substances is not down to individual choices, ignorance or technical inevitability, but has become structurally ingrained in the development of agriculture. The main social and collective function of agriculture, which is to ensure the survival of humanity by guaranteeing food security, has become subordinate to the logic of profitability through the industrialisation of the living world.

Agriculture appeared in various regions around the world nearly 10 000 years ago. It relies on the natural process of photosynthesis, which allows organic materials to synthesise by using energy from the sun. Gatherer societies gradually switched to agriculture by progressively selecting plants that could be widely reproduced through human work. For thousands of years this involved an essentially circular process with an overall balance between the various resources used (water, solar energy supplemented by human and animal contributions, nutrients from the soil) and complementarity being sought between the various plants cultivated. Any disruption of this balance resulted in disasters that could be temporary and local, such as food shortages, or prolonged and global, contributing to the destruction of a civilisation in combination with a series of other causes<sup>3</sup>.

The dynamics of capitalism have profoundly altered agriculture. Since the 1950s, the "green revolution" has made agricultural production heavily dependent on inputs consisting of synthetic chemicals. According to Eurostat data, the use of pesticides peaked in western Europe in the year 2000 or thereabouts. There have been many elements to this transformation. An agri-business sector controls a large part of the fertile land while imposing the industrialisation of the living world. Farmers themselves have been given a new identity as "entrepreneurs" of the land, which is now regarded as a simple raw material. Their room for manoeuvre has been reduced by the rising power of the chemical input suppliers (fertilisers<sup>4</sup>, pesticides), seed companies (by using patents to confiscate thousands of years of collective experience in the selection and improvement of cultivated species and by producing genetically modified organisms) and agricultural equipment manufacturers.

### Three European giants

Global pesticide production is highly concentrated as it is dominated by three European multinationals. In 2012, Syngenta, Bayer and BASF accounted for 47% of pesticide sales around the world, with market shares of 19%, 17% and 11% respectively. This extreme concentration of production gives these companies considerable influence. The instructions for use provided by pesticide manufacturers are generally impracticable under real working conditions. They are designed to release manufacturers from their liability with regard to the actual use of pesticides.

The link between farmers and consumers has stretched due to long distribution channels that have become internationalised under the control of the agri-foodstuffs industry and major distribution chains. This loss of power has also resulted in a loss of practical knowledge, which makes farmers vulnerable with regard to specialised professions. Their financial dependence on credit institutions also entails a loss of control over productive choices. To obtain loans, farmers must bow to the constraints of high-intensity agriculture.

These changes have not occurred without resistance. In a number of European countries, there are instances of environmentally friendly and non-predatory agriculture that are based on cooperative relationships allowing pressure from agri-business to be resisted. Far beyond biolabels<sup>5</sup> or "sustainable" certifications that do not guarantee genuine protection of occupational health, these innovative practices are particularly finding expression through the international coordination of the Via Campesina network. ●

## Different effects on men and women

A significant proportion of agricultural work is carried out by women, both directly by contributing to various production activities and indirectly by carrying out most of the domestic work and a large part of the work of managing family farms. Domestic work includes exposure to pesticides, particularly by washing work clothing. This double work is sometimes supplemented by a paid non-agricultural job. This is often the case with women working in factories located in rural areas.

Many of the studies on the health effects of pesticides have not separately analysed the effects on men and women. However, these differences exist and should be taken into account in the regulation.

A Mexican research programme attempted to assess the different effects of chemical contamination on men and women. A significant part of the programme was devoted to pesticides. The initial conclusions point to generally greater effects for women, particularly in terms of genotoxic damage. The explanation involves two factors: the gender division of work exposes women more to certain contamination. Biological differences also play a role, especially the fact that adipose tissues form a greater part of women's bodies. A number of chemical contaminants specifically tend to become concentrated in the adipose tissues.

Source: Cedillo L. (comp.) (2012) Género, ambiente y contaminación por sustancias químicas, SEMARNAT, Mexico.

*More information*

CIEL, Center for International Environmental Law (2015) Lowest Common Denominator: How the proposed US-EU trade deal threatens to lower standards of protection from toxic pesticides.

Garrouste L., Lyonnais L. and Mitralias R. (2014) Pistes pour une agriculture écologique et sociale, Syllepse, Paris.

INSERM, Institut national de la santé et de la recherche médicale (2013) Pesticides. Effets sur la santé. Expertise collective, Paris.

PAN, Pesticide Action Network (2014) A Poisonous Injection. How industry tries to water down the risk assessment of pesticide mixtures in everyday food.

Pesticide Action Network website (Europe): <http://www.pan-europe.info/index.php>

Via Campesina website: <http://viacampesina.org>

## **A special system of regulation**

EU legislation on pesticides was introduced to serve the purposes of the common agricultural policy. This ad hoc legislation therefore escapes the common rules on dangerous substances. The main reference text is a regulation of 21 October 2009, which replaced directives dating back to 1979 and 1991.

Active substances are approved in Europe for a set period, with just over 400 currently being approved. These active substances are mixed with other constituents to produce pesticides. Marketing authorisations for pesticides are granted nationally in each Member State. However, a marketing authorisation granted in a Member State benefits from the mutual recognition principle, which means that the same pesticide may be marketed on the territory of another Member State provided that its use involves "comparable conditions". To this end, Europe has been divided into three zones (North, Centre and South) that have fairly similar climates. As a general rule, marketing authorisations last for 10 years. They remain valid even if, in the meantime, the active substance is no longer approved. A Member State has little possibility of objecting to the marketing of a pesticide authorised in another country in the same zone.

Substances classified as CMR (carcinogenic, mutagenic or toxic for reproduction) in categories 1A and 1B are not in principle approved. However, substances in category 2 (i.e. suspected of having such effects) are usually approved even though classification in category 2 does not necessarily imply a low risk of cancer. This is a legal exercise, partly due to the extent of the research taken into account by the regulator and partly due to the strength of the industrial lobbies. This explains the differences between the European classification and the classification of the International Agency for Research on Cancer.

Removing dangerous substances from the market is a slow and complex process. There are three options: the approval for an active substance expires and is not renewed; approval can be withdrawn following re-assessment; the European Commission places certain substances on a list of substances that are "candidates for substitution"\*. However, this is not a straightforward ban as the marketing authorisations for pesticides containing the substance remain valid. Member States can continue to authorise pesticides containing these substances through an assessment procedure. It takes several years from a substance losing its approval for some of the pesticides containing that substance to be effectively removed from the market.

Several elements of this process pose a problem: – When substances are being considered for approval, independent studies conducted by university research centres are regarded as being of secondary importance. Particular credence is given to the risk assessment prepared by pesticide manufacturers, which is conducted on the basis of guidelines issued by the European Food Safety Authority (EFSA). These guidelines consider that wearing personal protective equipment (PPE) reduces the risks very significantly. However, these findings are constantly contradicted in practice. The actual levels of protection afforded by PPE are limited. This criterion is not in keeping with the principles of primary and collective prevention, as it places responsibility for uncertain protection on those persons who are at risk.

– The assessments do not take account of the cocktails of exposure that are the reality for both workers and consumers. In some cases, exposure to several pesticides has a greater effect than the sum of the effects of each individual pesticide. In other cases, different effects may even be observed.

– The regulation limits the possibilities of approving active substances that are endocrine disruptors. However, the European Commission should have defined criteria for this characteristic no later than December 2013. It has failed to fulfil this legal obligation. In the absence of legal criteria, most endocrine disruptors used in pesticides are still approved.

– Even when a pesticide is no longer authorised for marketing, exemptions can be obtained for certain crops. There is no effective control of the use of these exemptions.

– A number of pesticides contain nanomaterials. The regulation does not require a specific risk assessment that takes account of the increased danger to health or the environment that may be posed by these nanomaterials.

– The authority responsible for applying the regulation is not the European Chemicals Agency (set up under the REACH Regulation), but the European Food Safety Authority (EFSA). The credibility of this authority is limited due to its multiple links with pesticide manufacturers. According to a report published by the NGO Pesticide Action Network (PAN) in 2014, 52% of experts on the EFSA committees responsible for analysing the effect of pesticide mixtures on food have direct links with the pesticide industry.

The current regulation is not sufficient to protect public and occupational health. The situation may worsen if the TTIP – the Transatlantic Trade and Investment Partnership – is approved. According to the negotiating documents that have been made public, the European Commission has proposed downgrading the rules on pesticide residues to bring them into line with those of the Codex Alimentarius Commission. In most cases, this means that the pesticide residues authorised in food will be multiplied by a factor of between 2 and 5.

A directive was adopted in 2009 to ensure that Member States defined national action plans to reduce the risk posed by pesticides. Unfortunately, this positive initiative has not led to targets being harmonised among the Member States. Most of the national plans are vague and do not set overall quantified targets for reducing pesticide use.

\*This list should have been produced in December 2013. Under pressure from various Member States (particularly France), the Commission eventually produced a draft list of 77 substances in 2015. At the time of writing this article (October 2015), this list has still not been adopted.