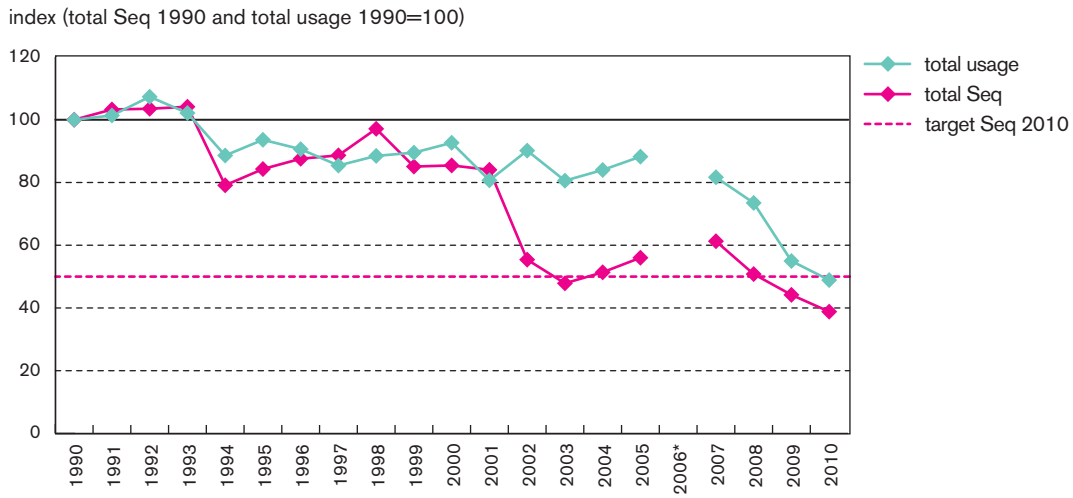
☺ Pressure on aquatic life from crop protection agents

DPSIR



* There are no sales figures available for 2006.

Source: UGent, FOD VVVL

Target reached

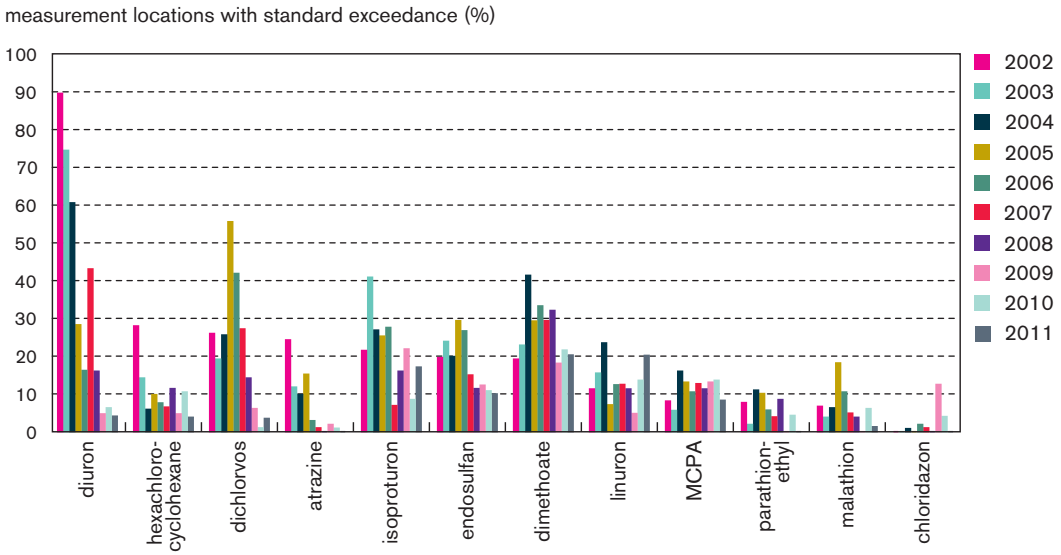
In the period 1990-2010, the use of crop protection agents in Flanders has almost halved. The introduction of integrated and biological crop protection, limitation of use through stricter residue controls, an improved range of crop protection agents, new technological developments (spray installations), better dosages, more efficient formulations and the aim of zero usage by public administrations are the basis for this decrease. However, the toxicity of crop protection agents and the time needed for them to degrade are to a great extent substance-specific.

The 'pressure on aquatic life from crop protection agents' indicator weights the quantity of the active substance in each crop protection agent sold each year in terms of its toxicity for aquatic organisms and persistence in the environment, and is expressed as the sum of the dispersion equivalents (Seq). It is therefore a measure of the risks for aquatic life associated with the use of crop protection agents. The MINA plan 3+ (2008-2010) aimed at a reduction of 50 % in 2010 with respect to 1990. The MINA plan 4 (2010-2015) aims at a further decrease in the period 2010-2015.

In 2010, the indicator value was more than 60 % lower than in 1990. The target of the MINA plan 3+ was, therefore, met. The pressure on aquatic life has decreased more than the total use of crop protection agents. In addition to the causes that explain the change in the total use, there is indeed the federal policy that takes the most toxic substances out of circulation. In the decrease from 2001 to 2002, for example, the banning of lindane (an insecticide) played a major role. Also the phasing-out of diuron (a herbicide) has had a noticeable effect on the total indicator value. The decrease from 2007 to 2008 has a lot to do with the banning of paraquat (a herbicide). The decrease in 2010 is to be attributed mainly to a decrease in the use of flufenoxuron (an insecticide) and fenoxycarb (an insecticide).

😐 Pesticides in surface water

DPSIR



The figure shows only those pesticides that caused the standard to be exceeded at least once in more than 10 % of the measurement locations in the period 2002-2011.

Source: VMM

Generally favourable developments, but still some problematic substances

Pesticides that find their way into the surface water can be toxic for aquatic organisms. Peak concentrations can cause acute effects, such as mortality. Concentrations that are too high for an extended period can cause chronic effects, such as reduced reproduction. That is why the standards for pesticides are twofold: a maximum concentration to avoid acute effects and an average concentration to avoid chronic effects.

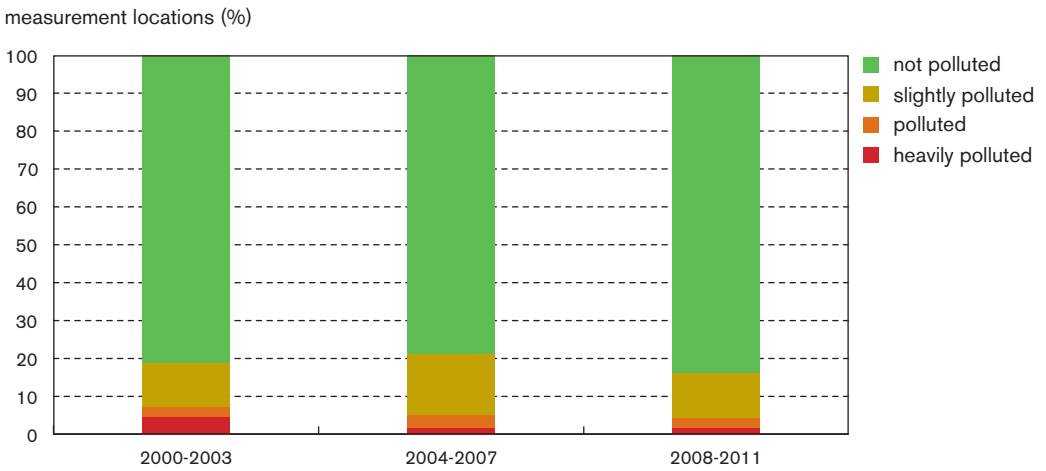
The situation has noticeably improved for a large number of substances that caused a large number of the standard exceedances in the period 2002-2004. This concerns, for example, diuron (a herbicide), dichlorvos (an insecticide), endosulfan (an insecticide), hexachlorocyclohexane (an insecticide) and atrazine (a herbicide). It is no coincidence that these are substances for which restrictions on use and/or prohibitions were introduced.

There are no official standards for all pesticides. Their concentrations can be tested against ecological reference values that are established according to methods similar to those for the official standards. A few of these substances are responsible for a large number of exceedances of these reference values. In 2011, the maximum concentrations of diflufenican (a herbicide) were too high in about 60 % of the sampled measurement locations; for flufenacet (a herbicide) and carbendazim (a fungicide) the maximum concentrations were too high in approximately 20 % of the measurement locations. Acute effects on aquatic life are to be expected in these surface waters. For oxadiazon (a herbicide), the average concentration in 2011 was too high in almost 30 % of the measurement locations and, for diflufenican, it was too high in about 93 % of the sampled measurement locations. Chronic effects can therefore occur there.

A statistical trend analysis per measurement location for 17 pesticides was for the first time carried out in 2012. The large number of measurement results below the detection limit and the many outliers (peak concentrations) complicated the trend detection. It was, however, found that oxadiazon and terbutylazine (herbicides) showed a significant increase at a relatively large number of measurement locations.

😐 Pesticides in watercourse sediments

DPSIR



Source: VMM

Favourable development, some persistent problematic substances

A large number of organochlorine pesticides (OCPs, mostly insecticides) have a tendency to bind with particulate matter in the water column. When these particles settle, the pollutants attached to them end up in the watercourse sediment. They can stay there for a long time. The measurement results are classified by quality on the basis of the comparison with the reference value of all the OCPs and evaluated against the environmental quality standards specified by decree for watercourse sediments.

82.5 % of all measurement locations sampled in the period 2008-2011 showed no deviation with respect to the reference value for OCPs and were, therefore, considered to be not contaminated.

However, there are certain individual substances that exceed the standard quite often. Thus, the standard for some degradation products of DDT (an insecticide) is exceeded in more than half of the measurement locations. Hexachlorobenzene (a fungicide) is nearly everywhere present in concentrations above the standard.

The monitoring of the watercourse sediment quality has been running for more than ten years and many of the measurement locations have already been sampled more than once in that period. In order to find out to what extent the watercourse sediment quality has changed in that period, 240 measurement points were selected that had been sampled for OCPs in the periods 2000-2003, 2004-2007 and in 2008-2011. The percentage of measurement locations with heavily polluted watercourse sediment has more than halved. The percentage of not polluted or slightly polluted sediments has increased slightly.

Improvements in the watercourse sediment quality can have various causes:

- removal of sediment (although remediation does not always lead to an improvement in the watercourse sediment quality because the historic contamination has sometimes penetrated deep into the sediment);
- due to reduced discharges of toxic substances, the newly formed watercourse sediment – in other words the top layer of sediment – is less contaminated;
- due to the changed physico-chemical quality of the water column, for example a higher oxygen concentration, release of toxic substances from the watercourse sediments into the water column can occur;
- pesticides also degrade, although for some of them this can take many years (e.g. DDT).