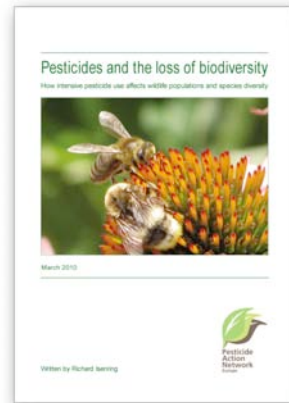


# Biodiversity and pesticides

You can download the PAN Europe research review 'Pesticides and the loss of biodiversity: How intensive pesticide use affects wildlife populations and species diversity' from our Campaigns page on the PAN Europe website [www.pan-europe.info](http://www.pan-europe.info)

In 2010, the UN International Year of Biodiversity, this PAN Europe review summarises recent research findings from the scientific literature on the impact of pesticides on biodiversity, with specific chapters on: Birds; Bees & butterflies; Mammals; Plants; Amphibians and aquatic species and Soil.



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Pesticide Action Network Europe (PAN Europe) was founded in 1987 and brings together consumer, public health, and environmental organisations, trades unions, women's groups and farmer associations from across 19 European countries. PAN Europe is part of the global network PAN working to minimise the negative effects and replace the use of harmful pesticides with ecologically sound alternatives.



'If biodiversity is to be restored in Europe and opportunities are to be created for crop production utilizing biodiversity-based ecosystem services such as biological pest control, there must be a Europe-wide shift towards farming with minimum use of pesticides over large areas'

*(Geiger, F. et al. Persistent negative effects of pesticides on biodiversity and biological control potential on European farmland. Basis and Applied Ecology (2010))*



# Biodiversity is vital: Reducing pesticide dependency

Pesticides have a major effect on biological diversity, alongside habitat loss and climate change. They can have short-term toxic effects on directly exposed organisms, and long-term effects can result from changes to habitats and the food chain. Policy intervention and greater coherence are urgently needed!

## What is biodiversity?

Biological diversity is life. Our life as it spans the immense range of ecosystems, species and individuals.

## Why is biodiversity important?

Charles Darwin and Alfred Wallace were among the first to recognise the importance of biodiversity for ecosystems, suggesting that a diverse mixture of crop plants should be more productive than a monoculture. Recent studies confirm that an intact, diverse community generally performs better than one which has lost species (Chapin et al 2002). Ecosystem stability (resilience to disruption) seems to arise from groups of connected species being able to interact in more varied positive and complementary ways (Tilman 2002). Communities of different animal and plant species perform vital functions within ecosystems. Ultimately, biodiversity is life.

## How pesticides influence biodiversity

Half a century ago, Rachel Carson's 'Silent Spring' clearly revealed the far-reaching environmental impact of pesticides, showing how some chemicals, organochlorines, a large group of insecticides are highly persistent in the environment.

Insecticides, rodenticides and fungicides (for seed treatment) and the more toxic herbicides all threaten exposed wildlife. Some pesticides lead to direct poisoning of species and can cause major population declines which threaten rare species. Other pesticides gradually accumulate in the food chain, something which matters particularly to vertebrates, and not least to higher order species and top predators like mammals or raptors. Non-targeted predatory mammals (eg dogs and foxes) and raptors often suffer 'secondary poisoning' by eating mice which have been poisoned by rodenticides. Finally, pesticides can reduce the abundance of weeds and insects which are important food sources for many species.

A 1997 report cites pesticides as a factor in the decline of British farmland bird species over the previous 30 years. In the Netherlands a typical arable field bird like the skylark is threatened with extinction because of the lack of wild plants and heavy pesticide use. In Germany, over 130 plants found near farmland are endangered or have vanished.

'A Europe-wide study in eight West and East European countries found important negative effects of agricultural intensification on wild plant, carabid and bird species diversity and on the potential for biological pest control. Of the 13 components of intensification measured, the use of insecticides and fungicides had consistent

negative effects on biodiversity. The study concludes that despite decades of European policy to ban harmful pesticides, the negative effects of pesticides on wild plant and animal species persist. At the same time the opportunities for biological pest control is reduced. If biodiversity is to be restored in Europe and opportunities are to be created for crop production utilizing biodiversity-based ecosystem services such as biological pest control, there must be a Europe-wide shift towards farming with minimal use of pesticides over large areas' (F;Geiger et al (2010).

## We need a biodiversity rescue plan

The UN Convention on Biological Diversity requires the EU's 27 Member States to develop national policies to set biodiversity conservation targets. Not all Member States are equally ambitious, meaning that the 2010 objectives to halt further biodiversity loss need a new quantitative rescue plan for 2020, setting clear quantitative and qualitative targets, timetables and requiring ambitious monitoring. They also need to ensure coherence and better targeting, on these and a number of other EU policies (for sensitive 'Natura 2000' areas and water), the establishment of new EU policies (on soil and bio-waste). However, the success of the biodiversity rescue plan will also to a large extent depend on the EU's implementation of the new 'Regulation on the Placing of Plant Protection Products on the Market', as well as on how seriously member states implement the new framework directive on the sustainable use of pesticides. An important tool would be for member states to use this new opportunity to set dependency/use pesticide reduction targets and clear timetables. A biodiversity rescue plan also needs to be accompanied by further reform

of the EU's Common Agricultural Policy (CAP), departing from the current model where farmers receive income support for up-keep of their land into a model where farmers receive funding to provide public benefits, which includes paying farmers to use sustainable agricultural practices based on prevention first, also called integrated production, whereby the more farmers provide environmental and health services, the greater the public funding they receive.

In the International Year of Biodiversity 2010, we should fight together for reform of the CAP to encourage better agricultural practices. We should start by encouraging more mixed agriculture, crop rotation and pastoral grassland and lower field size. Even more so, we should encourage the development of practices such as bigger field margins and the re-establishment of hedgerows. We should put prevention first, in a dynamic system, encouraging front-runners who are willing to make environmental improvements, and incorporate a policy of making truly integrated agricultural production the basis of the post-2013 CAP.

Such an approach would be a step in the right direction in reversing the decline of birds, bees, bats, arthropods and earthworms, which thrive best in association with organic farming. It is also the best way to re-establish communities of different animal and plant species which perform vital functions within ecosystems, bringing higher diversity which tends to be more stable, and as a result will also help ensure greater long-term food security.

