Lethal toxins

"Pollution is the second major driver of insect declines."[2]

Generally, insects are killed by lethal and sub-acute toxins in the soil, air and water resulting from things like industrial waste.[3] One of the sources of such environmental pollution includes synthetic fertilisers and pesticides used in agriculture. Modern intensive agriculture implies the systematic and widespread use of pesticides for controlling crop pests (insecticides), competing weeds (herbicides) and fungal infections (fungicides).[2]

"In terms of toxicity - insecticides are by far the most toxic to all insects."[2]

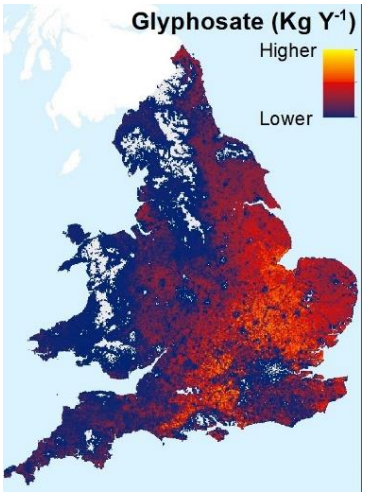
In addition to the species targeted by such treatments intentionally applied chemicals such as insecticides can cause the death of an array of other species.[3]

Insecticides reduce the diversity and abundance of plant foraging and ground dwelling insects. For example, they reduce populations of ladybirds and butterflies and inflict multiple lethal and sub-lethal effects on bees.[2]

Despite such devastating effects there has been an increase in applications of fertilizers, herbicides and pesticides across the UK.[4] In 2018 the total utilised agricultural area (UAA) covered an area of almost 17.5 million hectares of the UK - some 72% of the land area.[5] Pesticide Usage Surveys (PUS) for 2016 confirmed that some 73.17 million hectares were sprayed with insecticides or similar products.[6] This is obviously far more than the total land area under cultivation. The reason is that each crop is treated with pesticides multiple times.[6]

For example, in 2015 on average each hectare of farm land was treated 4.2 times with pesticides in the growing season.[7]

Not only are farmers repeatedly treating crops the overall areas of land being treated has also increased. Between 1990 and 2016 the area of land treated with all pesticides rose by 63%, the area treated with fungicides by 69% and herbicides by 60%.[7]



Map showing relative rates of glysophate across England and Wales[8]

"The new classes of insecticides introduced in the past 20 years - eg. neonictinoids and fipronil have been particularly damaging because they are used routinely and sterilise the soil...killing everything."[9]

The broad adoption of new types of insecticides including neonicotinoids and fipronil has been especially lethal.[10] Modern neonicotinoids are 10,000 times more potent that DDT, history's most notorious insecticide, which was banned in 2001 due to its impact on the environment.[7]

Insecticides are *"any substance that is used to kill insects"*[11] - simply they do what is says on the label - they indiscriminately kill insects of all species over extensive areas.[12] Why should anyone be surprised that the constant and repeated application of such lethal toxins across vast tracts of the landscape should do anything but decimate insect populations?

"Many factors have resulted in the decline of the UK's wildlife over recent decades...but policy driven agricultural change was by far the most significant."[13]

There is compelling evidence that agricultural intensification and the extensive use of pesticides is a primary factor for the decline of insect populations.[14] Major changes of current agricultural practices, in particular a serious reduction in pesticide usage and its substitution with more sustainable ecological based practices, are urgently needed to slow or reverse current declining insect populations and allow their recovery.[14] The government should provide more support to farmers using minimal or no pesticides.[7]

"Industrial-scale, intensive agriculture is...killing the ecosystems. The world must change the way it produces food."[10]

A global treaty is required to regulate pesticides worldwide, commencing with very strict controls on production and use and leading eventually to a total ban. Global policy changes supported by financial incentives are required to encourage a move away from intensive farming[1] to sustainable ecologically based practices.[9]

"The conclusion is clear:
Unless we change our ways of producing food, insects as a whole will go down the path of extinction in a few decades."[2]

The state of insect biodiversity across the Earth is now critical. Almost half of the species are rapidly declining and a third are threatened with extinction.[15] The staggering worldwide decline of insects is a warning of wider ecosystem collapse. The primary reasons for such declines are the loss of habitat due to intensive agriculture, deforestation and urbanisation and poisoning by pesticides and synthetic fertilisers.[9]

"It is imperative that current pesticide usage - mainly insecticides and fungicides, are reduced to a minimum."[2]

Or better still stopped completely! The situation is dire - insects - all life on Earth - urgently needs radical new policies and investment to create a landscape that supports and encourages Nature rather than kills it.[13]

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