

# Agriculture and insects

**Colin Tosh**

Intensive agribusiness is causing a global decline in insect populations with serious consequences for humans and the rest of nature.

As the son of an agricultural worker in NE Scotland in the 1970s and 80s I recall the amazing abundance and diversity of insects and other types of nature in agricultural areas.

We saw gigantic fish jumping for flies from clean, clear rivers; birds feeding mid-flight from mass migrations of flying insects; a hundred beautiful lacewings drawn to the glass of a well-lit bedroom window.

When I see the barren industrial zones that agricultural areas in the UK and other economically developed nations have now become, I am filled with sadness and anger. This decimation is treated with a shrug of the shoulders by farmers, politicians, the agri-industrialists that supply the weapons of destruction, and the general public alike.

## **Species richness**

Intensive farming is destroying not only useful insects such as the pollinators, but larger animals such as birds and mammals as well.

Insects are characterised by their huge abundance and diversity. [In 1980s](#) North America, insects occurred at around 100 kg per hectare: 15 times greater than the mass of humans, birds and non-human mammals in the same area combined.

Figures for species richness are equally impressive. Just over half the [species on earth are insects](#) and half of those are plant-eating insects. Vertebrates only make up a paltry 4 percent of species.

In their role as pollinators, decomposers, and natural regulators of pests, insects support our food webs and a healthy environment.

Insects feature at the bottom of almost all food webs. The larger feathered and furry animals cannot survive without them as a source of food. Messing with insect abundance is the last thing humans should be doing, yet insect abundance right across the globe is dropping and it is dropping fast.

## **Global decline**

Recent interest in insect decline followed a 2017 study showing that numbers of flying insects in Germany had dropped by an incredible 75 percent in the 27 [years since 1990](#). An influential review on [global insect decline](#) and a [flurry of media interest](#) followed.

To my mind, what is interesting about these recent articles is the way they point the finger at intensive agriculture and pesticide use.

Entomologists (insect scientists) have a well-concealed but cosy relationship with agriculture and the agrochemical industry. If entomologists are speaking out you can bet they are really worried.

Agriculture impacts nature so profoundly by virtue of its scale. England, for example, is around 70 percent agricultural land with half planted in crops (arable) and the remainder [pasture for feeding animals](#).

England is more or less all agricultural land. Natural habitat is restricted to patches here and there, so if nature declines across agricultural land it declines everywhere.

### **Increase in pesticides**

Agriculture leads a three pronged attack on insects. The first line of attack is through crop spraying with ever more potent insecticides.

In the UK the crop area treated with pesticides and the number of applications per area has doubled since 1990. The potency of pesticides has also increased dramatically with the introduction of the [neonicotinoids in the 1990s](#).

The number of honeybee lethal doses applied to the 4.6 million hectares of arable land in the UK has [increased sixfold since 1990](#). These pesticides don't just wipe out the pest insects; they kill almost all insects that happen to be living or resting in the crop.

Every year farmers kill pretty much every insect across just under half the land area of their nation.

Can we reasonably expect to have a healthy insect fauna in nations where this intensity of spraying is common place?

### **Herbicide spraying**

The second line of attack is herbicide spraying. Again using the UK as an example, the area of arable land treated with the herbicide glyphosate (Roundup) has increased 9-fold since 1990 to a staggering [2.6 million hectares](#).

The surface of cereal fields and field margins used to be awash with a diversity of wild plants. Now there is nothing but sandy soil and crop and most field margins contain pretty much nothing but grass.

Recalling that almost half of all insects depend on wild plants for food, there is no way we can expect to have a healthy population of insects and the animals that eat them when almost half the land of the nation is treated in this way.

### **Pasture management**

The last line of attack on insects by intensive agriculture is intensification of pasture. Traditionally grass pastures were managed with little chemical fertilisation, a low density of grazing animals, and long periods of rest between grazing.

They used to be an important habitat for plant and insect biodiversity. Now grass pasture is a high-throughput system for the production of meat and milk: they support nothing but grass and the large animals that graze on it.

Bearing in mind that grass pasture covers just under half of economically developed nations like England, this is a terrible blow to insects and nature in general.

### **Food security**

All we, the public, have gotten in return for agriculture's destruction of insects and nature is an increase in crop and meat yield per area of land.

This was supposed to mean cheap food and food security but commonly it has led to a move away from healthy traditional diets to those higher in fattening animal products and sugar, with a increase in obesity an ill health.

In the UK candy and junk food are everywhere but the fruit and vegetables that we should be eating remain out of reach for as many as 4 million of the UK's least well off. As for food security, the UK is a long way from self-sufficiency and only produces 60 percent of its own food with the rest imported.

International trade is considered to be more important than food security so any threat of altered trade relations like Brexit leads to food insecurity and panic buying.

And with the worldwide rise of powerful right wing zealots, who knows what disturbances to international trade and food security lie ahead?

### **Mobilising citizens**

In the UK, the response of the ruling Conservative Party to the issues discussed in this article is a new Agriculture Bill. However, the bill barely mentions pesticide and herbicide spraying, suggesting that they will continue unabated, which makes a mockery of the whole thing.

The solution to overuse of pesticides and herbicides is simple. All crops have a threshold beyond which insect pest and weed damage results in significant economic losses. A small team of government scientists could easily produce such thresholds for

UK crops and all the farmer would then need to do is check his/her crops regularly to see if the threshold has been crossed, when spraying would be allowed.

But as the current UK Government won't even mention pesticides and herbicides in their Agriculture Bill, these solutions seems a distant prospect.

We need a mass mobilisation of citizens in defence of nature and against intensive farming in a way we are beginning to see in response to the [problem of global warming](#). But it is increasingly clear that most governments simply ignore mass peaceful protest.

Politicians only understand money and economics and only when activists begin to impact 'the bottom line' of nations will politicians sit up and take notice.