

## Pesticides and Fertilisers

### Pesticides

**Pesticides are chemical substances used to kill or control pests.** They include **insecticides** (for insect pests), **fungicides** (for mould and fungi that cause plant diseases), **herbicides** (for weeds), **molluscicides** (for snails and slugs) and **rodenticides** (for rats and mice). Currently there are 3403 pesticide products meeting legislative requirements for use in the UK.

- In 2006, over 22, 000 tonnes of pesticides were applied to crops in the UK, on a total area of over 58 million hectares of agricultural land.<sup>i</sup>
- Many pesticides remain on the food we eat, despite washing and cooking. In 2008, the UK Pesticides Residues Committee tested 4129 samples of food and 45% of the samples contained pesticide residues.<sup>ii</sup>



### **The impact of pesticides**

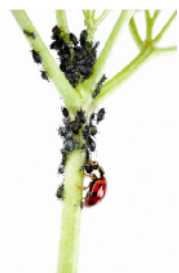
There are now concerns about **the impact of pesticides on human health.** Pesticide poisoning is a problem in developing countries where farmers do not always have protective clothes to wear whilst using the pesticides. The World Health Organisation estimates that at least three million people are poisoned each year.<sup>iii</sup> Pesticides have also been linked to increased incidence of some cancers and have been found to cause damage to the human nervous system.<sup>iv</sup>



There are also concerns about **the impact that pesticides have on the environment.** When a pesticide is applied to crops, some of it goes into the environment: some is vaporised and will eventually fall in rain, some remains in the soil, whilst some will go into surface and ground water.<sup>v</sup> The contamination of the environment by pesticides has serious consequences for some wildlife. Pesticides can contaminate their sources of food and disrupt how their hormones work in their bodies.<sup>vi</sup>

### **How organic farming produces food without pesticides**

Organic farmers use a very limited number of pesticides (only six are allowed on farms licensed by the Soil Association) and only as a **last resort**, i.e. when pests occasionally cause extensive damage to crops.



1. Organic farmers encourage insects and birds which are the natural predators of pests. Healthy populations of these 'beneficial' insects help to control pests naturally without the need for chemical pesticides.
2. **Crop rotations** provide a break in the life cycle of the pest by removing 'host' crops for prolonged periods of time. For example, a pest that attacks and eats a wheat crop

is less likely to survive on the same area of land if it is used the next year for growing a different crop or for grazing animals.

3. Organic farming creates a **healthy living soil**. As a result, micro-organisms in the soil process organic matter to provide a balance of minerals and nutrients which are used by plants to achieve grow vigorously and healthily. Such healthy crops are more able to withstand pest and disease attack.

4. Organic farmers **select crop varieties with natural resistance to particular pests and diseases**. This means the likelihood of disease problems occurring and the need to control them with chemical inputs is significantly reduced, or even avoided. (*See Information Sheet 1 for more information*).

### Fertilisers

**Nitrogen** is an essential chemical element that plants need for photosynthesis. All farmers apply nitrogen and other nutrients to improve their crop yields – either as artificial chemical fertiliser or livestock manures. However, sometimes there is more nitrogen than the soil micro-organisms and plants can take up and some of this nitrogen can be washed into streams or rivers. This **pollution** can result in the death of aquatic plants and animals.

Research comparing organic and non-organic farming systems has shown that organic farms have significantly lower nitrogen surpluses than non-organic farms and that nitrate leaching rates are 40-57% less per hectare on organic farms than on non-organic farms.<sup>vii</sup>

### **Organic farming does not use chemical fertilisers**

Organic farms do not use artificial chemical fertilisers. Instead, they use more natural methods to keep the soil fertile such as **crop rotation**, where crops and livestock are moved around different fields each year. An important part of the crop rotation is the growing of **legume** crops (such as beans and clover) that are nitrogen-fixing. As these crops grow they draw nitrogen from the atmosphere and make it available to plants growing in the soil, or the next crop to be planted there. Adding **animal manure to the soil also helps to keep the soil fertile**.

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<sup>i</sup> Pesticide Usage Statistics: Food and Environment Research Agency (FERA) at <http://pusstats.csl.gov.uk/myresults.cfm> (accessed 15th March 2010).

<sup>ii</sup> Annual report of the UK Pesticides Residues Committee

[http://www.pesticides.gov.uk/uploadedfiles/Web\\_Assets/PRC/PRC\\_Annual\\_Report\\_2008.pdf](http://www.pesticides.gov.uk/uploadedfiles/Web_Assets/PRC/PRC_Annual_Report_2008.pdf)

<sup>iii</sup> Pretty J (ed) (2005) *The Pesticide Detox: Towards a more sustainable agriculture*, Earthscan: London (page 25).

<sup>iv</sup> Pretty J (ed) (2005) *The Pesticide Detox: Towards a more sustainable agriculture*, Earthscan: London (pages 28-30).

<sup>v</sup> Pretty J (ed) (2005) *The Pesticide Detox: Towards a more sustainable agriculture*, Earthscan: London (page 13).

<sup>vi</sup> Pretty J (ed) (2005) *The Pesticide Detox: Towards a more sustainable agriculture*, Earthscan: London (page 15).

<sup>vii</sup> Stolze, et al 1999 *Environmental and resource use impacts of organic farming in Europe, 1999*.