

# THE TRUE COST OF **FOOD**

**GREENPEACE**  
Soil Association





# The true cost of food

## GM - AN ESCALATION OF INDUSTRIAL FARMING

In February, a leaked Environment Agency report stated: *Approval of certain GM crops for commercial use may encourage further intensification of agriculture.*<sup>1</sup> The cost will be borne by the environment.



GM maize

### Genetic drift

GM crops are living pollution. Once released into the environment, they cannot be recalled or contained. A study by the National Pollen Research Unit shows that the wind can carry viable maize pollen hundreds of kilometres in 24 hours.<sup>2</sup> The Environment Minister, Michael Meacher, has admitted that bees, which may fly up to nine kilometres in search of nectar, cannot be expected to observe a 'no fly zone'.<sup>3</sup> Current trial plots where GM crops are grown have a 'buffer zone' of only 200 metres between them and non-GM crops of the same species.

### Creation of superweeds

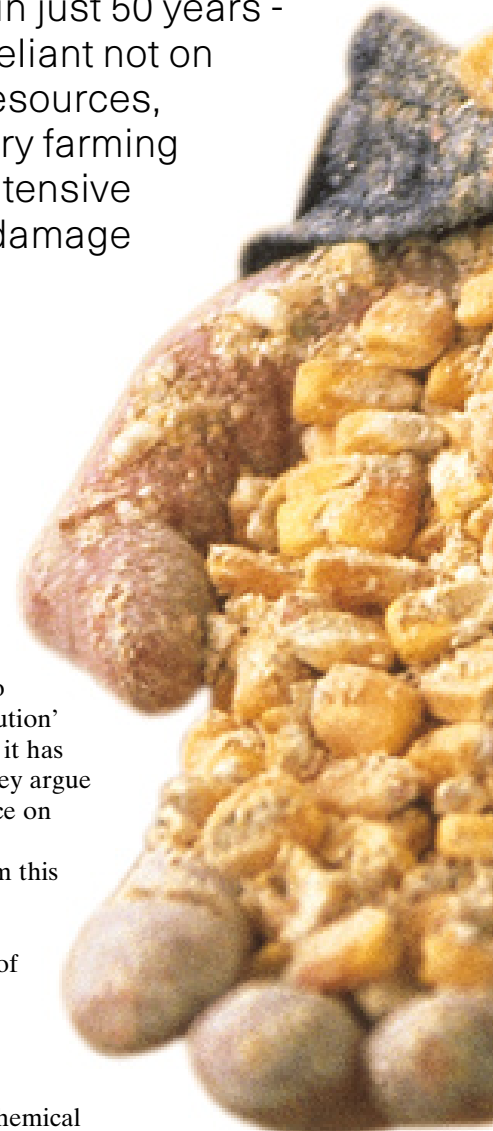
GM crops can cross-pollinate with other crops and wild relatives, and pass on their resistance to weedkillers or viruses. The offspring may become persistent weeds within arable fields. Ever more chemicals will be needed to control the problem.<sup>4</sup> Monsanto has admitted that this resistance is a 'very real thing' and that other weedkillers will have to be used.<sup>5</sup>

Agriculture is at a crossroads. After 4000 years of farming, agriculture has become industrialised in just 50 years - its yields increasingly reliant not on management of local resources, but on pesticides, factory farming of animals, and other intensive farming practices that damage the countryside.

This industrialisation has come at substantial cost to both human health and the environment. And the same agrochemical companies that made their name through the production of the chemicals sprayed on our fields and the hormones fed to our animals are now proposing a 'solution' to the problem of their own creation: it has been called the Gene Revolution. They argue that GM crops will reduce dependence on their own damaging pesticides.

In truth, far from liberating us from this destructive dependency on chemical inputs and their side-effects, genetic engineering represents an escalation of industrial farming practices. Seventy percent of GM crops are engineered to make them dependent on the agrochemical companies' own-brand herbicides.<sup>6</sup> This reinforces the agrochemical companies' control over the future of agriculture, while tying farmers into tight contracts. The market for GM research is dominated by five major transnational agrochemical companies - Monsanto, Novartis, DuPont, Aventis, and AstraZeneca; they also sell the seeds and agricultural chemicals and fertilizers.<sup>7</sup>

What genetic engineering denies us is the choice of genuinely sustainable agricultural techniques which modern organic farming represents. Genetic engineering and organic farming are incompatible. For the Government to allow GM crops to be grown is a clear judgement in favour of this technology - they have admitted





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GM maize from Hamburg, Germany

that cross-pollination with non-GM crops is inevitable.<sup>8</sup> GM crops are living organisms: they replicate, interbreed with relatives, mutate, adapt to new environmental conditions, and struggle for their survival as do all living creatures. There is no protection against this. Once released, genetic pollution will contaminate all our food - even organic.

*With genetic manipulation there's a huge new evolutionary risk and what's been proved safe today may change into something different tomorrow. [...] Exposing genes to nature is to expose them to evolution and evolution has no designer. It is impossible to know what it is going to do next.*  
Professor Steve Jones, geneticist<sup>9</sup>

Today we are faced with one of the most urgent choices of our time:

- Do we want industrial farming and GM food?  
or
- Do we want sustainable farming and organic food?

The choice is stark.

British people have made their opinion clear: a recent Taylor Nelson poll showed that 81% of those questioned want food producers to spend more money on developing organic food and not GM food.<sup>10</sup>



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## Pesticide use

Soya, cotton, and maize are the largest users of pesticides. Soya and maize account for the highest percentage of world-wide herbicide sales.<sup>11</sup> Cotton accounts for 24% of the global insecticide market.<sup>12</sup> All three crops have been genetically engineered to be resistant to herbicides or to produce their own insecticides.

While Monsanto calculates that the amount of active ingredient used now on GM soya is one-third lower than in 1993-94 on non-GM soya, this figure does not account for the fact that its new ingredients are more potent: lower weight of active ingredient is not the same as less herbicide.

## Disruption of the food chain

Crops designed to kill insect pests can also kill off the beneficial insects that either eat the insect pests or that play other important roles, like pollinating the crops.

Ladybirds fed on aphids that had eaten GM potatoes lived half as long and laid 38% fewer eggs, which were four times more likely to be unfertilised and three times less likely to hatch.<sup>13</sup>

## Unforeseen ecological problems

Industry and science have been wrong before - DDT, thalidomide, BSE ...

**GM food is unpredictable, uncontrollable, unnecessary, and unwanted.**



# The real cost of industrial farming

## BEEF - THE COST OF BSE

BSE has cost the taxpayer over £4 billion - more than £200 per household - and this excludes the costs of treating people who have developed or will develop new variant CJD.<sup>14</sup> Eight million cattle have been slaughtered, and 40 people are confirmed to have died: cases of nvCJD are being diagnosed at the rate of 5-10 a year.<sup>15</sup>

It is now widely accepted in the scientific community that BSE came about because cows were being fed ground-up bonemeal from sheep in their feed - something cows would never naturally consume.

If organic farming standards (which do not permit the use of animal-based products in feed) had been used, this crisis would not have happened. Further, if this £4 billion had been used to subsidise all organic meat sales during the last 10 years, organic meat would have been cheaper than factory-farmed meat.<sup>16</sup>



Culling BSE cattle

**Industrial farming is characterised by artificial chemical inputs, factory farming of animals, and destruction of habitat. The consequence is that we pay three times over for increasingly contaminated food and water - as consumers, as taxpayers, and as potential victims. But the environment bears the brunt of the cost.**

## Synthetic chemical pesticides

In 1997, 25,200,000 kilograms of synthetic chemical pesticides were sold in the UK. Most of these were sprayed on Britain's fields.<sup>17</sup>

Since the mid-1970s, three-quarters of farmland skylarks have vanished as a consequence of pesticide use and industrialised agriculture: that's 4,600,000 skylarks.<sup>18</sup>

A supermarket apple may have been treated 40 times with any of 100 chemicals.<sup>19</sup> A US study revealed that one in ten apples has residues of organophosphate insecticides that exceed permitted limits. The risk of eating an apple with a very high residue (that may cause severe health effects) is one in 1000.<sup>20</sup> So if you eat an apple a day, once in every three years you are likely to eat one of these. The UK Government's advice is that fruit should be peeled before children eat it.<sup>21</sup>

## Synthetic fertilizer

Up to two-thirds of synthetic fertilizer leaches away from agricultural land, and into groundwater, lakes, and streams.<sup>22</sup> This can result in blooms of blue-green algae and the de-oxygenation (known as eutrophication) of water: the consequence is fish death. In March of 1998, 150 tonnes of factory-farmed trout and hundreds of thousands of coarse fish were suffocated in the Kennet and Avon Canal and on the River Dun as a consequence of algal growth.<sup>23</sup>



Cleaning up blooms of blue-green algae





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### Factory farming

The use of antibiotics has increased 1500% in the last 30 years. There are 32,000,000 battery hens in the UK. Virtually all factory-farmed chickens are fed antibiotics every day of their lives as growth promoters and to counter the disease caused by the unhealthy, cramped conditions in which they live.<sup>24</sup> These hens live five to a cage, each allocated a space smaller than an A4 sheet of paper.<sup>25</sup>

There is a clear link between disease and factory farming - BSE is the obvious example. But salmonella, for instance, was virtually unknown in the 1940s. Food poisoning has increased 400% in the last ten years, and is now estimated to cost the taxpayer somewhere between £1 billion and £3 billion every year.<sup>26</sup>

There is widespread concern that the use of these antibiotics has led to the emergence of antibiotic-resistant strains of bacteria in humans.<sup>27</sup>

### Destruction of habitat

In the last 50 years, half Britain's natural woodlands have been destroyed,<sup>28</sup> and 40% of its hedgerows<sup>29</sup> - enough hedgerow to stretch four times round the world - and it is still disappearing at the rate of 10,000 miles per year.<sup>30</sup>

The equivalent of 100 football pitches of grassland is lost every day in the UK. These wildflower meadows are an important feature of the English landscape and some of England's most important wildlife habitats.<sup>31</sup>

The shorthaired bumblebee is now extinct in the UK because of loss of hay meadow habitat. The brown fritillary butterfly is also at risk.<sup>32</sup> The corncrake, which used to be found all over the UK, has dwindled to 250 pairs in the UK, 90% of them in the Hebrides. Loss of meadow habitat and early silage cutting are blamed.<sup>33</sup>



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The fritillary butterfly is at risk



© RSPCA

Cow with enlarged udder

### BST MILK - UNWANTED TECHNOLOGY

BST, also known as rBGH, is a GM hormone injected into one-third of dairy cows in the US to increase milk production. It is currently banned in Europe. There is the real threat that the US Government and Monsanto, the agrochemical company that manufactures the product, will use the World Trade Organisation to force the product into the EU. Yet, in the US, sales of organic milk have more than tripled between 1996-1998 as a result of much-publicised reports on the use of BST.<sup>34</sup>

The BST hormone causes a five-fold increase in a protein called IGF-1, which makes its way into the milk. An EU Scientific Committee report links IGF-1 to breast and prostate cancer.<sup>35</sup> It causes increased infection and disease in cows, making them produce more pus, and causing a substantial increase in mastitis, sores, foot problems, and reproductive disorders.<sup>36</sup> This increases use of antibiotics.

We already produce surplus milk. The average cow's milk yield has increased from 3000 litres per year twenty years ago to 5810 litres today. This increased production has led to surplus milk powder and butter mountains.<sup>37</sup>



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# The real value of organic farming

## PESTICIDE - AT WHAT COST?

Each time a farmer applies a kilogram of pesticide active ingredient, it costs £7.57 to clean it up.<sup>38</sup> As consumers, we pay for this through our water bills. And this is simply the direct cost of cleaning up our water supply. It does not incorporate the other costs of pesticide use:

### Wildlife

Water voles have virtually disappeared due to pesticide use.<sup>39</sup>



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### Wildflowers

Since 1960, there has been an 87% reduction in distribution of the cornflower.<sup>40</sup>



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### Birdlife

Tree sparrows, grey partridges, corn bunting, bullfinch, skylarks, and spotted flycatchers have all declined by between 70-89% in recent years.<sup>41</sup>



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Unlike industrial agriculture, modern organic farming does not set itself in opposition to the natural environment. Nor does it expect society or the environment to shoulder responsibility for its production methods. It relies on sound management of local resources rather than artificial inputs. Modern organic farming not only produces healthy food we can trust, but it contributes significantly to the environment, society, and local community development.

## Chemical and GM free

Organic farming makes no use of synthetic chemical pesticides, synthetic fertilizers, or genetic engineering. Thus, pollution of air and water is reduced, and nutrient losses are less.<sup>42</sup> In Germany, some water companies have realised it is cheaper to pay farmers to convert to organic farming than to clean up the water pollution of industrial farmers.<sup>43</sup>

## Improved landscape

The traditional British landscape is characterised by woodlands, hedgerows, stone walls, orchards, mixed extensive farms, meadows, and a diversity of crops in the fields, all of which are valued features on modern organic farms.<sup>44</sup>



## Diversity of wildlife

Organic farmers have adopted specific measures to encourage wildlife and protect habitats.<sup>45</sup> Organic farming standards stipulate the maintenance of wildlife habitats such as grassland, hay meadows, and moorland.

There are significantly more butterflies on organic farms.<sup>46</sup>

Sensitive cattle grazing regimes are helping to conserve the high brown fritillary butterfly.<sup>47</sup> This can be attributed to greater plant diversity, crop rotation, hedgerows, and the absence of pesticides.

Populations of skylarks and other endangered bird species are significantly greater on organic farmland.<sup>48</sup>

## Animal welfare

Organic livestock are allowed to roam freely and are reared without the routine use of antibiotics, growth promoters, or other drugs. All organic farm animals are fed a healthy, natural diet and are allowed to live a decent life in decent conditions.

## Jobs

A survey found increased employment on farms that converted to organic methods.<sup>49</sup> Modern organic farming is more labour intensive than industrial farming because it is reliant on management rather than artificial chemical inputs. Overall labour requirements tend to be 10-30% higher.<sup>50</sup>

## Regional development

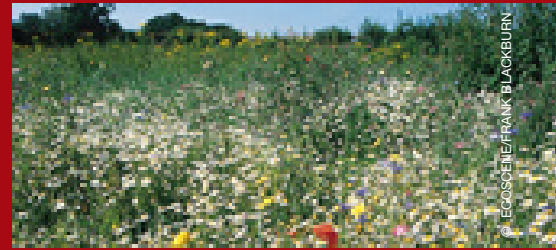
Modern organic farming can make an important contribution to regional development through increased employment and local food production.<sup>51</sup> A key principle of organic farming is to localize food economies, providing processing and distribution work within the region. Because of higher employment and local consumption of food, the whole community tends to benefit.<sup>52</sup>

*A factor that is often ignored when comparing prices of organic to conventional is the hidden costs of conventional farming. If elements such as air and water pollution, eroded soils and health care costs were factored into the price of produce, organic produce would be the same price or even cheaper than conventional products.*

Datamonitor<sup>53</sup>

## Landscape and habitat

Hay and wildflower meadows have declined 95% since 1945.<sup>54</sup>



## Human health

100,000 kilograms of lindane were sprayed on seeds, apples, oilseed rape, sugarbeet, wheat, and maize in 1997.<sup>55</sup> Lindane maybe linked with breast cancer. It can also cause behavioural changes, damage to the nervous and immune systems, and birth defects.<sup>56</sup> In 1996, over 40% of milk, cheese, and butter samples contained traces of lindane.<sup>57</sup>



## Ozone layer depletion

60-100 tonnes of methyl bromide are applied each year in the UK. A highly toxic fumigant, it is used on strawberries and to sterilise grain after harvesting. In the short-term, methyl bromide is considered to be 60 times more damaging to the ozone layer than CFC-11.<sup>58</sup>





# Modern organic farming yields results

*When you think how much money is spent in research terms on the genetic engineering research field - something in the region of \$1.6 billion per annum, it shows, I think, how little is being spent at the moment on alternative research.*

HRH The Prince of Wales



Prince Charles at the Centre for Organic Agriculture in Aberdeen - the centre is part-funded by Tesco



Modern horticultural organic farming

Industrial farming and agricultural policy have concentrated on ever increasing levels of production. The result has been the mass over-production of food for which there is no real market. The consequence for the taxpayer is the wasteful costs of subsidising the production of unwanted food surpluses that must be stored or dumped on world markets. This policy can be contrasted with the positive contribution modern organic farming can offer to our health and the environment.

While most comparative studies show that crop yields in organic agriculture are between 10-40% lower than industrial systems,<sup>59</sup> organic systems are nowhere near their full yield potential because insufficient research, development, training, or advice support has been given to the organic industry in the past.

Currently, the Government is spending a mere £2.2 million on research and development of the organic sector, and this is principally market-oriented.<sup>60</sup> By contrast, MAFF spends £125 million on R&D for industrial farming,<sup>61</sup> and in 1998, the Government spent £52 million on agricultural biotechnology.<sup>62</sup> However, most R&D on genetic engineering is funded by the agrochemical industry. As a result, organic yields vary considerably, according to techniques used and varieties chosen, but the potential for sustainable viable yields in professional organic businesses has been clearly demonstrated:

- A recent US study, published in *Nature*, showed that over ten years, the difference in yields between industrial and organically farmed maize was only 1%. However, the modern organic system had significant long-term advantages. Soil fertility increased dramatically under organic management, while it declined in the industrial trial. Moreover, the industrial system had a greater negative environmental impact, with a significant percentage of the synthetic fertilizer leaching into the groundwater.<sup>63</sup>

- Fifty-three percent of the land area of the UK is hills and uplands, and supports 60% of our breeding ewes and suckler cows. One MAFF-funded research project into organic agriculture in the uplands started in 1991 stated: 'Results from the organic unit at Redesdale show that it is possible to combine profitability with good levels of performance, without compromising animal welfare or the quality of the stock produced.'<sup>64</sup>



Organic farmer in Austria

However, the potential of modern organic farming is largely unrealised, as research funding has focused on industrial farming and more recently on genetic engineering. Organic yields could be improved if government and industry supported more research and development in modern organic farming.





Hi-tech watering system for modern organic lettuce production

In Sweden, even McDonalds uses organic coffee and milk in all its outlets, and has attempted to secure supply of organic meat for its burgers.<sup>65</sup> In Austria, more than 15% of all fruit and vegetables sold are organic,<sup>66</sup> and organic accounts for 11% of the overall food retail market.<sup>67</sup> In Denmark, 20% of milk produced is organic, and the Danish Agriculture Ministry estimates that this figure will rise to 40% in the next few years.<sup>68</sup>

The UK market value for organic produce could top £1 billion by next year.<sup>69</sup> In February 1999 alone, UK supermarkets experienced a 35-40% increase in demand for organic food, and Marks & Spencer said its increase was 'more than 100%'.<sup>70</sup> Sales would be higher still if production increased to meet demand.<sup>71</sup> Supply must increase dramatically.

The UK imports 80% of its organic fruit and vegetables.<sup>72</sup> The majority of these imports are for staples such as onions, carrots, potatoes, and brassicas, and come from other European countries - particularly Germany, Holland, and Italy. If the right mechanisms were put in place to encourage organic production, UK farmers could easily supply these staples.

The UK Government has earmarked just £6.2 million in 1999 for a revised Organic Conversion Scheme to assist farmers in conversion to organic farming: 'We have had as many applicants in the first two weeks of the new scheme as, on average, in each year since the scheme was first introduced in 1994. So funds may run out for this year.'<sup>73</sup> By contrast, in 1998, £75,589,275 was paid in England and Wales on 'set-aside' - a scheme designed to take industrial farmland out of production and thereby reduce surpluses.<sup>74</sup> Unlike other European countries, our Government does not support organic farmers after a five year conversion period.

However, modern organic farming and food production represents a huge commercial opportunity, with massive potential for rural development, environmental protection, and job creation.

*This market is going to go one way - and that is up. We can't get enough organic foods... We are desperate to find ways of getting more farmers and growers to convert.*

J. Sainsbury<sup>75</sup>



### Organic targets

Land farmed organically in Europe could reach 30% by 2010 if current trends continue. Some predict that up to 50% of EU agricultural land could be farmed organically by 2020.<sup>76</sup>

Germany and Sweden aim for 10% of their agricultural land to be organic in the next few years.<sup>77</sup> The Danish Government aims to treble Danish organic production over the next five years, and hopes that it will grow to 50% within the next ten years.<sup>78</sup> Austria has already reached 10%, with some sectors of Austria already 50% organic. Less than 1% of UK agricultural land has organic certification, and the UK has no targets.

# Conclusion

**UK agricultural policy can be characterised by irresponsible short-term priorities and a failure to respond to public needs**

## **Irresponsible short-term priorities**

Current market policies for agriculture emphasise quantity at the cost of food quality, public health, animal welfare, and environmental protection.

## **A failure to respond to public needs**

Industrial agriculture does not serve the needs of the environment, the farming community, or the people it feeds.

## **Time for modern organic farming**

Modern organic farming can match industrial farming in terms of genuine profitability and productivity. Unlike industrial farming, it does not favour the overproduction of unwanted goods and does not destroy that resource - the soil - upon which sustainable food production ultimately depends. The barriers to modern organic farming in the UK are not technical, but political and institutional.

The Government must act now to put in place a responsible agricultural policy that produces food that is safe, healthy, and farmed in an environmentally responsible way.

## **POLICY RECOMMENDATIONS**

### **Ban genetic engineering in food and farming**

Because of the inevitability of cross-pollination and genetic contamination, GM food and organic farming are incompatible. The health and environmental risks of genetic engineering in food and farming are unacceptable.



*Spraying of GM soya*

### **Phase - out artificial chemical inputs**

Pesticides and other synthetic chemical inputs, growth hormones, and routine antibiotics should be phased out. Polluters should compensate for environmental destruction.



*Hi-tech organic agriculture - salad crops*

### **Go organic**

The UK should set in place a long-term national conversion strategy which will support the shift of all our agriculture to organic methods. The UK conversion to organic farming should at least equal that of the rest of the EU - 30% by 2010 if current rates of growth continue. The UK should meet domestic demand for organic and aim to export.



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