



SEARCH



Summary

Organic farming has no scientific basis. It depends upon a false distinction between synthetic chemicals ('bad') and 'natural' chemicals ('good') and its rules are inconsistent and irrational. Claims that it is safer, more nutritious and better for the environment have not been substantiated and its inefficiency compared with conventional and other methods of farming make it unsuited to the needs of the developing world.

All plant life is organic. Therefore the term "organic" farming is tautologous: there can be no such thing as inorganic farming, or inorganic food. The word "organic" has been appropriated, however, by a movement which supports an eccentric method of farming that is as cavalier about science as it is about terminology. Indeed its origins owe more to mysticism than to science. One of the founders of the movement was the German philosopher Rudolf Steiner, who advocated feeding the soil and a process of bio-dynamic cultivation. He believed that cosmic forces entered animals like cows and stags through their horns and that we should plant by the phases of the moon and nourish the soil with cow horns stuffed with entrails. This may seem remote from the modern practice of organic farming, but even today the Director of the Soil Association, the main body that controls organic farming in

the United Kingdom, faced with scientific findings that show no evidence to support some of its claims, has argued that science is not sufficiently developed to detect the virtues of organic farming and that we must look beyond science to its spiritual dimension (Holden, 1999).

One of the basic principles of the organic creed is that synthetic chemicals are bad and natural ones are good. This distinction has no basis in science. It ignores the fact that a molecule is a molecule, whether it is made by a man-made synthetic process or by a natural one. Any number of synthetic chemicals, such as anti-bacterial drugs, are highly beneficial, while any number of natural chemicals, arsenic, ricin and aflatoxin for a start, are highly poisonous. Not surprisingly, the rules that farmers must observe for their produce to qualify as "organic" lack rhyme or reason. For example, organic farmers are not allowed to use the synthetic copper-containing fungicide Mancozeb to treat potato blight, but may use the inorganic compound copper sulphate instead. Mancozeb is practically non-toxic to human beings, unlike copper sulphate, which has caused liver damage in European vineyard workers.

Mancozeb has low toxicity for earthworms, birds and mammals, whereas copper sulphate is toxic to all three (Trewavas 2004). On every count the synthetic fungicide that is banned by the Soil Association is vastly superior.

Leaving aside its mystic elements and the arbitrariness of its rules, does organic farming nevertheless produce food that is safer, more nutritious and better for the environment than conventional farming, as its champions claim? Each of these claims needs to be examined in some detail.

Is organic food safer than conventional food?

Opinion polls have found that the main reason people buy organic food is that they believe it to be free from harmful pesticide residues (Health Which? 1999). In particular, there are widespread fears that synthetic pesticides cause various kinds of cancer and that we are suffering from an epidemic of cancer. These fears have no evidential basis. Since pesticides have been used more widely, the incidence of cancer has declined, even when smoking-related cancer is eliminated.

This is so despite the fact that the incidence of cancer increases with age and people now live much longer (Coggon and Inskip 1994). Furthermore, farmers, who are more exposed to pesticides than the rest of the population, have lower than average rates of cancer. Significantly rates of stomach cancer too have declined by about 60% in the last 50 years and the stomach would be especially exposed to any carcinogenic effects of ingested pesticides (Trewavas 2004).

The organic movement ignores the fact that that we consume many thousands of times more natural pesticides than synthetic ones, as the distinguished biologist Bruce Ames has shown, since plants make their own pesticides to ward off predators (Ames and Gold 1999). Those who stress the need for a diet free of pesticide residues also forget the lesson taught by the Swiss physician Paracelsus

many centuries ago, that it all depends on the dose. Every mouthful we eat and every sip of water we drink contains poisons, but in amounts that normally cause no harm. In fact, regulations set safety levels so high that they are between 100 and 1000 times above the concentrations at which harmful effects might be expected. Lord Krebs, the former head of the UK Food Standards Agency, the independent body set up to protect the interests of consumers and examine evidence about the safety of food, observed that one cup of coffee contains natural carcinogens equal at least to a year's worth of synthetic carcinogenic residues present in a normal diet (Krebs 2002).

It should also be noted that evidence suggests that a diet rich in fruit and vegetables is one of the best protections against cancer (Block et al. 1992). Chefs, life-style magazines and supermarkets constantly urge people to buy organic food. Yet encouraging people on lower incomes to eat more expensive food grown organically rather than cheaper food grown conventionally may in fact reduce their consumption of fruit and vegetables and increase the risk of developing cancer.

Is organic food tastier and more nutritious than conventional food?

There is no doubt that many people strongly believe that organic food tastes better and is better for their health. The problem is that evidence for such beliefs depends on comparisons that are not often made.

Organic fruit, for instance, tends to be fresh (unless it is imported, as most organic produce is in Britain) and fresh fruit tends to taste better than stored. Blind tests suggest that when people compare equally fresh organic and conventionally grown fruit, they cannot tell the difference (Hansen 1981). In fact the composition of the two kinds of produce is not materially different (Trewavas 2004). That was also the conclusion of the Food Standards Agency which, greatly to the annoyance of the organic movement, has persistently rejected claims that organic food is more nutritious and has declared that organic food is not significantly different in terms of food safety and nutrition from food produced.

The most thorough and comprehensive study of the nutritional differences between organic and conventionally-grown food, carried out for the Food Safety Agency, which analysed all relevant articles in peer-reviewed journals between 1958 and 2008, found that there was no good evidence that eating more organic food would benefit individuals consuming a normal varied diet and that differences in nutrient content were unlikely to be relevant to consumer health (Dangour 2009).

One of the difficulties involved in comparing the quality of particular kinds of produce is that it depends on the conditions under which it is grown, on the quality of the soil, the local climate and above all the skill of the farmer managing the farm. A valid test therefore requires comparison between conventional and organic produce farmed by the same farmer on the same farm over a prolonged period of time. This is particularly true for investigations into effects on the environment.

Surprisingly, some leading apologists for organic farming do not seem to believe in objective comparisons. They recommend running two entirely separate research teams to investigate GMOs and organic farming and imply that the same is true of research into organic and conventional farming (Watson and Atkinson 2002).

Is organic farming better for the environment?

Based on proper comparisons, one of the most impressive tests of the relative merits of different farming systems was performed over a period of ten years at Boarded Barns in Essex, England, where the same farmer in the same area cultivated crops in three different ways, by conventional farming, organic farming and using a system known as integrated farm management that specifies large field margins and high standards of animal welfare and hedgerow maintenance (Higginbotham et al. 2000). The actual system used was found to be the least important factor affecting biodiversity and the effects of pesticide application on the cropped area were of little significance. Some 80 – 85% of wild life existed in the field margins and hedgerows. In general, there was more preservation of wild life in fields cultivated by integrated farm management, especially where no-till farming was practised. Organic farming used more energy, and its only comparative benefit was its profitability, since it commands premium prices.

A research report from the Manchester Business School for the Department for Environment, Food and Rural Affairs in 2006 concluded that not enough evidence is available to state that organic agriculture will have fewer harmful effects on the environment than conventional systems.

There are two factors, however, that make organic farming less, not more, environmentally friendly than other systems. First, it relies on the tractor and the plough and controls weeds by frequent mechanical weeding. This damages worms and insects in the soil, causes soil erosion, releases more carbon dioxide into the atmosphere, disturbs nesting birds and is in every way less good for the land than no-tillage or low-tillage. By contrast both these practices can be facilitated by the cultivation of genetically modified herbicide-tolerant crops. Since herbicide-tolerant crops were introduced in the United States, more than a third of the soya bean crop grown there is now grown in unploughed fields, and overall no-till farming has increased by over 35% (Fawcett and Towery 2002). If the Soil Association is seriously concerned to “feed the soil”, it would abandon the tractor and the plough and instead of opposing genetic modification would become its leading advocate.

Secondly, organic farming makes less efficient use of land than other systems. That is one reason why its products cost more. Its advocates often quote misleading figures to show it can prove as efficient as conventional farms, but omit to mention that it uses more land to achieve the same yield and that comparisons must be made over a period of years, since most organic farms need a ley period in which no

crops are grown except grass, or clover or alfalfa to allow nitrogen fixation in the soil. Overall, various studies suggest that the yield of most organic crops is some 20 – 50% lower than the yield from conventional farming (Trewavas 2004).

In the light of this evidence, it is not surprising that whenever claims made for the superiority of organic farming have been tested in Britain by an independent body, they have failed. Apart from the conclusions of the Food Standards Agency already mentioned, the UK Advertising Standards Authority in July 2000 required the Soil Association to withdraw leaflets claiming that organic food tastes better, is healthier and better for the environment, because it found the claims could not be substantiated (ASA Adjudications 2000).

Organic farming and the developing world

In prosperous European countries, organic farming is a luxury consumers can afford if they wish to pay higher prices. However, it is inexcusable for the organic movement to seek to export its practices to developing countries and to urge them to reject the modern technology that has saved millions of people from starvation, despite the huge increase in the population of world. Furthermore, it has the effrontery to denounce the Green Revolution that saved hundreds of millions of lives in the developing world by applying modern farming methods that included the use of synthetic fertilisers. It denounces the technology that enabled twice as much grain to be produced in 2005 from the same acreage as in 1968 and spared agricultural land on a vast scale (Ridley 2010).

Over a billion people still do not have enough to eat. Furthermore, in the next few decades the population of the world is likely to increase by another three billion, most of whom will live in cities. Eating habits will change. With rising standards of living people will eat more meat and vegetables (and will keep more pets that are unlikely to become vegetarian). To meet these needs food production will have to double, at the least. Yet the Green Revolution is running out of steam because there is a growing shortage of good agricultural land and of water for irrigation. Besides, climate change threatens to increase droughts and turn ever more areas of the world into arid regions.

How can organic farming help reduce poverty and hunger, when the world desperately needs more efficient agriculture and better use of land? In many places the only way farmers who lack modern technology can feed a growing population is by cutting down more tropical forest.

GM technology holds out the hope that we can eliminate the pests and diseases that destroy half the crops in Africa and before long grow crops in arid or salty regions where no crops grow today. The organic movement offers nothing comparable, except a return to out-dated methods of farming that preceded the Green Revolution. As C.J. Prakash, a biotechnologist who advises the Indian Government, observed: “the only thing sustainable about organic farming in the developing world is that it sustains poverty and malnutrition”.

Thanks to the application of modern science to farming most people today are better fed, and live healthier and longer lives than ever before. We need every available new technology to continue this progress.

Belief in organic farming is part of the current widespread mood of suspicion and even hostility towards science and technology. It smacks of nostalgia for a golden past when in some imaginary Arcadia man was at peace with nature and simple farmers led a simple life. It looks to the past not the future.

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