Viewpoint: Uncomfortable truth — ‘Organic farming takes too much land to have any chance to feed the world in a climate-changed environment’

Science for Sustainable Agriculture (SSA) was recently asked by the farming media to comment on a policy paper issued by the organic certification body Organic Farmers & Growers (OF&G), calling on the UK Government to use its forthcoming land use framework to treble the area of organically managed land in England, claiming this would result in significant climate and biodiversity benefits.

Having reviewed the report, SSA welcomed OF&G’s acknowledgement that no single farming system holds all the solutions to the challenges facing our food system, but questioned the paper’s claim that a three-fold increase in the organic area would benefit the climate, biodiversity and the environment, taking into account the consequences of reduced food production on that farmland. This is what we wrote:

“The scientific evidence increasingly indicates that optimising food production on as small a land area as possible is the most sustainable way to feed a growing population while leaving space for nature and carbon sequestration. OF&G’s 10% target for organic land use is relatively modest, but the fact remains that any increase in organic farming will inevitably reduce yields, requiring more land elsewhere to make up for the loss in production. This could have significantly worse environmental and climate impacts at a global level. It would also drive up prices to consumers, many of whom cannot afford to pay a premium for organic food. These factors do not appear to have been accounted for in the report. In an increasingly volatile world, with food prices and availability seriously impacted by war, geopolitical instability and a rapidly changing climate, safeguarding our future food security is becoming as important as national security. The way forward does not lie in turning back the clock, but in embracing high-tech solutions, applying scientific data and evidence, and combining innovation with established best practice from a range of farming systems.”

A report last year from the World Resources Institute (WRI) noted that while around 85% of the planet’s usable land is already used for commercial forestry or agriculture, the world is on course to need more than 50% extra food and wood by 2050 compared to 2010. At present rates of yield increase, meeting this demand would mean converting an area of natural habitat up to two times the size of India. A biodiversity and environmental Armageddon.

As international climate expert Professor Johan Rockström recently warned, the ‘safe land-use’ boundary has no capacity for expansion: “We have reached the end of the road in expanding agriculture into intact nature.”

This issue highlights a key distinction between the perceptions and reality of ‘local’ and ‘global’ sustainability. Because if food production is reduced, for example by increasing the area of organic farming, someone else, somewhere else will have to make up the difference for the loss in yield. And the scientific evidence increasingly shows that this is likely to have significantly worse environmental impacts at a global level.

In a recent co-authored article in Nature, for example, conservation scientist Professor Andrew Balmford and environmental economist Professor Ian Bateman point out that while governments worldwide come under increasing pressure to adopt policies intended to lessen farming’s environmental impact – including
agri-environment schemes, rewilding and organic agriculture – a corresponding failure to account for the wider effects of reduced food production, particularly through increased food imports, could exacerbate problems of biodiversity loss, climate change and environmental degradation.

Independent research published in Nature has shown that if England and Wales switched 100% to organic, it would lead to a 21% increase in greenhouse gas emissions associated with our food supply, primarily because of the greater need for imports caused by a 40% reduction in food production compared to non-organic.

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The significance of these trade-offs was further illustrated by the largest UK study comparing the environmental impacts of organic vs. conventional farming practice, led by the Government’s former food security ‘champion’ Professor Tim Benton, which concluded in a 2013 paper in the Journal of Applied Ecology that “the relatively low yields of organic farms may result in larger areas of land being brought into agricultural production (locally or elsewhere), at a biodiversity cost much greater than the on-farm benefit of organic practice”.

With grain production per unit area 54% lower in organic compared with conventional fields, Professor Benton advised that organic production should be concentrated on more marginal land as a result.

This study was perhaps an early incarnation of the three-compartment model for land use conceived by conservation scientist Professor Andrew Balmford at the University of Cambridge, and championed by Henry Dimbleby in his National Food Strategy document, The Plan (July 2021).

This model is based on a land-sparing approach – optimising food production on as small a land area as possible, so leaving more room for intact nature and carbon sequestration – but acknowledges that a limited number of farmland species fare better under low-intensity farming systems, hence the provision for a third compartment alongside high-yield farming and land set aside for nature.

However, the allocation of land to each of these three compartments will be the critical factor in the ultimate success of a coherent land use framework which reconciles competing demands of food production, biodiversity, carbon sequestration, recreation, forestry, flood management and so on, and which does so based on sound science and evidence.

In a recent opinion piece for Farmers Weekly discussing the differences of view between OF&G and SSA on this issue, mixed farmer and columnist Stephen Carr may, perhaps unwittingly, have come up with a potential solution.
Mr Carr argues that organic farming has a place, pointing to the conservation benefits of his own organic livestock grazing protected scrubland in the South Downs National Park, while at the same time making clear that it would be ‘completely inappropriate’ for more productive UK farmland to be farmed organically because “the best hope for biodiversity is for food production to be intensified on the very best land.”

We would wholeheartedly agree. Indeed, these trade-off impacts also underline the need to embed data science and sustainability metrics at the heart of a farm policy and land use agenda focused on securing the optimum balance between food production, resource use and environmental impact.

As a group, Science for Sustainable Agriculture has consistently argued that a national, centralised approach to the collection, analysis and application of farm-level data is needed to provide an essential evidence base to benchmark and track the impact of farming and land use policies, to inform and drive best practice improvements in sustainable, efficient production at an individual farm level, and to provide information to consumers about the sustainability impact of each unit of food produced, whether that is a litre of milk or a kg of potatoes.

Mr Carr’s suggestion that prime agricultural land should not be farmed organically is reinforced by a 2020 report that the National Trust’s flagship organic farm at Wimpole Hall in Cambridgeshire had gone ‘carbon negative’ in its organic wheat production. But with yields of just 5.19t/ha, this required twice as much farmland, and cost twice as much to produce, as conventional wheat production. Carbon negative but otherwise unsustainable.

This is precisely why meaningful measures of agricultural sustainability must take account of a broad range of resource use and environmental impact parameters, related to the quantity of food produced.

Only then will we truly understand the comparative sustainability impact of our food choices. For some it may make for uncomfortable reading.

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