

**NewStatesman**

# **New season: What does Labour have planned for agriculture?**

With Maria Eagle, Lord Rooker and Mark Spencer

Supported by



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# How to feed the world

Feeding a growing population poses a significant challenge. With agricultural resources under increasing pressure, addressing this issue requires

an effective strategy. Labour's view on what policies are needed was the focus of a *New Statesman* round table, supported by the Crop Protection Association.



**Dr Tina Barsby**  
Chief executive, National Institute of Agricultural Botany (NIAB)



**Andrew Clark**  
Director of policy, National Farmers Union



**Caroline Drummond**  
Chief executive, Linking Environment and Farming (Leaf)



**Maria Eagle MP**  
Shadow secretary of state for environment, food and rural affairs



**Professor Paul Miller**  
Past president, Institution of Agricultural Engineers



**Jim Moseley**  
Interim director general, Food and Drink Federation



**Daniel Pearsall**  
Group co-ordinator, APPG on Science and Technology in Agriculture



**Henry Robinson**  
President, Country Land and Business Association (CLA)



**Lord Rooker**  
Chair, National Environmental Health Board



**Becky Slack**  
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**Professor Richard Tiffin**  
Director of the Centre for Food Security, University of Reading



**Nick von Westenholz**  
Chief executive, Crop Protection Association

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# Balancing the debate

By Mark Spencer

The politicising of agri-science decision-making is dangerous and should be avoided if we are to meet the food production targets of a growing global population

**T**he role of science and technology has always been important in farming, but never more so than today. With 200,000 more mouths to feed every day, the balance between global food supply and demand is becoming ever more precarious. Alongside efforts to reduce waste, change diets and improve distribution, the only realistic prospect of providing enough food for a world population set to exceed nine billion by 2050 is through productivity growth.

At the same time, the potential loss of half the world's arable land over the next 40 years due to water shortages places a responsibility on countries less vulnerable to the predicted impact of climate change to maximise their agricultural potential.

Agricultural science and technology has the potential not only to increase the physical volume of output, but also to develop smarter farming methods to reduce emissions and conserve resources.

The potential for scientific innovation to transform UK and European agriculture is hugely exciting. An exploding knowledge base in biological, genetic, engineering and data science is opening up exciting new opportunities to improve our farming systems.

So, it is encouraging that, after decades of chronic underinvestment in productive agricultural research, the UK policy environment has responded so positively.

The 2013 UK agri-tech strategy sent a clear signal that Britain's food and farming industries are once again viewed as a strategically significant sector of the economy, and that renewed investment in applied agri-science and technology can help generate much-needed growth, jobs, export earnings and inward investment.

Enjoying cross-party support, this policy initiative represents the strongest



Juncker: not a fan of scientific advice

recognition by any government in more than 30 years of the importance of supporting a productive, resilient, hi-tech farming sector.

The implementation of the strategy is still at an early stage. Given the long-term nature of agricultural R&D, it is vital this renewed policy focus on applied, industry-facing research is maintained under a future government, whatever its colour, providing the framework for a truly integrated agri-science strategy connecting fundamental research right through to practical application.

But major challenges still remain. Without a more balanced and informed public debate, and without science-based regulation of agricultural innovation, key opportunities for the UK agri-food sector may be lost.

For too long, society has taken the contribution of scientific progress in agriculture for granted. More than that, we have become complacent about the availability and affordability of food, and allowed a creeping demonisation of modern farming practices. This in turn has brought a worrying shift towards unscientific or

politically motivated regulation of agri-science, particularly at an EU level.

For example, the recent decision by the new European Commission president, Jean-Claude Juncker, to scrap the role of EU chief scientific adviser represents a major setback, and should serve as a wake-up call to Europe's leaders to guard against politicising agri-science decision-making if Europe's farmers are to contribute fully to the global challenges of food security and climate change.

Although the EU-28 is one of the world's major food-producing economies, and a leading centre of agricultural research, its current policies on agri-science do not reflect the pressing need to increase the productivity, resilience and resource-use efficiency of our farming systems. Continued access to scientific and technological innovation in agriculture is essential, yet EU policymakers seem intent on blocking progress in critical areas such as biotechnology and crop protection.

That is why OECD-FAO projections indicate that agricultural productivity within the EU-28 is falling behind other major global competitors, with growth of just 4 per cent projected over the next decade, compared to 40 per cent for Brazil, and 16 per cent for North America.

An ongoing challenge, therefore, and an important focus for the All-Party Group, is to understand the factors influencing public attitudes towards modern, hi-tech agriculture, and also to identify ways to develop a better understanding of the role of science and technology in improving the security, sustainability and affordability of our food supply. ●

*Mark Spencer is the Conservative MP for Sherwood and is the acting chair of the All-Party Parliamentary Group on Science and Technology in Agriculture*

# What's on the menu?

By Gareth Jones

Labour's food security strategy was explored during a recent round table, but did everyone get the answers they wanted?

With the general election just a few months away, business leaders around the country are waiting to find out what lies ahead. The agricultural sector is chief among them, keen to find out how a future government plans to feed our ever-growing population and address urgent challenges such as the changing climate, land usage and declining crop yields.

When scanning the potential post-election horizon, it is possible to size up the Conservatives and the Liberal Democrats by looking at their record over the past five years. In this time, the government's £160m support for the agricultural technology sector has received a broadly positive response, with even Labour offering its backing. However, other policies such as voluntary health targets

– access to healthy food being central to food security – for food retailers have come in for criticism. And let us not forget the various decisions around pesticide use and GM which have led to criticism that many policies have been unduly influenced by public opinion rather than scientific evidence.

Labour's intentions, meanwhile, are a bigger puzzle. There have been suggestions that food security has not been given enough attention in speeches by shadow ministers. And a tweet from Maria Eagle MP, stating that her top priority was climate adaptation, left some observers wondering where the need to increase productivity fits in. It is for these reasons that the *New Statesman*, in partnership with the Crop Protection Association, convened a round-table discussion with

Eagle, the shadow secretary of state for environment, food and rural affairs, in order to find out exactly how she and her party are proposing to tackle the challenge of securing our food supply.

From the outset of the meeting, Eagle emphasised in no uncertain terms that she feels the government has failed to produce a long-term, evidence-led strategy for food and farming. Reserving particular criticism for the Department for Environment, Food and Rural Affairs (Defra), she felt it has not been "a science-led department" over the past five years and has not been able to "punch its weight across Whitehall", adding that perhaps Defra's chief scientific adviser, Professor Ian Boyd, has been "too quiet", possibly at the behest of the government. The overall picture, she argued, is one of





Proper scientific understanding of the pros and cons of policy will be at the heart of Labour's agri-science strategy

“policy fragmentation and incoherence”.

The attack lines, then, are clear. What positive interventions would Labour make, however? Eagle confirmed that the party's flagship policy seems poised to be a resurrection of *Food 2030*, the strategy that was launched by the Brown government in January 2010 but which did not survive beyond the general election. The original *Food 2030* began with a stakeholder consultation in August 2009, and culminated in a comprehensive 80-page food strategy that cut across government departments, outlining what the food system should look like in 2030 and how to get there.

It is precisely this sort of consultative, collaborative approach that Eagle believes is necessary to ensure that the problems of food security and the environment

are addressed in an effective and complementary manner. She told the room that contrary to perception, we are not facing a binary choice between food and the environment. Rather, she argued, the two are interlinked: “We've seen food security slightly declining in the last few years, but the one thing that will make it decline an awful lot further is degradation of our natural environment at the same sort of level we've seen in the past few years.”

In fact, Eagle believes that there are many common interests among stakeholders, and these can form a nucleus from which to progress. “You're never going to be able to reconcile those who think you shouldn't use pesticides ever with those who think it is the only way of growing more food in the future. But that doesn't mean we shouldn't promote dialogue and

a proper scientific understanding of the pros and cons of any particular policy.

“If you have stakeholders who disagree with a decision you make, at least they have a proper understanding of why you came to that position and have a way of feeding in their views,” she said.

Unfortunately, despite being questioned as to what the specifics of a new *Food 2030* might be, Eagle did not give much away, although she did suggest that formal, cross-departmental mechanisms could be used to tie departments in to it. Instead, she preferred to stick to a broad, strategic vision. Perhaps there is a certain logic in this: if Labour wants to be truly consultative and science-led, it makes sense to wait until a new formal consultation has been held. However, this unwillingness to commit to the detail ►

► means Labour could appear not to have any new or eye-catching solutions, leaving the farming and agri-science sector dangling (along with everyone else) until the launch of the election manifesto – it is expected to be published in mid-April.

First to respond to Eagle's comments was Nick von Westenholz, chief executive of the Crop Protection Association, which represents the interests of the UK plant science industry, who noted that, contrary to public perception, the Labour Party has often been better received among the farming community than the Conservatives, going right back to Tom Williams and the Agriculture Act 1947. He said although the original *Food 2030* had come rather late in that Labour administration, he was "very pleased" to hear Eagle talk about the need for an overarching strategy to smooth the tension between increasing agricultural productivity and protecting the environment.

"All too often we see policies which adversely affect productivity without seeming to have noted that there is an impact [on the environment]," he told the group. "There may be occasions where policies are required for safety or environmental protection and adversely affect productivity. We would like to see the next government take a much more formal approach to assessing the impact of its policies on productivity, essentially through a 'food-proofing' mechanism similar to the rural-proofing mechanism."

He added that there are "deep concerns" in his industry that governments aren't fostering the innovation required to increase agricultural productivity. With a nod towards the European Union's recent decision to ban three neonicotinoids, he said: "We're admittedly seeing this more in Europe than the UK, but there is an approach to risk management which is actually more about risk avoidance, and which takes an overly precautionary approach to the environmental risks we are facing. Innovation is by its very nature a risk-taking activity and it is also a very important activity."

This problem of the UK's innovation capacity was echoed by a number of guests attending the round table, with Professor Richard Tiffin, director of the Centre for Food Security at the University of Reading, warning that this field of science has received insufficient investment for as long as twenty or thirty years.

Professor Paul Miller, a former president and now pesticide application specialist at the Institution of Agricultural Engineers, added that the UK is no longer developing the technologies that will allow us to manipulate the balance between productivity and the environment in the future.

"In terms of our engineering base," he commented, "we have gone from being a relatively powerful country and source to being one that is effectively buying technology in from Europe and the US. That concerns me and we should stop it as soon as we can."

Dr Tina Barsby, director of the National Institute of Agricultural Botany, warned that this underinvestment was evident in the shrinking number of institutions working in agricultural and veterinary sciences. She called for replication of the "catapult centre" model that has been used in other sectors to promote research and development collaboration between scientists, engineers and businesses: "We don't have a catapult in agri-tech to enable us to lift technology out into industry in a big way. [The technology entrepreneur] Hermann Hauser has recently reviewed the catapult centres and he's recommending we add more."

Elsewhere in the discussion there was talk of whether more concrete metrics could be used to give direction to the

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"If we've got the freedom  
to use biotechnology, are  
we going to do it?"

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UK's food security strategy. Daniel Pearsall, co-ordinator for the All-Party Parliamentary Group on Science and Technology in Agriculture, pointed out that it is now more than five years since the Royal Society coined the phrase "sustainable intensification" to describe the need to increase food production while minimising the effect on the environment. Yet the term remains woolly, with little agreement about what it means in practice.

"I think it is about reducing it to the criteria," he explained. "Where we're falling behind in the UK and Europe is in the use of data to assess what's really going on. We're now at a point where the data capability is such that you can start to formulate clear targets and then frame the

science and everything else around it."

One concrete intervention that has been advocated by the coalition, with the support of the Natural Capital Committee and the Ecosystem Markets Task Force, is biodiversity offsetting. This seeks to provide a framework to ensure that any environmental damage to one area of land is compensated with the creation, enhancement or restoration of another. However, its progress has been slow; the Environmental Audit Committee has warned that the government's proposals are too simplistic, and that pilot projects initiated in 2011 must be allowed to run their course before a decision is made.

Some environmentalists have warned that without proper protections the scheme could allow irreplaceable natural habitats to be sacrificed, but Henry Robinson, the president of the Country Land and Business Association, told the group that while the scheme needs further thought, he believes it is one of the most solid policies available. "We're trying to get this balance between farming and the environment, but it is almost impossible for a farmer who has bills to meet to do something good for the environment if he is not actually paid for it. Higher-level stewardship [a funding scheme for farmers to improve environmental management on their land] covers 1 per cent of the country; it's a tiny amount."

The shadow minister stopped short of giving her support to the concept, but said she believed the policy had been mishandled by the government. "One of the big problems was when the farming Secretary of State stood up and said ancient woodland in the same breath as biodiversity offsetting. That raised huge concerns among those who were wary about putting market prices on things. It's all gone quiet since then."

Conversation about how to increase food productivity while protecting the environment inevitably brought genetically modified foods to the fore, with the Labour peer Lord Rooker launching a particularly impassioned argument in their favour. "I was really pleased to see what Maria said about being science-based, but you've got to be serious about being science-based. If we've got the freedom to use biotechnology, are we going to do it?"

He added: "We should get on and use it... The Americans have eaten GM food for twenty years, and there's not a shred



How does your garden grow? Education about how food is produced is essential

of evidence that it's a medical problem."

In response, Eagle confirmed Labour's backing for GM. "The implication of my saying, 'It's a scientific department, we'll listen to what the chief scientist says,' is that that perhaps goes in areas where you don't necessarily instinctively agree with their viewpoint. GM foods are a scientific issue upon which you base decision-making, especially now some of that decision-making is being repatriated back to nation states [from the EU]. Decisions about that have to be made on the basis of the scientific evidence; they have to be."

However, a more moderate view was offered by Tiffin, who said scientists need to be encouraged to think more broadly about big systemic questions. "We have to get scientists to broaden their horizons, to start to think about the food system, to understand the food system, and to understand what the trade-offs are in that system. GM isn't simple. While there's no evidence of any health-damaging effects, there is some evidence to say that it might have some ecosystem-damaging effects. It's that type of tension that becomes controversial between scientists."

Caroline Drummond, chief executive of Leaf (Linking Environment and Farming), added that there was a need for public education around GM food in order

to take away the fear factor. "People are less fearful of the situation when they have more understanding about it. It's really critical that the public is engaged at all stages of dialogue."

When it comes to public health, the government's flagship initiative has been the "responsibility deal", whereby 773 mainly private-sector organisations have signed voluntary pledges to improve their products and staff conditions. Yet the scheme has faced criticism, the consumer advocate Which? citing a lack of clear targets and a lack of pledges to tackle important areas such as saturated-fat reduction.

Lord Rooker said he felt the deal had been "a bit of a failure", but Jim Moseley, interim director general at the Food and Drink Federation, said critics shouldn't underestimate the progress being made. "We've got an enormous amount of success from the responsibility deal. I also think we've kept our light very much under a bushel, in the sense that nobody really knows how much salt, sugar and fat we've really taken out of products."

Another section of this industry that perhaps needs to do more to educate the public about the challenges it faces is the farming community, which, as Andrew Clark, the director of policy at the National Farmers Union, noted, has been

feeling "besieged and under the cosh" – market volatility, particularly in relation to dairy prices, having had a particularly negative impact.

When asked about the Common Agricultural Policy (CAP), Clark highlighted concerns about the tensions the UK has with Europe. "The CAP is absolutely critical to the fortunes of farmers, and whether you like it or not, it sets the environment in which many of us work," he said. "So we need a government which has close engagement with Europe to shape what that looks like. One that is coming and going and not sure where it lies is not a reliable partner with the industry."

This, of course, speaks to Labour policy, and Eagle was only too happy to make the case against an EU referendum. "You talk to anybody who has day-to-day dealings with the EU and they will tell you we have lost influence because we have moved away from being at the heart of the discussions and instead have worked our way to the sidelines and started shouting about how terrible Europe is."

Having influence over our food production will be critical to the security of our supply. The farming and agri-science sector will be watching Labour's manifesto pledges with interest to ensure the right policies are on offer. ●

# Growing pains

By Meurig Raymond

The UK farming industry has been having a rough ride of late, but with the right policies it can increase its output to the benefit of us all



Declining food self-sufficiency in the UK hit the national press recently, following predictions that by 2040 domestic production will meet only 53 per cent of our needs. Since its high point of 80 per cent in the mid-1980s, self-sufficiency has been on the wane, creating a challenging environment for British farmers, who find themselves becoming less competitive than their European neighbours. In consequence, more food that could be produced in the UK is being imported, and with it the opportunity to shorten supply chains and control production standards becomes weaker.

This is despite the demand for domestic food being on the rise; 85 per cent of the British public want to see more home-grown food on supermarket shelves. Pair this with our world-class agricultural science, and it presents a great opportunity to expand UK food production and, in doing so, reduce food imports and sustain the rural economy.

Farmers are hindered further by the reduction in access to vital plant protection products (PPPs), the tools farmers

depend on to fight off pests and diseases, make sure their plants are resilient to adverse weather and grow well. EU regulation is preventing their use, to detrimental effect on production. The NFU's Healthy Harvest campaign, for instance, which has the backing of the independent Andersons report, proves that production of apples, carrots and frozen peas is at great risk of being reduced drastically within four years – the lifetime of the current European Parliament.

One solution to this problem is for the UK to use the regulatory decisions of other EU member states on PPPs. This would improve harmonisation across the EU, remove the risk of competitive disadvantage for UK growers and maximise access to PPPs registered in other parts of Europe with minimal delay. This would also reduce the additional costs for further research that are placed on levy boards, and would facilitate better use of levy funds on necessary research and development – rather than it having to be used to meet bureaucratic UK regulatory requirements.

The challenge for farmers does not stop with PPPs. Although the UK is a world leader in agricultural science, lack of access to this puts our farmers at a competitive disadvantage. Agricultural technologies available to the rest of the world are not available to the UK, creating a huge hurdle for an industry eager to move forward and keep up with the demand for food. GM and other biotechnologies are, to some farmers, very viable options for their business. Policies and legislation on these need to be proportionate and based on robust, scientific evidence, both in the UK and across the EU.

The livelihood of farmers is very much at the mercy of volatility in both weather and prices – be this floods like those experienced in 2014, or the ongoing dairy crisis, in which prices paid to farms have dropped by 21 per cent over the past year.

It is small wonder that last year the Irish government extended its version of farm profit averaging from three to five years to recognise the volatile nature of farm profits. This means farmers are provided with the ability to level the impact of volatility



EU restrictions on the use of pesticides are putting UK apple production at risk

with an even spread of tax to pay on their profits of up to five years. Understandably, given the increased volatility for farmers, there has been growing interest in this idea, particularly in the dairy sector.

The capital investment-intensive nature of the farming industry means that purchasing the infrastructure, machinery and equipment needed to drive businesses forward is also very dependent on farm incomes, which in turn are dependent on weather and markets. Fiscal incentives to enable farm businesses to manage volatility and promote capital investment will uphold robust farming businesses in good economic health.

While much derided by commentators, the Common Agricultural Policy provides a lifeline for many farming businesses. It supports a thriving agricultural industry across Europe, which is why its reform is an extremely contentious issue. As an organisation, the NFU has consistently advocated a CAP that increases farming's market orientation and farmers' competitiveness in the global market. The CAP strengthens the position of

farmers in the supply chain and reforms should be undertaken in a planned and even-handed manner across the EU.

However, the latest reform failed on all counts and has run contrary to progress made in previous CAP reforms. A number of opportunities will present themselves in the coming years to influence the shape of the CAP and to put it back on the right path. The UK presidency of the Council of Ministers during the second half of 2017 will put the UK in the driving seat to shape the CAP reform agenda and set the pace for 2020 and beyond.

The rules on "greening" in place under the reformed CAP are "a hornet's nest of technical problems and impractical demands", according to Gail Soutar, the NFU's chief economics adviser. These are rules around crop diversification and the use of land that is permanent grassland or an area of ecological focus. The European Commission has made it clear that greening is here to stay, but has asked for ideas about how to simplify the policy. The NFU has provided a number of technical suggestions that would make

the rules simpler and more pragmatic.

However, the concerns of the NFU go beyond purely those of a technical nature. The crop diversification rule, for one, which forces farmers to grow at least three crops, is one rule that puts significant pressure on many with little rationale behind it. It will increase costs, reduce efficiency and increase traffic on rural roads, all with no proven environmental benefit. We believe it is right to continue to seek an alternative approach for farmers who have difficulty with the measure.

As for livestock farmers, they are still slaughtering 26,000 cattle a year in England to counter bovine tuberculosis (bTB) and there is still a spread of the disease – so "clean", bTB-free areas are at risk. In April 2014, the government issued the first ever bTB eradication strategy for England, which the NFU supports. Its implementation will be vital in reducing the number of cattle sent to be slaughtered.

The pilot badger culls in Somerset and Gloucestershire, now halfway through, are showing some encouraging early results. In Somerset, farmers are reporting that the incidence of bTB on farms has gone down from 34 per cent to 11 per cent. In Gloucestershire, vets are reporting indications of a reduction in bTB on farms and one prominent farmer has gone clear for the first time in 11 years.

It is vital that these pilots complete their four-year programmes, aligned to official veterinary advice. Roll-out to other counties in the high-risk area is also incredibly important, while in the edge area we need to have a serious, systematic and large-scale vaccination programme. In the low-risk areas, cattle measures have been tightened and some new measures are being consulted on now.

The farming industry undoubtedly faces many challenges, but its track record in resilience shows the strength of the sector, not least because this resilience contrasted with most other industrial sectors during the recession. In the five years to 2013, farming output grew by £2.34bn (34 per cent). Agriculture's gross value added in 2011 and 2012 contributed £8.6bn more to the UK economy between 2008 and 2012 than it did between 2003 and 2007. It is predicted that, with the right policies, Britain's farmers can continue this impressive performance. ●

*Meurig Raymond is the president of the National Farmers Union*

# Fixing the food and drink trade deficit

By Stephen Devlin

Should our balance of trade in the food and drink sectors be a priority for the next government? Possibly not

The UK relies on the rest of the world for food, and has done for a very long time. While our balance of trade in food and drink has deteriorated over the past decade, it still remains in better shape than almost all of the period between the 1930s and 1970s. When you look at this long-term trend, the lower trade deficits of the 1980s and 1990s look more like an exception than the norm. Government statistics do not record a single year in which this trade balance was in surplus.

So, does it matter if we continually import more food and drink than we can export? First, it is important to recognise that our balance of trade is not the same thing as our food security, despite the conflation of these issues among many in industry and the media. Some of the main components of our import bill are wine, cheese, chocolate and juice; by far the biggest contributor to our export income is whisky. If we aggressively expanded our whisky exporting capabilities so that our trade deficit approached zero, would we then become more secure? Clearly not.

Food security is determined by our ability to withstand the volatility of a global food system with minimal pain. In this sense, macro food security – a whole nation’s ability to feed consistently itself – is arguably strong: the EU as a group has a self-sufficiency ratio of about 90 per cent. Micro food security – the ability of all individuals to gain access to affordable and healthy food – is far more of a concern. The main relevance of our deficit in food and drink is the extent to which



Liz Truss has looked to China for trade links

it contributes to our more general current account deficit – our overall economic imbalance with the rest of the world.

The next government should not be tricked into believing this trade deficit is the only or most important problem that needs to be solved. Our food system is undeniably a mess, with environmental degradation, labour exploitation, public health and the concentration of land ownership all requiring urgent attention.

However, if reducing the deficit is considered a priority, the government must recognise that the prescription of “increasing British production” is simplistic and probably unwise. Instead, this deficit can be reduced in two ways. We can expand production generally, thereby boosting exports, and accept the costs that this is likely to imply for our environment, due to more intensive use of our land, and for our local economies, which will be drained by increasingly concentrated businesses. Or we can diversify our existing production, producing more of

the things we import, such as vegetables, and less of the things we export, such as barley and milk.

These strategies are not mutually exclusive but it is clear that the former has been favoured in recent years. The Secretary of State for Environment, Liz Truss, recently recommitted herself to the war against “red tape” – otherwise known as environmental and social protections – which she expects will allow farms and food businesses to expand production. With the UK already among the least regulated economies in the world, this seems like wishful thinking. She also places faith in the rise of China to increase demand for UK agricultural produce, particularly milk. This may well increase the value of our output and reduce the deficit, but it will not make us more secure at home.

Our deficit in food and drink trade is not the same thing as our food security. It is a microscope, focused incorrectly, when what we need is a broad lens. The next government should abandon the exclusively economic interpretation of food policy and seek to reorient our food system towards the goals of well-being, social justice and sustainability. Reducing our dependence on global markets through diversifying our agricultural production may contribute towards that. But dismantling regulations and waiting for Chinese growth puts our environment and local economies at risk, with no benefit for our food security. ●

Stephen Devlin is an economist at the New Economics Foundation

# Guilty until proven innocent

By Linda Field

The jury is still out on the impact of pesticides on bees, so why have some neonicotinoids been banned by the EU?

Ever since man developed the “agricultural” production of crops there has been a need to protect them from pests, pathogens and weeds that reduce yield and waste valuable inputs. Today it is estimated that between 25 and 75 per cent of crop production would be lost if no pesticides were used. In a world where we need to maximise food production, such losses are unacceptable.

The use of synthetic insecticides started in the 1940s with compounds such as organochlorines (notably DDT) leading the way. These were replaced by organophosphates and carbamates in the 1950s, which lasted until the 1970s. Doubtless these compounds played an important role in insect control but they were also toxic to non-target organisms, even mammals, which gave rise to deep concerns about their use. An important breakthrough came in the mid-1970s with the new synthetic pyrethroid insecticides, offering good control of insects and very low toxicity to mammals. They quickly became the most widely used compounds and this remained the case until the 1990s when they started to be less effective as resistance developed, and a new, even better group of chemicals, the neonicotinoids (neonics), came on to the market.

The neonics gave equally selective control of insect pests, having very low toxicity to mammals and other non-targets but they had the added advantage of being “systemic”. That is, they move through the plant and so can be used as seed treatments, avoiding costly and potentially

contaminating spraying. These properties resulted in neonics growing in use and in 2013 they took over from pyrethroids as the most widely used insecticide globally.

Though they were so effective at controlling crop pests, in 2013 the EU enforced a “restricted use” of some neonics, preventing seed treatment on crops that flower. Why was this? It all started around 2010 with growing concern that sub-lethal doses of neonics present in pollen and nectar of treated crops could affect insect pollinators, especially bees. This led Defra to do a study that concluded: “Studies do not provide unequivocal evidence that sub-lethal effects will have serious implications for bee colonies.” However, amid growing lobbying, in 2013

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There are many factors adversely affecting bees

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the European Food Safety Authority recommended that neonics should be used only on crops not attractive to bees. This led to two EU votes, the second of which imposed the restriction in use from December 2013 for two years.

While it has been shown that sub-lethal doses can affect bee behaviour and possibly make them more susceptible to other stresses, most of these studies have been done in laboratory experiments and many have used doses that are unlikely to be present in the nectar/pollen of crops.

It is true neonics can be detected in nectar/pollen at low levels but whether these are responsible for damage to bees is not proven. There are many factors adversely affecting bees (the varroa mite, virus disease, adverse weather, loss of food supplies) and trying to unravel the effect of any one component is difficult.

There is a view that if there is any risk from neonics we should restrict/ban them. However, this “precautionary principle” takes no account of risks of the ban, such as farmers having to cope with lower yields or use other, older, potentially more damaging chemistries. This came to the fore in autumn 2014 when some of the first UK crops of oilseed rape, not protected by neonic seed treatments, were badly damaged by cabbage stem flea beetle. This led to many farmers using multiple sprays of pyrethroid and, indeed, a spray of neonic, allowed under “emergency use”. The problem was compounded by the beetles’ resistance to pyrethroids.

Where are we now? In the UK, where rape is the main crop affected by restrictions, there is a big threat from flea beetles, and possibly aphids and pollen beetles. This could result in farmers not growing rape, which in turn would affect bee populations negatively, as it is a source of nectar and pollen. What we need is much more information about what lies behind bee declines, and whether these are caused by any factors we can control. ●  
*Professor Linda Field is the head of the biological chemistry and crop protection department at Rothamsted Research*

# GM: the pros and cons

Does GM still deserve its negative reputation or has science proved that it has a valid role to play?

## The case for GM

GM helps secure our food supply

Is that a cotton shirt you are wearing? If it is, you probably have genetically modified (GM) technology on your back right now. If you ate British-reared chicken, beef or pork last night, it is likely that your dinner dined on GM produce.

Given the controversy that still surrounds them, you could be forgiven for thinking that GM crops are a new, fringe technology. Yet we are more than 30 years in to the era of GM – the latest phase of crop breeding, based on human’s ability directly to change the characteristics of plants, by addition, subtraction, or alteration of DNA sequences.

Such crops, principally in the form of herbicide-tolerant and insect-resistant maize, soya, cotton and oilseed rape, have been on the market since 1996. In 2014, according to the International Service for the Acquisition of Agri-biotech Applications (ISAAA), GM crops were grown by 18 million farmers on four billion acres in 28 countries.

The benefits are clear. For farmers, growing crops and protecting them against weeds and insect pests has become easier and more predictable, leading to higher yields. For consumers, a more stable and consistent supply of food has led to lower prices. But there have been environmental benefits, too. Insect resistance allows farmers not to spray pesticides as often and, as a result, reduction of biodiversity, often the collateral damage of agriculture, doesn’t occur as much. On the other hand, herbicide-tolerant crops allow farmers to control weeds more easily, therefore reducing the need for tilling,

which damages the structure of soil and its living inhabitants. It has been estimated by independent researchers that globally, GM technology has reduced pesticide use by 37 per cent, increased crop yields by 22 per cent and farmers’ profits by 68 per cent.

Despite these proven benefits, there are no GM crops grown in the UK, a situation caused largely by the impasse in the EU approval system. Yet British and wider European agriculture is still dependent on GM technology. The European animal feed business and consequently our livestock farmers rely on imports of GM soya from South America and the United States, the vast majority of which is GM.

In February 2015, a report by MPs on the House of Commons science and technology committee concluded that adopting GM maize, rape and beet varieties could increase UK farmers’ profits by between £28m and £48m a year. Meanwhile, the National Farmers Union warns that half of the UK’s food will come from overseas “within a generation”, as a rising population and stalling productivity combine to erode British self-sufficiency further.

At the heart of opposition is the claim that GM food is a health risk. There is no evidence to support this. Despite trillions of meals being made with GM ingredients, there has not been a single proven case of harm caused to anyone who has eaten them.

Proponents of organic agriculture believe that GM is incompatible with organic methods. There is no logical scientific reasoning behind this. Agriculture of all

kinds, including conventional and organic, is an attempt to modify and control nature. For example, insect-resistant GM crops contain within their cells the same insecticidal protein approved by organic authorities for use as a spray.

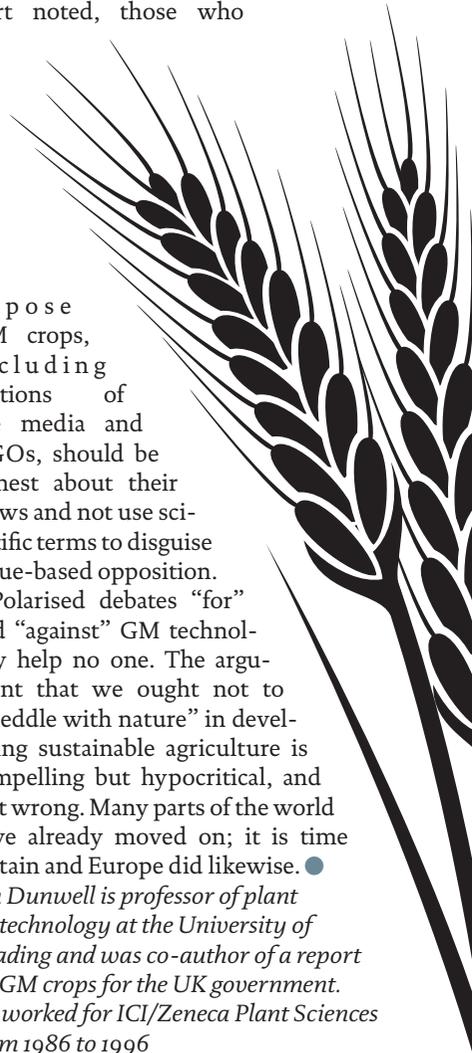
Others say GM technology is no better than modern methods of conventional breeding. But these methods would be unlikely to produce many new varieties, such as the genetically modified vitamin-enhanced “golden” rice, as Greenpeace recently acknowledged.

The tide is beginning to turn. Increasingly, policymakers are being urged not to reject GM technology unless there is solid scientific evidence that it could cause harm. As the MPs’ report noted, those who

oppose GM crops, including sections of the media and NGOs, should be honest about their views and not use scientific terms to disguise value-based opposition.

Polarised debates “for” and “against” GM technology help no one. The argument that we ought not to “meddle with nature” in developing sustainable agriculture is compelling but hypocritical, and just wrong. Many parts of the world have already moved on; it is time Britain and Europe did likewise. ●

*Jim Dunwell is professor of plant biotechnology at the University of Reading and was co-author of a report on GM crops for the UK government. He worked for ICI/Zeneca Plant Sciences from 1986 to 1996*



## The case against GM GM is bad for wildlife, bad for people

At the start of the year, the EU decided to allow countries to choose whether or not to grow GM crops. This was welcomed by a committee of MPs, who claimed that public support for GM is growing and that it would be good for GM farming. They were wrong on both counts.

First, the Food Standards Agency has just issued results from its regular polling on public attitudes to food safety. For the

first time, opposition to GM foods has actually increased, and is now at its highest since these polls began. The pro-GM campaign is wrong to say the public is becoming less concerned about GM.

Second, the EU move makes it possible for member states to ban GM on social, economic or environmental grounds, even if the European Food Safety Agency has passed the crop through its own (thoroughly inadequate) regulatory procedures. This move was condemned by Monsanto, which called it a “sad piece of legislation” and said that it was a “bad move for Europe” as it undermines science and European farmers.

However, the move has been welcomed by many EU countries because they want to ban all GM crops. In Germany, the anti-GM ministry of agriculture is strongly supported by the federal environment minister, who wants to make sure “genetic engineering cannot be used under any pretext in Germany”. The same goes for ministers in Scotland and Wales, where farming plays a significant part in the national economy, and where governments take the interests of their farmers more seriously than in England – they are determined to protect their agriculture by staying non-GM.

England’s ideological support for GM started under Tony Blair – he publicly stated his belief in GM food, whatever the public opposition, because he believed it was right (much the same as his attitude to invading Iraq). England became a strongly pro-GM country and successive governments have maintained that reputation. This is bizarre. There is a huge and growing global market for guaranteed non-GM agricultural products. English farmers recently

won a contract for the single largest export – 25,000 tonnes – of oilseed rape in more than two decades. The company involved says that it was reassurance about the prevention of GM contamination, unlike that which has occurred in shipments from other countries, which was a key reason in it winning the contract. Such exports would almost certainly end if England started growing genetically modified oilseed rape. There is no country in the world where GM food is labelled in response to public demand for GM food and sold as such in the retail market. There are no queues of consumers, in the UK or anywhere else in the world, lined up demanding GM food.

Long US experience shows that GM crops lead to lower yields, and greater pesticide use overall, as shown by research based on US government figures for pesticide use. They deliver no benefits to consumers. In the UK a five-year government study found GM crops worse for wildlife than conventional farming methods, which as UK government farmland bird data shows, is already terrible – we lose one pair of breeding birds every minute.

GM is 25 years old, and there are now newer, faster technologies, such as marker assisted selection, that are delivering dozens of better crops for farmers in Africa and elsewhere, without GM’s risks and uncertainties.

For 25 years, politicians in all parties have been seduced by misleading promises from the GM industry – the drought-busting, saline-tolerant, nutritionally enhanced, disease-resistant miracle crops have been just around the corner since Monsanto promised in 1998 that GM would feed the world.

Instead we have a reality where GM crops will not achieve any of this, but will maintain a system of agriculture that is dependent on climate-damaging, manufactured nitrogen fertiliser and toxic chemicals. That clearly benefits the pesticide industry (now misleadingly called the “crop protection industry”), but is of no use to the public. They should be consigned to the dustbin of history. ●

*Peter Melchett is the policy director of the Soil Association*



# The future of farming

By Zak Bentley

The agri-science and tech sector is a leading light when it comes to finding innovative solutions to farming and food production challenges

## Crop wisdom Barn Owl Wireless, Martin Lishman

### What does it do?

It enables grain-store managers to monitor and adjust crop temperatures and manage ventilation systems in stores remotely, via a combination of radio signals, GSM data transmission and cloud computing. The system is accessed from the internet, including through most smartphones and tablets, and enables users to manage their stores based on regularly updated data.

### Why is it needed?

The Barn Owl Wireless system can save the farmer up to 40 per cent in energy costs, as well as the farmer, or other paid labourers, not needing to check the store physically. It can be particularly efficient for those farms owned by overseas investors, who can log in to the system from their base.

### How will this impact on food security?

By ensuring that stored crops are always kept in optimum condition, Barn Owl Wireless could reduce waste by quickly telling farmers of any leaks or insect infestations. The automated temperature adjustments also remove potential for

human error in grain stores and prevent loss of quality.

## To serve and protect Robocrop InRow Weeder, Garford

### What does it do?

The Robocrop uses video analysis to locate individual crop plants ahead of the tractor the cameras are attached to. It influences the steering to identify the weeds from the crops and remove the weeds accordingly while keeping the crop intact. It can act either as an in-row weeder or an automatic crop thinner, an option controlled by the operator.

### Why is it needed?

The Robocrop is fully compliant with legislation, as the machine is purely mechanical and involves no use of chemicals. It improves efficiency in weeding, removing the need for manual labour. Trials in 2010 showed it to be 2.8 hours quicker per acre than hand-weeding in lettuce thinning.

### How will this impact on food security?

The technology leads to better-quality crops as a result of the precision Robocrop is based on, and has been developed for use on transplanted crops

such as lettuce, cabbage and celery. The use of such robotics will help prevent weeds killing crops, producing a better quality and quantity of vegetables.

## Double whammy GuideConnect, Fendt

### What does it do?

This system is based on two tractors, with one controlled by a driver while the other is driverless. The two tractors are connected via GPS navigation and radio, and the vehicle tractor will follow the manned tractor, performing the same operating procedure, replicating the tasks being performed and following a predetermined course.

### Why is it needed?

The addition of a second tractor meets the demand for larger working widths at the same time as reducing other costs.

### How will this impact on food security?

This system has the potential to double the efficiency of the driver, with Fendt hoping to develop the system to include more tractors in the system. Aside from the time saved by the additional vehicle, it would help keep costs down. The driverless tractor would also be useful

for repetitive farming tasks such as destoning bed soils and row crop work.

## A bird's-eye view

URSULA Scout,  
URSULA Agriculture

### What does it do?

Imagery of farmland captured by an unmanned aerial vehicle (drone) is analysed to provide precise locations of weeds. Carrying specialist cameras and sensors, it is completely autonomous and uses satellite tracking to fly between waypoints.

### Why is it needed?

It provides data that helps improve control of weeds, pests and disease to achieve higher yields. It enables the farmer to target the intervention required precisely, leading to a more efficient use of chemicals, as well as a more accurate knowledge of the farm.

### How will this impact on food security?

A key benefit of URSULA Scout is the improved control of black-grass weed populations. Providing precise locations of these weeds can reduce the number of damaged crops. It can also ensure effective herbicide application and enable the farmer to concentrate efforts on crops needing more attention.

## Precision pesticides

N-Sensor,  
Yara

### What does it do?

N-Sensor is a tool placed on top of the tractor, allowing farmers to measure a crop's nitrogen requirement as the tractor passes across the field, and to apply nitrogen at an appropriate rate. This happens instantaneously as the tractor passes through.

### Why is it needed?

N-Sensor increases fertiliser efficiency by applying exactly what is necessary (too much nitrogen is damaging for both the crops and the environment) and helps abide by EU legislation. It also helps keep the quality of crops homogeneous across the length of the field.

### How will this impact on food security?

With the use of precision farming, the N-Sensor greatly optimises crop



Life's too short: female offspring of this GM fruit-fly won't see maturity

quality and consistency. Yara's own trials across a 13-year period showed its use can increase yields by up to 10 per cent. Lodging – areas of cereals that fall flat, a common cause of crop loss – was reduced by 80 per cent when using N-Sensor, preventing significant crop waste. It also proved to have a great impact on the environment, making nitrogen savings of up to 14 per cent.

## Fruit fly can't fly

Oxitec GM fruit fly,  
Oxitec

### What does it do?

This genetically modified version of the male Mediterranean fruit fly contains a gene that ensures any female offspring will die before reaching maturity – resulting in fly-free orchards.

### Why is it needed?

The Mediterranean fruit fly in its current form can infest more than 300 types of cultivated and wild fruits, vegetables and nuts. Oxitec says that despite the use of pesticides, between 20 and 40 per cent of food production is lost to insects. Its solution is an ambitious attempt to solve this problem.

### How will this impact on food security?

If Oxitec's technique is to work, the world may see far fewer damaged crops and a large increase in successful food production. Trials for Oxitec's flies have

been approved in Brazil. If these trials are successful this could be commercialised in a couple of years.

## The greenhouse effect

Thanet Earth greenhouse,  
Thanet Earth

### What does it do?

Thanet Earth is the UK's largest greenhouse complex, producing tomatoes, peppers and cucumbers for sale in UK supermarkets. All crops grown here are hydroponic, involving the plants growing in water rather than soil. Controlled by a computer, a dripper provides them with food and water, dependent on such factors as the weather, time of day and light levels.

### Why is it needed?

Thanet Earth is a limited answer to the food security question and the climate change threat that comes with it. The hydroponic conditions in which the fruits are grown allows their growth to be advanced in order to meet peak market demands.

### How will this impact on food security?

Currently, Thanet Earth produces 12 per cent of the UK market for tomatoes and cucumbers. Despite the 91-hectare size of the site, the complex, based in east Kent, will not solve the world's food security crisis. What it does do is create a blueprint for other countries to follow. ●

# 2015 GENERAL ELECTION

OUR POLICY PRIORITIES FOR THE NEXT GOVERNMENT



**Crop Protection  
Association**

Agriculture in Britain and Europe is at a crossroads. It is estimated that, in the face of climate change, pressure on finite natural resources and dietary preferences, feeding a global population set to reach 9.5 billion by 2050 will require a 70% increase in global agricultural productivity. Yet policy-makers in Europe seem dedicated to reducing Europe's agricultural capacity, rather than establishing the right conditions for us to play our part in feeding ourselves, and the world.

The next UK government must not only ensure that Whitehall and Westminster properly support domestic food production, but they must also pursue a pragmatic yet robust approach in Europe, from which the lion's share of policy and regulation affecting British agriculture currently stems. The world cannot afford for Europe to become the museum of global agriculture, and the UK government must demonstrate a progressive and enlightened leadership in promoting modern, productive and sustainable agriculture.



To achieve this, the next UK government must take a strategic approach to food policy: to combat concerns about our own food security (less than 60% of food consumed here is now grown on these shores), to help drive job creation and economic growth, and to meet our moral obligation to help to feed a growing global population. To this end, the CPA is calling for the next government to produce a UK Food Plan, which at its heart must address **three key priorities: the "Food Proofing"** of policymaking, a commitment to **science-based decision making**, and the championing of **innovation and proper risk management**.

## A UK FOOD PLAN:

At the heart of the government's food plan should be a commitment to a balanced approach that protects and enhances our natural environment whilst increasing UK agricultural productivity. Our three policy priorities underpin that commitment:

1

### 'FOOD-PROOFING' POLICYMAKING

Policymakers must ensure the needs of domestic food production are properly considered in the development and implementation of all public policy. The next government should institute protocols, similar to established practices such as rural-proofing, to 'food proof' policymaking and avoid any unintended consequences that can damage productivity.

2

### SCIENCE-BASED DECISION MAKING

The next UK government must commit to science-based decision making and pay heed to the advice of government Chief Scientific Advisers. This must be accompanied by a commitment to proper risk-assessment on matters where questions of precaution arise, such as the use of innovative technologies in agricultural production, something the UK government must press for in the EU.

3

### THE 'INNOVATION PRINCIPLE'

There should be a clear commitment to innovation through better regulation. Innovation is a risk taking activity, but it's one that stimulates economic growth, creates jobs and provides solutions to the major challenges facing society. The UK government, and in turn the EU institutions, must adopt an 'Innovation Principle' which ensures that impact on innovation is taken into full account in policy and legislative processes.

For further information please visit  
[www.cropprotection.org.uk](http://www.cropprotection.org.uk)



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