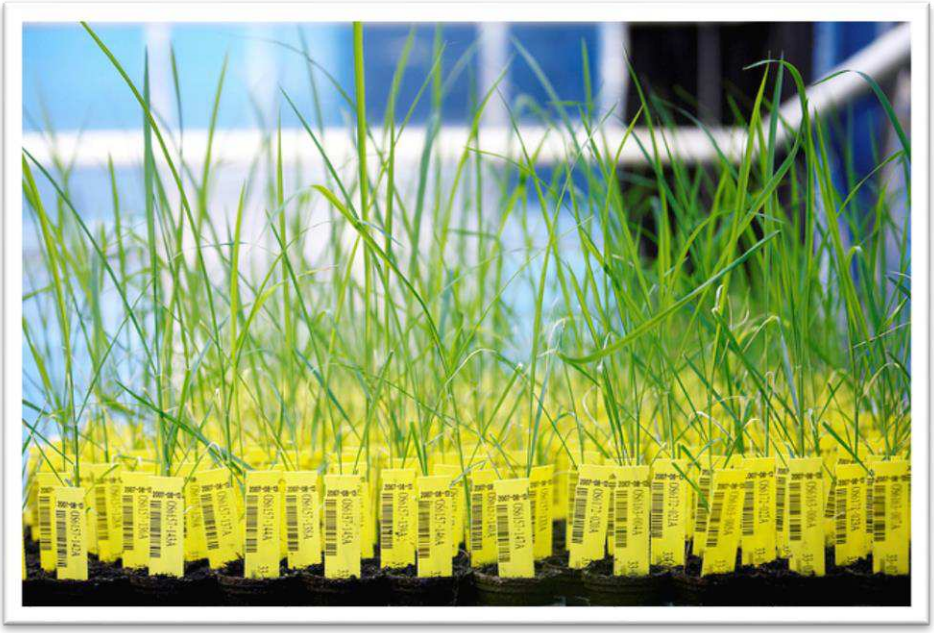
Number 64
26 August 2015

Economic Bulletin

THE GREEN REVOLUTION WE NEED AND ITS ANTI-SCIENCE OPPONENTS



- Anti-science greens endanger both the economy and the environment
- GM crops are safe and could increase food supply whilst protecting the environment
- Shale gas and nuclear power are valuable and clean energy supplies
- The UK and EU should embrace biotech innovation and scientific progress

1. INTRODUCTION

Vitamin A deficiency causes enormous suffering amongst those afflicted by it with blindness and ultimately death being the final outcomes for many in the developing World. The World Health Organisation (WHO) has estimated that one in three pre-school children in the World is vitamin A deficient with half of the children who become blind dying within a year. It is therefore a travesty that one of the most effective ways to save these lives through a genetically modified crop known as Golden Rice has been constrained for so long. Despite being ready for trials since 2000 and

being offered for free to those who need it most, a toxic cocktail of government imposed bureaucracy, outright sabotage and scare-mongering with no credible basis in science have prevented it from being taken up on a worthwhile scale. In the meantime, millions of children have gone blind and died.

Unfortunately, this extends far beyond Golden Rice and the development of GM crops. An array of activists and politicians are simply choosing to ignore the evidence that technologies ranging from shale gas extraction to nuclear power can make us greener, safer and healthier. This vehement opposition to crucial scientific advancements in the UK and elsewhere must be overcome.

2. GM CROPS

Norman Borlaug's work on increasing crop yields along with the expansion of irrigation infrastructure in the middle of the last century led to a huge increase in agricultural production and food security. It is clear that another wave of technological progress is needed to feed a growing population. The UN estimates that food production needs to grow by 70% by 2050 in order to meet rising demand. This means that the Total Factor Productivity (TFP) growth of agriculture will have to continue to rise. The OECD estimates that between 1961 and 1970, the average annual TFP growth rate of agriculture in developed economies was 1% and in developing economies it was 0.7%. This annual growth rate has increased steadily in recent decades to reach 2.4% and 2.2% in developed and developing economies between 2001 and 2009. Increasing agricultural productivity is necessary but by no means inevitable.

Allowing the growth of GM foods will allow scientists and farmers to reinvigorate Borlaug's Green Revolution through new ways to increase crop yields. This could mean growing crops which are more resistant to diseases, insects and herbicides, more capable of surviving in adverse weather conditions and better able to provide the nutrients which are essential for human and animal health. If food production on the same scale today was generated using the methods of the 1950s, then 82% of all land would need to be used for farming instead of 38%.

As a result, aside from helping to reduce global hunger and to increase life expectancy, extending the use of GM crops would allow much less intensive use of land, greater resilience to a changing climate and a reduction in the need for plant protection products. A recent meta-analysis of the impacts of GM crops which looked at 147 original studies showed that adopting GM technology increased crop yields by 22% and farmer profits by 68% whilst reducing the use of chemical pesticides by 37%. The gains are even higher in developing countries than in developed countries.

Despite heavy restrictions and outright bans across the World, the use of GM crops has grown steadily since the first commercial plantings in the 1990s to reach 18 million farmers on 181 million hectares across 28 countries. This means that there is now robust evidence on whether GM crops are safe for human consumption. The results are clear. A meta-review published last year examined the last decade of GM crop safety research and looked at 1,783 research papers, reviews, relevant opinions and reports.

The meta-review concluded that GM crops are safe for human and animal consumption with not a single credible paper showing a negative effect on people or animals consuming them. It also concluded that there is "little to no evidence" of GM crops having a negative environmental impact or negative impact on native animal species. Indeed, non-GM crops were found to reduce biodiversity more than GM crops. As the WHO has pointed out, "no effects on human health have been shown as a result of the consumption of such foods."

Unfortunately, anti-GM activists don't just spend their time condemning food businesses or making bland statements about how nature is too complicated to understand. They have been incredibly effective at scare-mongering over the effects of GM foods, disrupting trials and even burning crops in the UK and elsewhere. However, whilst Hard-Left activists can terrorise innovative farmers, it is the fault of policymakers that such heavy burdens have been placed on the advancement of this biotechnology. No GM crops are grown commercially in the UK and the contribution of EU countries to global GM cultivation is negligible with only one bioengineered crop being commercially cultivated.

The Scottish Nationalist Government is merely the latest executive power to engage in intellectual vandalism by banning GM crops on the basis of protecting the clean reputation of its food and farming industry. Of course, this seems to forget that traditional agriculture still relies heavily on the use of pesticides and fertilisers and that countless staple foods from carrots to almonds to cauliflower have gone through human alterations in the past. Moreover, it means that developments like omega-3 enriched oilseeds which could lead to more sustainable salmon farming are under threat.

Across the EU, the Commission proposes allowing member nations to ban GM crops entirely for non-scientific reasons. This adds to the current practice of individual countries being able to block EU-wide approval of new GM crops and is a serious impediment to biotech innovation in the UK. It is not entirely clear how that is compatible with a professed belief in the Single Market or indeed with supporting farmers and consumer choice. Furthermore, as the Science and Technology Commons Select Committee argued earlier this year, the EU's Precautionary Principle is acting as a powerful barrier to progress; something that the CPS has discussed before. The regulations assume GM crops are intrinsically more dangerous than non-GM crops, don't seriously consider the benefits of the crops and can lead to applications being delayed for decades.

EU regulatory constraints on GM crops are also depressing rural economies; it is estimated that European farmers could see annual revenue growth of up to nearly €1 billion if they could cultivate GM crops such as cotton and soybeans. Across the World, unnecessary regulation is crushing research and development in biotechnology. For example, genetically modified trees can grow more wood and deal better with forest diseases and pests but only gained approval after a decade of field trials. Unfortunately this does not bode well for cutting edge developments such as gene drive technology which could transform medicine and agriculture. GM technology can significantly increase food supply, reduce environmental damage and is safe and ready to be used right now.

3. SHALE GAS

As with agriculture, so it is with energy. The UK's domestic production of primary fuels has fallen by 29% since 2010 and by 62% since the peak in 1999; net energy import dependency is at 45%. It is quite clear that extracting the UK's own reserves of shale gas using fracking could help to increase our energy security. Furthermore, Poyry energy consultants estimate that if shale gas production in Lancashire is allowed to proceed, gas prices could fall by 2% to 4% from 2021 and gas import dependency will be 58% in 2030 compared to 79% without any shale gas production. Embracing fracking in the UK could also create tens of thousands of new jobs and boost industrial competitiveness.

The economic reasons to frack are clear but so are the environmental reasons. As Richard and Elizabeth Muller explained in their CPS report, the PM2.5 air pollutant is killing more than 3 million people every year, mostly in the developing World. This little known but deadly air pollutant is caused primarily by burning coal which causes secondary chemical reactions from emitted sulphur and nitrous oxides. By comparison, shale gas leads to an average 400-fold reduction of PM2.5 and 4000-fold reduction in sulphur dioxide and a 70-fold reduction in nitrous oxides. As we move to more sustainable energy sources, shale gas can be an effective bridging fuel as its carbon emissions are also far lower than for coal.

As the Royal Society and Royal Academy of Engineering have argued, the "health, safety and environmental risks can be managed effectively". Concerns over water pollution and scare stories about earthquakes have been completely overblown. The risk of water contamination is very low and any seismic activity is likely to be even smaller than would be generated by coal mining. Every serious environmentalist should support fracking.

4. NUCLEAR POWER

Nuclear power is a large scale, abundant, low carbon energy source using a developed technology. Globally, it could be crucial in providing secure energy supplies whilst aiding the transition to a sustainable energy mix. Unfortunately, once again it seems that fears over the safety of nuclear power – enthusiastically encouraged by some on the Green Left – have been grossly exaggerated. Of course, radiation is a concern but under a sensible regulatory framework the risks can be well managed.

Studies published in the British Journal of Cancer argue that there is little evidence that living near a nuclear power plant increased the risk of developing childhood leukaemia. Other studies show that there is no difference in cancer incidence between those living near nuclear power plants and the general population. An older, comprehensive study by the US National Cancer Institute concurs. Elsewhere, Kharecha and Hansen concluded that nuclear power has in fact contributed to a large reduction in global mortality because of the fall in air pollution and the Tyndall Centre for Climate Change Research argues that the safety risks from nuclear power are comparable to the lifecycle impacts of renewable energy technologies.

5. MARKET ENVIRONMENTALISM

Climate change is not the only environmental challenge; air pollution, water pollution, soil quality and the preservation of biodiversity are all critical. The response to many of these environmental challenges should be to extend the role of markets, to develop and strengthen property rights and to give people a more powerful incentive to protect the environment. For example, deteriorating water security with falling chemical and biological quality is a cause for concern. Allowing the growth of water trading will provide an incentive to invest in water infrastructure, storage and piping and the result would be less leakage and improved water quality.

Unfortunately, hostility to the role of business and markets for too many greens comes alongside reactionary opposition to new technologies and an anti-science attitude. The argument that water, food and energy are too important to be left to the market forgets that it is only because of the market that we can get the innovation and scale of production necessary for a growing population and changing climate.

6. CONCLUSION

Failing to embrace technological progress is endangering the environment, the economy and millions of lives. The overwhelming body of evidence points towards GM, fracking and nuclear power as vital tools to deliver greater human prosperity and a safer, greener planet. We cannot afford to ignore these tools.

7. MUST BE READ

- Why every environmentalist should favour fracking – Richard Muller, Elizabeth Muller
- Britain must act on water security – Adam Memon, Angeliki Terpou, Tim Knox

8. MUST BE READ ON CAPX

- Scientists could end animal cruelty – Daniel Bier
- The women wealth creators of the West Bank – Joe Ware

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