



In our last issue we published two articles which provided evidence of agronomic and environmental benefits from the use of GM crops.

These demonstrated significant cost savings to growers and that those financial benefits were greatest for farmers in the developing world. A role of this journal is to provide evidence based information into the public domain to help decision makers and practitioners reach rational decision, driven by facts rather than emotion.

With that in mind we make no apology for publishing in this issue a review of the disadvantages of these crops and a critique of many of the claims made for their benefits. The article by Helen Wallace argues that:

1. It is unsatisfactory that large international companies should supply a high proportion of seed. It is claimed this:

* Has destroyed small scale and self- provision of seed by individual farmers. However, as many conventional crops are hybrids seed saving for re-sowing is not appropriate.

* The technology focuses research on areas where profit is most likely to be made thus reducing potentials social benefits of the technology. This may be seen as an issue of policy failure rather than a critique of the GM technology, particularly as in these financially straitened times large public investment in agriculture is unlikely to be made; simply because governments do not have any spare cash.

* The products are protected by patent. This can be presented in an acutely hostile way when the revenue from a patent is attached solely to a specific product that has become widely used. In practice, however, only such revenues make it attractive for companies to undertake high cost research programmes, most of which lead to no direct commercial return but lie at the root of discovering new, needed, technologies for future use.

2. The gains from GM technology are ephemeral as resistant pests and diseases will develop, requiring resort to more potent chemical means of control than those currently employed by the industry.

* This argument applies to every new technology. As methods change new niches arise in the system to which plants and diseases adapt. It is also quite relevant to the existing systems of crop production. Weed, pest or disease resistance is something farmers grapple with every day.

3. Concern exists about unintended impacts, applies to every technical advance from the industrial revolution to IT which is transforming wide areas of social life and the economy.

The response surely is not to ban innovation but to monitor all new systems and explore the multitude of possible impacts. In fact GM has been subject to more rigorous (not to say hostile) monitoring than any other of the innovations currently reshaping the world in which we live. We need to keep vigilant but the evidence so far does not seem to justify prophecies of catastrophe.

This point is accentuated by the fact that in Europe the agricultural industry does not feel able to undertake the research to explore how herbicide tolerance, for example, may be used as a tool to enhance farmland biodiversity by developing new treatment regimes.

This point was explored in an earlier issue of the Journal, using herbicide tolerance in sugar beet as an example.

4. The article makes reference to the environmental impact of the technology by quoting a number of situations where the use of GM technology plus herbicides has led to loss of habitat and nutrition for wild species of plant or animal.

These are of interest but the overall impact of new technology has to be assessed in terms of its ability to sustain increased agricultural output on a finite land area.

The argument also tends to miss the point that any form of agriculture replaces the pre-existing land use and habitat and that man has thus been changing the genetic structure of our crops and stock and destroying tracts of the environment since farming began.

Inescapably, by whatever means, if we are to cope with growing numbers of people and rising real incomes we have to farm more intensively. GM technology seems to be one of the more promising ways in which that might be secured.

If nothing is done, then more and more of the marginally fragile land area will come into use – impacting on the total environment, including wild species and on the system as a whole, to provide the food required.

We now have an opportunity to use a novel technology to reduce use of pesticides and the greenhouse gasses associated with agriculture. Surely, if we are to preserve the critical and delicate parts of the earth's biosphere, we need to do all we can to make our industry as benign as possible.

We are aware that for a long time the impact of biotechnology was said to be enormous – but 10 years away. Now we have some real progress but some of the more important goals, nitrogen fixation and drought tolerance, remain largely undelivered.

The appropriate response is not to stop exploiting GM technology, but to recognise that it is a long-term project demanding investment on a substantial scale which may not necessarily lead in the short or even medium term, to the solutions we seek.

It may be that this is an area in which public funding is essential and where hostile propaganda will make it politically unacceptable. The long run real costs of such neglect should cause alarm.

Some of our readers may have seen the recent set of articles on the technology in *Nature* (Volume 497, No. 7447; 2nd May, 2013).

There is not the space, nor is it appropriate for us to discuss these articles in detail. Suffice it to say that the papers highlight benefits as well as disadvantages, demonstrating that the technology is not going to solve all our problems, but is clearly a solution to some.

To refuse to engage or explore the technology by vilification or ignorance of the facts is unhelpful. Man is a curious as well as potentially destructive animal.


The technology is here. We believe the right approach is to exploit those components which offer benefits to the industry, by simplifying and reducing production costs, the environment, by allowing us to reduce harmful greenhouse gasses and pesticide use and thus the loss of yield owing to these challenges.

That will lead to societal benefits and help us to develop the most appropriate use of this new development in the age old art of plant breeding.

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 Professor Sir John Marsh,

 Robert Cook

 18th June 2014

Comments

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