



Aims

This was the first meeting in the series, and the aim of it was to help lay the foundation for the rest of the year by taking a global view of the connections between food security, biodiversity and bioenergy. The three witnesses will also use their research and interests to think about some of the research pathways that will help us to prepare for and address these future challenges.

Witnesses

This month, the three witnesses were:



Dr Tina Barsby

Chief Executive
The National Institute of Agricultural Botany (NIAB),
Cambridge



Ariel Brunner

Head of EU Policy,
BirdLife International, based in Brussels



Professor Paul Dupree

Professor of Biochemistry,
Department of Biochemistry, University of Cambridge

Witness introductions

This month, the witnesses were asked to focus their introduction on two questions:

- 1) What do you perceive as being the main gaps in our knowledge?
- 2) What would you include in the 'next generation' of research questions?

Take home messages

After the meeting, everyone was asked for the three things that they took away from the discussion and what aspects of it they found most interesting

Doug Crawford-Brown

1. Under what political, legal, social, etc conditions would genetic engineering of crops gain broader support, especially in the EU?
2. Subsidies for specific crops may distort the market for crops, but they also have other aims, such as preserving specific rural lifestyles. How do we balance the food aims of policies against these broader cultural aims?
3. If we were to turn crop processing into a biochemical production process that could turn out many different products from the same raw crop stock (food, fuel, fibre for clothing, etc), what would/should the mix of products be and how would this be governed (if at all)?

Howard Griffiths

1. Recognition of global convergence on the lowest common denominator - in that internationalised markets are driving down commodity prices and human nature demands higher living standards for less; but balancing populations demands for energy and food security will increasingly demand local solutions for local people (my "Royston Vasey" scenario- League of Gentlemen)- be it local solar/energy generation including solar, wind and perennial biofuel crops or intensifying agricultural production and marketing
2. How to tackle such an apparent contradiction - education in both developed and developing world, and transparency in delivery and use of aid packages to encourage local resilience, but need for Cambridge to harness the power of those global drivers and use our collective expertise to make a difference
3. Compromise compromise compromise - in reaching agreements, providing policies and imposing regulations- and recognise/respect the views of others. However, whether an ardent conservationist, GM proponent or climate change denier, present the evidence for risk and reward calmly and encourage a positive outcome. Stop moaning and have a positive attitude.

Peter Guthrie

1. (Tina Barsby) there are distortions in levels of research for different crops based on commercial returns for companies; seeds get precedence over vegetative crops – this is a Cinderella issue where knowledge that should benefit society is not gained because there is not a profit driver.
2. Policy (Ariel Brunner) is subject to pressure groups even in the face of overwhelming evidence – the differing strengths of pressure groups (eg farmers) distort the direction of policy making
3. Research (Paul Dupree) is focussed and narrow (for well understood reasons) leading to knowledge gain being the dominant rationale rather than increased understanding of a recognised problem. Paul said he would continue his research into lignocellulosic sugars even if it were shown to be leading up a blind alley. The consequence of this is that the scientists (academic researchers) are not the ones who decide what to research or what the implications are. So who is? There is an implication that the Research Councils have this role; are we satisfied they have a sufficiently broad remit? I am not sure I am.

Ian Hodge

1. Participative plant breeding
2. Priorities for biodiversity conservation (in context of climate change) and potential accommodation with farming
3. Corporate roles in developing and influencing agricultural technology

Helen Curry

The three speakers intersected (and conflicted with one another) in ways that did push the discussion in useful directions.

I was struck overall by the difference in the speakers' expressions of faith in technological solutions. For example, it was clear from Tina Barsby's comments that she sees genetics as the solution to problems of both food security and environmental degradation (i.e., we can just use genetic tools to breed better crops that use fewer chemical inputs); but by comparison, Ariel Brunner seemed to categorize the achievements of genetics to date as one of the major threats to food security and a source of environmental degradation (i.e., the success in creating high-yielding crops has narrowed our diet to a few crops which are mostly inbred and which require uniform environmental conditions and high levels of chemical inputs).

My own research on the histories of agricultural technologies and conservation biology leads me to sympathize more with Brunner than Barsby. In fact, I felt like his views of both technological realities and human nature were as sensible as any heard from those of us engaged in more academic pursuits. He was very clear and convincing in his explanation that technological fixes are never so straightforward as is initially imagined, with unanticipated ramifications all over the place, and also in his point that we cannot simply expect people to eat food that is more sustainable to produce and deliver (as is also evidenced every meeting in meals we eat...)

Therese Rudebeck

Tina Barsby talked about how research is driven by the market, and particularly how/what crops get on to the market. She argued that there is a tension and a gap between the commercial value of supply and the public demand for crop varieties – mentioning so called 'orphan crops' such as sugar beet which reproduce vegetatively and where relatively little research has been directed towards. Targeted genetics is the only way to go.

Burning research issue: Genetics. We all depend on plants, we need to develop the tools.

- How do you involve farmers into the breeding process/participation?
- How do we get the sorts of technology developed for commercial gain into non-commercial areas? (vegetative + African market = double negative)

Ariel Brunner argued that there are real tensions between agriculture and biodiversity, between various scales, between lobby and necessary shifts (disinformation campaigns), between the old and transformed world etc.

Burning research issue: what really matters/what are really the problems around land use? AND developing holistic sustainable farming scenarios for specific locales.

- We're still missing a quantitative analysis of the key drivers behind biodiversity loss
- Sustainable farming...what is it? ; relationship between sustainable farming and biodiversity and conservation? ; what are the elements of risk built into innovations such as high yielding crops
- Food security today is a local, not a global issue – how can we bring scale into this discussion?

Paul Dupree argued that there is huge potential for creating biofuels from the sugars in plant cell walls. For example, it is now feasible to convert these sugars into ethanol and it is becoming more economically viable.

Burning research issue: look for the opportunities for renewables – for example, waste materials.

- What are the effects of developing these technologies on land use (e.g. is less land used because fuel production is more efficient or is more used to grow biofuels because it's more profitable?) and on soil (e.g. the straw is being removed)?
- What are the effects on greenhouse gasses?
- Can it be economic without government incentive?
- Could it be used as animal feed?

